An Evaluation of Maritime Policy in Meeting the Commercial and Security Needs of the United States

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Executive Summary

This report evaluates the adequacy of current maritime policy in meeting the commercial, economic, security and environmental needs of the United States in the next three decades. The report assesses ability of the maritime transportation system and maritime policy to cope with increasing trade volumes. The evaluation is conducted in the context of a long-term forecast of the foreign trade of the United States through the year 2038. The forecast and the participation of the United States in global trade are presented in sections I-III.

Section IV describes current federal role, and especially the role of the Maritime Administration, in the areas of port development, shipbuilding, national security, taxation, labor and safety laws, the environment, vessel operations, maritime education, technological improvements and the Marine Highway Initiative. Where appropriate, the policies are assessed for meeting the current and future commercial, security and environmental needs of the nation. The section describes which policies are contributing to sustaining the competitiveness of the United States in the global maritime industry and which are hindering or failing to support such competitiveness.

Section V then describes the obstacles to reform in maritime policies. Section VI explores options for reforms to maritime policies that are not meeting the commercial or other needs of the nation as well as the possible consequences of these reforms.

The findings of this report lead to the overall conclusion that the current body of policies is only supportive of domestic maritime trades. Policy is not supportive of U.S. participation in international trades. The U.S.-flag oceangoing fleet has been in decline relative to the fleets of other maritime nations. Building ships in the U.S. and operating U.S.-flag ships is more costly than building or operating ships in other nations. However, the report also finds that possible reforms can lend more support to the U.S. maritime industry.

Furthermore, the report finds that there is a greater disconnect between U.S. maritime policy and the current state of the global maritime transportation system and foreign trade. Maritime policy is constrained by legislative authority and remains narrowly focused on vessels. However, vessels and the ports they call on are only one portion of the global transportation and supply network that delivers goods to U.S. consumers and businesses and serves the needs of the nation's exporters. The maritime transportation system also consists of the multi-modal networks that link to ports and inland waterways. Changes at ports, shipping patterns and vessels affect the types and volumes of goods transported on U.S. highways and railways. Waterborne transport can be either a solution or a contributor to congestion on the nation's roads. Policy makers have a large role in determining which one it will be. The emergence of short-sea shipping and better multi-modal coordination in port development can alleviate congestion and environmental degradation. Such action will be even more crucial as trade volumes are forecast to increase. Transportation policy must recognize that the operating fleets are inextricably connected to a widespread network of ports and inland transportation links including railroads and highways.

An industry oriented, commercially sensitive organization within the United States government is needed to grapple with oversight and foster iterative communication with industry, to support the flow of goods. Past levels of investment and attention to the industry have not kept pace with global trade realities. Government support for the system of freight transport must anticipate and respond to potential bottlenecks that could serve to undermine economic growth. The main policy challenge is to ensure that the maritime system will have adequate capacity and reliability to transport ever increasing volumes of cargo and numbers of people in an efficient and environmentally sound manner.

Introduction

As the report will demonstrate, global trade is very critical to the U.S. economy, and the maritime system underpins the vast majority of U.S. international trade. In fact, about 78% of goods by volume that the U.S. sells to and buys from the rest of the world move by water. International commerce by water affects people and industries throughout the entire country, including those living far away from the coasts. Many goods that consumers regularly purchase arrive at the nation's ports, and are then distributed by rail and truck to warehouses, retailers and finally to consumers. Farmers and manufacturers rely on the maritime network to sell their goods overseas. In addition, the maritime domain itself is responsible for thousands of jobs on vessels, ports, shipyards, and numerous support industries. Clearly, the maritime system is comprised of a myriad of users, supply-chains, and connections to other modes and industries. Disruptions or inefficiencies in the maritime system can thus have costly impacts on a large number of participants in the U.S. economy.

The report will also demonstrate that trade is forecast to grow substantially in the next three decades and will comprise an increasing share of U.S. GDP. Positioning and preparing the U.S. maritime industry to transport a larger share of traded goods is critical to the U.S. economy and national security interests. A larger U.S. share in global maritime trade industries – including shipbuilding, oceanborne shipping, logistics, multi-modal transport and support service – leads to higher rates of job and national wealth growth. Investments must be made today in order to ensure that the U.S. maritime system will transport a larger share of tomorrow's increasing volumes of goods and passengers in an efficient, competitive, secure and environmentally sound manner.

However, current maritime policy is not focused on the maritime system as a whole, and does not consider the role of international and domestic waterborne commerce in national wealth creation. Nor does it focus fully on the infrastructure needed to ensure that the anticipated volumes of future trade will flow smoothly through the U.S. economy. Instead, due to the legacy of the Merchant Marine Act of 1936, maritime policy making is heavily focused on the U.S.-flag fleet. While the U.S.-flag carrier fleet is an important part of the maritime transportation system, it is only a portion of the whole system, and must be approached with the broader context of maritime freight transport and the free-flow of commerce through out the economy.

The U.S. Flag Merchant Marine

The Maritime Administration defines the U.S. Merchant Marine as “the commercial ships or fleet of a nation, and to the people who operate them. The United States Merchant Marine also serves as an auxiliary in time of war or national emergency, transporting goods or materiel needed by the Armed Forces.” The Merchant Marine consists of several components, including the ocean going fleet and the inland-waterway fleet.

The world merchant fleet in 1975 consisted of 22,872 ships with a capacity of 556,572,000 deadweight tons. At that time, the United States ranked eighth in terms of deadweight

tonnage. In 1975 the U.S.-flag fleet included 857 oceangoing ships with a capacity of 17,694,000 deadweight tons.

As of December 2007, the ocean going fleet consisted of 89 ships operating in the U.S. foreign trades and 100 ships in the ocean going "Jones Act" (U.S. origin to U.S. destination) trades totaling 8,593,243 deadweight tons. This ocean going fleet is down sharply from previous years: at the end of 1996, there were 291 active oceangoing ships in the U.S. fleet.[1]

At present, U.S.-flag ships carry only about 1.5 percent of the foreign trade of the United States, despite the increasing importance of trade to the nation for economic development and rising concerns and threats to national security.

In addition to the oceangoing fleets, the domestic "Jones Act" fleet includes over 38,000 vessels representing an aggregate investment of $48 billion. This fleet operates in the U.S. inland waterways and the Great Lakes. The building and maintenance of the Jones Act fleet sustains roughly 150,000 direct and indirect jobs throughout the U.S. economy.[2] The maritime industry also includes the U.S. shipbuilding industry. As of December 2007, 21 oceangoing ships for the Jones Act trades were on order for construction in U.S. shipyards. As of May 1, 2008, the fleet operating on the Great Lakes consisted of 63 ships with a capacity of 1.9 million net tons.

The operating fleets are thus a crucial component of the U.S. economy and maritime transportation system. However, as the report will demonstrate, the forecasted volumes of imported and exported goods to be moved over the maritime system and other modes, will not be supported by the U.S. fleet alone.[3] Transportation policy must recognize that the operating fleets are inextricably connected to a widespread network of ports and inland transportation links including railroads and highways.

The maritime system and maritime policy as they both stand today are not fully capable of handling the large increase in the flow of goods and people that is expected to materialize in the next few decades. National transportation policy creation must recognize the critical role of the maritime transportation system in the U.S. economy and recommend actions to ensure that the future U.S. maritime system will have the adequate capacity, efficiency, and environmental integrity to support continued growth of the domestic economy and to secure U.S. leadership in the world economy.

The Maritime Administration Strategic Plan notes a need to increase U.S. transportation options, including the maritime sector, in order to promote continued economic growth and provide for the safe and efficient movement of domestic and international freight. The Strategic Plan notes a need for vessels suited to moving all kinds of cargo to support the increasing volumes of U.S. trade. This in turn requires an advanced network of ports,

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[1] The counts of ships refer to self-propelled ships with a capacity of 10,000 deadweight tons or more.

[2] ***The Economic Contribution of the U.S. Shipbuilding Industry.*** Prepared by LECG, LLC for the Shipbuilders Council of America. April 2002.

[3] The forecasts are for U.S. imports and exports and do not include domestic offshore, U.S. coastal and inland waterways maritime cargo movements.

terminals, truck fleets, rail cars, and barges to carry the cargoes to the consumer. Operating this system requires trained personnel ashore and afloat and support services to keep the total transportation network up and running.

The growth of U.S. international trade has exceeded the growth rate in the overall economy for over twenty-five years and the large majority of traded goods tonnage moves by water transport. Therefore the statement of the need to increase maritime sector transportation options as a part of overall transportation options derives directly from observed growth patterns in the economy.

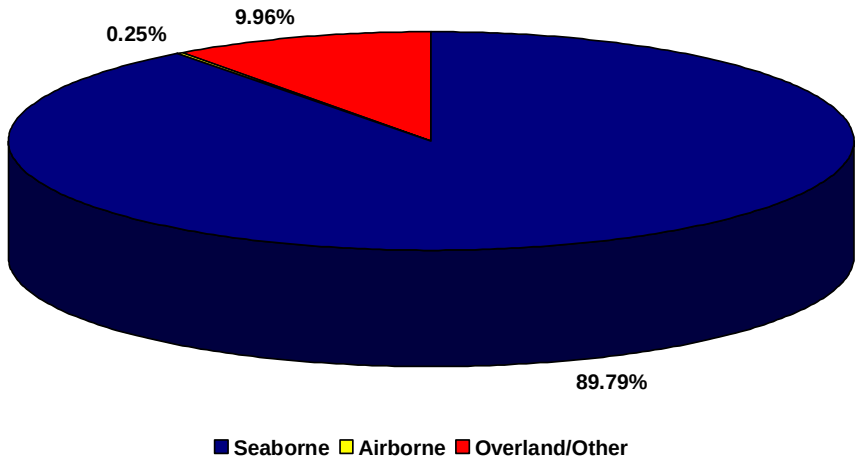
The report begins with an assessment of the current state of the global trade and maritime system. The role of the U.S. economy and U.S. Federal policy in trade and transportation markets are evaluated within the global system. U.S. participation in global maritime trade will be presented through data, highlighting the flow of goods between various trading partners. Next, the report will discuss the expected future demand on U.S. maritime infrastructure and institutions as driven by growth in global trade. Current U.S. Federal policies, including their role in shipyards, taxation, maritime education, port development, the environment, national defense, and policy consolidation, will then be assessed for their abilities to meet the expected future needs of the maritime system. Finally, prospective reforms and impediments to those reforms will be discussed and considered.

I Global Economy: Trade and Transportation Markets

International trade is crucial to the world economy. According to the OECD, total world trade reached almost $3 trillion (in 2000 U.S. dollars) in 2007. Together with the flows of finance, information and people, the flows of goods integrates the world's economies. Trade in turn is underpinned by a global transportation and communication network. Reviewing the data on global trade generally leads us to recognize that trade is growing not only in absolute terms but also as a portion of both the global and U.S. economy.

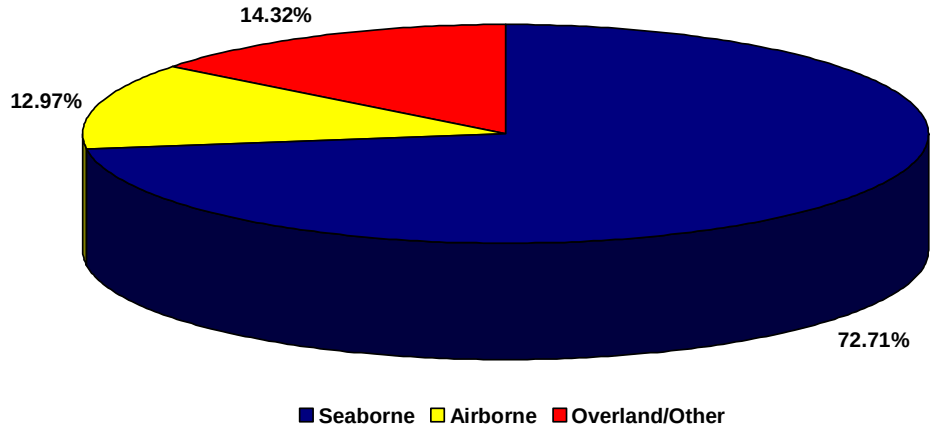
As demonstrated in Figures 1 and 2 below, the maritime domain comprises a large portion of this network, and is crucial to all participants in global trade, as 90% of imports and exports by volume are at some point transported by water.

Figure 1: 2008 Modal Shares of World Trade by Volume
Millions of Metric Tons



Source: IHS Global Insight, Inc., World Trade Service

Figure 2: 2008 Modal Shares of World Trade by Value
Billion Dollars – Nominal



Source: IHS Global Insight, Inc., World Trade Service

The world shipping fleet has been growing in response to ever expanding trade. The UN Commission on Trade and Development reported the world fleet broke the 1 billion deadweight tons (dwt) mark (a measure of fleet carrying capacity) for the first time to reach 1.04 billion dwt after expanding by an impressive 8.6 per cent for 2007. Developed countries controlled 65.9% of the world total. Developing countries and economies in transition respectively control 31.2% and 2.9% of the global fleet, although many of these vessels are owned by persons and companies in developed countries. Furthermore from the UN reports based on data compiled early in 2007 the average age of the world fleet fell marginally to 12 years. Globally, containerships represented the youngest fleet with an average of 9.1 years.

The importance and growth of trade to the U.S. economy is demonstrated in the following sections in our evaluation of regional trade and our forecast of trade flows to the year 2038. Freight volumes and values of goods are considered and utilized for explanations of the relative scale of trade and of projected growth rates, though rigorous analysis of any particular commodities or goods types are beyond the scope of this study. The relative position of the U.S. maritime industry is highlighted through an analysis of global and regional maritime capital expenditures and gross maritime industry revenues.

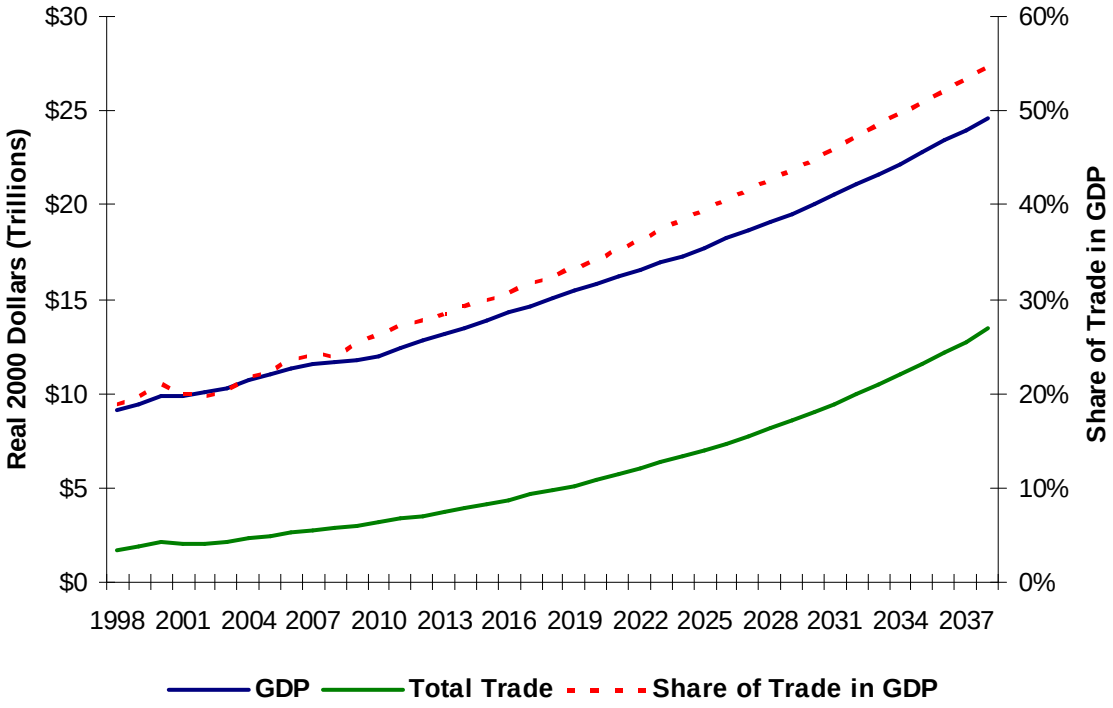
II U.S. Economy: Trade and Transportation Markets

While disruptions to trade are always possible, trade tends to grow under normal circumstances because it is driven by growth in population and wealth. The U.S. population is projected to increase from about 300 million people in 2008 to just under 400 million in 2038. Even if the number of tradable goods produced and consumed per person does not increase, trade would increase from population growth alone. However, as the economy continues to grow, consumption and production increases per person as well. Some of this new economic activity results in additional trade. More specifically, trade also increases as a result of freer trade policies and agreements, which facilitate specialization of production and more complex global supply chains, resulting in more trade in intermediate goods. This increases total trade more than trade in goods for final consumption. Increasing percentages of jobs, income, wealth and U.S. infrastructure are tied to trade. In turn, the share of the U.S. economy subject to influences of both domestic and foreign trade and transportation policies also increases.

International trade is already a critical component of the U.S. economy. According to the OECD, the trade-to-GDP ratio[4] for the U.S. increased from about 20.5% in 1990 to over 28% in 2006. The World Bank predicts that this ratio will rise to 35% by 2020, showing that trade will become an even more important component of the U.S. economy. Our data, as presented in Figure 3 below, confirm these estimates. Trade will not only grow in absolute terms, it will also increase as a share of GDP and thus as a contributor to growth in U.S. jobs and wealth. If current trends continue, imports and exports will comprise almost 55% of GDP by 2038. In other words, trade will grow twice as fast as the U.S. economy as a whole.

[4] The trade-to-GDP ratio is the sum of imports and exports relative to total GDP. It indicates the extent of a country's participation in the world economy, or conversely, the extent that a country's economy relies on international trade.

Figure 3: Growth in the Share of Trade in Real U.S. GDP (1998-2038)



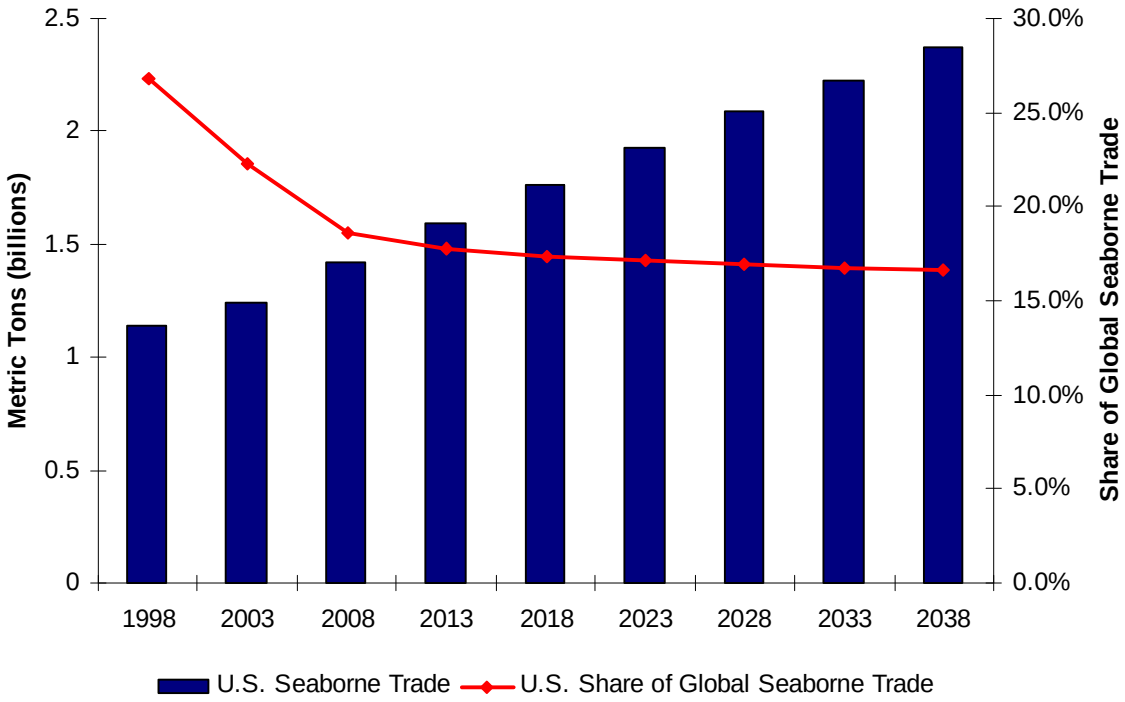
The section below demonstrates that much of the growth in trade volumes will rely on being moved by water.

