



WORLD SHIPPING COUNCIL
PARTNERS IN AMERICA'S TRADE

Panama Canal Expansion Position Paper

May 2006

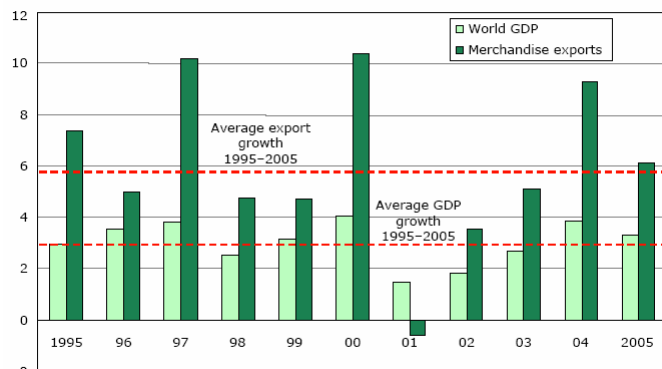
The Panama Canal Authority (ACP) recently submitted a proposal to the Panamanian government for expansion of the Canal through the construction of a third set of locks. The locks would be large enough to handle the larger post-Panamax ships that are currently in use and are increasingly being built for global commerce that cannot transit through the current locks. The complete ACP proposal can be viewed at: <http://www.pancanal.com/eng/plan/>, select Panama Canal Expansion Proposal – Third Locks Project.

Members of the World Shipping Council are some of the Canal's principal users and appreciate the very important role that the Panama Canal serves in facilitating global trade. An analysis of trade growth, key markets, vessel fleet configuration, current Canal capacity, and alternative routing options demonstrates that expansion of the Canal's capacity is necessary both to accommodate the volumes of global commerce and to sustain Panama's position in that growth.

Global Trade

World Trade Organization (WTO) statistics show that the global economy's merchandise exports grew at a rate of 6% in 2005 and the value of those exports increased 13%, exceeding US\$10 trillion for the first time. For 2006, the WTO estimates a 7% growth in world trade and a 3.5% growth in the world economy, which reflects the relationship between the two metrics that has developed over the last decade. World trade continues to grow at approximately twice the rate of the world economy, confirming the importance of international commerce to sustaining a strong economy in the future.

Growth in the volume of world merchandise trade and GDP, 1995-05
Annual percentage change



Source: WTO.

Container Trade

Container trade, which is the principal facilitator of international goods movement, will continue to experience steady growth. This sector has grown an average of 9% per year since 1980, and more than an average of 11% per year since 2000, consistent with the strong growth of the overall economy. Drewry Shipping Consultants estimates that cargo moving in containers accounts for over 70% of the value of all the international trade that moves via the sea. *In 2006, that will result in almost 346,000 container shipments a day and by 2014, that number will exceed 600,000 – an increase of more than 75%.*

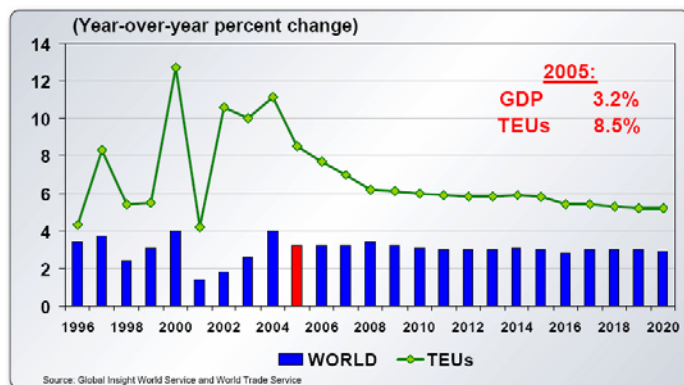
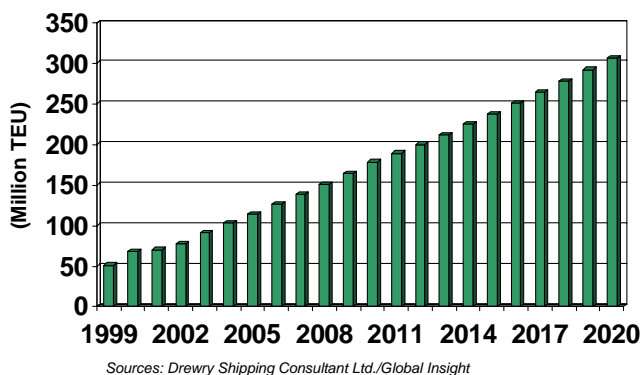
The use of containers and container ships has risen steadily because they provide the fastest, least expensive conveyance for international cargo. Even today, cargo moving on break-bulk vessels continues to convert to container shipping. Marc Levinson, in his recently released book “The Box – How the Shipping Container Made the World Smaller and the World Economy Bigger” presents plausible evidence to suggest that today’s

