

The High-Speed Ship/Agile Port System In The Commercial / Military Market



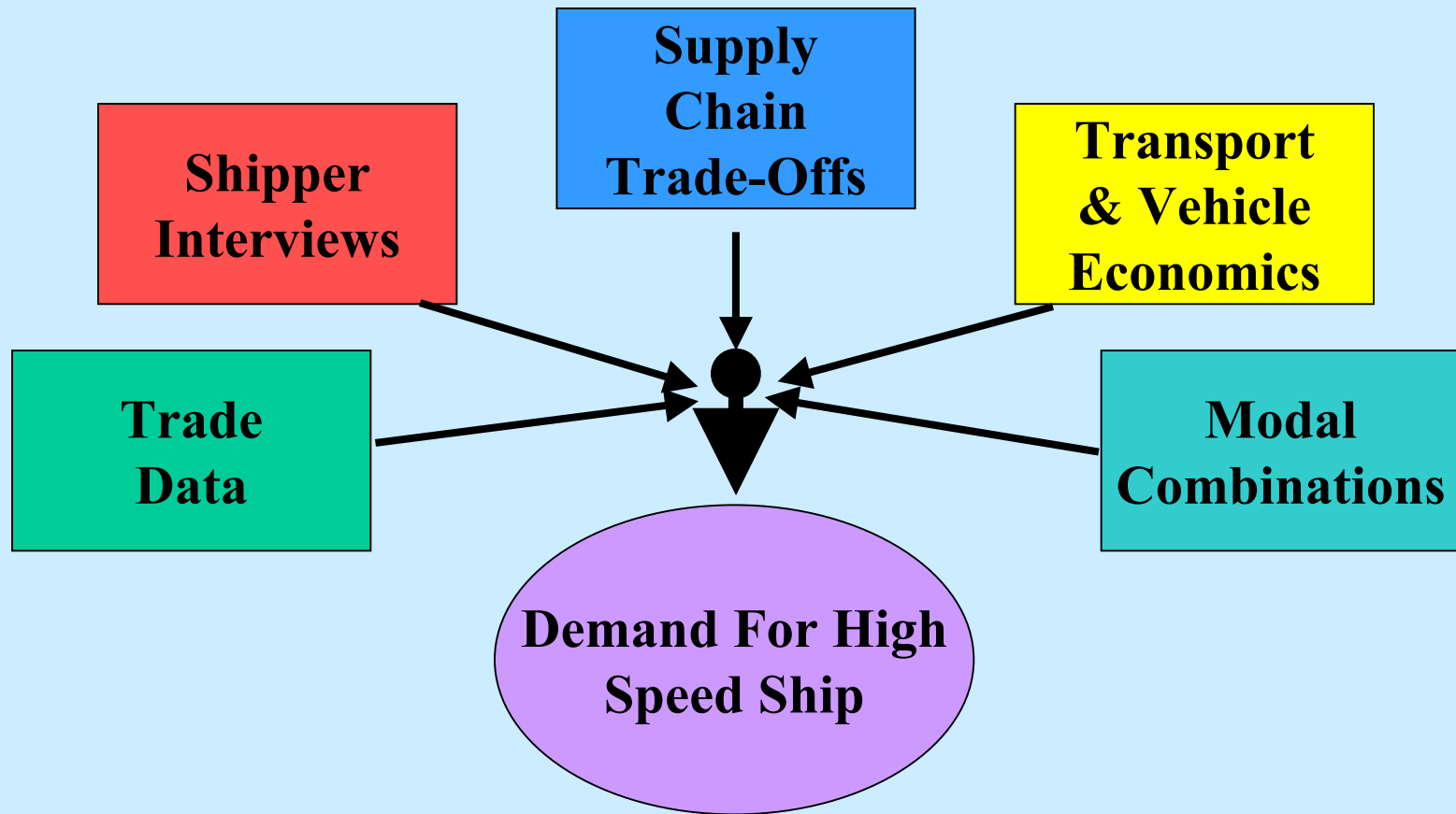
Introduction

- Research Objective: Test the commercial viability of a High-Speed Ship/Agile Port (HSS/AP) system
- Initial Concentration on:
 - *Demand for HSS/AP service by shippers*
 - *The Transpacific Market*
- What is the potential for shippers to divert cargo from existing modes to HSS/AP?
Why?

