PDMT Panel Project on Short Sea Shipping Final Brief

John Malone
Dr. Matthew P. Tedesco

NSRP Joint Panel Meeting
New Orleans, LA
December 11, 2007

Background

- **Short Sea Shipping (S3): The initiative to reduce highway congestion through increased use of short-haul seaborne cargo shipping between U.S. ports.**
- **Marine Transportation System National Advisory Council (MTSNAC) recommendation: Establish a joint working group among interested parties (shipyards, ship owners, ship operators, shippers, etc.) to explore the possibility of sharing requirements for future marine transportation system capabilities and the development of generic ship designs that could meet such requirements.**
- **ECB tasked PDMT panel with facilitating partnerships through a workshop and accelerating the shipbuilding opportunities associated with potential U.S.-based Short Sea Shipping (S3) operations**

PDMT Project: Shipbuilding Opportunities in Short Sea Shipping (S3)

Goal: Accelerate the shipbuilding opportunities associated with potential U.S.-based Short Sea Shipping (S3) operations.

Objectives:

1. Increase the engagement of U.S. shipbuilders in the broader industry dialogue pertaining to potential S3 operations in the U.S.

2. Develop a "roadmap" for the realization of shipbuilding contracts to support S3 operations in the U.S.

3. Stimulate partnerships between shippers (notably the trucking industry), ship owners/operators, U.S. shipbuilders, ship design agents, government interests and other key constituents that may result in cross-functional industry teams to address market-specific shipbuilding initiatives and/or internally or externally funded R&D projects to develop technologies that will accelerate the realization of U.S. S3 opportunities.

PDMT Project: Shipbuilding Opportunities in Short Sea Shipping (S3)

Tasks:

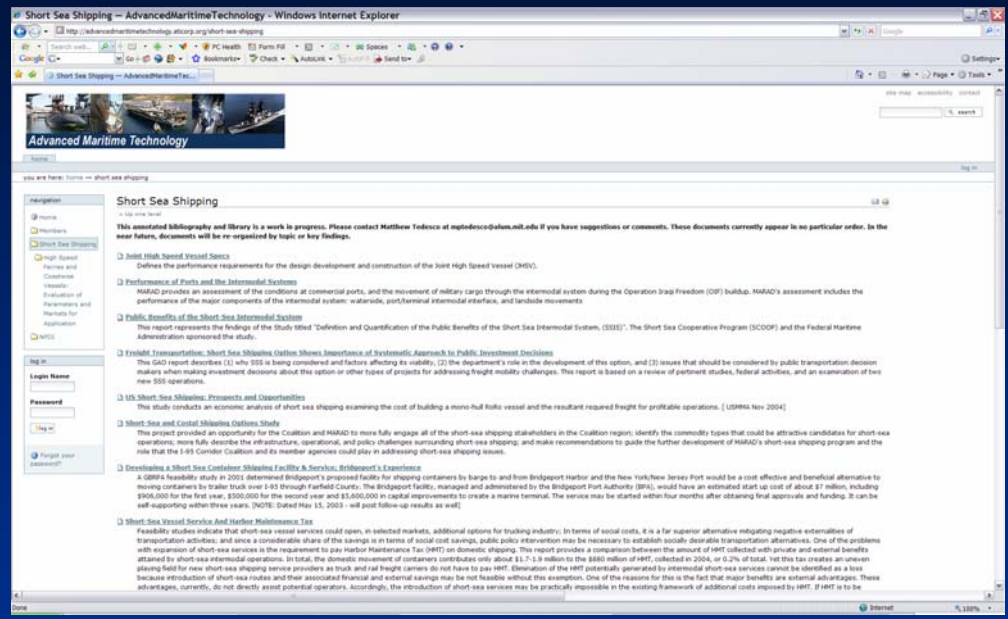
1. **Select a core planning team (5 or 6 people) consisting of representatives from the principal S3 constituencies**
2. **Prepare a "current state" document summarizing the key aspects and issues of S3 including the viewpoints of each constituency. The core team will also identify invitees to an NSRP-sponsored workshop.**
3. **Plan and conduct a workshop that will bring together representatives of all constituencies that are key to a successful SSS implementation. Attendance at the workshop will be by invitation only, with a target of 20-35 participants.**
4. **Prepare draft report of findings (S3 "Roadmap")**
5. **Prepare final report incorporating comments by workshop attendees.**

Core Planning Team

- Brian Carter – NASSCO
- Stephen Flott - SeaBridge
- John Malone – Vice Chair, PDMT Panel
- Ron Silva – Westar Transport
- Dr. Matthew Tedesco – Consultant
- Rick Thorpe – Herbert Engineering
- Harvey Walpert – Bender Shipbuilding
- Mark Yonge – Maritime Advisors/SCOOP

S3 Document Database

- **Online Short Sea Shipping Library**
  - Central, annotated, library available to the NSRP community
  - References for the “Current State” document under development
  - Supports workshop planning
- **40+ documents posted to date**
  - Topics include market analysis, ship types, and potential business models from 2000 to present
- **Summarized key findings in “Current State” document**