strong global economy was made possible in large part by the introduction of the shipping container. “[B]efore the container was in international use, ocean freight costs alone accounted for 12 percent of the value of U.S. exports and 10 percent of the value of U.S. imports. ... [It] was so expensive that in many cases selling international was not worthwhile.” Today, ocean transportation is a very small percentage of the cost of most goods; it costs less than a postage stamp to ship a new pair of athletic shoes from Asia and three cents to ship a bottle of beer.

Container shipping has transformed the international movement of goods and as a result it is not only growing faster than the world economy, but continues to grow faster than merchandise exports. This happens not only because it has become the shipping method of choice for international cargo but results

from several additional factors. These include: continued conversion of break-bulk cargo to containers; a greater percentage of movement of lighter weight, high value products moving in containers as compared to the movement of bulk commodities; and, freer trade, promoted by agreements like NAFTA, CAFTA and

World Container Traffic



the WTO, which enable businesses to more easily source components from around the globe. This means that the volume of goods traded and moved will continue to exceed the volume of goods sold for final consumption. Carriers will continue to focus on operating solutions that enable them to provide the assets and the service needed to effectively handle this ever-increasing volume while containing cost for their customers.

Trading Partners

The United States will continue to be a principle driver of world trade. As a result, the efficient provision of transportation services for goods moving in U.S. trades will be a key component of continued global economic expansion. The Canal also serves to link other

important trade routes, such as the West Coast of South America (WCSA) and Europe, and the East Coast of South America (ECSA) and Asia. The rapid growth of China’s exports to global markets has been a particularly important feature of changing trade demands. To continue efficiently linking the world’s economies closer together in a reliable manner,

international shipping companies must plan and operate networks requiring sustainable long-term shipping routes. The Panama Canal, however, is presently operating at close to capacity and is limited with respect to the size of vessels it can handle. It cannot handle forecasted future demands without expansion.

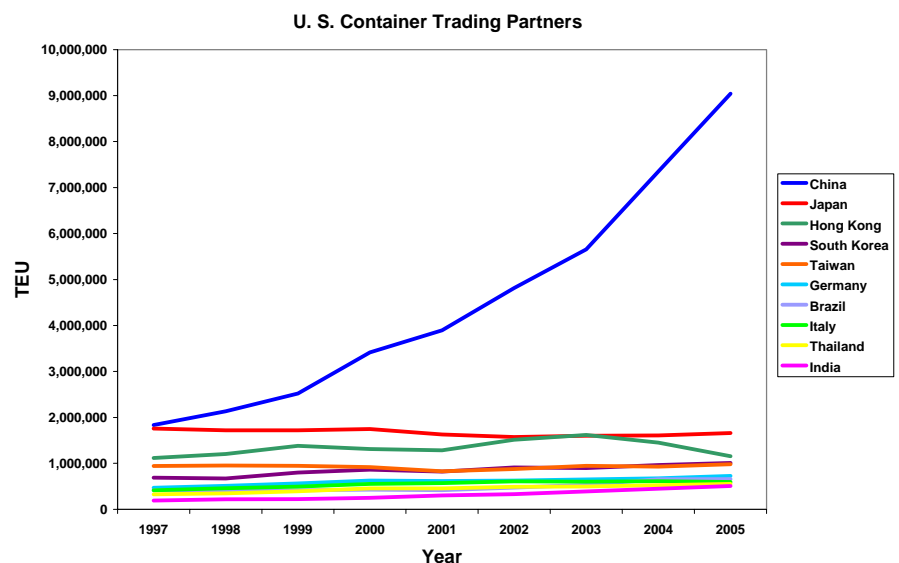
(Country GDP Rank in Billions of Real (2003) U.S. Dollars)