III U.S. Participation: The Maritime Dimensions of Trade and Transportation

U.S. participation in international trade is heavily reliant on the maritime transportation system. The patterns of U.S. usage of the system will be considered and evaluated in this section of the report.

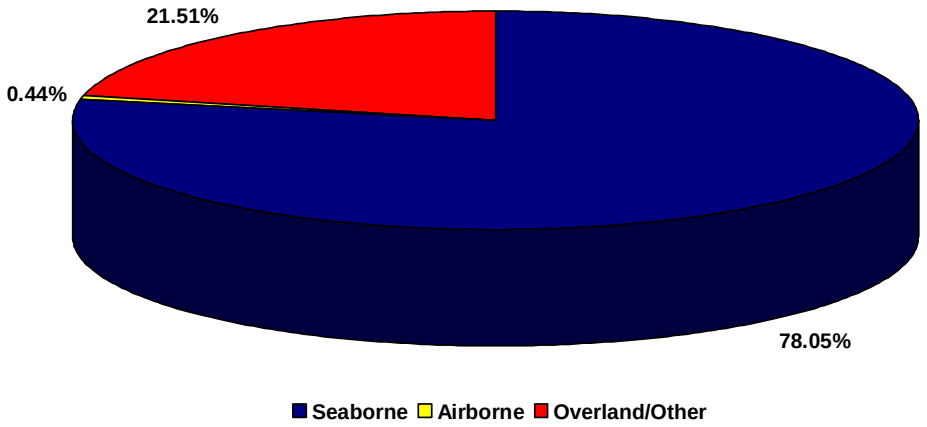
The Unites States is an important participant in global maritime trade, as shown in Figure 4. Although the absolute volume of U.S. seaborne trade will rise by about 67% over the next 30 years, the share of U.S. seaborne trade in the global economy is expected to fall by about 2% from about 18.6% in 2008 to 16.6% by 2038. The slight decline is explained by growing integration of developing countries into the world economy and their increasing contribution to global trade. Nevertheless, the total volume of goods trade by the United States that is transported by sea is expected to increase from about 1.42 billion tons in 2008 to about 2.37 billion tons in 2038.

Figure 4: U.S. Share of Global Seaborne Trade (1998-2038)



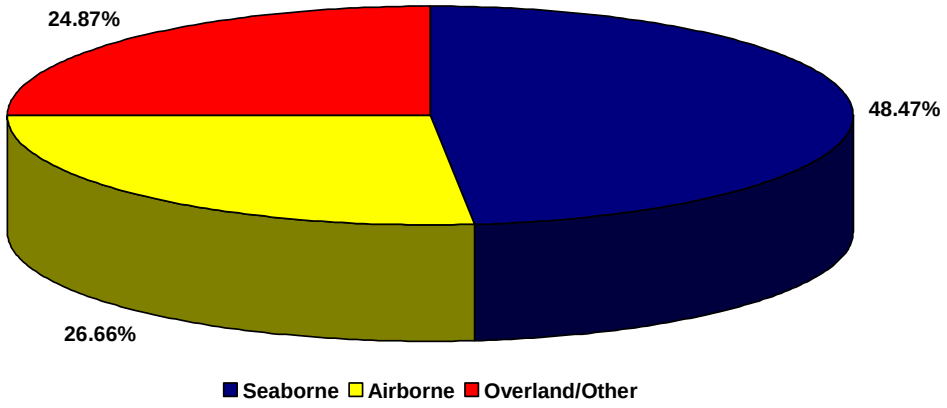
Seaborne trade already accounts for some 90% of the global freight moving in international commerce by volume. As show in Figures 5 and 6, seaborne trade comprises 48% of the value and 78% of the weight of total U.S. imports and exports. Maritime trade is thus increasingly critical to the global and U.S. economy. An inadequate maritime system will hinder many participants in trade, from grain exporters in North Dakota, to fishermen in New England.

Figure 5: 2008 Modal Shares of U.S. Imports and Exports by Volume
Millions of Metric Tons



Source: IHS Global Insight, Inc., World Trade Service

Figure 6: 2008 Modal Shares of U.S. Imports and Exports by Value
Billion Dollars – Nominal



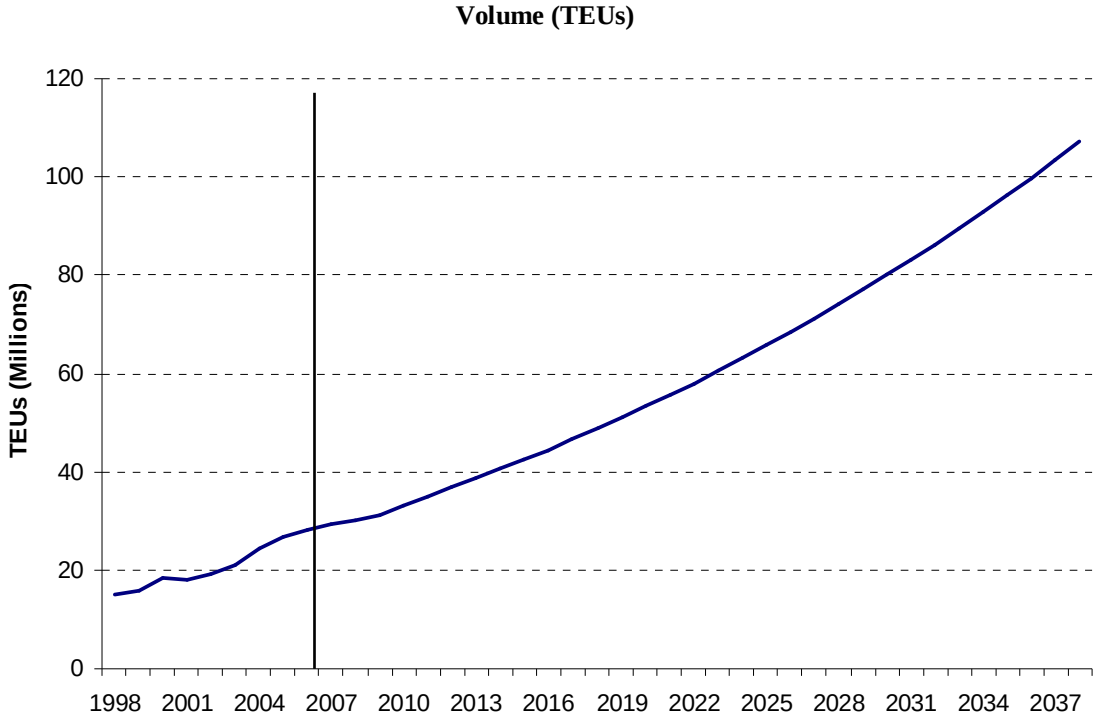
Source: IHS Global Insight, Inc., World Trade Service

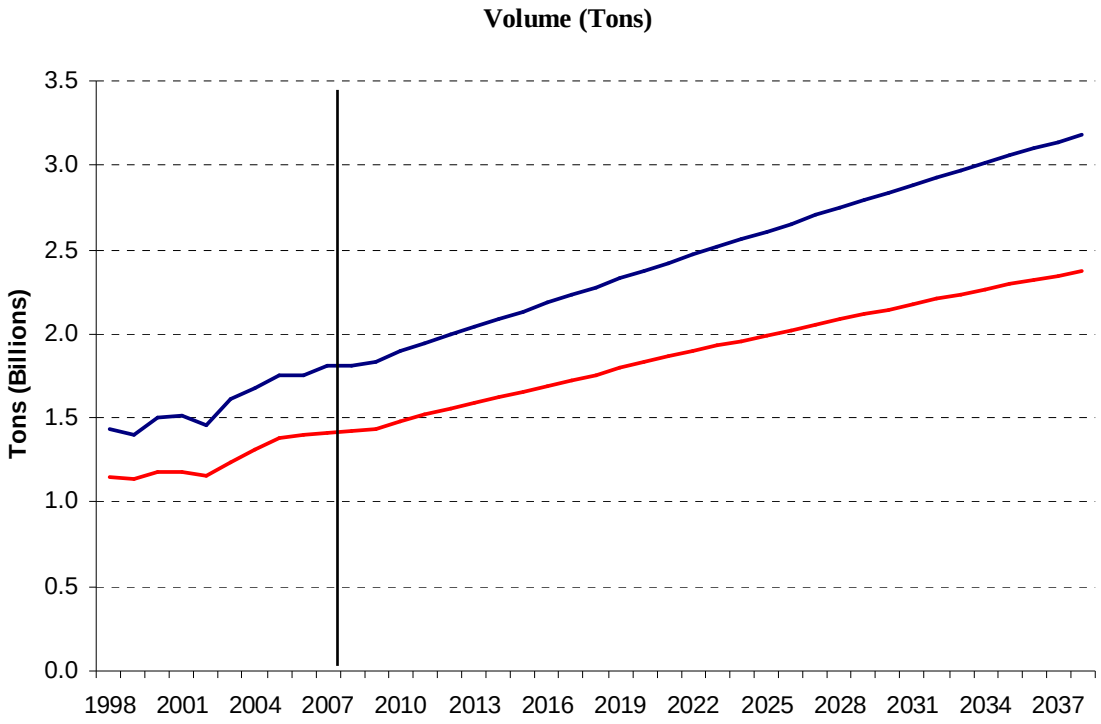
The state of the maritime transportation system and the effectiveness of U.S. maritime policy must be evaluated within the context of both current and projected trade flows. U.S. trade with the rest of the world is projected to keep growing and will reach about 3.2 billion tons by 2038. Most of these goods, about 75% will continue to be transported by sea.[5] U.S. policy must begin preparing not just the maritime system, but the entire multi-modal transportation system, to effectively and efficiently handle such volumes of cargo.

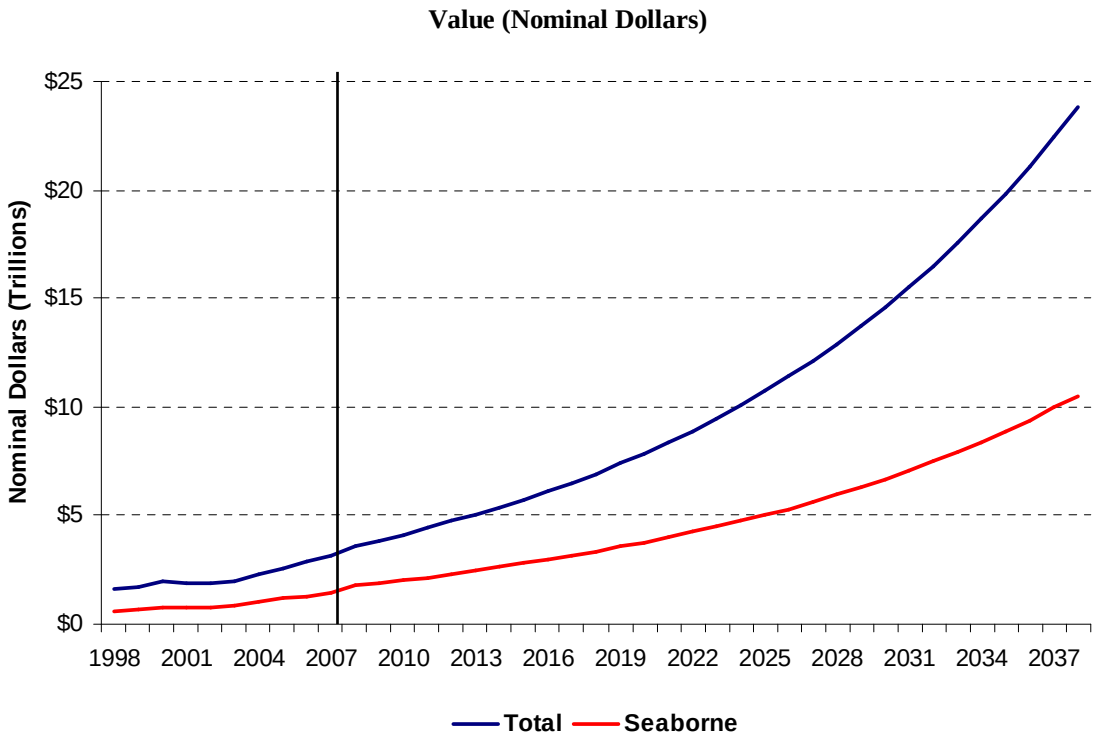
[5] The slight drop in the share of the volume of goods projected to be transported by sea can be explained by even faster than average growth in overland trade with Canada and Mexico.

Figure 7 includes the past, current and projected amount of total U.S. imports and exports as measured in TEUs, tons and nominal dollars. U.S. trade will double to about 60 million TEUs by 2023 and will surpass 100 million TEUs by 2037. Total trade will increase from about 1.8 billion to about 3.2 billion tons from 2008 to 2038, of which about 1.4 billion and 2.4 billion, or about 75%, will be moved by sea, respectively. Trade will grow even faster by value, rising from about $3.6 trillion in 2008 to $23.8 trillion by 2038, and will account for an ever larger share of the U.S. economy. About $1.8 trillion in 2008 and $10.5 trillion in 2038 worth of goods will be transported by sea. Thus, over the next 30 years, trade will increase by an average annual growth rate of 1.9% by volume and 6.4% by nominal value. These growth rates reveal that the U.S. will be trading in goods of higher value per ton and highlight yet again the increasing importance of trade to the U.S. economy and national wealth creation.

Figure 7: Total U.S. Trade by Volume and Value (1998-2038)

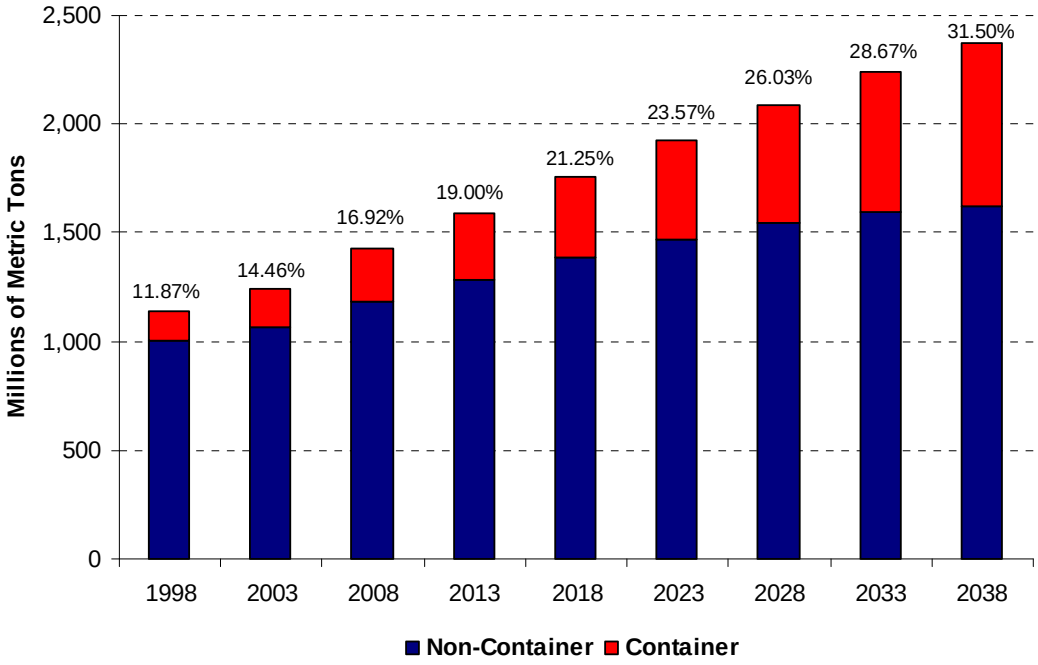



Volume (Tons)
Tons (Billions)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1998 2001 2004 2007 2010 2013 2016 2019 2022 2025 2028 2031 2034 2037


Value (Nominal Dollars)
Nominal Dollars (Trillions)
$25
$20
$15
$10
$5
$0
1998 2001 2004 2007 2010 2013 2016 2019 2022 2025 2028 2031 2034 2037
Total
Seaborne

Although total trade will be growing in absolute terms by both volume and value and as a share of GDP, certain components of seaborne trade will grow faster than others. Figure 8 demonstrates the growing importance of containerized trade for the United States. As can be seen from the figure, about 17% of total seaborne tons imported and exported by the U.S. are currently containerized. However, almost a third of trade will be containerized by 2038.

Figure 8: Container Trade as Component of Total Seaborne Trade



U.S. policy must thus ensure that enough container-handling capacity will be available at the nation's ports and at the points where seaborne trade connects to highways and railways. Currently, the continuing growth in containerization is a major contributor to bottlenecks in U.S. freight transportation. For example, about 7.7 million TEUs will be imported through U.S. South Pacific coastal ports, including Los Angeles, Long Beach and Oakland by the end of 2008. A typical line-haul truck carries two such TEUs[6], which translates to about 3.85 million one-way annual truck trips or about 10,548 trucks on the road each day. If the trucks are lined up one after the other, this volume of truck traffic is approximately equivalent to 80 miles. The arrival of larger container ships creates even more truck and rail traffic during the days of unloading.[7]

Although containerized trade is projected to grow at a faster rate than bulk trade, the top five commodities in terms of metric tons traded by the United States over the next thirty years will remain bulk commodities. Thus, although both public and private entities must prepare

[6] Ammah-Tagoe, Felix and Deborah Johnson. ***Understanding Potential Bottlenecks in the United States: A Look at the GeoFreight Visual Display Tool.*** 7th MTS Research and Technology Coordination Conference, Washington, D.C., November 16-18, 2004 (Here after, Ammah-Tagoe & Johnson, 2004).
[7] Ammah-Tagoe & Johnson, 2004.

for an influx of containerized cargo, bulk capacity must still be prepared to handle continued growth. Table 1 below shows the top five commodities imported and exported by the United States. The top commodities both imported and exported are mostly petroleum related products, metals and minerals. The U.S. is also a large exporter of grain. Farms and mines in inland states are thus heavily reliant on seaborne trade to move their products to customers all over the world.