Research is Structured to Identify:

- Potential customers
 - *Retailers, manufacturers and wholesalers*
 - *By Value or “Perishability” of commodity*
- Discussion drivers for modal and logistics choices
- Sensitivity to various price and operating scenarios for HSS/AP
- Commercial and military applications

Elements of the Analysis of the Demand for the High-Speed Ship/Agile Port System



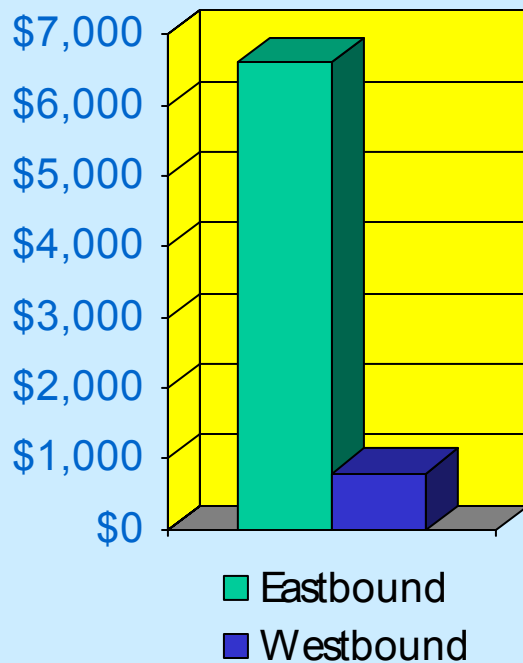
Size and Composition of the Transpacific Market

The Transpacific Market

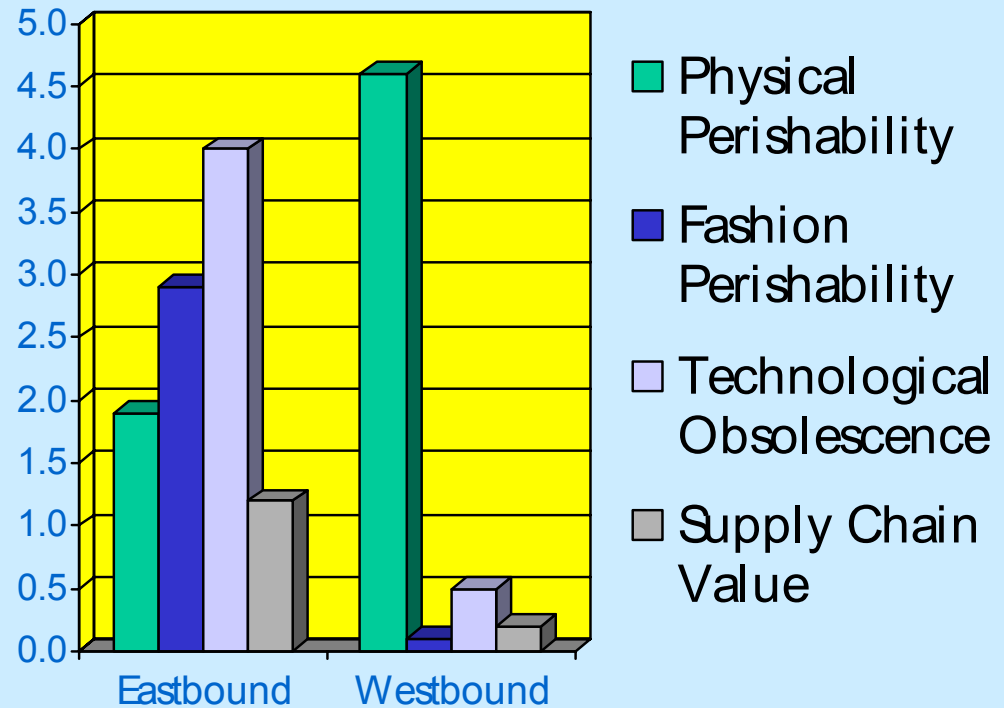
- World's largest container market - approximately 11million TEUs annually
- Relatively high concentration of high-volume, time-sensitive merchandise
- History of substitution of modes: air for ocean and vice-versa