2000	2010	2020	2030	2040	2050
U.S.	U.S.	U.S.	U.S.	U.S.	China
Japan	Japan	China	China	China	U.S.
Germany	Germany	Japan	Japan	India	India
U.K.	U.K.	Germany	India	Japan	Japan
France	China	U.K.	Russia	Russia	Brazil
Italy	France	India	U.K.	Brazil	Russia
China	Italy	France	Germany	U.K.	U.K.
Brazil	India	Russia	France	Germany	Germany
India	Russia	Italy	Brazil	France	France
Russia	Brazil	Brazil	Italy	Italy	Italy

Source: Global Insight World Service

U.S. Container Trades

Container volume growth, expressed in 20 Foot Container Equivalents (TEUs), highlights the recent changes in international cargo movement resulting from global economic growth. The United States’ top five trading partners are the Asian economies of China, Japan, Hong Kong, South Korea and Taiwan and represent more than half the TEU volume, with China alone accounting for 35% and rising. The trade between



Asia and the U.S. is the world's largest and that pattern is likely to continue for some time. This means that serving the trade between Asia and the U.S. East Coast will likely remain the largest contributor to Panama Canal revenues from the container trades; however, without expansion of the Canal, the revenue opportunity for Panama will be constrained by the Canal's current capacity.

Other Container Trades

South America has been experiencing strong growth in container trades, with capacity increases in the trades on the East Coast of South America (ECSA) in excess of 10% last year, and an increase of about 30% on the ECSA-Asian routes. The West Coast of South America (WCSA) has also experienced strong growth, with more than 20% growth in the trade from WCSA to Europe. That growth is fueled by exports from Chile, which represent 60-70% of the total, and are benefiting from a strong Euro and the European Union/Chile trade agreement. Services that transit the Panama Canal enroute to Europe will remain the most favorable route for this trade.

Trade volumes between Asia and Central America and the Caribbean are smaller, but also favorable. Most carriers serve those markets using the main services established for the large U.S. trade and utilize relay points to feeder networks east of the Panama Canal. This volume, while often more difficult to readily identify, further increases the demand for capacity on services otherwise referred to as U.S. services. The ability to serve the Latin America markets, when combined with the expected growth in the Asia to U.S. trade, make the need for carriers' use of larger and larger vessels even more compelling.

Other Factors to Consider

Some of the most significant routes for transporting future trade volumes will continue to be those that would increase demand for Panama Canal transits. Carriers need to establish regular, reliable services for the routes that will link the world's trading partners. Those liner shipping services must be supported by sufficient land side capacity in port terminals, railways and highways to move goods to their final destination. Therefore, carriers review the availability of future infrastructure before committing new services upon which importers and exporters will rely and integrate into their supply chain management planning.

U.S. Transportation Infrastructure

Over the last ten years, the rapid growth of international trade has resulted in a doubling of the container volume moving through the U.S. transportation infrastructure without a comparable increase in the pace of capacity expansion. As a result, the U.S. land-side transportation system has developed bottlenecks, particularly in the areas surrounding and connecting major port gateways. While there are projects planned or underway in the U.S. to add capacity, they are not

currently adequate to handle forecasted demand. In particular, U.S. West Coast ports and their connecting rail and highway infrastructure are facing substantial challenges. This system will continue to face significant stress, and all users of the system will continue to seek efficiency improvements and alternate, reliable routings to avoid the costs and delays experienced in certain corridors.

- **Port Terminals**

In order to effectively handle expected cargo volumes transiting through U.S. ports, additional vessel capacity, marine terminal capacity and efficiency, and connecting infrastructure capacity are all needed. The industry has responded with substantial private investment in ships, equipment, data systems, and the maritime infrastructure, including partnerships with the public port authorities to expand capacity wherever practical.