Table 1: Top 5 Imported and Exported Commodities

IMPORTS (Million Tons)

1998		2008		2018		2028		2038	
Crude Petroleum	452.4	Crude Petroleum	484.3	Crude Petroleum	521.7	Crude Petroleum	526.9	Crude Petroleum	505.4
Petroleum Refineries	101.4	Petroleum Refineries	110.0	Petroleum Refineries	117.8	Petroleum Refineries	122.6	Petroleum Refineries	120.9
Iron and Steel	47.3	Stone, Clay and Other Crude Minerals	52.7	Stone, Clay and Other Crude Minerals	68.9	Stone, Clay and Other Crude Minerals	82.7	Non-Metallic Products	94.7
Stone, Clay and Other Crude Minerals	44.3	Natural Gas	35.8	Non-Metallic Products	52.9	Non-Metallic Products	76.2	Stone, Clay and Other Crude Minerals	91.7
Ores and Scrap	36.6	Iron and Steel	34.9	Iron and Steel	51.1	Iron and Steel	65.9	Iron and Steel	75.0

EXPORTS (Million Tons)

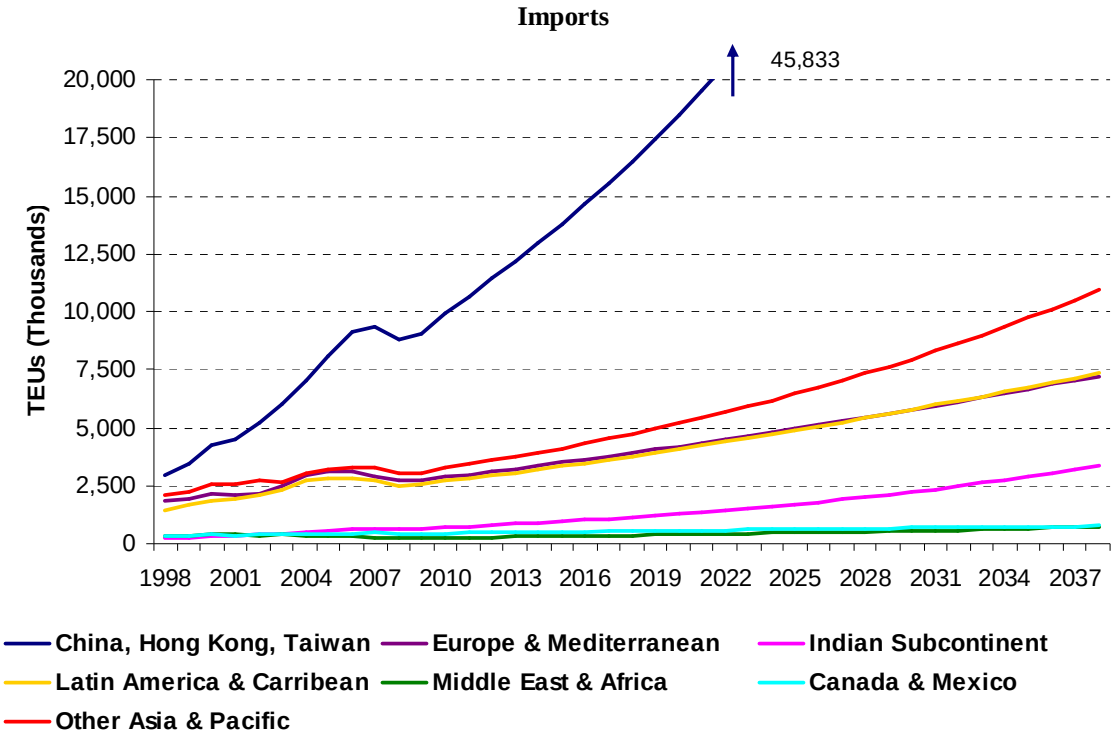
1998		2008		2018		2028		2038	
Coal	116.0	Grain	112.8	Grain	132.9	Grain	147.6	Grain	154.6
Grain	77.8	Coal	99.3	Coal	103.5	Coal	102.5	Coal	95.1
Petroleum Refineries	25.1	Petroleum Refineries	62.4	Petroleum Refineries	68.5	Oil Seeds	70.6	Synthetic Resins	88.2
Oil Seeds	21.7	Residual Petroleum Products	39.8	Oil Seeds	53.9	Petroleum Refineries	69.4	Oil Seeds	82.3
Residual Petroleum Products	21.5	Oil Seeds	36.4	Residual Petroleum Products	43.5	Synthetic Resins	61.2	Petroleum Refineries	65.0

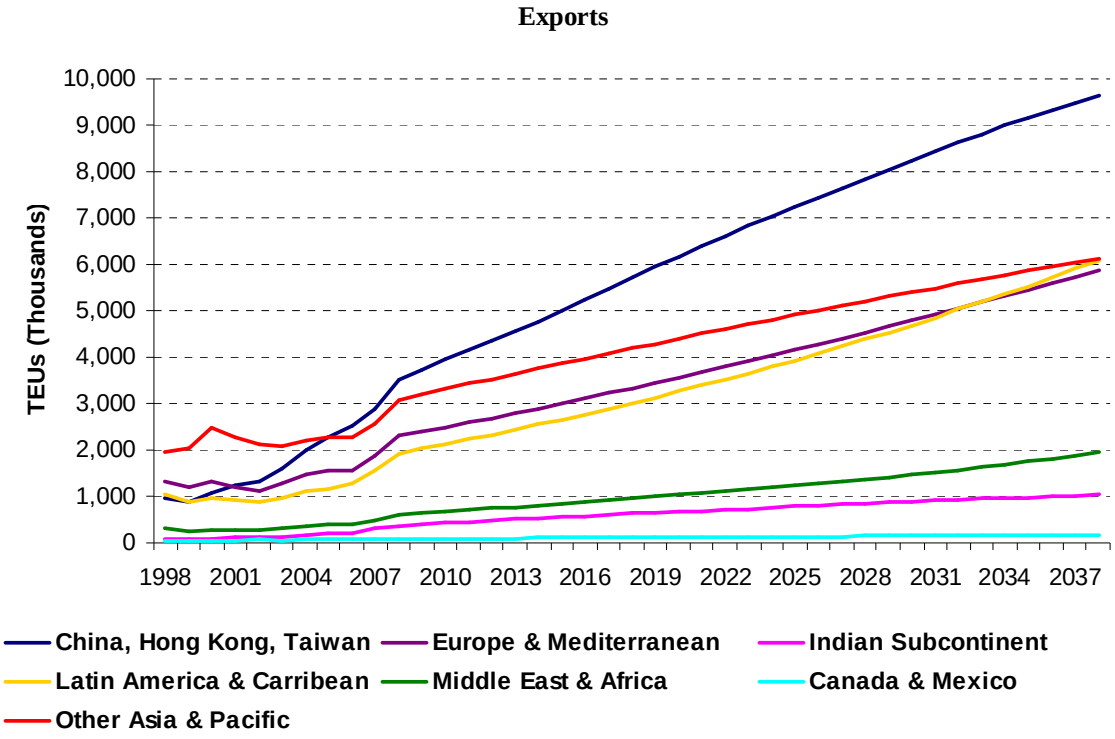
Next, Figure 9 demonstrates the distribution of U.S. imports and exports among trading regions. (See Appendix A for list of countries comprising each region.) Note that imports are projected to comprise about two-thirds of total annual traded TEUs over the next three decades.

Imports from China, and other Asian countries are expected to continue driving growth in U.S. trade. In fact, although imports from China will no longer grow at double digit rates, but at a rate of about 5.6% over the next three decades, they will still increase by a factor of 5 between 2008 and 2038 to reach almost 46 million TEUs. Imports from the Indian subcontinent will also grow at a compound average annual rate of about 5.6%, but from a much lower level and will reach about 3.3 million TEUs. The second largest trading source of imports will be Asian and Pacific countries, excluding China, who will contribute almost 11 million TEUs by 2038 at a growth rate of about 4.3%. Although trade with NAFTA partners will also grow briskly, much of it will be overland.

On the export side, China, Hong Kong and Taiwan will also continue to be the largest recipients of U.S. cargo. After growth of about 4% per year, exports to China will reach 9.6 million TEUs by 2038. Other Asian countries, Latin America and Europe will also be large importers of U.S. goods, with each region importing about 6 million TEUs by 2038. The fastest average annual growth rate for waterborne exports will be for the Middle East, at more than 4.6%.

Figure 9: U.S. Imports and Exports by World Region (1998-2038)





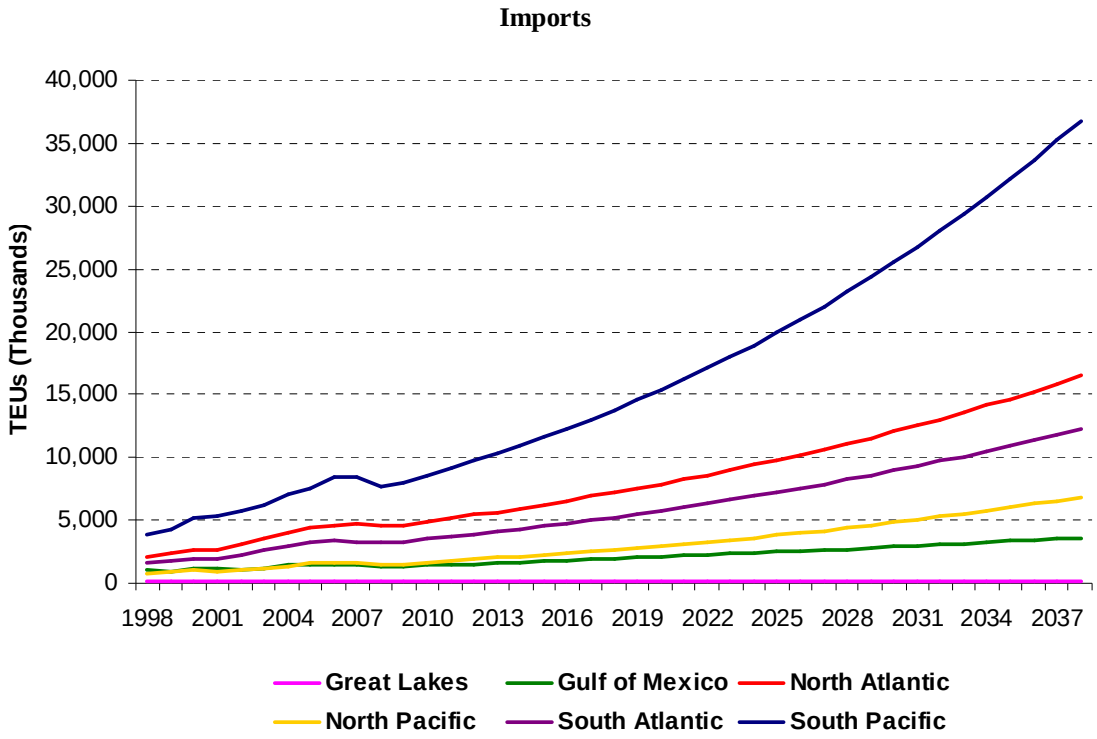
Ever increasing trade with China and other Asian countries will especially put pressure on ports on the Pacific Coast of the United States, as demonstrated in Figure 10[8]. Currently, about 7.7 million TEUs are imported through the ports in the South Pacific U.S. Coast, including the major ports of Los Angeles, Long-Beach and Oakland. By about 2020, the level of 2008 imports will double and by 2038, assuming no diversion to other countries or regions, imports in the South Pacific U.S. Coast will reach almost 37 million TEUs. In other words, the import volume of the U.S. South Pacific ports alone will increase by almost a factor of five. The total number of TEUs in this region, including exports, will reach more than 46 million TEUs.

The ports on the Atlantic coast of the U.S. will also experience an influx of containers, due to continued robust trade with Europe and Latin America. By 2038, North Atlantic U.S. ports will handle more than 22 million TEUs of cargo and South Atlantic U.S. ports about 19 million TEUs, up from about 6.7 million and 5.9 million TEUs in 2008, respectively.

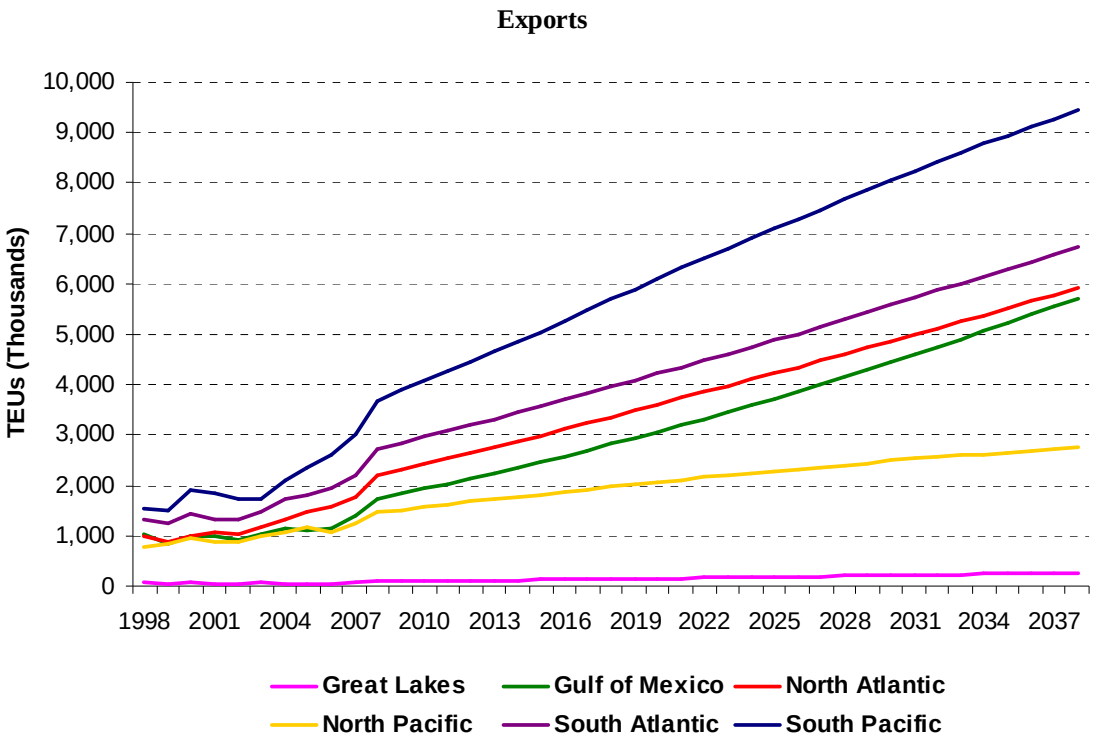
[8] U.S. Coastal regions include the following Customs District port gateway areas:
Great Lakes – Buffalo, NY; Minneapolis, MN; Duluth, MN; Milwaukee, WI; Detroit, MI; Chicago, IL; and Cleveland, OH.
Gulf Coast – Mobile, AL; New Orleans, LA; Port Arthur, TX; and Houston/Galveston, TX.
North Atlantic – Portland, ME; Boston, MA; Providence, RI; New York City, NY; Philadelphia, PA; Norfolk, VA; and Washington, DC.
North Pacific – Seattle, WA; and Anchorage, AK.
South Atlantic – Wilmington, NC; Charleston, SC; Savannah, GA; Jacksonville/Tampa, FL; San Juan, PR; U.S. Virgin Islands; Miami, FL; Savannah/Wilmington; and Norfolk/Mobile/Charleston.
South Pacific – San Diego, CA; Los Angeles, CA; San Francisco, CA; and Honolulu, HI.

Without improvements to efficiency and additional capacity, these ports will simply not be able to handle such volumes of cargo. There is certainly much that can be done in order to address short-comings in efficiency. By some metrics, the throughput of many Asian ports is currently up to four times the throughput of the best U.S. port.[9] However, a quadrupling of throughput alone will not be sufficient to handle the forecasted growth in imports by 2038. Investments in additional port capacity will also be necessary. According to one estimate, the two ports of Los Angeles and Long Beach alone will require an additional 3,600 acres of space to handle potential demand by 2020.[10] Furthermore, the multi-modal network that transports goods from ports to consumers and businesses across the nation will also require investment and innovation in both efficiency and capacity.

Figure 10: Imports and Export by U.S. Port Area (1998 – 2038)



[9] Transystems Corp., CAL EPA March 2006. ftp://ftp.arb.ca.gov/carbis/gmp/docs/agile_ports.pdf
[10] Ammah-Tagoe & Johnson, 2004.



In summary, U.S. trade with the rest of the world will continue growing at a robust pace and will comprise an increasing share of U.S. GDP. Trade will thus be responsible for a growing share of job and wealth creation. Growth will be particularly strong in containerized trade, reflecting increasing trade with China and other Asian countries, although trade in bulk commodities will continue to dominate. Growing trade with Asia will put particular pressure on the South Pacific ports, which have already showed signs of congestion and stress.

Although trade in goods is a large driver of GDP growth, the shipping, transport and logistics industries that are critical to trade are in themselves contributors to national wealth and GDP growth. Nations that capture a larger share of the global shipbuilding and the ocean liner transport markets will contribute even more to the growth of their economies. Every day, thousands of vessels ply the world's ocean highways and America's waterways carrying enormous quantities of consumer goods and cargo. But the journey today no longer begins and ends at a port. It begins with construction of the ships that carry goods produced around the globe and can conclude at a department store's receiving dock in Indianapolis or any other American city.

U.S. maritime policy and private activity must quickly align to meet both the challenges and opportunities presented by the tremendous increases in trade volumes. The challenges will include strains on infrastructure, the economy and the environment. All modes and stakeholders need to begin to work together and develop solutions to mitigate congestion and environmental impacts and to expand capacity and efficiency on the multi-modal transportation system to ensure that economic growth is uninterrupted and the free flow of

commerce is growing at its full potential. Policy makers must also work towards capturing the opportunities presented by increasing trade volumes. Given the right policies and incentives, the U.S. can capture a bigger share of the global shipbuilding market and contribute more to the transport of traded goods.

Will the future U.S. transportation infrastructure accommodate the forecast growth and how an expanded role for the marine transportation system can help accommodate this growth?

The growth in trade and the commodity composition of trade affect the demand for the various modes of transportation, and puts particular strain on specific geographic areas. Currently and in the near future, trade in lighter weight, higher value products moved in containers, is outpacing trade in bulk commodities. This results in higher demand for associated high service infrastructure, such as container handling capacity at ports, and seamless multi-modal connections to highways and railways and increases demand for inland transportation infrastructure such as highways and railroads. A disproportionate share of freight growth is concentrating in key gateways at ports, airports and international cargo hubs, many of them in urban areas.

An increase in gateway demand without a corresponding increase in the supply of transportation, through improvements in efficiency and additions to capacity, will result in bottlenecks, increased congestion, environmental degradation, and interruptions in the flow of commerce. Since more jobs, incomes and consumer consumption are tied to growing trade, the answer is not to hurt the economy by stemming the demand, but to invest in supply.

The National Surface Transportation Policy and Revenue Study Commission in its December 2007 report estimates the level of investment needed for surface transportation infrastructure alone at $225 billion per year for the next 50 years. Of this, 36 percent was identified as being sustainable from the Federal Highway Trust Fund, assuming that state, local, and private funding remains steady. This difference identified by the Commission represents an investment gap of between $3.8 and $7.0 trillion by 2035 in national surface transportation infrastructure programs.

The Commission notes that if the nation fails to address the investment needs for surface transportation congestion will continue to affect every mode of surface transportation as a result of mismatch between demand and supply of limited capacity. America's economic leadership in the world will be jeopardized.

Unfortunately, after the Commission identified a funding level needed for the next fifty years, it failed to agree on a funding mechanism. The inability of the Commission to identify a viable funding mechanism strongly suggests that needed improvements to surface transportation will not be made, or will be made only in a piecemeal basis. Therefore, it seems inevitable that more serious congestion will occur blocking the flow of cargo and adversely impacting economic growth.

The Commission also notes that the U.S. population is becoming increasingly concentrated in ten groups of metropolitan areas referred to as "megaregions", seven of which are coastal.

Since freight transportation is largely between population centers, or to and from population centers, the growth of the megaregions should present an emerging potential for waterborne trade among the megaregions located on the Pacific, Atlantic, and Gulf coasts. The emergence of such waterborne commerce has been anticipated by Section 1121 of the Energy Independence and Security Act of 2007 which seeks to establish Marine Highway Corridors as "extensions of the surface transportation system".

Although the National Surface Transportation Policy and Revenue Study Commission acknowledged the importance of the nation's ports and waterways to the surface transportation system, it did not recognize the potential for marine highways to complement the existing rail and highway systems. This may suggest a role for future Maritime Administration activities.

The Waterfront Coalition noted in its May 2005 testimony before the National Surface Transportation Policy and Revenue Study Commission:

> "America depends on international trade that is imported and exported in marine containers. Our farmers find customers in foreign lands, our manufacturers use parts, raw materials, and inputs that come from the four corners of the globe, and sell their finished products to customers here and abroad. American brand names depend on supply chains that stretch globally, and reach consumers around the world with their American presence. And the domestic retail industry--which provides American consumers with the best quality, price, and selection anywhere on Earth--depends on trade for everything from fresh produce to hand tools."

How will the growth in U.S. trade with the rest of the world impact the U.S. maritime and multi-modal transportation systems? The Waterfront Coalition again noted in its testimony before the Commission:

> "Maritime commerce does not begin or end at the ports, however. An intermodal transportation system links American ports to consumer markets, manufacturing and distribution centers, and agricultural production and processing facilities throughout our nation. That network--comprised of waterways, railroads, highways, distribution warehouses, container yards, and terminal facilities--is the U.S. Marine Container Transportation System."