Value and Perishability Are More Prominent in the Eastbound Direction

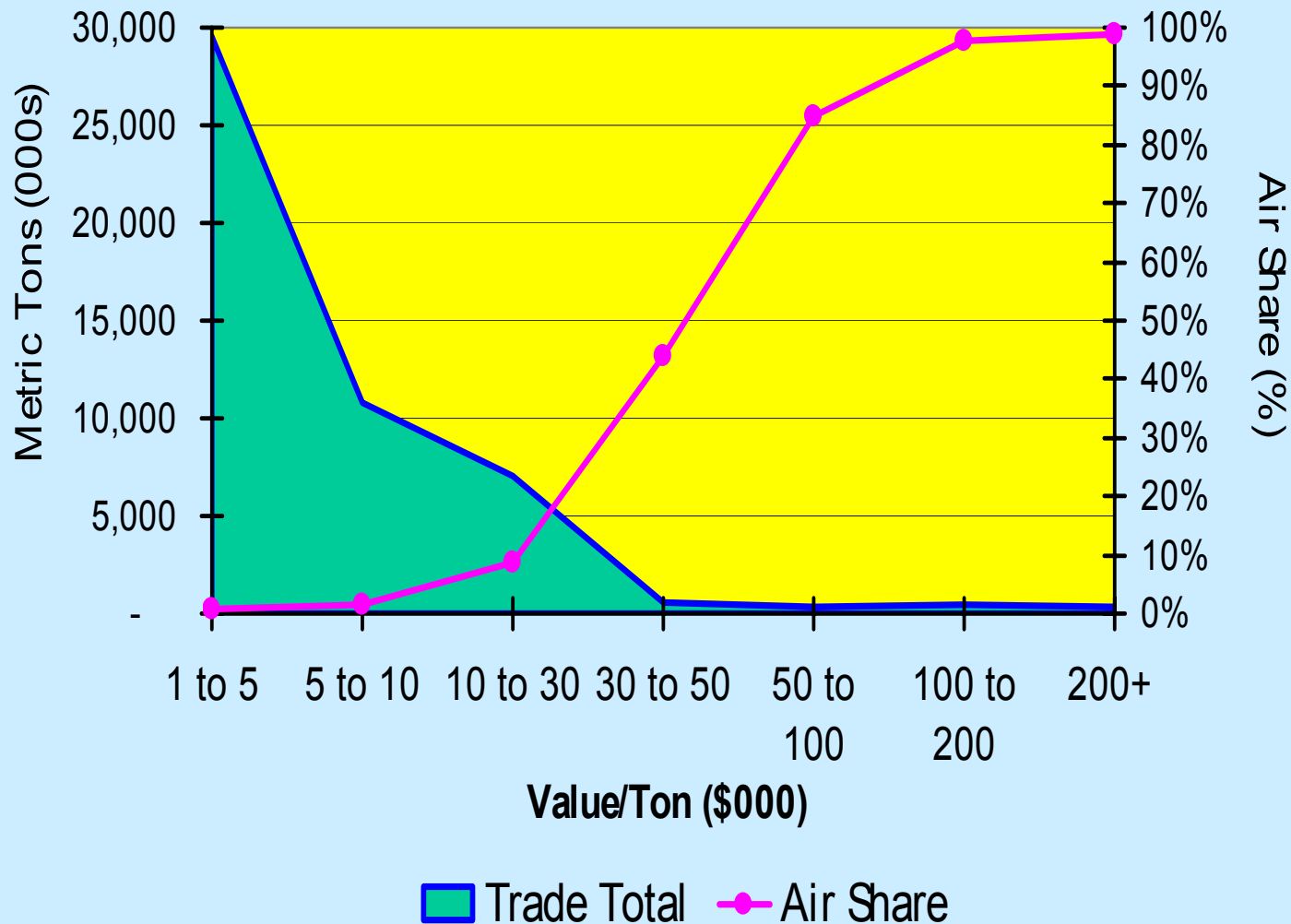
Top 5 Commodities' Value Per Ton



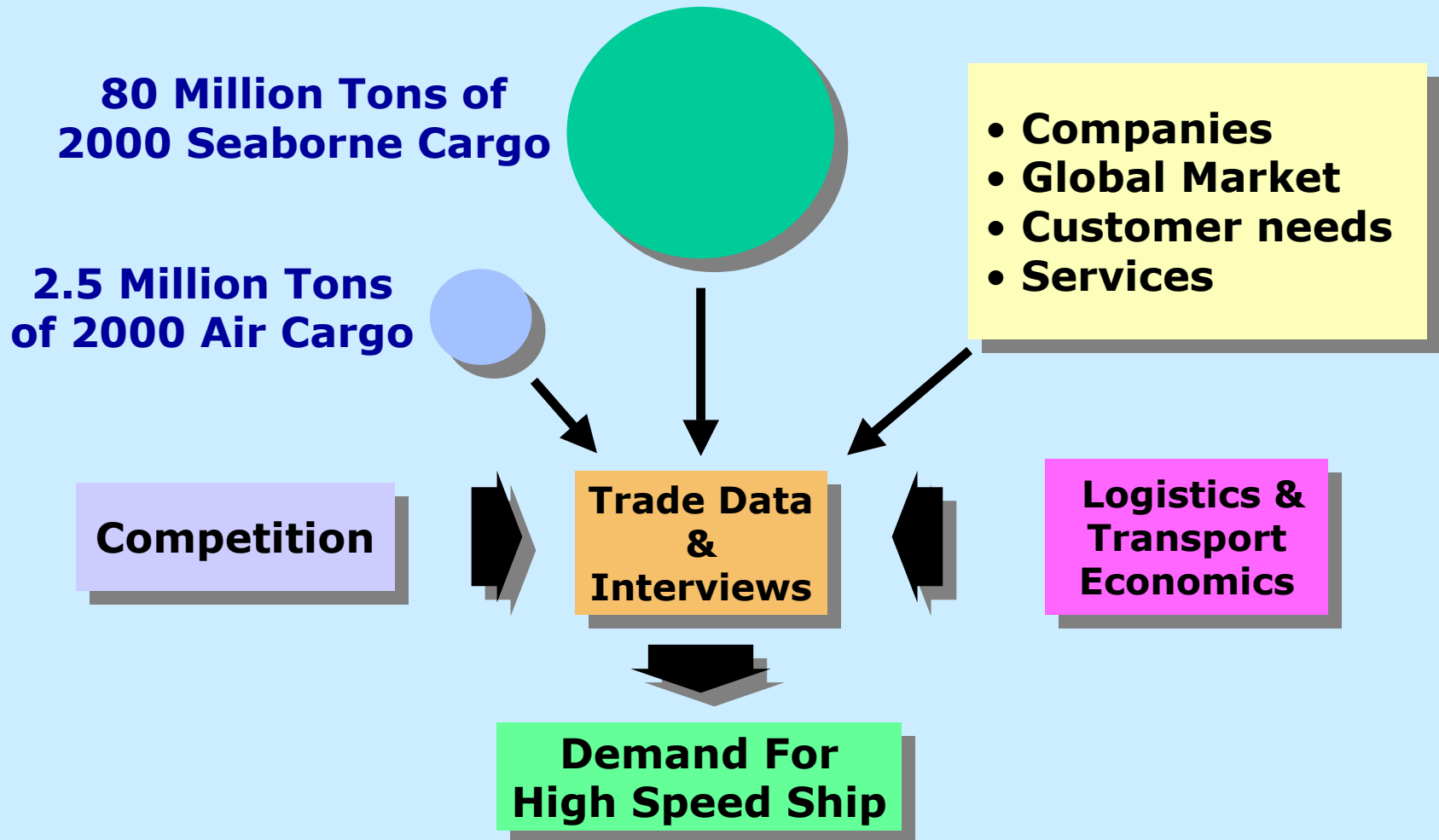
Metric Tons (millions)



Air Share Increases With Commodity Value



Trade Data Is The Foundation From Which Demand Is Derived



Shipper Receptivity to the High Speed Ship/Agile Port Concept

The Sample Was Import-Oriented With Broad Industry Representation

Industry and Transpacific Import/Export Mix of Sample (Number of Respondents)