Although international containerized cargo moves through 116 ports in the U.S., 85% percent of that trade flows through ten U.S. ports, which currently represent the major U.S. gateways for container trade. These are:

On the West Coast:

The Los Angeles/Long Beach port complex

Oakland, CA

The Puget Sound ports of Tacoma and Seattle

On the East and Gulf Coasts:

New York, NY

Charleston, SC

Savannah, GA

Norfolk, VA

Houston, TX

The ports of Los Angeles and Long Beach combined handle 36% of the total U.S. container volume. Overall, 42% of the total U.S. container volume moves through West Coast ports. The U.S. West Coast ports have limited ability to expand physical capacity, and efforts to obtain efficiency improvements to increase the number of containers that can move through the existing terminal space in order to accommodate future growth is limited by labor relations issues. Prince Rupert, Canada has the only significant new container facility expansion project underway on the West Coast, designed to link Asia and mid-West markets.

The East and Gulf Coast ports handle 58% of the volume today and that percentage is expected to rise. A number of ports in this region have physical capacity expansion capabilities and *7 new terminals*, (5 on the East Coast and 2 on the Gulf Coast), are currently in various stages of development and are expected to be available in the next 10 years. These

are:

- Virginia – Norfolk area
 - APM Terminals Portsmouth (a private facility) – under construction
 - Craney Island Container Terminal – proposed
- North Carolina – Wilmington area
 - North Carolina International Port – proposed
- South Carolina – Charleston area
 - Naval Shipyard Container Terminal – planned
 - Jasper City Container Terminal – proposed
- Florida – Jacksonville
 - Dames Point MOL Container Terminal – under construction
- Alabama – Mobile
 - Choctaw Point Container Terminal – under construction
- Texas – Houston
 - Bayport Container Terminal – under construction

It is expected that these new facilities will represent major new gateways for the future, in addition to the facilities at the existing top 10 ports.

East and Gulf Coast U.S. ports recognize that Canal expansion can provide them with an opportunity to capture a growing share of Asia-U.S. commerce, particularly as U.S. West Coast port congestion and labor inefficiencies persist as well as continuing congestion with the U.S. rail capacity serving West Coast ports. The ACP and these U.S. ports have established a network of close, formalized consultations to communicate market research. Additionally, the ACP and the ports actively exchange information regarding their respective capacity expansion efforts. These efforts also provide the U.S. ports with an enhanced ability to plan their own dredging and shore side expansion plans to handle the projected increase in trade.

Major U.S. importers are locating more of their distribution centers near the population concentrations of the U.S. East Coast and Gulf, which provides for an enhanced role of the U.S. East Coast and Gulf ports in handling cargo from Asia, ensuring a growing demand for all-water service from Asia. The best link between the expanded East and Gulf coast capacity and Asia would be the all-water route of the Panama Canal however the Canal's present capacity and vessel size limitation constrict the opportunities to capture that growing share of Asia-U.S. Since most of Panama Canal traffic originates from or travels to the East Coast of the United States, the ACP has partnered with several U.S. East Coast and Gulf port authorities –such as New York/New Jersey; Norfolk, Virginia; Savannah, Georgia; Charleston, South Carolina; New Orleans, Louisiana; Houston, Texas; Miami, Dade County and Tampa, Florida; and the Dallas-NAFTA Trade Corridor Coalition- to seek cooperation in boosting trade along the All-Water Route, the route from Asia to America's East Coast via the Panama Canal.

▪ **Railways and Highways**

The volume of U.S. domestic freight transported – all modes – grew about 20% from 1993 to 2002, with trucks on highways handling 71% and rail carrying 14%. Approximately four million miles of public roads together with more than 140,000 miles of railroad track are utilized to move both these huge volumes of U.S. domestic freight, as well as international cargo to and from U.S. ports. By 2020, that road and rail network will need to carry more than double the freight volume that moves over it today. The current system cannot support that demand without additional capacity.



More than one third of the U.S. container trade moves through the Southern California port complex of Los Angeles and Long Beach; however, over half the cargo unloaded in those ports is destined to move inland beyond California. The primary origin of the cargo is Asia, more specifically China. Even though the majority of cargo is not destined for California, it enters through those ports in part because it is arriving on vessels of 5000 TEU or greater, which currently cannot transit the Panama Canal.