The observations of the Waterfront Coalition are reiterated in substantial part by the creation of the President's Ocean Action Plan, the identification of U.S. Marine Transportation System (MTS), the creation of the Interagency Committee on the Marine Transportation System, and specific steps outlined in the strategic plans of the Department of Transportation and the Maritime Administration as detailed in the following section. Given the role of the MTS as part of the network serving the economy of the nation, there is a need for a federal entity who can act in the national interest across the MTS.

National transportation policy must be set to meet the national interest. The Federal role is to follow a national transportation policy that will ensure that the future U.S. maritime system

will have the adequate capacity, efficiency, and environmental integrity to support continued growth of the domestic economy and to secure U.S. leadership in the world economy. National transportation policy making must be aligned and coordinated today to ensure that the future U.S. maritime system will have the adequate capacity, efficiency, and environmental integrity to support continued growth of the domestic economy and to secure U.S. leadership in the world economy.

IV The Federal Role in Maritime Trade and Transportation Today

This section provides a description of the policy directives and legislative authorities that underlie the current federal programs that affect the U.S. Merchant Marine, U.S. maritime commerce and the U.S. maritime industry. Included are details on the programs administered by the Maritime Administration and an assessment of these programs in meeting the current commercial, security and environmental needs of the maritime industry in particular and national commerce in general.

The Role of the Department of Transportation in transportation in general is established by Title 49 U.S.C Subtitle I Chapter I § 101, the broad statement of policy for the Department.

(a) The national objectives of general welfare, economic growth and stability, and security of the United States require the development of transportation policies and programs that contribute to providing fast, safe, efficient, and convenient transportation at the lowest cost consistent with those and other national objectives, including the efficient use and conservation of the resources of the United States.

(b) A Department of Transportation is necessary in the public interest and to

(1) ensure the coordinated and effective administration of the transportation programs of the United States Government;
(2) make easier the development and improvement of coordinated transportation service to be provided by private enterprise to the greatest extent feasible;
(3) encourage cooperation of Federal, State, and local governments, carriers, labor, and other interested persons to achieve transportation objectives;
(4) stimulate technological advances in transportation, through research and development or otherwise;
(5) provide general leadership in identifying and solving transportation problems; and
(6) develop and recommend to the President and Congress transportation policies and programs to achieve transportation objectives considering the needs of the public, users, carriers, industry, labor, and national defense.

The Federal role in Maritime Trade and Transportation is generally assumed to be defined by the Merchant Marine Act of 1936, and as it has been amended by subsequent legislation.

The policy statement of that act states:

It is necessary for the national defense and development of its foreign and domestic commerce that the United States shall have a merchant marine

(a) sufficient to carry its domestic water-borne commerce and a substantial portion of the water-borne export and import foreign commerce of the United States and to provide shipping service essential for maintaining the flow of such domestic and foreign waterborne commerce at all times,

(b) capable of serving as a naval and military auxiliary in time of war or national emergency,
(c) owned and operated under the United States flag by citizens of the United States, insofar as may be practicable,
(d) composed of the best-equipped, safest, and most suitable types of vessels, constructed in the United States and manned with a trained and efficient citizen personnel, and
(e) supplemented by efficient facilities for shipbuilding and ship repair. It is declared to be the policy of the United States to foster the development and encourage the maintenance of such a merchant marine.

The legislative authority clearly focuses on the merchant marine but not on the maritime transportation system as a whole. In reality, the concern of the Maritime Administration today is to focus on maritime transportation policies that will take advantage of the wealth that can be gained from water transportation and increase the U.S. presence in global commerce. However, it is limited by its authorizing legislation. It is clear that the policy statements contained in the Department of Transportation and Maritime Administration authorizing legislation have not resulted in a robust U.S. Flag Merchant Marine and that maritime policy remains narrowly focused on vessels, rather than on the transportation system as a whole.

Another reason for this shortcoming is that at the Federal level, eleven of the fifteen cabinet-level departments and four independent agencies play important roles in the development of ocean, coastal, and Great Lakes policy. These agencies interact with one another and with State, Territorial, Tribal and local authorities and others to find the balance between conservation of ocean resources and ensuring that the American public enjoys the multiple benefits of its resources. These agencies are not subject to the policy guidance of the Department of Transportation or the Maritime Administration.

An active role in the economy for the maritime industry is also identified in the Department of Transportation Strategic Plan for fiscal years 2006 – 2011. As one of six strategic goals, the plan establishes a “Global Connectivity” goal, which is intended to “Facilitate an international transportation system that promotes economic growth and development". The DOT strategic plan further states:

> “The globalization of the American economy has put pressure on our ports, borders, and airports. Many of the Nation’s most important infrastructure facilities (truck terminals, port facilities, rail yards, and airports) are located in major urban areas. When combined with increasing local traffic, greater volumes of international freight and passenger traffic will result in more congestion and delay and, as a result, higher shipping and travel costs. Continued restrictions that prevent access to foreign markets for transportation services are harmful to U.S. commercial interests. Unless new technologies and operating procedures are adopted, heightened security requirements will increase transit times for passenger and freight movements, which would result in higher operating costs for transportation operators and higher costs for

> U.S. shippers and the traveling public. Higher transportation costs would make it more difficult for U.S. businesses to compete in international markets."

To accomplish this objective, the DOT Strategic Plan notes a need to improve essential intermodal transportation linkages. For oceanborne trades, these linkages obviously include ships, ports, and the inland rail and highway infrastructure as well as the information systems that facilitate the operation of vessels in the maritime and wider freight delivery systems.

The U.S. maritime industry also includes the U.S. commercial shipbuilding industry. In 2004, there were 89 shipyards in the major shipbuilding and repair base of the United States. This major shipbuilding and repair base is defined by the Maritime Administration as including those shipyards capable of building, repairing, or providing topside repairs for ships 122 meters (400 feet) in length and over. This includes six large shipyards that build large ships for the U.S. Navy. The shipyards construct a variety of ships, tugs, and barges for the U.S. domestic trades, vessels for the U.S. Coast Guard, as well as large commercial ships for the U.S. ocean trades. Shipyards are located on the Atlantic, Gulf, and Pacific coasts and on the Great Lakes. In 2006, 85,300 people were employed in the U.S. shipbuilding industry, down from about 166,900 people in 1975. The shipyards are supported by companies engaged in the design and manufacture of ship systems, components, technologies, equipment and in providing technical support services.

In addition to the shipyards that constitute the major shipbuilding and repair base, there exists a significant U.S. boatbuilding industry that in 2006 employed 53,900 people. This boatbuilding employment is up from a figure of 43,800 in 1977. Thus, the combined U.S. shipbuilding and boatbuilding industries provided employment for 139,200 people in 2006.

Shipbuilding activity can also be tracked by U.S. Coast Guard vessel registration data. For 2008, this record indicates that U.S. shipyards delivered 13 large deep-draft vessels including naval ships, merchant ships, and drilling rigs; 58 offshore service vessels; 142 tugs and towboats, 51 passenger vessels greater than 50 feet in length; 9 commercial fishing vessels; 240 other self propelled vessels; 23 megayachts; 10 oceangoing barges; and 224 tank barges under 5000 GT.

The Strategic Plan of the Maritime Administration notes that "Greater use of the maritime transportation system, through elements like short sea shipping, offers the potential to reduce passenger and freight congestion. In addition, we expect the U.S. military will increase its reliance on commercial freight transportation systems." The plan establishes three strategic objectives for the Maritime Administration:

> **Commercial Mobility:** Promote and facilitate a United States maritime transportation system that improves the safe and efficient movement of goods and people.
> **National Security:** Assure that sufficient sealift capability and intermodal transportation infrastructure exist to support vital homeland and national security interests.

Environment: Promote maritime and intermodal transportation solutions that enhance environmental stewardship.

Specific programs managed by the Maritime Administration to achieve these objectives and to provide support for the maritime industry or that otherwise affect the MTS are discussed below.

a. Port Development

Ports are the essential link between U.S. and foreign commerce and between waterborne transport and the overland modes of transport which together deliver goods to businesses and consumers. Port development and growth through capacity additions, efficiency and technological improvements is crucial to the national economy. The forecast growth in trade is expected to bring even more strain on U.S. ports, particularly on the West coast. Maritime policy and transportation policy at large must align to ensure that U.S. ports are prepared to handle the increase in transported volumes in an efficient and environmentally responsible manner and are able to compete with the ports of neighboring countries.

The U.S. port infrastructure makes the critical connection between the world maritime trading system represented by the world fleet to the U.S. economy and U.S. consumers and producers. There are more than 300 ports in the United States, and they vary greatly in ownership, size and the type of cargo and vessels handled. Ports may be operated by a state, a county, a municipality, a private corporation, or a combination. Many ports are complex entities, involving facilities for transportation by several modes of transportation: water, rail, road, or even air.

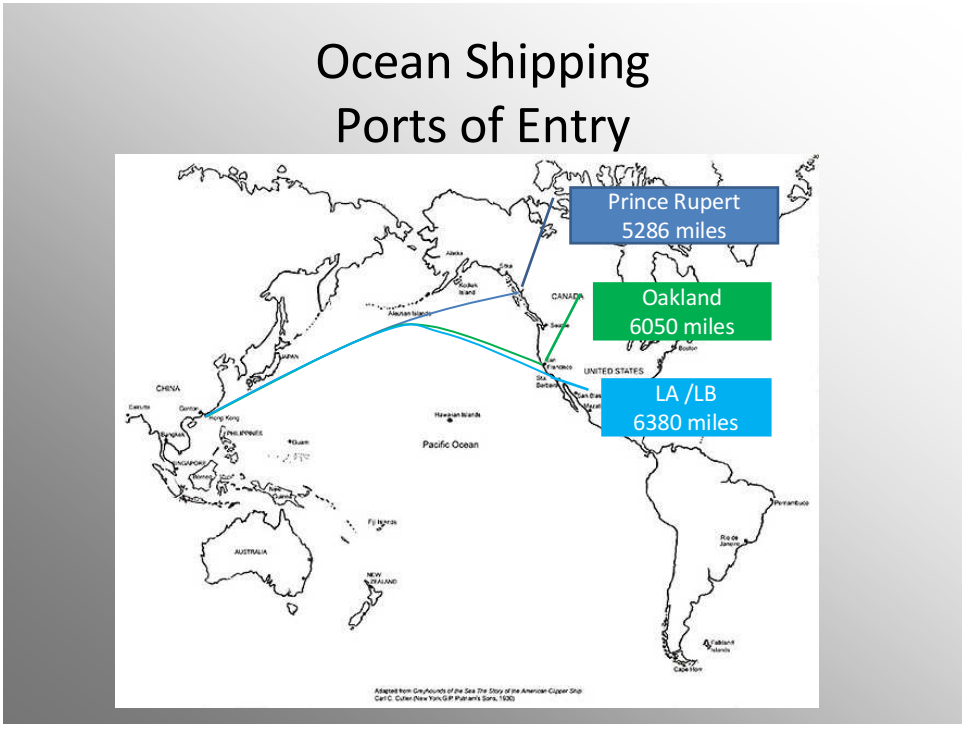
The nodes on the maritime network through which commerce flows have developed with little federal coordination, intervention, or support. Having been initially driven by the location of population nodes, ports have developed in the most urbanized parts of the U.S. coastline. Although this pattern of development takes advantage of proximity to workforces and markets, the increasingly expensive, finite spaces where the large vessels of today can berth for loading and unloading have led to a set of very large facilities and that create additional congestion on adjacent infrastructure. The existence or lack of rail and road infrastructure has often either facilitated or stymied port development.

The Maritime Administration does not have the authority to steer port development. That authority resides with the states and private sector port operators. However, it is in the national interest to have effective and efficient commerce. Although the Federal government has the effective role of being a spokesperson for the national interest in port development, neither the Maritime Administration, nor any other federal entity, has the statutory authority for this role. No federal entity determines the national optimal direction in overall port development. Nor does any federal entity study efficient freight routing through the broader multi-modal transportation system.

The Role of Ports in the Maritime Supply Chain and Port Utilization

The maritime system is comprised of a series of interconnected critical paths and supply chains. Disruptions in one node or chain can thus lead to failures or delays in other parts of the system. The maritime supply chain includes U.S. imports, foreign shippers, foreign ports of origin, ocean steamship lines, North American ports of entry, rail and truck connections to inland points, distribution centers, and truck connections over the U.S. highway system to final destinations. Increasingly, the movement of goods over supply chains is managed by single entities (suppliers or customers) or third party logistics providers. The supply chain managers expect the components of the supply chain to be in place and provide sufficient capacity. The components of the supply chain are privately owned (railroads, steamship companies), publicly owned (the highway system) or owned by a public-private partnership.

An example demonstrating multi-modal supply chains and choice in port utilization can be developed by considering the transport of import commerce moving from Asian production centers to Midwestern U.S. markets. The U.S. market for the cargo is centered at the inland distribution center, not the ocean port of entry. As an example, there exist several possible ocean routings for a product moving from Asian producers to a distribution center in the Midwest.



From the U.S. West Coast to the Midwestern markets there are also several possible routes:

Source: BNSF Railway website

The BNSF Railway intermodal rail service map shows relative intermodal cargo volumes on its intermodal routes, In this case, it is apparent that the majority of the containerized cargo moving to the Midwest does not take the shortest route as measured by miles. However, the earlier analysis has indicated that by 2038, the South Pacific U.S. ports will, assuming current routing patterns, experience nearly three times current container cargo volumes. It is unclear what impact the modifications to the Panama Canal will have on these cargo routings, although higher capacity locks available starting the middle of the next decade will enable larger vessels, with lower unit operating costs, to operate between Asia and the U.S. Atlantic and Gulf coasts. The Panama Canal's toll policies and U.S. railroad rate structure will strongly influence the outcome of the competition on these two routes in the future.

Federal Oversight of Port Development

This example further demonstrates the national interest in not only port development, but multi-modal freight corridor development. At this time, there is no federal agency explicitly charged with monitoring the operation of this complex supply chain, let alone just the ports. Federal oversight of maritime infrastructure projects would allow projects to be treated as a part of an integrated and coordinated national strategy.

An appropriate federal role in steering port development can be modeled so that the private sector and states steer investment in infrastructure and users of the system determine the most efficient way to use that infrastructure for their purposes. At the same time, a federal entity should be empowered by Congress to serve as a monitor to determine and advocate for the national-interest. The Maritime Administration's relationship with the maritime industry and knowledge of the maritime system, as well as experience in managing complex port development projects, place it in a position to facilitate cooperation and monitoring of the maritime infrastructure including ports. The Maritime Administration can serve as an honest

broker that helps diverse interests to work together to achieve not only local, but also national objectives.

Although its statutory role in port development is limited, the Maritime Administration does administer various programs and policies pertaining to ports, some of which are described in greater detail below. It provides expertise on port financing and port infrastructure project management, and has assisted major ports in their recent redevelopment plans. The Maritime Administration is also the U.S. government's licensing agency for Deepwater Liquefied Natural Gas (LNG) ports. It is also involved in ports through its role in defense. The Maritime Administration chairs the National Port Readiness Network Steering Group, and administers Port Planning Orders for 15 commercial strategic ports so they may fulfill defense requirements.

Specific Maritime Administration Port Development Projects

The Maritime Administration is currently involved in two port development projects, the Port of Anchorage and the Port of Guam.

In 2003, the Maritime Administration established a partnership with the Municipality of Anchorage to assist in developing and modernizing the Port of Anchorage. The agency's role has been to provide federal oversight and coordination of projects, to act as a central procurement organization that leverages federal and non-federal funding resources, and to streamline the environmental review and permitting process. The project will include a new intermodal rail connection to the Alaska Railroad, road access improvements, a new direct road to Elmendorf Air Force base, 135 acres of new port real estate, three new 100' gauge gantry cranes, and new staging areas for military deployments.

In 2008, the Maritime Administration established a partnership with the Government of Guam and the Port of Guam to assist in modernizing and expanding the Jose D .Leon Guerrero Commercial Port. Again, the Maritime Administration will provide federal oversight and coordination of projects, and act as a central procurement organization that leverages federal and non-federal funding resources. It will also streamline the environmental review and permitting process. The improvements will upgrade the former U.S. Navy port to provide modern and efficient transportation access to the island of Guam and to the region to meet Department of Defense requirements for the Guam build-up.

Broadening the Maritime Administration's current involvement in the development of maritime infrastructure projects provides a streamlined process for forming public/private partnerships with state and local maritime entities. These partnerships are better able to develop infrastructure projects which address local needs and support regional and national requirements for increased capacity due to anticipated increases in international trade. The Maritime Administration's current program also provides an opportunity to combine federal resources with local and private funding while also providing a one-stop shop for coordinating environmental requirements, permitting, and resource agency involvement. While supporting the Department's strategic plan to reduce congestion and to support international trade, the Maritime Administration's ability to work with DOD and the

maritime industry also ensures that projects are constructed to meet defense and national security capacity requirements.

Regulatory Impediments to Port Development: Great Lakes

Through its role as a coordinator and project manager, the federal government can facilitate port development. However, uncertainty in federal regulations can also hinder port development and regional maritime transportation. One example of this involves the Great Lakes, where uncertainty about future ballast water management regulations to minimize the introduction of invasive species into the lakes may well be hindering investment in the transportation system. The industry needs to understand the method in which regulation will respond to this environmental challenge. Timely implementation of regulations regarding ballast water management and associated standards could help reduce regulatory uncertainties and the associated barrier to the development of trade-enhancing transportation infrastructure and services on the Great Lakes. [11]

More generally, having timely and clear regulations pertaining to the environment, technologies and other regulatory areas is crucial for the smooth functioning of maritime commerce and infrastructure development. Regulatory intentions must be clearly communicated to the industry and implemented in a timely manner.

Dredging

Port and channel dredging is administered by the U.S. Army Corps of Engineers, which identifies dredging needs and contracts for dredging work. While there are many operational dredging projects, a backlog of projects is growing.

Dredging helps assure that state of the art container vessels, including the large post-Panamax vessels, are able to approach U.S. ports. If the most efficient vessels can not operate in U.S. waters, or vessels can not be fully-loaded, U.S. consumers and businesses will suffer through higher transportation costs. More, smaller vessels may be used instead or vessels may be diverted to ports in neighboring countries. For example, if they can not clear the harbor, large container ships may be diverted from New York to Halifax, and U.S. wealth creation will be hurt. The federal role must advocate for the commercial importance of such dredging projects and champion timely dredging, and is appropriate for the port development model previously mentioned.

Harbor Maintenance Tax

The Harbor Maintenance Tax has been identified as a significant burden on marine commerce. Initially intended to be a source of funding for harbor maintenance, the tax collected has greatly exceeded expenditures on harbor maintenance with the result that fund balances have radically increased. The industry views the growing balances as inappropriate.

[11] Transportation Research Board Special Report 291, ***Great Lakes Shipping, Trade and Aquatic Invasive Species.***

Table 2
Summary of Recent HMTF Operations,
Actual (FY 2003 - 2006) and Projected (FY 2007 - 2008)
(thousands of dollars)

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
Beginning Balance	1,873,414	2,092,077	2,366,260	2,782,934	3,305,746	3,947,000
Revenues (HMT & Accrued Interest)	804,518	922,383	1,122,630	1,320,933	1,439,000	1,580,000
Total Available	2,677,932	3,014,460	3,488,890	4,103,867	4,744,746	5,526,746
Transfers (Expenditures)	585,855	648,200	705,956	798,121	798,000	799,000
Ending Balance	2,092,077	2,366,260	2,782,934	3,305,746	3,946,746	4,727,746

Source: FY 2003-2006 figures - Department of the Treasury, Bureau of the Public Debt, Office of Public Debt Accounting, Division of Federal Investments, Trust Fund Management Branch. FY 2007-2008 figures - Fiscal Year 2008 Budget, with adjustments to reflect accrued interest rather than interest deposited.

A February 2008 review of port related user fees by the Government Accountability Office found:

> "GAO suggests Congress review the link between the HMF fee and expenditures, and establish an HMF stakeholder advisory body. GAO is making eight recommendations to the Secretaries of Homeland Security, Agriculture, and the Army to better align the fees with the activities they support, and to improve collections, oversight, and reporting. All three agencies generally agreed with our findings and recommendations."[12]

No action has been taken on this recommendation.