Industry	Mainly Import	Mainly Export	Mixed	Total
Automotive	10	3	3	16
Retail/Footwear/Apparel	18	2	1	21
Food & Beverage	4	10	-	14
Electronics	13	5	1	19
High Tech	11	3	2	16
Medical/Pharmaceutical	1	5	2	8
Chemicals	-	9	3	12
Heavy Industry	-	10	1	11
Other Manufacturing	24	22	1	47
Textile	8	2	-	10
Other	10	13	4	27
Total	99	84	18	201

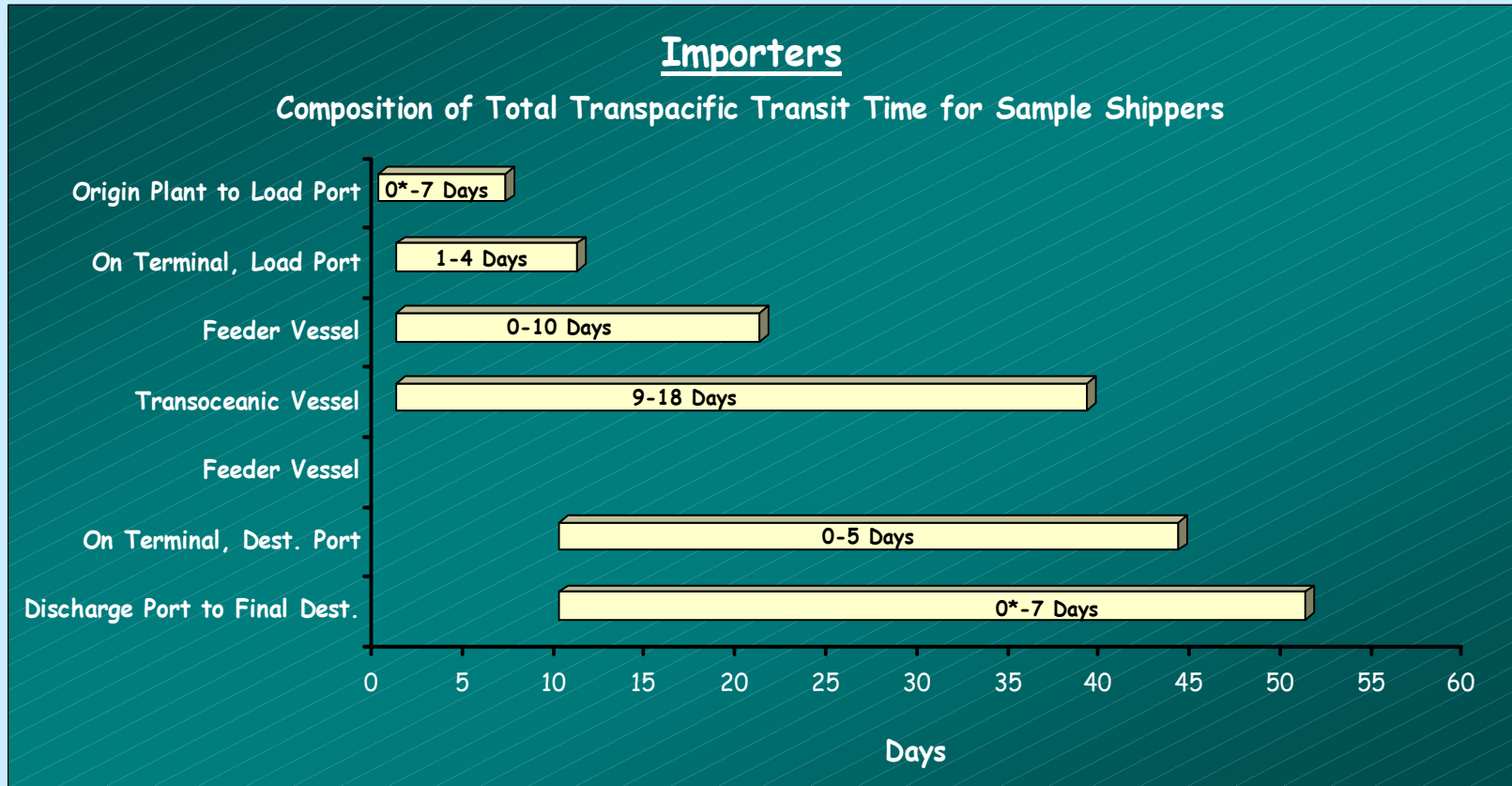
A Majority of Shippers Have a Door-to-Door Perspective