- Visit http://advancedmaritimetechnology.aticorp.org/short-sea-shipping
- Contact mptedesco@alum.mit.edu to recommend additions or to comment on documents

Current State Document

Addressed the following subjects:

- **Markets for Short Sea Shipping**
- **Operator and Stakeholder Perspectives**
- **Lessons Learned Overseas**
- **Short Sea Shipping Vessels**
- **Military Considerations**
- **Regulatory and Legislative Considerations**
- **Labor Considerations**
- **Building Short Sea Shipping**
- **Port Infrastructure**
- **Public Benefits of Short Sea Shipping**
- **Economics of Short Sea Shipping**

NSRP S3 Workshop

- **Objectives**
  - Review draft “Current State” document
  - Document stakeholder visions for Short Sea Shipping
  - Document roadblocks and gaps
  - Identify R&D priorities applicable to the NSRP
  - Develop draft roadmap for engaging shipbuilders in SSS market
- **Time & Place**
  - Immediately following the 4th Annual Journal of Commerce (JoC) Short Sea Shipping Conference
  - April 19 and 20
  - Caribe Royale Resort Hotel – Orlando, FL
- **Attendees (see next slides)**
- **Agenda (see next slides)**

NSRP S3 Workshop – Attendees

First Name	Last Name	Title	Organization	Ship Owners / Operators	Trucking	Port Representatives & Terminal Operators	Statutory & Regulatory Experts	Waterfront Labor Issues	Maritime Economic & Cargo Market Analysis	Financial Community Representatives	Ship Design Agents / Naval Architects	Shipbuilders - Big 6	Shipbuilders - 2nd Tier	Other Non-Government Organizations	MARAD & U.S. Navy & Other Govt Orgs
Bilyana	Anderson	Deputy Program Manager	Naval Sea Systems Command, PMS-325B												1
John	Avis	Director of Business Development, Strategic Programs	BMT Designers & Planners, Inc.							1					
Dan	Bagnell	Director of Naval Architecture	CDI Marine Systems Development Division							1					
Richard	Berkowitz	Director, Pacific Coast Operations	Transportation Institute				1								
Tim	Bresnahan	Vice President, Business Development & Finance	TECO Transport Corp.	1											
Patrick	Carlton	Director, Marine Highway and Passenger Services	MARAD Office of Intermodal and System Development												1
Brian	Carter	Manager, Commercial Business Development	General Dynamics NASSCO								1				
H. Clayton	Cook	Counsel, Corporate Finance Group	Seward & Kissel LLP						1						
Cole	Cosgrove	General Manager, Ship Management	Crowley Liner Services, Inc.	1											
Carlos	del Real	Marketing Manager - Government Programs	Marinette Marine Corporation									1			
Maurizio	De Pellegrini	Chairman, Technical Dept., SCOOP	International Marketing & Business, Inc.							1					
Stephen	Flott	Chairman	SeaBridge, Inc.	1											
James	Fowler	NSRP Program Manager	Naval Sea Systems Command, 05DM												1
Jim	House	Technical Director, NSRP	Advanced Technology Institute (ATI)										1		
William	Kruse	Consultant	TranSystems / Manalytics International					1							
Robert	Latorre	Professor, Naval Architecture and Marine Engineering	University of New Orleans										1		
John	Malone	Principal Consultant	Malone Consulting Services							1					
Dan	McGreer	Manager, Advanced Analysis	AkerYards Marine, Inc.							1					
Darshan	Murphy	Doctoral Candidate	University of Central Florida					1							
Chuck	Nugent	Vice President of Marine Fabrication	Atlantic Marine Florida LLC									1			
Torey	Presti	President	National Shipping of America, Inc.	1											
John	Reeve	President	Reeve & Associates					1							
Jay	Reichgott	Chief, Marine Division	McLaren Engineering Group			1									
Dave	Sanford	Director of Navigation Policy and Legislation	American Association of Port Authorities			1									
Ron	Silva	Chief Executive Officer	Westar Transport		1										
Matthew	Tedesco	Consultant	Matthew P. Tedesco					1							
Rick	Thorpe	Senior Principal	Herbert Engineering Corp.							1					
Harvey	Walpert	Senior Advisor, Military Affairs	Bender Shipbuilding & Repair Co., Inc.									1			
Dave	Wood	Engineering Project Manager	Northrop Grumman Ship Systems								1				
Steven	Wynn	Ship Design Manager, Joint High Speed Ship (JHSS)	Naval Sea Systems Command, 05D1												1
Mark	Yonge	Managing Member	Maritime Transport & Logistics Advisors, LLC					1							
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= Primary constituency