In summary, a federal role is desirable for specifically overseeing the national interest in port development. Port development projects must view ports as links in a multi-modal, global supply chains. Plans should take into consideration the impact on the efficiency, competitiveness, and environmental health of multi-modal freight corridors. Federal policies pertaining to dredging, zoning and taxation at ports must consider the competitive implications of such policies. If U.S. ports can not provide competitive services to large ships whether due to shortcoming in dredging, congestion, or uncompetitive tax policies, ships will be diverted to ports in neighboring countries. U.S. consumers and business will also suffer from increasing transportation costs.

b. Maritime Tax Policy

Taxation and direct financial support from the government are important tools not only for raising funds for programs and infrastructure, but also for creating incentives for industry behavior. In an especially global and mobile industry, such as the maritime industry, tax policy also affects the relative competitiveness of U.S. cargo carriers and other industry

[12] Government Accountability Office report GAO-980321, Federal User Fees Substantive Reviews Needed to Align Port-Related Fees with the Programs They Support, February 2008.

participants as compared to the industry in other countries. Policy makers must thus be careful to strike the correct balance between meeting funding needs and supporting industry competitiveness.

Tax policies have a substantial impact on U.S. ship ownership as demonstrated by the role of Subpart F of the U.S. Internal Revenue Code. Prior to 1986, Subpart F exempted payment of taxes on foreign earnings of U.S.-owned Flag of Convenience (Foreign Flag) ships provided those earnings were reinvested in qualified shipping assets. The intent of the provision was to permit use of pre-tax income for fleet replacement. The Tax Reform Act of 1986 repealed the Subpart F tax exemption which led to a substantial decline in the U.S.-owned foreign-flag fleet: between 1986 and 1991 the U.S.-owned foreign flag fleet dropped from 17 million deadweight tons to 12 million deadweight tons. In 1986 there were 429 U.S.-owned, foreign flag ships in the international bulk shipping markets, by 2000 that fleet had declined to 273 ships. The number of U.S.-owned foreign-flag tankers also declined dramatically over the same period: from 246 tankers to 126 tankers. The 2004 American Jobs Creation Act (AJCA) restored the Subpart F tax deferral with the result that U.S. flag owners have acquired foreign companies. This has increased the number of U.S.-owned foreign-flag ships and a U.S. subsidiary company of a foreign flag owner has constructed a substantial number of tankers in U.S. shipyards for the domestic tanker trades.

The U.S. maritime industry is faced with numerous taxes, subsidies, and incentives, many of which are evaluated below. (Tax policies and incentives pertaining to shipbuilding or port maintenance are described in other sections). While almost all developed and developing countries use a combination of taxes and incentives to support their shipping fleets, the actual outcome of the policies differs widely. U.S. tax policy, together with the U.S. cabotage regime described in the Shipbuilding and Shipyards section, is supportive of domestic maritime trade. However, on balance the current tax structure for the U.S. maritime industry does not extend beyond the U.S. border and is not supportive of the participation of U.S.-flag carriers in foreign trades. The fact that many foreign governments provide more or better targeted support for their fleets has often been argued to be one of causes of the relative decline of the U.S. foreign trade shipping industry.

There are a great many other taxes on marine operations. For example, an October 2006 study by the Great Lakes Maritime Research Institute, “Tax Systems and Barriers to Great Lakes Maritime Commerce,” identified 119 assessments by various federal agencies as identified by the United States Government Accountability Office. Other taxes faced by the maritime industry are discussed in the section under Tax Policy.

Policy must strike the correct balance between raising adequate funds for port maintenance, taxing the industry for general fund purposes, and ensuring that U.S. maritime commerce remains competitive on an international level. As users of U.S. port infrastructure, both U.S. and foreign vessels benefit from it, and can be expected to fund it. At the same time, competition considerations must be balanced against funding needs.

Tax Exemption of Seamen's Wages

Most major maritime nations, including traditional maritime nations with developed economies similar to our own (European Union nations) and flag-of-convenience nations, either do not tax or sharply reduce taxes on the income of their mariners in international shipping. Seafarers on U.K.-flag vessels, for example, are granted a complete tax rebate for income earned on vessels in international trade, if they do not reside or work at home for more than six months.

One possible policy action is to exempt from federal tax the first $80,000 dollars of income earned by U.S. citizen merchant mariners working aboard U.S.-flag vessels in the international trades. Adoption of the merchant mariner exemption would reinforce the tonnage tax incentives enacted in 2004 by reducing the significant competitive disparity in tax burdens by granting merchant mariners tax status similar to that available for nearly all other Americans who work overseas. The exemption would also help U.S.-flag operators compete by reducing tax and manning costs and would increase mariner recruitment and retention by making American mariner wages more competitive with on-shore employment opportunities. This proposal would not be very costly. The Joint Committee on Taxation estimated the mariner tax exemption proposal in February, 2004, at $142 million for five years.

U.S. Tonnage Tax Alternative to the Corporate Income Tax

The U.S. tonnage alternative to the corporate income tax was signed into law on October 22, 2004 as part of the American Jobs Creation Act of 2004. Prior to this date, U.S.-flag ship owners engaged in international trade paid taxes based on the profits earned by their vessels. By authorizing an alternative tax regime based on the tonnage of a taxpayer's U.S.-flag fleet, owners of large ships (with at least 10,000 deadweight tons) in foreign trade can elect to pay a lower tax rate. Such U.S. ship operators should become more competitive – on a more "level playing field" – relative to foreign ship owners that pay little or no tax by registering their vessel in so-called flag-of-convenience (or "open") ship registries. Examples of locations with flag-of-convenience registries include Panama, Liberia, Bahamas, Malta, Cyprus, Singapore, Hong Kong, Marshall Islands, St. Vincent & the Grenadines, and the Isle of Man.

The tonnage tax also offers more predictability and stability as the annual tax no longer has to fluctuate as profits rise and fall with business cycles. Instead of being an unknown variable cost, the tax is now a known fixed cost and it facilitates financial planning.

Under the U.S. tonnage tax regime, all qualifying companies under a single corporate structure must elect to use the tonnage tax alternative to the corporate tax. A qualifying company must also operate vessels that are strategically and commercially managed in the United States, and there are limitations placed on the depreciation of qualifying shipping assets.

The Act also defers U.S. tax on the foreign shipping income of a controlled foreign corporation affiliated with a U.S. company. Together with the tonnage tax provision, the tax deferral further enhances the competitiveness of U.S. companies in international shipping. According to the December 2004 issue of ***Lloyd's Shipping Economist***, U.S. companies that already have set aside funds for tax liabilities on overseas shipping earnings felt an immediate impact from the new tax law.

Over the past decade, many members of the European Union have also responded to the increasing competition from flag-of-convenience ship registries by implementing a tonnage regime, and other countries such as South Korea and India are now following suit.

Since the U.S. tonnage tax regime was only enacted at the end of 2004, it is still too early to measure its full impact on the size of the U.S.-flag fleet in foreign trade. However, the U.S. maritime tax regime is now more in line with that of other maritime nations.

c. Labor Laws, Safety and Liability

Labor and safety laws in the U.S. for workers working both on board vessels and in shore-side occupations are some of the most stringent in the world and create one of the safest maritime industries. They provide protection for workers and set high standards in the global shipping industry. In addition, the Maritime Administration works with industry to develop technological solutions and improve vessel design to further increase safety.

At the same time, the relative laxness in labor and safety laws in some foreign countries provides a cost incentive not to register under the U.S.-flag. Current labor, safety and liability laws in the maritime domain are discussed below.

Personal Injury and Liability

Seamen are not covered under standard Federal and state workers compensation laws that apply to all other occupations except railroad workers. Workers compensation laws were enacted after the Jones Act, which covers personal injury laws for seamen. Under standard workers compensation laws, injured employees receive compensation in exchange for foregoing the right to sue their employers for most personal injuries. The compensation usually includes wages, coverage of medical expenses, and benefits for dependents killed during employment. It does not usually however include punitive damages and general pain and suffering damages. Workers are thus guaranteed fixed compensation, employers face more predictable personal injury costs, and both avoid a lengthy and costly legal process.

Certain provisions of the Jones Act provide protection to workers who are injured during the course and scope of their employment on board vessels. The Jones Act is outside of the standard workers compensation system. In summary, vessel operators must provide a "seaworthy" vessel for employment that has been properly constructed, inspected and

maintained. Failure to do so that results in an injury can lead to the vessel owner or operator being found negligent.[13]

Unlike under workers compensation – a "no-fault" system - under the Jones Act it is not sufficient to merely prove injury, but the employer must be found at fault. A small degree of negligence is sufficient to meet the burden of proof. Both workers and employers can thus face a lengthy and costly legal process. Employers are faced with uncertainty as to the size of damages, which can include punitive and pain and suffering damages, and workers are not necessarily guaranteed compensation for injuries.

The mariner or seaman occupation is one of the most dangerous jobs and a high degree of worker protection is necessary. At the same time, policy makers must recognize that the degree of uncertainty in personal injury claims creates a lengthy and costly legal process and creates a large disincentive for registering under the U.S.-flag. One foreign operator estimates that the additional cost of personal injury and insurance for hiring U.S. mariners is 19,000 dollars per worker per year.

Extension of U.S. Labor Laws to Foreign Fleets

Whether U.S. personal injury tort law extends to foreign fleets calling U.S. ports is largely a legal question. All things being equal, a ship-owner is more likely to be subject to United States law if the injured seaman is an American than if the injured party is not. However, foreign owners have every incentive to try to avoid facing personal injury claims in the U.S., where negligence awards are by far the highest in the world.

d. Other Vessel Operations Issues and Policies

The cost of operating a U.S.-flag vessel is generally higher than the operating costs of vessels registered under other flags. Higher operating costs have contributed to the decline in U.S. participation in foreign trades. In addition, the availability of a great many forms of operating assistance offered by foreign nations to support their shipbuilding and ship operations make it difficult for U.S. flag vessel operators to compete in the foreign trades. Some of the reasons for relatively higher operating costs are explored in this section. Other reasons are discussed under Labor Laws, Safety and Liability as well as the section on Tax Policy.

Foreign Shipbuilding and Operating Supports

Foreign nations provide a broad range of assistance to support their maritime and shipbuilding industries. These supports may include; shore-side restrictions, research and development aids, cabotage aid support, government ownership, customs duty levies and requirements, tax benefits, export aids, establishment of second or open registries, bilateral or other trade agreements, cargo preference, financing programs or loan guarantees,

[13] For the full text of the Jones Act pertaining to personal injury, refer to: http://www.shipguide.com/jones-act/toc.asp.

restructuring aids, construction subsidies or other direct aids, operating subsidies or restrictions.

Table 3 below lists the policies utilized by maritime nations to support either shipbuilding in their countries or the vessel operations of their fleets. While this table is from 1993, an internal 2004 Maritime Administration survey shows that nearly all of these policies are still in effect today. This is not intended to be a comprehensive listing of maritime subsidies, but it does indicate the pervasiveness of international maritime supports. Clearly, the competitiveness of the U.S. maritime and shipbuilding industries and its existing fleet are highly affected by the policies employed not only in the U.S. but also in other competing maritime nations.

Table 3: Global Policies in Support of Shipbuilding and Vessel Operations, 1993

Country	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Algeria						x					x	x		x	
Argentina					x	x			x			x		x	x
Australia*		x		x	x			x	x	x	x	x			
Bahamas										x		x			
Bangladesh					x	x					x	x		x	
Belgium*		x		x		x		x	x	x	x	x	x		x
Brazil				x	x	x		x	x	x	x	x		x	
Burma					x						x				
Canada*							x	x	x			x	x		
Chile						x			x	x	x	x			
Colombia												x		x	
Cote D'Ivoire						x					x	x		x	x
Cyprus									x						x
Denmark*		x		x		x	x	x	x	x	x	x	x		x
Ecuador					x						x	x			
Egypt						x			x			x		x	x
Finland*		x		x		x		x	x	x		x	x		
France*	x	x	x		x	x		x	x			x	x		x
Germany*		x	x	x		x		x	x	x	x	x	x		x
Greece*			x	x			x	x	x	x		x			x
Honduras						x						x			
Hungary											x	x			
India		x		x	x	x	x		x		x	x		x	x
Indonesia					x	x				x	x	x			x
Israel						x			x		x			x	x
Italy*	x	x	x	x	x	x		x	x	x	x	x	x	x	x
Japan*		x	x	x		x	x	x	x	x	x	x	x		x
Kenya					x						x			x	x
Korea	x		x	x	x	x		x	x	x		x	x		x
Kuwait					x	x					x				
Malta		x							x		x			x	
Mexico	x					x			x	x	x	x		x	x
Morocco	x	x			x	x			x		x			x	x

Country	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Netherlands*		x	x	x		x		x	x	x			x		x
New Zealand*									x			x			
Nigeria						x				x		x		x	x
Norway*		x		x		x			x				x		x
Pakistan						x	x		x		x	x			
Panama									x		x				x
Peru		x		x		x			x			x		x	x
Philippines					x	x			x	x		x		x	x
Poland											x	x			x
Portugal*	x	x			x	x			x	x		x			
Romania	x	x				x					x	x			x
Singapore											x				
South Africa				x		x		x							
Spain*		x	x	x	x	x		x	x	x	x	x		x	x
Sri Lanka				x		x				x	x	x			x
Sweden*	x			x		x			x	x		x			
Switzerland*				x					x						x
Taiwan		x		x	x	x			x	x	x	x			
Thailand		x			x	x			x	x		x			
Turkey*		x			x				x			x			
United Kingdom*		x	x			x			x		x	x			x
United States*	x			x	x	x			x	x		x			x
Uruguay				x	x	x			x	x	x	x			
Venezuela					x	x					x	x			

Key: 1- Operating Subsidies; 2- Construction Subsidies; 3- Restructuring Aids; 4- Financing Programs 5- Cargo Preference Requirements; 6- Bilateral or Trade Agreements; 7- Scrap and Build Aids; 8- Export Aids; 9- Tax and Depreciation Benefits, 10- Customs Duty, Levies and Requirements; 11- Government Ownership; 12- Cabotage; 13- R&D Aids; 14- Insurance Aids; 15- Other Aids.

* indicates membership in the Organization of Economic Cooperation and Development (OECD).

Source: Lovett, William A. ***United States Shipping Policies and the World Market***, 1993. Table 3.1.

Insurance

Insurance costs for U.S.-flag operators are higher than for non-U.S. flag operators primarily due to liability costs. The costs created by personal injury rules and the Jones Act were discussed in the section on Labor Laws, Safety and Liability above. Vessel insurance costs are also higher, reflecting the higher construction and replacement costs of U.S.-built vessels under the Jones Act.

Self-Propelled and Articulated Tug and Barge (ATB) Standards

Federal regulations can influence the design and operation of vessels in sometimes unintended ways. The area of self-propelled and ATB standards is one such example, where regulations pertaining to operations create strong and inefficient incentives for ship utilization.

There are advantages and disadvantages to operating ATBs or self-propelled ships for inland, short-sea or lake trades. Self-propelled ships have higher fuel efficiency and better maneuverability and reliability than tug and barge arrangements. ATBs have other inherent operating advantages such as higher flexibility and can be safer, quicker and cheaper to operate than standard tug and barge arrangements.

However, many of the reasons ATBs are cheaper to operate are due to regulations. ATB's are a combination of a tug and a barge that stays coupled through specially designed machinery at most times, but can also be decoupled. They are thus regulated as tugs and barges and not as ships, and face lower operating costs than tug and barge groupings such as Integrated Tugs and Barges (ITBs) that are classified as ships. Tugs and barges have smaller crew requirements than self-propelled ship with the same voyage, service, cargo and capacity.

Crew size determinations are applied on the basis of the size of the self-propelled vessel. Specifically the ATB requires a crew of 10 persons, while a tanker of the same capacity would require, as a consequence of regulations and union agreements, a crew of 20 persons. This results because crew standards are based on vessel size: the tug is treated as a small vessel with lower crew requirements (the size of the cargo carrying barge is not considered in the crew size determination), whereas a tanker with a capacity similar to the ATB combination is treated as a large ship. The labor advantage can thus favor ATBs over self-propelled ships with similar build costs despite the disadvantages in fuel efficiency, maneuverability and reliability.

This example highlights that regulatory requirements in one area, such as manning requirements, can result in the shipowner making poor design choices in another area, such as the type of ships utilized by operators for similar services. Current crewing laws are not optimal from the stand-point of commerce. They distort ship choice and cause the market to choose ships that would be considered less efficient were it not for the crewing regulations.

International Ship Registry

Other maritime shipping nations, such as the United Kingdom and Norway, maintain second international corporate registries for vessels. The creation of such a registry in the United States might attract more ships to operating under a U.S.-flag registry. It is difficult to imagine what options a U.S. flag second registry might offer to attract owners. Given the plethora of third flag and non U.S. flag registry options, it is highly unlikely that an open registry associated with the United States would be successful unless combined with other tax policies and incentives.

Ownership Criteria

Requirements for U.S. vessel ownership impede foreign sources of capital from being invested easily in the industry. The current regulations prevent U.S. vessels from being sold, leased, chartered, delivered or otherwise transferred to non-U.S.-citizens and go on to exclude any "interest in" U.S. vessels by non-U.S. citizens. While financial markets have been creative in overcoming the exclusions through such mechanisms as lease financing, the

situation potentially raises the cost of capital for the industry as the competition is less open to non- U.S. sources of funds. In global capital markets, impeding potential non-U.S. investors means fewer potential investors are in the U.S. market, lowering competition among competing lenders or investors for serving vessel capital needs.

Passenger Trades

Passenger trades in U.S. foreign commerce are regulated under the 1886 Passenger Vessel Services Act. The act is similar to the Jones Act and restricts movement of passengers between U.S. ports to U.S.-flag ships. However, this act does not prohibit foreign-flag ships from departing from a U.S. port, visiting a foreign port, and returning to that same U.S. port, as many cruise lines do.

Currently, only one large U.S.-flag ship operates in passenger service, offering voyages in the inter-island Hawaii market. Two large U.S-flag passenger ships exited that market during 2008, unable maintain profitability due to a massive influx of foreign-flag capacity. U.S.-flag ships can be successful in cruise operations, provided that the provisions of the Passenger Vessel Services Act are enforced. However, limited enforcement of the current law has enabled foreign-flag cruise ships to capture most all of the U.S. cruise passenger market by offering lower-priced services than U.S.-flagged operators can.

Logistics and Support Services

Ocean shipping has evolved substantially in the last fifty years from disconnected port-to-port operations to a door-to-door logistics and service industry. The U.S. maritime industry led this transformation with the pioneering use of the container, now the standard instrument of trade all over the world. To support ocean container operations, the U.S. transport industry created double-stacked trains and continue the development of ever more efficient door-to-door logistical operations, software, and tracking systems. The ocean based shipping industry is now a finely coordinated international operation involving ships, ports, railroads, trucking companies, and inland distribution centers. These operations thus involve a broad range of interrelated support services including insurance, finance, law, research and technology development, sophisticated communications, and cargo tracking systems. In recognition of this transformation, other nations devote substantial resources to link these many factors to create service clusters.

U.S. leadership and innovation in logistics and support services is critical to the U.S. economy. State-of-the-art logistics and communications are crucial to the management of modern supply chains and thus to the maritime industry, an integral part of the supply chains. Without constant investment and innovation in these support services, the U.S. maritime industry will not be globally competitive.