- Most respondents, exporters and importers, purchase international transportation from the point of origin (typically a manufacturing plant) to destination (typically a distribution center), or door-to-door
- However, a significant minority, mainly exporters, purchase on a port-to-port basis

Distribution of Ocean Freight Movements

	<u>% of Respondents</u>	<u>% of Volume</u>
Door-to-door	62	53
Door-to-port	7	7
Port-to-door	7	18
Port-to-port	24	22

The Ocean Portion Is Usually Less Than Half of Total Transit Time



* For port-to-port shipments, inland transit time is not relevant

Source: Interview data; Manalytics estimates

Implications of Key Logistics Trends for High-Speed Ship Demand

- E-Commerce
 - More finely tuned supply chain management; increased shipment frequency and smaller shipment size; increased demands on carriers' IT capabilities
- Network Expansion
 - Demand for frequent, fast and reliable transport service to/from more remote locations; increased Intra-Asia opportunities
- Use of Intermediaries
 - Increased market power of intermediaries; pressure for volume discounts for ocean transportation

Implications of Key Logistics Trends for HSS Demand (cont'd)

- Shipment Size and Frequency
 - High-speed ship system must have the ability to efficiently handle LCL; must equal or exceed standard ocean in frequency of service
- Changing Modal Mix
 - High-speed ship system can provide an urgently needed lower-cost alternative to air, provided that it can replicate key services currently provided by air:
 - * *Shipment size (LCL) and frequency*
 - * *Broad geographic coverage*
 - * *On-time reliability*
 - * *Significant transit time savings vis-à-vis standard ocean service*
 - * *Expedited Customs clearance*

Impact of the High-Speed Ship/Agile Port on Shipper Supply Chains

Types of HSS/AP Impacts on the Transpacific Supply Chain

- The HSS/AP offers significantly faster ocean speeds and cargo movement through ocean terminals
- In the Transpacific trade, this means a reduction in total transit time of 4 to 12 days, depending on length of lane and vessel speed assumptions
- Shippers can derive major quantifiable benefits from the improvement in speed:
 - Reduction of in-transit inventory levels
 - Offset delays elsewhere in the supply chain, particularly in manufacturing
 - Faster response to changes in customer demand, fewer markdowns

Types of HSS/AP Impacts on the Transpacific Supply Chain (continued)

- Shippers may also restructure their supply chains to take advantage of HSS/AP
 - Shift origins and destinations to where the HSS/AP service is available
 - Ship entirely new product, previously not feasible with conventional modes

Participants in In-Depth Analysis: Five Distinct Segments

- The Phase 1 analysis suggests that the potential demand for HSS/AP can be grouped into five segments, each representing a significant portion of the Transpacific trade
- The in-depth analysis includes 30 companies, representing the five segments as follows:
 - Consumer Goods Retailers (6) – general merchandise (3), household furnishings (2) and apparel
 - Plant-to-Plant Shippers of Raw Materials and Semi-Finished Goods (6) – automotive, computers, chemicals, machinery(2), electronics
 - Manufacturer/Wholesalers (12) – footwear (2), apparel (2), textiles, motors, electronics (3), musical instruments, toys and toiletries
 - Refrigerated Food Products Shippers (3) – fish, meat, fruits & vegetables
 - Special Projects Shippers (3) – construction project manager (3)

Retailers: Key Considerations

- Avoidance of Stockouts
 - Variability of consumer demand and delays in receiving merchandise from overseas suppliers can lead to out-of-stock merchandise at the retail level, or foregone revenue. Expedited transportation can reduce required levels of safety stock.
- Uncertainty of Demand for Fashion Goods
 - In addition to high value, many consumer goods have significant fashion content, and it is difficult to judge the strength or duration of demand. This places a premium on short lead times to avoid markdowns from full retail price on fashion-sensitive merchandise. Current approaches to this problem are accelerated manufacturing techniques, location of production closer to the point of consumption and selective air shipments.

Retailers: Key Considerations

- Opportunities for Direct-to-Store shipments
 - With shorter lead times and containers loaded at origin specific to retail store locations, retailers can avoid costs of storing and handling goods at intermediate locations.