As outlined on the map, the rail and road network is extensive in the Eastern half of the country and sparser in the Western half. Today, this results in congestion and delays, particularly during peak volume periods. Significant capacity must be added in those corridors to keep pace with the growing demand. Carriers and their customers are also increasingly looking to establish routing options through other ports, particularly for the high volume of cargo that is ultimately destined for Mid-West, East and Gulf Coast states. Canal expansion would significantly facilitate such an option.

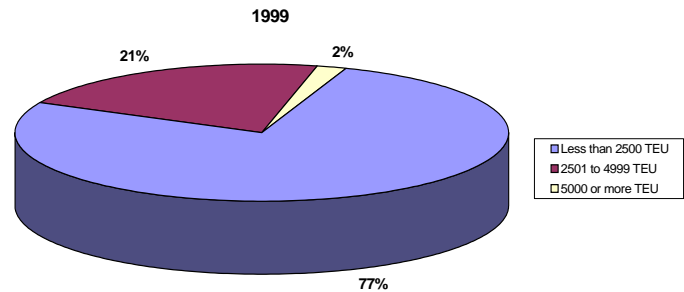
Vessel Fleet Development

The average size of a containership has grown larger every year since 1980, because carriers must continuously maintain or reduce their unit cost - the cost of moving a container, and big vessels can carry more containers at lower cost.

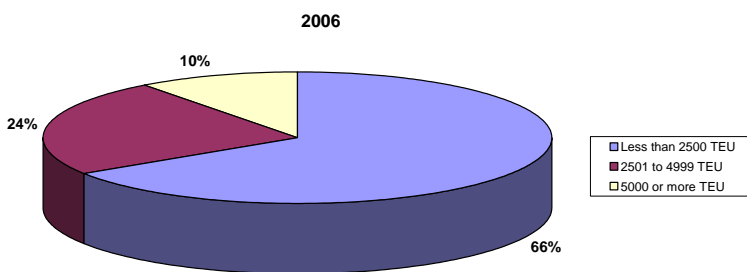
Bigger ships require deeper shipping channels to access ports and bigger cranes to load and unload the ships. Port terminal expansion and new terminal construction plans are being developed to accommodate bigger ships now and into the future.

Ships of about 5000 TEU or greater are referred to as post-Panamax because they are too wide to transit through the Panama Canal's current locks. Because of their efficiencies, these post-Panamax ships are increasingly used on the high-volume trade corridors, including the Trans-Pacific trades; however, the Canal cannot currently take advantage of its global position and serve this growing segment of world commerce because of its current size constraints.

In 1999, the fourth year that the industry took delivery of a vessel of more than 5000 TEU, those ships comprised only 2% of a global fleet of 2,449 ships, providing a total of four million TEUs in capacity. Note that 77% of the ships in the 1999 fleet would have limited use today in the main trades between the U.S. and Asia and the U.S. and Europe, because they are now too small to be efficient in those trades.

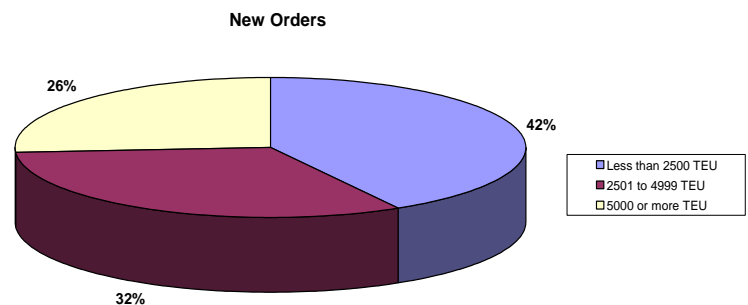


Just seven years later, the larger ships now represent 10% of the 2006 fleet of 3,641 vessels providing over 8 million TEU in capacity. Thus the increasing use of larger vessels enabled the industry to double available capacity - an increase of 100% - even though the number of ships only increased by 50%. This



means that the amount of total capacity will increasingly be available only on ships of 5,000 TEU or larger, which cannot currently transit the Panama Canal. *Over 60% of the total capacity ordered in 2003 is assigned to post-Panamax vessels with an average size in excess of 7,000 TEU.*