Just as other nations, the U.S. should devote resources to maintaining and further developing such technological and service clusters with the goal of providing world class shipping services. One role for the federal government in this area is to develop a trained labor pool. To that extent, the U.S. Merchant Marine Academy trains graduates not only for work on

board vessels, but also for shore-side logistics positions, many of which require the use of sophisticated technology. Most importantly, federal policy makers can stimulate domestic and foreign demand for U.S. logistics and support services by nurturing multi-modal links and tailoring legislation to the door-to-door nature of the maritime transportation system.

e. Shipyards and Shipbuilding

The state of the U.S. shipbuilding industry and the programs administered by the Maritime Administration that support the industry are evaluated in this section. Historically, involvement in vessel building and operations and support of the U.S. shipbuilding industry through various programs has been a primary function of the Maritime Administration. The lower costs of building ships in foreign yards, often brought about by lower wages, less regulation, and the ready availability of government programs of support and financial aid, make it impossible for U.S. shipyards to compete with foreign shipyards on a direct basis. As a result, the U.S. shipbuilding industry largely supports the domestic Jones Act vessel operating industry. In some cases, notably in the construction of high-end cruise ships, higher cost European shipyards have come to dominate the market through sophisticated design and series construction and the establishment of strong relationships with the shipowners. The European shipyards building the high end cruise ships also benefit from the broad range of government supports including construction subsidies and financing programs.

U.S. Domestic Shipbuilding Base

The current active shipbuilding base consists of 89 shipyards, as defined by the Maritime Administration, and many more small and mid-tier shipyards located throughout the inland river and coastal waterway system of the United States. Shipyards in the active shipbuilding base employed 85,300 workers in 2006 and the U.S. boatbuilding industry which operates in all 50 states employed a additional 53,900 people in 2006. The shipyards support a broad range of industries engaged in the design and manufacture of ship systems, components, technologies, equipment and in providing technical support services.

Ships that are being built in U.S. yards are primarily for U.S. trade, or for military and national security purposes. While the shipyards produce some oceangoing vessels and naval ships, and have particular strength in tanker construction, the majority of vessels produced are barges and tugs for the domestic waterway systems. More than 30,000 barges and tugs operate on the nation's inland waterway system. Strict attention to origin of build and citizenship for manning requirements has been a significant pillar underlying the national cabotage regime under the Jones Act. No vessels are produced for international commercial sales. Labor skill requirements, material specifications and work rules are rigorous. U.S. yards and ships are thus safer than many foreign shipyards, but also more costly. For example, in 1990, a ship built in the U.S. by Matson Navigation with a capacity of about 1,900 TEUs, cost approximately $140 million to build. In 2007, the ***Emma Maersk***, one of

the largest containerships in the world with a capacity of close to 12,000 TEUS, was built in Denmark for just $5 million more.

The U.S. shipbuilding industry has an insignificant share of the world market for ocean going cargo or passenger vessels. The ocean vessel building industry is dominated by South Korea, Japan and China, with a combined share of about 80%.[14] The higher cost of operating oceangoing vessels under the U.S. flag has contributed to a decline in the U.S.-flag oceangoing fleet. As of December 2007, the ocean going fleet consisted of 89 ships operating in the U.S. foreign trades and 100 ships in the ocean going Jones Act (U.S. origin to U.S. destination) trades. This ocean going fleet is down sharply from previous years: at the end of 1996, there were 291 active oceangoing ships in the U.S. fleet.

Table 3, above, specifically noted that in 1993, 19 nations, including 10 OECD nations, provided construction subsidies to their shipyards. These long standing programs of support for shipbuilding in other nations have served to promote a strong shipbuilding base in those nations which in part has made it difficult for the U.S. shipbuilding industry to compete in the world market.

Shipyards in the U.S. thus contribute to the U.S. manufacturing base, create skilled jobs, and support related service industries. However, they also produce more expensive ships than foreign competitors. U.S. maritime policy must balance the benefits of providing support for the shipbuilding industry with the costs of producing ships less efficiently, especially as more domestic vessels will be needed with the emergence of the Marine Highway System.

U.S. Shipbuilding Promotional and Support Programs

The Maritime Administration manages several promotional programs that serve to maintain the domestic commercial shipbuilding base. These include:

- **Title XI Federal Ship Financing Program**

The Title XI program provides for a full faith and credit guarantee by the United States Government to promote the growth and modernization of the U.S. merchant marine and U.S. shipyards. The guarantee of debt obligations applies to private entities seeking to finance the construction or modernization of U.S. flag vessels or export vessels in U.S. shipyards and for U.S. shipyards seeking to invest in technology. The FY 2009 Consolidated Security, Disaster Assistance and Continuing Appropriations Act (HR 2638) provides $48 million for new Title XI loan Guarantees in the National Defense Sealift Fund. This funding is intended to strengthen the U.S. shipbuilding industry and facilitate the construction of ships for the Jones Act Fleet.

Historically, Title XI has served certain domestic industry segments, such as barges, well. However, it has not been adequate to support the U.S.-flag ocean vessel industry except in some relatively rare occasions where ships built for the domestic trades also serve international markets.

[14] Lloyds Register Fairplay; UNCTAD.

- **Capital Construction Fund**

The Capital Construction Fund (CCF) program was created to assist owners and operators of U.S.-flag vessels in accumulating the large amounts of capital necessary for the modernization and expansion of the U.S. merchant marine. The program encourages construction, reconstruction, or acquisition of vessels through the deferment of Federal income taxes on certain deposits of money or other property placed into a CCF.

Operators of American-flag vessels are faced with a competitive disadvantage in the construction and replacement of their vessels relative to foreign-flag operators whose vessels are registered in countries that do not tax shipping income. The CCF program seeks to counterbalance this situation through its tax-deferral privileges. However, on its own, the program does not counterbalance subsidies provided by other governments for their shipyards. The program does fulfill its other goal of assisting in the modernization and expansion of vessels used in the noncontiguous domestic trade and the Great Lakes trade.

Aside from the Title XI program and the Capital Construction Fund (CCF) program, shipbuilding assistance for the U.S. foreign trades once consisted of an additional third program: the Construction Differential Subsidy (CDS). Title XI serves as a mortgage insurance program, which enables owners to secure long term vessel financing in the capital markets. The CCF help owners accumulate capital for investment in ships. The CDS in turn was designed to offset higher U.S. construction costs and subsidies provided by foreign governments for their shipyards. The termination of the Construction Differential Subsidies made it virtually impossible to build ships in U.S. shipyards that could compete in the foreign trades. The result has been to restrict the CCF and the Title XI programs to the much smaller market where they can still be used successfully: the domestic or Jones Act trades market.

- **Small Shipyards Grant Program**

In addition to Title XI and the CCF, as of 2006, the Maritime Administrations also has a program for aiding smaller shipyards. Under this program, there is currently an aggregate of $10 million available for grants for capital improvements and related infrastructure improvements at qualified shipyards that will facilitate the efficiency, cost-effectiveness, and quality of domestic ship construction for commercial and Federal Government use.

- **Technical Assistance Programs**

The Maritime Administration program also administers various programs to aid ship builders in developing and deploying more advanced technologies in the shipbuilding process and on board vessels. For example, it oversees technical panels as part of the National Shipbuilding Research Program (NSRP), a program that address technical and management issues related to military and dual-use vessels. The agency also has research programs on vessel design under its Research, Technology, Demonstration and Deployment (RTDD) initiative.

Although such programs serve an important function in helping U.S. vessels stay technologically efficient and competitive, they do not receive any dedicated federal

funding. The Maritime Administration does not have a Research and Development budget to foster technology development.

Cabotage and the Domestic Shipping Industry

Although not managed by the Maritime Administration, the Merchant Marine Act of 1920, generally referred to as the "Jones Act" provides the basis for substantial domestic vessel operating and shipbuilding industries. The Jones Act requires that waterborne commerce between U.S. ports be carried on U.S. built and U.S. flagged vessels and requires that at least 75 percent of the crew be U.S. citizens. The penalty for violation is a fine up to the value of the cargo paid to the U.S. government.

The Jones Act cabotage requirement is a condition of doing business in U.S. domestic trades. In rare circumstances, when a need can be demonstrated to exist in the interest of strictly defined national defense or national security issues, waivers to the Jones Act, can be granted by U.S. Customs and Border Protection (CBP) and the Maritime Administration determines the availability of U.S. flag ships and makes a recommendation to CBP on individual waiver requests. Waiver requests are very controversial and usually are met with strong opposition from the U.S. maritime industry and maritime interests.

Construction of vessels for the Jones Act trades constitutes a substantial component of U.S. shipyard activity. In effect, the act provides a captive market for the U.S. shipyard industry. Operators of vessels in domestic trade have no choice but to purchase from U.S. shipyards. At the same time, domestic trade is shielded from the competition of foreign vessels.

In summary, current programs support shipbuilding for the domestic Jones Act fleet, but not for the wider U.S. flag foreign trade fleet. U.S. shipyards face higher costs than foreign yards and as a result have a very small share of the ocean vessel market. The domestic vessel market is protected from foreign competition through the cabotage regime and aided by financing programs that are largely inadequate for the U.S.-flag foreign trades vessels.

Cargo Preferences and Set-Asides

Aside from the cabotage rules under the Jones Act, the U.S.-flag ship operating industry is also supported by cargo preferences and set asides. This set of rules defines categories of commodities in foreign trade whose transport is given preferential access to U.S. flag vessels. 118 U.S. flag vessels participated in moving preferential cargo in 2006. In fact, more than 50% of the revenue of some operators is derived from trade in preferential cargo.

While the policy was not initially intended to support such large shares of operator revenue, the knowledge that a ship can get a defined rate for a defined amount of volume of cargo has allowed containerships to be more competitive in international markets and has supported certain vessels that tailor their operations to the preferences. They serve as a baseline of support for liner operators and can serve to make U.S.-flag containership operations more competitive in the world market.

The cargo preference and set-aside rules are highly complex and create difficulties in administration and monitoring of compliance with federal law. While they support domestic operators, they can also raise costs for domestic users of the preferential commodities if foreign operators can otherwise deliver the goods at a lower price. As with other subsidy and preference policies, the costs and benefits to the various affected parties must be understood and choices made between winners and losers.

In summary, U.S. tax policy in the shipping industry must be designed with consideration of the tax and subsidy regimes in other maritime nations if the U.S. is to be competitive in the global economy. The industry is mobile and will respond to the relative costs and benefits of building, operating and registering in different nations. Assuming all other costs and benefits are equal, as long as other nations provide either larger or better targeted incentives for their fleets, the U.S. fleet will remain uncompetitive in foreign shipping. The current tax regime in the U.S. has not been supportive of the industry in international trade, but only in domestic trade.

At the same time, U.S. tax policy towards the shipping industry must also evaluate the impacts of taxation and other incentives on the transportation costs faced by the customers of the industry – the vast majority of U.S. businesses and consumers. This group benefits the most when it has a choice between competitive, efficient and high quality service providers. U.S. maritime tax policy should thus be structured in a way that provides support to U.S. flag carriers with the least possible market distortions and the most possible incentives to remain efficient and competitive.

f. National Security and Civil Emergency Response

The U.S. military relies on the reliability and availability of the maritime system in order to conduct global and domestic operations. Furthermore, it is in the interest of national security that the continuous flow of goods is sustained at all times. It is a national imperative to ensure that the economy maintains its supply routes and access to export markets.

While the Department of Defense (DOD) and the Department of Homeland Security (DHS) hold the primary responsibility for national security and homeland defense, the Maritime Administration serves vital civil defense functions. The Maritime Administration's national security related programs provide commercial and government-owned shipping capability in times of national emergency and to meet Department of Defense strategic sealift requirements.

The Maritime Administration's Maritime Security Program provides funding for militarily useful U.S.-flag and U.S.-crewed ships that are made available to the DOD at times of war or national emergency. The Maritime Administration, under the National Shipping Authority, can also assume control over the nation's vessels and ports in times of emergency.

Maritime Security Program (MSP)
Voluntary Intermodal Sealift Agreement (VISA) Program

The MSP serves to maintain an active, privately-owned, U.S.-flag and U.S.-crewed liner fleet in international trade. This fleet is also available to support the Department of Defense (DOD) sustainment in a contingency.

The MSP was reauthorized by the Maritime Security Act of 2003. The reauthorized program is for fiscal years (FY) 2006-2015 and provides funding for 60 ships. Annual funding authorization for FY 2006-2008 is $156 million and increases to $174 million in FY 2009-2011 and $186 million for FY 2012-2015. As of October 1, 2008, 59 vessels were enrolled by 13 U.S.-flag carriers. The MSP helps retain a labor base of skilled American mariners who are available to crew the U.S. Government-owned strategic sealift fleet, as well as the U.S. commercial fleet, both in peace and war.

MSP is responsible for retaining approximately 2,400 U.S. citizen mariners. The structure of MSP encourages flexibility as operators are able to upgrade their fleets to compete in the global marketplace. During FY 2008, seven MSP ships were replaced with newer ships increasing military useful capacity by over 362,000 square feet. Maritime Administration approvals are required to ensure that vessels entering the MSP meet Maritime Administration and DOD requirements. The Maritime Administration and the U.S. Coast Guard have established expedited procedures to encourage reflagging of modern, efficient vessels into the U.S. fleet.

MSP carriers must commit 100 percent of their MSP vessel capacity and related intermodal transportation resources to Stage III of DOD's approved Emergency Preparedness Program, VISA. MSP contributes over 77 percent of the total capacity committed to VISA. VISA operators without MSP contracts are required to commit 50 percent of their U.S.-flag capacity to Stage III of the VISA program. VISA provides DOD with assured access to commercial intermodal capacity to move ammunition and sustainment cargo. The objective of VISA is to maximize DOD's use of the multi-billion dollar, state of the art, U.S. commercial intermodal transportation system to serve America in peace and war while minimizing disruption to commercial operations. VISA activation would be time-phased to streamline the availability of capacity to coincide with DOD requirements.

VISA was established as the Emergency Preparedness Program (EPP) in accordance with the MSP, and provides contractual arrangements with private U.S.-flag ship operators to make intermodal transportation services available in times of national emergency. VISA provides DOD with assured access to emergency intermodal sealift capacity that complements DOD's organic sealift capabilities in a coordinated, seamless transition from peace to war. VISA participants, except those in MSP, do not receive direct financial support from the Federal Government; however, all participants obtain priority consideration in the award of DOD peacetime cargoes. The programs are based on lessons learned from the successful implementation of temporary sealift and airlift agreements in support of Operations DESERT SHIELD/DESERT STORM. All MSP vessels are required to be enrolled in VISA, through which, carriers are contractually committed in advance to provide specified amounts and

types of commercial equipment to the DOD if VISA is activated. The two programs have not been tested in an actual mobilization because there has not been a major contingency since they were created. MSP and VISA work together to provide sealift resources.

More than 90 percent of all U.S.-flag dry cargo ships are enrolled in the MSP and VISA programs obligating two-thirds of the carrying capacity of the entire U.S.-flag dry cargo fleet.

Voluntary Tanker Agreement (VTA)

The Voluntary Tanker Agreement (VTA) is an agreement established by the Maritime Administration to provide for US commercial tanker owners and operators to make their vessels available voluntarily to satisfy Department of Defense needs. It is designed to meet contingency or war requirements for point-to-point petroleum, oil, and lubricants movements, and not to deal with capacity shortages in resupply operations.

The Maritime Administration requires that each participant in the VTA submit a list of the names of ships owned, chartered or contracted for by the participant, and their size and flags of registry. There is no prescribed format for this information. The collected information is necessary to evaluate tanker capability and make plans for the use of this capability to meet national emergency requirements. This information will be used by both the Maritime Administration and Department of Defense to establish overall contingency plans. Respondents are tanker companies that operate in international trade and who have agreed to participate in this agreement.

Ready Reserve Force (RRF)

The government owned RRF fleet is activated only upon the request of the DOD, and ships are ready to be fully operational within their assigned 5 and 10-day readiness status and sail to designated loading berths.

The RRF program was initiated in 1976 as a subset of the Maritime Administration’s National Defense Reserve Fleet (NDRF) to support the rapid worldwide deployment of U.S. military forces. As a key element of the DOD strategic sealift, the RRF primarily supports transport of Army and Marine Corps unit equipment, combat support equipment, and initial resupply during the critical surge period before commercial ships can be marshaled. The RRF provides nearly one-half of the government-owned surge sealift capability. Management of the RRF program is defined by a Memorandum of Agreement (MOA) between DOD and Department of Transportation.

The RRF currently has 51 vessels. It provides a ready source of "surge" shipping, available when needed by the DOD's U.S. Transportation Command (USTRANSCOM), to support rapid deployment of U.S. military forces. All NDRF activities, including the RRF, are funded from appropriations transferred to the Maritime Administration from Navy’s National Defense Sealift Fund in accordance with a 1997 Memorandum of Agreement between the Maritime Administration and USTRANSCOM. The ships are outported (berthed at locations other than the Maritime Administration reserve fleet sites) at locations that are coordinated

with military planners and chosen to minimize sailing time to strategic loadout ports. Outported RRF ships are also used as training platforms for cargo handling by Navy and Army units and for homeland security training by various law enforcement agencies.

RRF ships are expected to be fully operational within their assigned 5 and 10-day readiness status and sail to designated loading berths. Commercial U.S. ship managers provide systems maintenance, equipment repairs, logistics support, activation, manning, and operations management by contract. Ships in priority readiness have Reduced Operating Status (ROS) maintenance crews of about 10 commercial merchant mariners that are supplemented by additional mariners during activations. Readiness of the RRF is periodically tested by DOD directed activations of ships for military cargo operations and exercises.

The program has experienced a total of 559 vessel activations, with an average of about 27 activations per year since 1990.

National Shipping Authority and Strategic Ports

The National Shipping Authority (NSA) grants the Maritime Administration control over national vessels and ports at time of emergency. During peaceful time, the DOD designates 15 strategic commercial ports for contingency military operations. However, the Maritime Administration oversees their planning. Emphasis has been placed on preparing assets to be used under the NSA not only for mobilization to face military threats, but also threats to homeland security and for natural disaster relief.

In summary, the Maritime Administration plays an active role in maintaining and preparing maritime assets - especially vessels, but also ports, equipment and facilities- for national and civil defense purposes. The higher costs of registering under a U.S.-flag limit the availability of commercial vessels for these functions. While monetary support for commercial vessels and having a fleet of government-owned vessels may be currently sufficient for providing enough vessels for sealift operations, the continued decline in the number of U.S.-owned, operated and registered vessels can pose a risk in the future. As trade volumes continue to increase, addressing the disincentives to U.S.-flag registration will be a crucial step towards ensuring emergency and military preparedness while simultaneously having enough vessel capacity for commercial trade.

g. Environmental Policy

Growing public concern and understanding of environmental issues has created a demand for policy to mitigate environmental impacts. Today, the maritime industry is required to comply with rapidly evolving operating and design rules pertaining to emissions, water treatment, and disposal of various materials. As the volume of waterborne traffic increases and more vessels call upon expanded infrastructure along the nation's waterfronts, environmental compliance in a cost-effective and efficient way will become even more imperative and challenging. It is in the national interest to have policies that ensure the commercial viability

of the marine transportation system in a way that mitigates adverse impacts on the environment and human health while complying with the modern environmental legal framework.

There is concern that regulations promulgated by other Federal agencies that affect the operations of the various components of the maritime industry, while intended to meet the responsibilities of the issuing agency, may not always properly consider the impact of proposed regulations on domestic and international trade. Through the Office of Environment and Compliance, the Maritime Administration works with other agencies to ensure that regulations do not unduly impede the commerce of the United States.

Also, the Office of Environment and Compliance works with the maritime industry to help it develop business practices for complying with environmental laws and regulations and to find technological solutions to environmental problems. The Maritime Administration ensures that all the ships it owns and operates are in compliance with all environmental regulations. It also advocated for uniformity in environmental rules pertaining to the maritime industry at the national and international level. It ensures that the commercial interests of maritime transportation are represented and considered in environmental discussions, laws and other solutions. As examples, the Administration has a role in the areas of invasive species management and the reduction of vessel stack emissions.

Invasive Species

As with other environmental issues, the Maritime Administration's intentions are to ensure that solutions pertaining to the introduction of invasive species carried in the ballast water of ships are developed in an internationally consistent manner and without damage to the free flow of maritime commerce. For example, it participated in the cross-agency National Invasive Species Management plan which calls for international cooperation, prevention, education and outreach, early detection, control and management, and research. Together with the National Oceanic and Atmospheric Administration (NOAA) and the Fish and Wildlife Service (FWS), it champions the development and deployment of new water treatment technologies and conducts tests on board its own ships.