Retailers: Response to HSS/AP Offerings

Percentage Diversion to HSS/AP - Based System						
Potential Benefits of HSS/AP	Price Premium = \$1,500 per FEU			Price Premium = \$3,000 per FEU		
	Days Saved			Days Saved		
	6	8	10	6	8	10
Reduction of In-Transit Inventory	5%	7%	12%	0%	0%	2%
Avoidance of Retail Markdowns	12%	15%	21%	3%	6%	8%
Reduction in Warehouse Inventory	2%	2%	3%	0%	0%	1%
Total Diversion	18%	24%	36%	3%	6%	11%

Note: Diversion estimates are derived on an incremental basis to avoid double counting

Application Of Diversion To The Transpacific Surface Trade

- Basis of trade volume is the year 2000 containerized metric tonnage between the U.S. and Asia (including Australia and New Zealand)
- Each record of trade data includes information regarding port of loading/discharge, commodity type, and value per metric ton
- An econometric model was created to reflect survey responses related to the potential diversion of trade to the high speed ship / agile port vessel (HSS/AP)

Various High-Speed Ship Scenarios Were Evaluated by Respondents

- To assess the demand for high-speed ship service, survey respondents were asked to estimate the amount of their existing cargo that would be diverted under varying combinations of service and price:
 - Prices of high-speed ship service between 25% and 100% higher than conventional ocean service
 - Transit time savings between 4 and 10 days vs. conventional ocean service
 - Reliability improvements between 0 and 50%
- Respondents evaluated up to nine scenarios

Estimated market volumes by current mode for the 40 knot ship:

• Transpacific EB Surface	2.5	million m ton
Transpacific WB Surface	0.5	
Transpacific EB Air	0.3	
Transpacific WB Air	0.2	
Subtotal		3.5
Logistics Considerations		0.7
Subtotal		4.2
Intra-Asia TBD		
Total		4.2+

The Rationale for Diversion Is Improvement of Supply Chain Performance

- Most respondents who indicated some likelihood of diversion to high-speed ship cited improved logistics cost, speed and end-market results

“Time is money. We estimate that for every day a shipment is in transit, it costs us \$25K. It provides flexibility with a 3rd shipping option”

“(Main factors are) product mix and customer demand. . . . The faster the ship the more I can convert from air. On the ocean side, if the high-speed ship goes twice as fast, my inventory carrying cost (savings) offset the higher ocean costs.”

Potential Military Applications



There Are Specific Military Requirements In The Sea-Lift Sector

- Speed over a long distance: 40 knots may be acceptable for shorter lanes and smaller vessels, but 60 knots is the goal for main-line ocean sea-lift.
- Roll-on roll-off capability: the anticipated conflict is not in a developed country with shoreside infrastructure in place, but rather in locations where the sea-to-land transfer must be self sustaining.
- Heavy lift: a variety of cargo types would travel by sea, and a significant portion of these cargoes will be tanks, humvees, artillery and heavy machinery, requiring reinforced decks and a 70-ton stern ramp. Heavy lift containers are also part of the logistics profile and hence of the ship design.

Specific Military Sea-Lift Requirements (continued)

- Flexibility to perform operations at sea: the time spent reaching destination would be used for all types of on-board operations, including vehicle outfitting, materials sequencing, maintenance, and parts assembly.
- Helicopter operations: the Chinook is the workhorse for lifting vehicles and equipment, and a helo flight deck would be required on board, for off-shore use. Helo storage and maintenance capability is also required.
- Ships' gear: to handle heavy cargoes and perform simultaneous operations at shoreside.

Specific Military Sea-Lift Requirements (continued)

- Human cargoes (supercargoes): some 50-75 personnel would be a reasonable complement for a ship in the Pacific lanes.
- Command and control suite: for the commanding officer, staff, and support equipment.
- Computer and communications capability: related to the command and control requirement, but also with the capability to manage/ track/ highlight any and all of the materials and equipment on board.
- Tactical flexibility: responsiveness of the vehicle to adapt to changing scenarios and requirements.

Next Steps in the Evaluation

- Assessment of competitive initiatives
- Logistics and operations simulation
 - Deployment
 - Financial Analysis
- Infrastructure analysis
 - Ports
 - Cargo Handling
 - IT
- Completion of commercial and military supply chain analyses
- Enterprise analysis