The pattern is further evidenced by the current new ship orders as more than one quarter of all those orders is for ships with a capacity larger than 5000 TEU. The smallest ships will be needed for short-sea trades and as feeder vessels and the mid-range ships will fit well into the North-South trades. The main East-West trades linking Asia, Europe and the Americas will be served predominantly by vessels of 5000 TEU or larger in the future. *Estimates are that by 2011, 50% or more of the capacity of the global fleet will be comprised of these larger ships.*



This means that unless the Panama Canal is expanded, routing options from Asia to the U.S. are limited to entering via the already congested U.S. West Coast to connect to a strained U.S. infrastructure; or entering via the U.S. East and Gulf Coasts by transiting the Suez Canal. That route is undesirably long from the large North Asia market and using it as the primary all-water route will add transit days and cost to both the carrier and the customer.

Establishing the Shipping Routes

Planning a vessel network is complex because there are many factors to consider. Importers and exporters need regularly scheduled service that can be reliably incorporated into their supply chains. The economic and world trade information indicate the need for more services and capacity between the U.S. and Asia - particularly North Asia - and also a need to plan for fairly rapid growth in the trade with India.

Although it is physically possible to serve the Asia – U.S. trade today by transiting the Indian Ocean to the Cape of Good Hope in Africa and then crossing the Atlantic Ocean, that route is too long and too costly to be a viable option for regularly scheduled service.

Similarly, there is a possibility that some decades from now, shipping routes could open up via the North Pacific and Arctic Oceans through the North West passage. It is important to note that even if the climate enabled the possibility at some point, the route would at best, be one that could only be used on a seasonal basis, which does not make it a viable option for the regularly scheduled service required to transport goods from Asia. As a result, there are three viable vessel routing options for carriers serving the Asia – U.S. trades:

- 1) By vessel to the U.S. West Coast and by rail and truck to final destination
- 2) By Vessel to the U.S. East or Gulf Coast via the Suez Canal
- 3) By vessel to the U.S. East or Gulf Coast via the Panama Canal

Given the volume of cargo that needs to be transported, the location of available port terminal capacity, and the congestion points that are emerging in the U.S. inland transportation system, carriers will consider all three options when developing a new service.

Evaluating the Options

In addition to a review of available port terminal space and the related road and rail service, carriers consider the type and number of ships needed for the service; the type and number of ships available; the cost to operate those ships and the ability to consistently maintain a regular schedule.

The table on the next page provides an example of a routing evaluation summary for a new service from Asia to the United States.

Routing evaluation for a new service from Asia to the U.S. – Example Only

(Note: (+) is positive; (-) is negative; (o) is neutral).