Research and development into such technologies will continue, until a viable solution is created. In the meantime, a federal role will remain for championing these efforts and ensuring that the future deployment and investment costs of new technologies does not unnecessarily hamper commerce or disadvantage the U.S. maritime industry.

Oil Pollution Act of 1990 (OPA-90)

The Oil Pollution Act of 1990 was intended to reduce environmental damage from oil spills. Among other issues, it effectively mandated the use of double hulled tank vessels. This development has had a significant impact on the U.S. tanker and tank barge fleets. The replacement of single hulled vessels with double hulled tank vessels is virtually complete. In addition to providing protection for the marine environment, OPA-90 led to substantial ship construction in U.S. shipyards to replace the single hulled domestic tanker fleet.

OPA-90 is thus an example of where clear and timely environmental regulations stimulated U.S. maritime commerce and shipbuilding. It contrasts with the uncertainty regarding ballast water treatment regulations on the Great Lakes that may be hampering infrastructure development (discussed in the Port Development section above).

National Pollution Discharge Elimination System (NPDES)

As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into the waters of the United States. The Maritime Administration and the U.S. maritime industry face significant Clean Water Act (CWA) issues related to discharges from vessels. The issues revolve around "discharges incidental to the normal operation of a vessel" which historically have been legally exempt from the permitting requirements of the CWA. After recent court decisions, discharges from vessels are no longer exempt. As a result of these court decisions both domestic and international vessels operating in U.S. waters will now be required to secure permits for these discharges or to prevent the discharges within U.S. waters.

The Maritime Administration is also working closely with the EPA to ensure that the Agency's own vessels can be covered by this new permit. It appears that the EPA and the Maritime Administration will be able to reach an appropriate accommodation for those vessels that the Maritime Administration actually operates as part of its Ready Reserve Force and National Defense Reserve Fleet programs (these are DOT sealift support programs that assist DOD in times of emergency). However, the Maritime Administration's inventory of non-operating, non-retention vessels (i.e. obsolete vessels slated for disposal) are not covered by EPA's general permit.

Right Whale Ship Collisions

National Marine and Fisheries Service (NMFS) has established regulations to implement a 10-knot speed restriction for all vessels 65 ft (19.8 m) or longer in certain locations along the east coast of the U.S. Atlantic seaboard during certain times of the year. These new speed restrictions will take effect in waters off New England beginning in January 2009 when whales begin gathering in this area as part of their annual migration.

The purpose of the regulations is to reduce the likelihood of deaths and serious injuries to endangered North Atlantic right whales that result from collisions with ships. Their slow movements and time spent at the surface and near the coast make right whales highly vulnerable to being struck by ships, especially since shipping lanes into East Coast ports cut across their migration routes. NMFS notes in its October 10, 2008 rulemaking on this issue that the Western North Atlantic right whale (Eubalaena glacialis) was severely depleted by commercial whaling. The only remaining population off North America was reduced to a few hundred whales or less by the early 1900s. Despite protection from commercial whaling since 1935, the remaining population has failed to fully recover. The best current estimate of minimum population size is 313 whales, which is approximately the same as it was 25years ago. At this level, with the exception of North Pacific right whales, North Atlantic right

whales are the world's most critically endangered large whale species and one of the world's most endangered mammals. In this regard, the primary cause of the species' failure to recover is believed to be mortality caused by collisions with ships and entanglement in commercial fishing gear. Since 1990, there have been more than 50 confirmed deaths, 56 percent of which have been attributed to ship strikes (22 deaths) and entanglement (6 deaths).

The 10-knot speed restriction will extend out to 20 nautical miles around major mid-Atlantic ports. According to NOAA researchers, about 83 percent of right whale sightings in the mid-Atlantic region occur within 20 nautical miles of shore. The speed restriction also applies in waters off New England and the southeastern U.S., where whales gather seasonally.

This regulation will clearly have a significant impact on East coast merchant shipping lanes and operations. At this point, the extent of the impact is unclear. The Maritime Administration as the Federal agency closest to the operating maritime industry should monitor the issue and gather anecdotal information.

Stack Emissions

Globally, emissions from vessels represent more than 14 percent of nitrogen emissions fuel combustion sources and more than 16 percent of sulfur emissions from world petroleum use.[15] The reduction of emissions from vessel stacks is another environmental area where the Maritime Administration helps with industry compliance, champions national and international standards, and encourages the development of technological solutions. It fulfills this role largely though partnerships with industry, states, universities and through work and U.S. representation at the International Maritime Organization (IMO).

As with work on invasive species, progress on reducing stack emissions will be ongoing, particularly as maritime trade increases. A federal role will thus remain for pressing for international standards in regulation so as not to disadvantage U.S. industry and to ensure that investment is directed in an efficient way, supportive of maritime commerce. The U.S. maritime industry will continue relying on help from the Maritime Administration with compliance and information on emissions regulations and for developing emission-controlling technologies.

While reducing stack emissions is a desirable environmental policy, such reductions must be approached through a multi-modal approach that accounts for net emissions caused by goods flowing through commerce from origin to destination. In comparison to other modes of transport, ships can transport large volumes of freight at relatively lower levels of emissions and higher levels of fuel efficiency. For example, 13.4 jumbo hopper rail cars, or 58 large semi-trailers are needed to ship the equivalent amount of freight as one 1,500 ton barge.[16] Furthermore, federal policy should recognize that ensuring the ability of larger vessels to enter U.S. ports can also help to reduce stack emissions, by allowing the transport of a given amount of goods an a smaller number of ships with larger capacity.

[15] Corbett, J.J., and P.S. Fischbeck, Emissions from Ships, ***Science***, ***278*** (5339), 823-824, 1997.
[16] Iowa Department of Transportation

The federal role in controlling stack emission is thus two fold. First, the Maritime Administration can continue work on reducing emissions from vessels themselves. Second, water transportation can be promoted as a more environmentally sound alternative to shipping via truck or rail.

Uniform Environmental Improvements

Current environmental policy is highly fragmented across agencies and geographic jurisdictions. By nature, regulations must often focus on a very narrow geographic area or ecosystem, a particular pollutant or species of marine life, or on a particular segment of the maritime industry. Whereas certain standards are set at the national level, states and local governments implement environmental regulations, and can often set more stringent rules.

The mobile nature of the maritime industry and the high level of activity across jurisdictions and functions require coordination at both the national and international level. The global nature of maritime trade requires harmonious standards regardless of the origin or registry of vessels. To provide such coordination and to aide the industry in complying with environmental regulation, the Maritime Administration advocates uniformity in national and international laws and standards. Together with the U.S. Coast Guard, the Maritime Administration ensures U.S. representation at the IMO, whose role is to set international standards pertaining to the environment, safety and security in maritime transport. The agencies technical expertise in vessel design and its relationship with the U.S. maritime industry, other federal agencies and state and local governments can be leveraged at the IMO to craft international environmental maritime standards.

The current lack of uniformity in maritime environmental regulations, clearly points to a sustained federal role for coordinating with state and local government and for advocating standardization at the international level. The lack of standardized, national and international environmental regulations adds to the costs faced by the maritime transportation system. Coordination and monitoring at the national level can lead to more uniform environmental improvements. A higher level of standardization and cooperation can ease the informational and financial costs of compliance for the maritime industry as well as the monitoring and enforcement burden for entities in the federal government. A U.S. federal role in pressing for uniform international maritime environmental standards will also minimize the diversion of ships to the ports of neighboring countries for environmental reasons and ensure that U.S. ships do not encounter a plethora of at time conflicting regulations as they transverse global waters.

h. Maritime Education

The Maritime Administration has a large role in the training and education of mariners. It operates the U.S. Merchant Marine Academy at Kings Point, New York, one of five Federal service academies. The Maritime Administration also provides training vessels and other support to six state maritime academies, listed in the following table.

Table 4: U.S. Maritime Academies

U.S. Merchant Marine Academy	Kings Point, NY
California Maritime Academy	Vallejo, CA
Great Lakes Maritime Academy	Traverse City, MI
Maine Maritime Academy	Castine, ME
Massachusetts Maritime Academy	Buzzards Bay, MA
State University of New York Maritime College	Bronx, NY
Texas Maritime Academy	Galveston, TX

Combined, these maritime academies annually graduate between five and six hundred U.S. Coast Guard licensed merchant marine officers. The graduates of these academies have world class educations, U.S. Coast Guard Unlimited licenses and the advantage of hands on experience on board various types of vessels. The number of graduates is steadily increasing and replenishing the pool of new merchant mariners in the maritime industry.

The Maritime Administration also supports continuing education for mariners and was responsible for the development of IMO model courses for Ship Security Officer, Company Security Officer, and Port Facility Security Officer under the provisions of the International Ship and Port Facility Security Code (ISPS Code). These courses were recently updated to meet new Department of Homeland Security (DHS) and international training requirements. The administration is also active in the current rapid growth of maritime education at the high school and middle school levels.

Although private degrees in logistics and other fields related to maritime commerce are available at private universities, a federal role in the training of mariners is crucial for both national security and commercial reasons. Mariners who graduate from the USMMA and those who receive student incentive payments at the state academies have an obligation to sail as an officer aboard U.S. flag vessels. Additionally, they are enrolled in the U.S. Navy Reserve Merchant Marine Reserve Program which provides a guaranteed source of licensed officers to meet the crewing requirements created by the activation of the Maritime Administrations RRF vessels and the Military Sealift Command surge vessels should normal crewing practices fail. The obligation to serve would not materialize without a federal role in training.

The Maritime Administration has increased opportunities for U.S. mariners aboard Liquefied Natural Gas (LNG) carriers through the development of a voluntary Deepwater Port U.S. Manning initiative. Programs like this encourage the employment of highly trained and skilled U.S. mariners to meet the current and forecasted demand for professional mariners in the international shipping industry. Furthermore, the high quality of training at U.S. merchant marine academies sets a global standard for the industry, and U.S. mariners are sought by foreign vessel operators. Mariner training is thus one of the few areas in the global maritime transportation system where the U.S. has a leadership role.

While interest in the maritime industry has recently increased, principally due to security concerns, much work remains in the area of public outreach. A more extensive federal role in

public outreach would help to foster an understanding of the critical function of the maritime transportation system to the U.S. economy, its jobs and its consumers.

Ship Operations Cooperative Program

The Ship Operations Cooperative Program (SOCP) addresses and promotes commercial operations through the identification, development, and application of new methods, procedures, and technologies. SOCP's overall objective is to improve the competitiveness, productivity, efficiency, safety, and environmental responsiveness of U.S. vessel operations. All U.S. based vessel operators and organizations that support vessel operations are eligible to participate in the program. With the support of the Maritime Administration, industry, labor, and Government are working together to address common challenges and identify new solutions for improvements in ship operations. One of the challenges is insuring an adequate supply of qualified mariners. A part of the program called "A Career Afloat" thus promotes awareness of the maritime industry among high school students and serves as a gateway to maritime careers. This program currently includes at least 12 maritime high schools throughout the United States.

i. Technology Development and Deployment

The Maritime Administration serves the critical role of providing technological expertise, outreach, and promotion for the maritime industry. It also coordinates research, development and deployment of technologies and innovations with industry and universities. Through Research, Technology, Demonstration, and Deployment (RTDD) it facilitates innovation in the U.S. maritime transportation system and supporting industries. RTDD's technological expertise and programs span the areas of vessel building and design, vessel operations, alternative energy research and energy technologies, mariner technical training and education, cargo handling productivity and more.

However, the Maritime Administrations role in promoting and deploying new technologies and innovative practices is limited to providing coordination and expert advice. It is the only DOT operating administration that does not have a Research and Development or a technology development budget. It is thus limited in conducting research into technologies that can improve port efficiency, negate environmental impacts, improve shipyard efficiency, develop short-sea shipping or otherwise help the U.S. maritime system to innovate and compete.

A federal role in research and development is important to all industries, including the maritime industry. Government can facilitate collaboration between research entities, provide funding, expertise and the dissemination of innovative practices. Adopting state-of-the-art technologies is especially important for the competitiveness of the U.S. maritime industry in the global market. By being innovative, the U.S. maritime industry can compete on quality, efficiency and customer service, as it is often not able to compete on cost alone.

j. Short-Sea Shipping and the Marine Highway Initiative

Short-sea shipping is one area where a strong federal role and leadership is needed. As discussed through out the report, maritime federal policy has been far more successful in fostering a U.S. shipping industry in domestic trades than a U.S.-flag industry for foreign trades. Under the existing cabotage regime, the domestic trades industry can be expanded much further with the advent of Short-Sea Shipping. The Maritime Administration is thus leading the Marine Highway Initiative (MHI) which provides incentives for and advocates for short-sea shipping.

The benefits of short-sea shipping are far from confined to the domestic shipping industry itself. In other words, the short-sea shipping industry exhibits many positive externalities and spillovers for the rest of the U.S. economy, and is thus an exemplary area for federal support. The MHI is just one example of how waterborne transportation must be a solution and work in conjunction with other modes to ensure the free-flow of domestic and foreign commerce in the United States. Waterborne transport can alleviate congestion along the nation's highways. It can add to the efficiency and flexibility of global and domestic supply chains, as seaborne shipping does not require fixed infrastructure aside from ports. Since waterborne freight transportation is a far more fuel efficient mode, it is also part of the solution to alleviating environmental problems and dependence on foreign oil.

The Maritime Administration is creating incentives for the emergence of such a short-sea shipping network. The incentives that prove effective should be continued and others should be developed along the way.

The first step in encouraging the emergence of short-sea shipping is explaining and advocating its benefits to the public and to law makers. The Maritime Administration thus conducts public outreach.

The Maritime Administration is also beginning to identify potential projects. Investment should be prioritized for areas where short-sea shipping can alleviate the most congestion. Project planning is rightly involving other modes, private entities, and state and local governments. It is important that the marine highway is viewed as a solution for freight flows and global supply-chains as well as a compliment, not a competitor, to other modes. The administration is also working with shipyards and companies on vessel design and repair to increase the number and the effectiveness of vessels for use in short-sea shipping other domestic waterway movements.

Given congestion on many roads and the long-term trend of increasing transportation costs, the federal role of encouraging the supply of short-sea shipping is correct. The demand for the service has been voiced and can be expected to grow, especially with the aid of public outreach and greater understanding of its benefits.

V Obstacles or Impediments to Implementing Comprehensive Policy Reforms

This study has identified a greatly increasing demand for future marine transportation resources to meet the requirements of the U.S. economy. These marine transportation resources include not only the ships that carry the cargoes, but also the ports and inland rail and highway infrastructure. It is unclear if the forecast seaborne trade can be accommodated by the current infrastructure: this means that some sort of change must be forthcoming. The broad goal of today's policy and policy-making structure should be to anticipate the increasing volume of cargo and passengers in the future and to ensure and facilitate their flow through the maritime system in an efficient, safe and environmentally conscious manner. The focus should be on maritime transportation policies that will take advantage of the wealth that can be gained from water transportation and increase the U.S. presence in global commerce.

The current decentralized structure of maritime policy making in the U.S. does not have one clear leader to coordinate all the functions that can assure the realization of this goal. Responsibilities for commerce facilitation, safety, national security, finance, and environmental integrity in the maritime domain are spread across many agencies and departments, with overlapping and at times contradictory missions. Having a central authority among these various interests could help to remove obstacles to reform. Such a central agency would then work towards aligning policy to move larger volumes of goods and passengers and ensuring that policy is responsive to as well as shapes changes in the market place.

Obstacles or impediments to market and policy adjustments are thus assessed in light of the increasing trade flows. Structural aspects of existing agencies, programs, laws, rules, regulations and policies that limit U.S. participation in maritime trade are examined.

a. Decentralized Federal Maritime Policy Control

There is no cohesive, nationally adopted, Federal Policy that notes the critical interface between the world ocean transportation system and the U.S. inland transportation represented by the Nation’s ports (although the Committee on the Maritime Transportation System has recently begun a dialogue on this interface).

The role of policy and agency jurisdictions in energy, environment, port development, tax policy, and supply chains such as those for food products, raw materials, semi-finished and finished goods are not considered. Disconnection between the individual, discrete missions of the numerous responsible agencies often results in suboptimal approaches to issues, insufficient responses to challenges and adversely impacts efficiencies for delivery of government programs.

There is also no policy focus on the through movement of goods across all elements of the surface transportation system.

Although the interagency Committee on Marine Transportation System was established in part to address this issue, it is unclear what impact it will have. The CMTS reflects a fairly slow process: it was directed to be created by the 2004 Ocean Action Plan, the CMTS was formally established in August 2005, and delivered its initial report on July 10, 2008. The CMTS report identifies several action items with a broad range of words including "Work collaboratively, Encourage, Propose, Share, Publish, Facilitate, and Develop."

The CMTS does have an executive staff and a small staff on detail from the member agencies. However, historically, broad ranging committees of this sort with wide ranging membership and a soft focus have not been particularly successful in addressing the issues they were created to meet. It is unclear what impact the CMTS can have because its charter limits it to consultation and coordination. It has no inherent legislative authority. The CMTS charter specifically states that "Each agency shall fund the costs of its own participation in the CMTS" and "Nothing in this charter shall be construed to require the obligation of any budgetary resources on the part of member agencies." The charter also appears to limit the authority of the CMTS by stating "Nothing herein shall derogate from the authority vested in any agency or to other government entity by statute, executive order, presidential directive, or any other instrument." The success of this committee in addressing maritime transportation issues should be monitored.

b. Non-complementary Goals of Federal Agencies

It is inevitable when many Federal agencies have been granted authority over aspects of the Marine Transportation System that conflicts will occur. As previously noted, eleven of the fifteen cabinet-level departments and four independent agencies play important roles in the development of ocean, coastal, and Great Lakes policy. An agency pursuing a statutory objective inherent in its operating charter may not fully appreciate the impact of its actions on the various components of the maritime industry. Inefficient communications and overlapping decision-making can be obstacles to planning and policy making pertaining to the maritime system. Thus, it is important that the Maritime Administration be aware of, and participate in, to the extent possible, the activities of other agencies that have an impact on critical maritime operations.

c. No Federal Leadership in Permits and Regulation

The lack of a singular authoritative oversight body for establishment and furtherance of the national maritime domain limits the prioritization of policy and implementation and support of the active participants across the maritime dimension. With over eighteen federal agencies involved in the maritime dimension of federal policy-making, strategic considerations are

often secondary relative to the particular interests of each individual agency. The lack of a coherent structure of regulation increases the cost of compliance for participants in the maritime domain.

One exception to this is the regulatory authority over LNG facilities constructed offshore in federal waters provided to the Secretary of Transportation by the Transportation Security Act of 2002.

d. Public Interest

A policy framework that is supportive of the globalized maritime network is in the public interest. System reliability, safety and security impact consumers, producers, users of public land, employers and workers. A lack of public understanding of the impact of the maritime network on every-day lives can hinder the progress of policy and reforms. Farmers far away from the coast will lose out to competing grain exporters if the maritime system malfunctions. Inefficiencies or delays in shipping add to the cost of consumer goods. Industry and consumers can lose billions of dollars when parts of the system shut down for only a day or two.

The maritime transportation system thus impacts many geographically disbursed interests and various industries. Many of these entities may not have a unified vision for the future of the maritime system and some have competing interests. However, if presented with the right message, all consumers and business that rely on the system will agree that maintenance and improvement in infrastructure as well as investment in innovative maritime technologies will benefit them. Virtually all participants in the U.S. economy can benefit from having an efficient, reliable and flexible maritime system.

An alternative approach to maritime issues and development of a comprehensive maritime policy would combine all Federal maritime responsibilities in a single agency: the Federal Maritime Administration. As noted by former Secretary of Transportation, and former Chair of the House Committee on Transportation and Infrastructure, Norman Y. Mineta, this agency would broaden its focus to the role of maritime infrastructure, vessels and waterways in the U.S. transportation system as a whole, This agency would include the aids to navigation functions currently in the Coast Guard and the responsibilities of the Army Corps of Engineers that currently relate to domestic ports and waterways.

VI Prospective comprehensive reform requirements

Prospective comprehensive reform requirements to evaluate the expansion and role of U.S. participation in global and U.S. marine transportation markets will be the concluding focus of this report. Past and current U.S. maritime programs have focused on the issues of ships and crews, not the vital role that marine transportation plays in the of the entire United States economy. The policy focus for the Maritime Administration should shift to broad functioning of the Marine Transportation System as a critical component of the total national logistics system. As stated earlier, the focus of U.S. maritime policy should be to develop maritime transportation policies that will take advantage of the wealth that can be gained from water transportation and increase the U.S. presence in global commerce. The Maritime Administration should continue to lead the Marine Highway Initiative (MHI) which provides incentives for and advocates for short-sea shipping.

The approach to making maritime policy must first undergo a paradigm shift away from decentralized policy-making that concentrates on distinct functions of the maritime system, towards a coordinated, systemic approach with the goal of supporting an increasing flow of goods through the maritime system. Most importantly, it is crucial that policy makers recognize that in order to handle the volumes of goods that will flow on the maritime system in the future, actions to shore up the maritime system must begin today. Coordination of policy should be underpinned by technologies and communications channels and balance the interests of efficiency, reliability, safety, national security and the environment in the flow of commerce. Maritime policy should also recognize the global nature of the maritime system and promote U.S. economic interest and participation.

a. Port Development

As with other aspects of policy, port development should be assessed in a more systemic manner. Currently, the needs of individual ports are often assessed separately from the needs of having adequate port capacity that maximizes efficiency in maritime shipping on a national level. In addition, ports must be viewed as an entry and exit point on a wider intermodal network. Communication among and between institutions should thus be strengthened with the aim of managing and optimizing the roles for transportation and trade related to infrastructure for ports including the depths of channels for navigation, port security and labor adequacy and safety.

Previous sections of this report have noted that it may be difficult to move the cargo volumes forecast for the future over existing U.S. domestic transportation infrastructure. The April 2008 Freight Bottomline Report – Water Transportation[17] by Cambridge Systematics presented to the American Association of State Highway Transportation Officials (AASHTO) notes:

[17] Freight Bottom Line Report – Water Transportation, Alan Meyers, AICP, Cambridge Systematics, April 15, 2008

"#1: Nobody knows exactly how important our MTS is, what it does for us, or what happens if we fail to maintain and improve it.
#2: There is no guiding assessment of MTS deficiencies and needs, and no guiding framework for MTS improvements.
#3: The mechanisms for funding and delivering MTS improvements are fundamentally broken."

The AASHTO report also recommends assessment of MTS deficiencies and recommends:

- Direct US DOT to conduct a national MTS Condition and Performance Evaluation Study, a national MTS Future Framework Study, and a formal Functional Classification of MTS Waterways and Connectors.
- AASHTO should develop "best practice" guidance for states for MTS planning.

Given the importance of the Marine Transportation System, including the linked inland components, these recommendations should be followed and the Maritime Administration should be instructed to take the lead in this effort for the US DOT. The Maritime Administration has stated in the November 2007 "A Vision for the 21st Century" that the future marine transportation network "must move a larger volume of goods and people with high levels of reliability and efficiency."

Because the transportation issues identified in this report cover transportation from the point of origin to ultimate U.S. inland destination, the MTS concept should be broadened to include the potential performance of the inland transportation links, where appropriate.

As mentioned in the section on taxation above, the February 2008 recommendations on the Harbor Maintenance Tax should be pursued.

Because the Maritime Administration is the federal agency most closely linked to oceanborne cargoes, it should monitor the performance of the entire system on an ongoing basis.

b. Maritime Tax Policy

Fiscal policy provides funding for federal programs and serves to achieve the aims of the federal government. Broadly, the tax structure can be used to encourage or discourage various market outcomes in areas of commerce, the environment and safety. Given international trade agreements, the maritime industry can be shaped through fiscal tools such as tax incentives, tax increases, tax deferments, tax credits, acceleration of depreciation of assets, and a range of measured, technical tax structures that can attract or shift a combination of public and private investments. It has been demonstrated, as in the case of the repeal and ultimate restoration of the Subpart F tax deferral, that Federal tax policy can have a substantial impact on U.S ship ownership.

Thus, the makers of maritime tax policy must be careful to assess the impact of taxes, fees or subsidies on market incentives. Tax policy is one tool in ensuring an adequate infrastructure,

the efficient flow of commerce, the competitiveness of the U.S. maritime industry, and the betterment of the environment. The correct balance between customs taxes and user fees is the one that provides adequate funding and sends the desired signals to market participants.

There should be a greater understanding of the relative competitive nature of the U.S. maritime industry in relation to competing service providers.

Reforms should be made to the tax treatment of U.S.-flag vessels and crews operating in the foreign trades to make the taxation of U.S. citizens more consistent with the tax treatment of their foreign flag competition.

c. Labor Laws, Safety and Liability

The best policy response to the dangers of the seaman's occupation must maintain strict worker protection and safety standards but work can always be done on reducing legal complexity and compliance costs for a given standard of safety. One way to achieve this is to move towards a "no-fault" regime under standard workers compensation rights. This would provide guaranteed compensation for injured workers, while removing uncertainty from employers and greatly reducing legal costs for both parties.

d. Other Vessel Operations Issues and Policies

To increase the capacity and range of U.S.-flag vessel fleet operations will require changes in policy. As the primary obstacle to greater vessel operations is the high cost of operating U.S.-flag vessels, reform should primarily be focused on changes to regulations that enable higher productivity of operations and use of lower cost resources. Reform of vessel crewing regulations could enable cost savings from productivity gains from greater application of current vessel technology as well as shift the mix of vessels operated to those that are more cost effective. When combined, reforms to reduce U.S.-flag vessel operating costs could slow or reverse the decline in U.S. participation in foreign trades. Changes to operational regulations are only one part of the reform that could affect the industry with other reforms discussed in areas of labor laws, safety and liability, and tax policy.

e. Shipbuilding and Shipyards

Shipyard infrastructure exists for maintenance and dry-docking of vessels, as well as for construction of new vessels. U.S. potential to develop capabilities in shipyards can leverage resources, expand employment and increase skills and technological advantages for the nation's maritime future. Federal policy can promote shipbuilding and ship maintenance in the U.S. and address the following issues:

- Labor skills and capacity for industrial expansion have diminished greatly over past decades as a result of a decline in shipyard activity.
- Promotion of specialized knowledge, skills, technology, and financing structures to ensure competitiveness in the global marketplace.
- Recognize national security interests in having a shipbuilding industry while also responding to market constrains. A domestic shipbuilding capability is essential to maintain and modify sealift support vessels.
- Maintain existing programs and legislation that serve to maintain current commercial shipbuilding base. These include:
    - Title XI Federal Ship Financing Program
    - Capital Construction Fund
    - Small Shipyards Grant Program
    - Jones Act support

Benefits resulting from the existence of a shipbuilding industry include employment, maintenance of a supplier base, and maintenance of a domestic ship repair capability.

f. National Security and Civil Emergency Response

The reliable movement of goods and people is an imperative for national defense and security, and thus the management of the maritime domain to enable maritime interests to respond to emergencies is inherent to the federal role. As the flow of goods and people growth, and congestion on the maritime and adjacent modes increase, the task of providing security and safety will become more complex. Coordinated defense and security and collaboration with elements of the federal maritime dimension are required and will thus become even more crucial.

The critical role of the U.S. merchant marine in the defense of the nation is now evident in the roles being played by the Ready Reserve Force, the Voluntary Intermodal Sealift Agreement (VISA) and Voluntary Tanker Agreement (VTA) programs. These critical programs require ships and U.S. citizen crews.

The Department of Homeland Security was an example of a governmental re-organization to respond to a need for change in the area of national security where many aspects of regulation and enforcement were consolidated. Different agencies are still responsible for different aspects of security and safety such as navigational safety, immigration, prevention of terrorism and criminal activity, labor safety, and food safety. Policy goals need to move towards inspecting higher volumes of ships and cargo while minimizing impacts on the efficient flow of commerce. The goal can be achieved through encouragement of use and development of technology, coordination across agencies and communication with foreign trade partners.

g. Environmental Policy

Measures to avoid or mitigate the environmental impacts of shipping create costs for the shipping industry and for its customers – the vast majority of consumers. However, damage to the environment creates costs, not least for human health and enjoyment. These competing costs are often borne by different groups. The environmental and commercial interests of maritime stakeholders are often fragmented and dispersed geographically or functionally. As described in section four above, policy making is dispersed across functions and jurisdiction as well. However, the mobile nature of the maritime domain requires a coherent set of national and international policies in order to protect the environment in an efficient way that minimizes the costs of compliance and ensures commercial viability.

Policy reform begins with the recognition that the maritime domain impacts the environment and that the environment impacts the maritime domain. Since environmental impacts can happen at a local, regional, national or global level, coordination and cooperation with local, state and foreign governments, and international bodies will be necessary. In addition to environmental regulation and enforcement, federal policy can encourage research and development into technologies that help to mitigate environmental impacts as well as encourage the commercialization of some technologies.

Commercial, recreational and environmental interests may at times be at odds with each other, highlighting the need for communication and centralized coordination of maritime policy. Although facilitating commerce in an environmentally responsible manner is the goal of many agencies, the regulation of commerce and environment is separated and spread out over many agencies. In addition, different agencies have jurisdiction over the regulation and oversight of coasts, water, air and ocean pollution, and ship disposal, without a central role for overseeing the use of resources and balancing competing priorities.

The environmental advantages of marine transportation, including fuel efficiency and reduced emissions need to be emphasized.

Measures to avoid or mitigate the environmental impacts of shipping create costs for the shipping industry and for its customers – the vast majority of consumers. However, damage to the environment creates costs, not least for human health and enjoyment. These competing costs are often borne by different groups. The environmental and commercial interests of maritime stakeholders are often fragmented and dispersed geographically or functionally. Environmental regulation thus requires the coordinated action of many stakeholders at the local, state, national and international level. However, the mobile nature of the maritime domain requires a coherent set of national and international policies in order to protect the environment in an efficient way that minimizes the costs of compliance and ensures commercial viability.

The Maritime Administration, as the agent of the Marine Transportation System should play an active role in environmental actions that affect the operation of that system.

h. Maritime Education

Maritime education includes two components; educating the maritime workforce, and educating the public about the critical role the maritime transportation system has in supporting the U.S. economy, its jobs and its consumers. Consolidation and specialization within the maritime education system may be necessary to meets the needs for the future maritime dimensions. Merchant marine academies and other institutions can be increasingly specialized for future courses and strategies, while others are developed with generalized capabilities. Management across the system of institutions would be a means to most efficiently allocate resources, minimizing duplications in response to market requirements. Communication among and between institutions with the aim of managing and optimizing the federal expenditures would look forward to the appropriate roles of U.S. merchant mariners and applied technologies.

An increased understanding by the general population of the importance of the U.S. maritime transportation and services industries can be achieved through increased focus in public outreach on the impact of the maritime industry on almost all participants in the economy.

The seven maritime academies produce highly trained, licensed officers, who supply the pool of U.S. mariners necessary to meet the nation's economic and national security requirements. Additionally, the U.S. is one of the new sources of mariners necessary to meet the global requirements for mariners and to address world wide shortages of licensed officers. Graduates are also serving in key positions at all levels of the shoreside industries supporting the maritime sector, including logistics, insurance, finance, law, shipbuilding and ship repair, research and technology development and communications.

Given the forecast increase in maritime commerce, the maritime training programs should be continued to ensure the availability of U.S. citizens trained in all aspects of marine transportation in the U.S. workforce.

i. Technology Development and Deployment

Applications of technology remain critical to the advance of safety and efficiency in the maritime sector. As the federal role supporting industry research and development is important to all industries, the support provided by the government through the Maritime Administration to maritime industry should continue. The government can continue to facilitate collaboration between research entities, provide funding, expertise and the dissemination of innovative practices that improve the productivity and performance of the industry. Adoption of state-of-the-art technology helps keep the industry as efficient and as safe as possible and helps minimize government expenditures on other maritime programs when operating costs are reduced through resulting productivity increases.

j. Short-Sea Shipping and the Marine Highway Initiative

The efforts to promote greater use of short-sea shipping through the Marine Highway Initiative should be significantly expanded, including funding for nationally significant demonstration projects. The environmental, safety and congestion-mitigation benefits of increased use of short-sea shipping grow increasingly important over time and provide relief to capacity constraints faced by rail and highway transport in the nation.

k. Consolidation of Federal Policy and Decision-making

Communication among and between institutions with the aim of managing and optimizing their interests will help to ensure that when the strains on the system arise, that resources are marshaled to respond. This can most effectively be accomplished when there are clear authorities, pathways or streams of communication and plans of action with measured responses that are designed to achieve results. Slow bureaucratic processes that delay or obstruct constituencies and maritime interests do not facilitate effective responsive management.

Governance under one agency creates efficiency for the public the agency serves, as well as for administration within the agency itself. There are a range of issues that can be aligned for the future that can be facilitated by the consolidation of responsibilities. Application and oversight as well as the extension of U.S. labor laws to the standards by which foreign vessels must adhere in U.S. territorial waters can be extremely complex. The needs for safety and security of the United States, the vessels in the operational corridors, as well as the physical and general well-being of the seafarers operating within the territorial waters of the nation must be integrated across disciplines. A Federal Maritime Administration would be well positioned to orchestrate such cross-cutting domestic and international interests, providing guidance and understanding industry responsibilities in this context.

The Ocean Action Plan acknowledges the broad importance of the coordination of Marine Transportation System policies to the security and economy of the United States. However, the legislative consolidation of commercial maritime functions in a single Federal agency is a necessary next stop to frame, and implement, public policies to improve the Marine Transportation System.

Conclusion

Policy makers must better align the multi-modal transportation system, of which the maritime system is a key part, with the needs of the U.S. economy – an economy whose participants rely on a system of global supply chains and a highly complex coordination of people and equipment for the free flow of commerce to prosper. The transportation system has evolved to the point where manufacturers and retailers are dependent on precise scheduling of cargo deliveries and the ability to track and trace all assets around the clock throughout the supply chain – whether those assets are in the air, or on water or land. Through these advances, businesses can reduce costs, improve efficiency and offer a wider range of products and services to meet commercial demands and make the United States more competitive in the world economy.

Within this realignment, decisions must be made to improve the ability of maritime policy to meet the commercial, economic, security and environmental needs of the United States in the coming years. Current maritime policy remains narrowly focused on vessels, rather than on the transportation system as a whole. While the desired outcome is a seamless intermodal system from end to end, this can only be achieved when each component – the U.S.-flag fleet, the marine highway, ports and intermodal connectors, shipbuilding and repair, a highly trained and educated workforce, and related services are fully integrated into the overall transportation system.

Proponents of a marine transportation system serving the interests of the United States must choose whether they wish to advocate the preservation of existing institutions and policies that have failed to produce a viable maritime industry that is capable of serving both the domestic and the international trades or to strike out in new directions that will, in the words of the Maritime Administration, be "A Vision for the 21st Century."

We can begin now to shape the structures for decision-making. We as a nation can bring to light the facts of how much trade is moving, where it is moving, from where, and to where, who is moving it and how it is going to move. People and materials will need to move to respond to the consumption patterns of the future. It will require comprehensive reform from all quarters in the national interest and in the interest of humanity, to overcome the impediments to reform. It can be achieved.

APPENDIX A: REGIONAL AGGREGATES

Europe and Mediterranean

Albania
Andorra
Austria
Belarus
Belgium
Luxemburg
Bosnia-Herzegovina
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
EEU n.e.s.
Estonia
European Free Trade Association (EFTA) n.e.s.
Faeroe Islands
Finland
France
Germany
Gibraltar
Greece
Greenland
Hungary
Iceland
Ireland
Israel
Italy
Jordan
Latvia
Lebanon
Lithuania
Malta
Netherlands
Norway
Other Europe n.e.s.
Poland
Portugal
Republic of Moldova
Romania
Russian Federation
Slovakia
Slovenia
Spain
St. Pierre and Miquelon
Sweden
Switzerland
Syrian Arab Republic
The Former Yugoslav Republic of Macedonia
Turkey
Ukraine
United Kingdom
Yugoslavia

Indian Subcontinent

Afghanistan
Bangladesh
Bhutan
British Indian Ocean Territory
India
Maldives
Nepal
Pakistan
Sri Lanka

Latin America and Caribbean

Anguilla
Antigua and Barbuda
Argentina
Aruba
Bahamas
Barbados
Belize
Bermuda
Bolivia
Brazil
Caribbean n.e.s.
Cayman Islands
Central American Common Market n.e.s.
Chile
Colombia
Costa Rica
Cuba
Dominica
Dominican Republic
Ecuador
El Salvador
Falkland Islands (Malvinas)
French Guiana
French Southern and Antarctic Territories
Grenada
Guadeloupe
Guatemala
Guyana
Haiti
Honduras
Jamaica
Latin American Integration Association n.e.s.
Martinique
Montserrat
Netherland Antiles
Nicaragua
Panama
Paraguay
Peru
Rest of South America n.e.s.
Saint Kitts and Nevis
Saint Vincent and the Grenadines
Suriname
Trinidad and Tobago
Turks and Caicos Islands
Uruguay
Venezuela
Virgin Islands (British)

Middle East and Africa

Algeria
Angola
Bahrain
Benin
Burkina Faso
Burundi
Cameroon
Cape Verde
Central African Republic
Chad
Comoros
Congo
Congo (Democratic Republic of)
Côte d'Ivoire
Djibouti
Egypt
Ethiopia
Eritrea
Equatorial Guinea
Gabon
Gambia
Ghana

Guinea
Guinea-Bissau
Iran (Islamic Republic of)
Iraq
Kenya
Kuwait
Liberia
Lybia
Madagascar
Malawi
Mali
Mauritania
Mauritius
Morocco
Niger
Nigeria
North Africa n.e.s.
Oman
Other Africa n.e.s.
Qatar
Reunion
Rwanda
Saint Helena
Sao Tome and Principe
Saudi Arabia
Senegal
Seychelles
Sierra Lione
Somalia
South Africa
Sudan
Tanzania (United Republic of)
Togo
Tunisia
Uganda
United Arab Emirates
Western Sahara
Yemen
Zambia
Zimbabwe

Other Asia and Pacific

Armenia
Areas n.e.s.
Azerbaijan
Australia
British Antarctic Territory
Brunei Darussalam
Cambodia
Christmas Island
Cocos (Keeling) Islands
Cook Islands
Developing Market Economies in East Asia n.e.s.
East Timor
Fiji
Free Zones
French Polynesia
Georgia
Japan
Kazakhstan
Korea (Democratic People's Republic of)
Korea (Republic of)
Kribati
Kyrgyzstan
Lao People's Democratic Republic
Macau
Malaysia
Micronesia (Federated States of)
Mongolia
Myanmar
Nauru
Neutral Zone
New Caledonia
New Zealand
Niue
Norfolk Island
Oceania n.e.s.
Papua New Guinea
Philippines
Pitcairn
Samoa
Ship Stores and Bunkers
Singapore
Solomon Islands
Special Categories
Tajikistan
Thailand
Tokelau
Tonga
Turkmenistan
Tuvalu
Uzbekistan
Vanuatu
Viet Nam
Wallis and Futuna Islands

Note: n.e.s. is not elsewhere specified

APPENDIX B: TRADE AND FORECAST DATA

The IHS Global Insight global trade forecasts include all commodities that have physical volume, but not services or commodities without physical volume, such as electricity. These commodities are grouped into categories derived from the International Standard Industrial Classification (ISIC). The forecasts here group all commodities into 77 ISIC categories.

For all trade partner countries in the world, IHS Global Insight tracks 54 major countries individually and groups the rest of the countries in the world into 16 regions according to their geographic location. Therefore, the trade forecasts are for 77 commodity groups traded among 70 country/regions. This is a framework of 77×70×(70-1), or 371,910 potential trade flows. Because not every country trades every commodity with every other country, there are 269,158 bilateral trade routes with non-zero trade in this forecast.

IHS Global Insight forecasts world trade in nominal and real commodity value and then converts them to physical volume by transportation mode.