Route	U. S. Infrastructure Availability	Number and Size of Ships for a service	Cost Implications	Schedule Reliability
Asia to U.S. West Coast (WC)	(-) No new WC port terminals planned (+) 1 new West Canada terminal (-) No major expansions planned (+) Deep draft readily available (+) Intermodal facilities and connectivity (Note: With volume growth, this could soon change to neutral or even negative without significant capacity expansion) (-) Only 3 major gateways (LA/LB, Oakland and Sea/Tac)	(+) Minimum 5 ships (o) Minimum ship capacity 2000 TEU (+) No maximum TEU size limit	(-) Congestion (-) Limited on-dock rail (-) Environmental impact mitigation (+) Fewer ships	(-) Congestion causes delays (-) Rail capacity strained (-) Rail transit times have increased (+) Short ocean transit
Asia to U.S. East and Gulf Coasts (EC) via the Suez Canal	(-) Limited EC ports for 5000+ TEU ships until dredging projects complete (+) Minimum 7 new EC terminals to be added in next 10 years (+) Minimum 7 EC ports dredging to deepen channels for larger vessels (+) 9 major gateways in 9 different states	(-) Minimum 11 ships needed (o) Minimum capacity 2000 TEU; target size is 5000 TEU or greater (+) 10% of current fleet is 5000 TEU or more (+) 26% of new orders is 5000 TEU or more (+) No vessel size restriction through the Suez Canal	(-) More ships needed (+) Bigger ships reduce cost per TEU (-) Long transit from North Asia (+) Good transit from India and South Asia	(-) Long transit affords more opportunities for delay (+) Ample Suez Canal capacity (-) Transit through potentially volatile region (+) New EC capacity alleviates congestion
Asia to U.S. East and Gulf Coasts (EC) via the Panama Canal	(-) Limited EC ports for 5000+ TEU ships until dredging projects complete (+) Minimum 7 new EC terminals to be added in next 10 years (+) Minimum 7 EC ports dredging to deepen channels for larger vessels (+) 9 major gateways in 9 different states	(o) Minimum 8 ships (-) 10% of current fleet is 5000 TEU or more and cannot use current Canal (-) 26% of new orders is 5000 TEU or more and cannot use the current Canal (-) Size restricted to 2000 to 4800 TEU ships	(-) Only 600 ships globally in optimal size of 3000 to 4800 TEU (-) Limited vessel availability creates higher charter rates (+) Less ships than via Suez (-) More ships than via West Coast (-) Use of smaller ships increases cost per TEU (+) Good transit from North Asia	(-) Canal at capacity (-) Canal transit delays experienced (+) New EC capacity alleviates congestion (+) Route avoids WC congestion, cost and inland infrastructure bottlenecks

Conclusions

Carriers will continue to use all three shipping routes; however, with planned increases in port terminal capacity concentrated on the U.S. East and Gulf Coasts, carriers and their customers will increasingly seek to move more of their Asia trade through those ports.

The expected growth in trade with India and South Asia can be served effectively via the Suez Canal to the U.S. East and Gulf Coasts and that route may become the preferred route for goods moving between those countries as new services are introduced to accommodate the future cargo volume.

The higher volume routes between North Asia and the U.S. West Coast will continue to show substantial growth rates. The routes for that trade have the advantage of shorter ocean transits and the ability to use fewer vessels to provide a consistent weekly service. However, the port terminal capacity on the West Coast, the U.S. rail and highway infrastructure constraints, environmental and community pressures constraining California port growth, and labor relations issues present obstacles to the West Coast's ability to absorb all the growth that is expected. As a result, some future growth will shift to East and Gulf Coast ports, and the terminal expansion projects underway in these ports will enable them to absorb that growth in addition to the growth in volume on existing routes and services.

The preferred route for the cargo moving between North Asia and the U.S. East Coast and Gulf, is that via the Panama Canal due to the shorter transit and the ability to use fewer vessels when compared with the Suez route. But, without expansion of its capacity to handle more vessels and larger vessels, the Panama Canal will become an increasingly less viable and competitive option to maintain its essential position as one of the world's great trade gateways.

The Panama Canal Authority's proposed plan for expansion is based on a sound and well-reasoned analysis of both the future market demands of world trade and what Panama needs to do to maintain its role in the world economy.

About the World Shipping Council

The World Shipping Council was established to address public policy issues of interest and importance to the international liner shipping industry. Its members have invested over U.S. \$150 billion in the assets and related transportation network that moves more than two-thirds of the world's trade in goods. They carry roughly 93% of the United States' containerized imports and exports or more than \$500 billion worth of American foreign commerce per year. The Council's members include the full spectrum of ocean common carriers, from large global operators to trade-specific niche carriers, offering container, roll-on roll-off, car carrier and other international transportation services. For more information, go to: www.worldshipping.org

Additional Resources

<u>Subject</u>	<u>Source</u>	<u>Website</u>
Panama Canal	Panama Canal Authority	www.pancanal.com
World Trade	World Trade Organization	www.wto.org
U.S. Container Trade	U. S. Dept. of Transportation Maritime Administration	www.marad.dot.gov
U.S. Ports	American Association of Port Authorities	www.aapa-ports.org
U.S. Railroads	American Association of Railroads	www.aar.org
U.S. Highways	U. S. Dept. of Transportation Federal Highway Administration	www.fhwa.dot.org

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Please address questions or comments regarding this paper to akappel@worldshipping.org.