= Secondary constituency

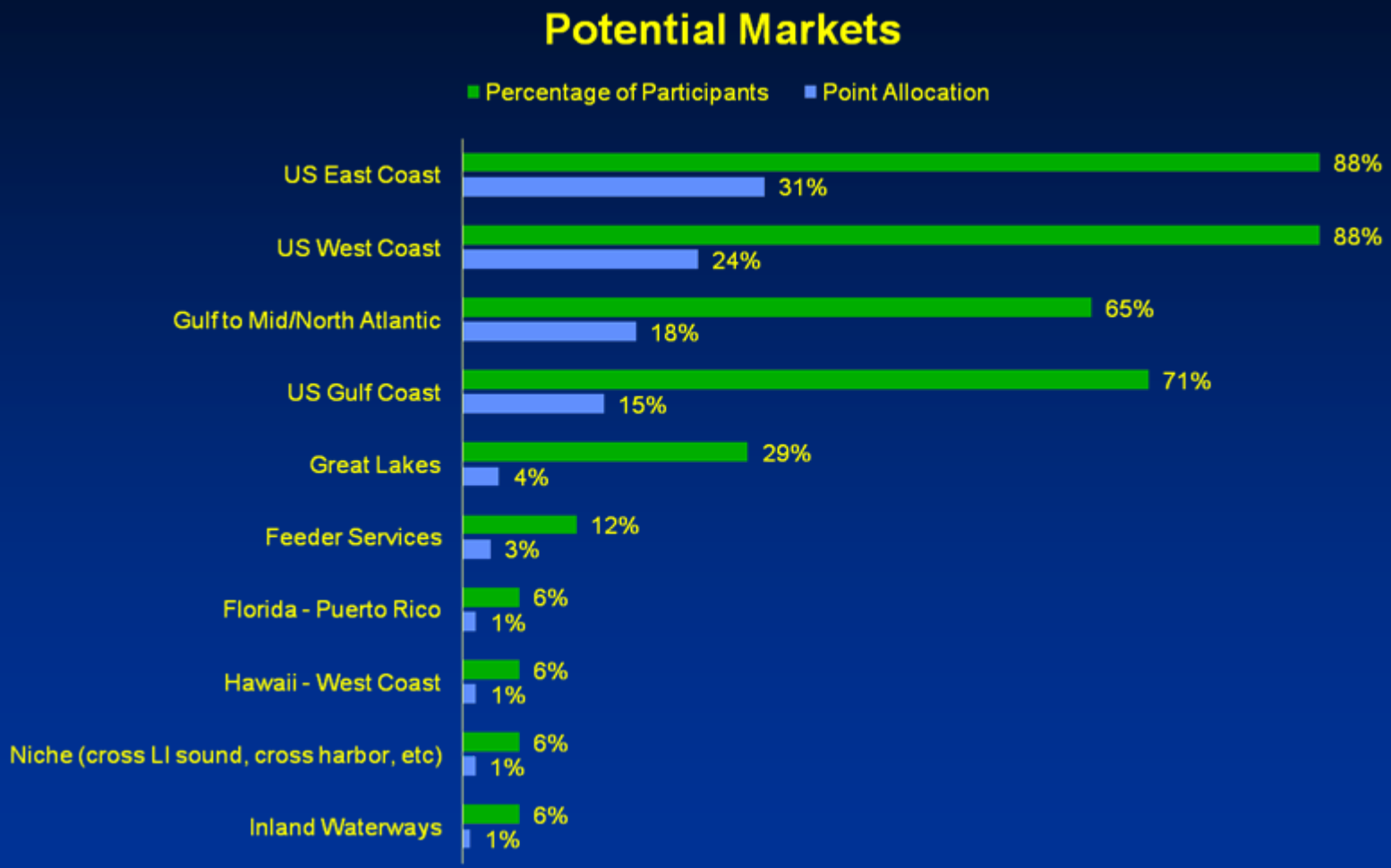
NSRP S3 Workshop – Agenda, April 19

7:00 – 7:30	Check-in & Continental Breakfast	
7:30 – 8:00	Welcome & Workshop Overview	John Malone – Vice Chair, PDMT Panel Harvey Walpert – NSRP Executive Control Board Dr. Matthew Tedesco – Consultant
8:00 – 10:00	Markets for Short Sea Shipping in the U.S. (Breakouts)	John Reeve – Reeve & Associates Bill Kruse – TranSystems / Manalytics
10:00 – 10:15	Break	
10:15 – 11:30	Operator's Perspectives	Cole Cosgrove – Crowley Liner Services Torey Presti – National Shipping of America Ron Silva – Westar Transport
11:30 – 12:30	Lunch Lessons Learned Overseas	 Mark Yonge – Maritime Advisors
12:30 – 2:45	Short Sea Shipping Vessels	Dr. Matthew Tedesco – Consultant Dan Bagnell – CDI Marine Systems Development Rick Thorpe – Herbert Engineering Corporation John Avis – BMT Designers & Planners Marty Toyen – Seaworthy Systems
2:45 – 3:00	Break	
3:00 – 4:30	Military Considerations	Bilyana Anderson – NAVSEA PMS 325B Steven Wynn – NAVSEA 05D1
4:30 – 5:00	Day 1 Synopsis & Plan for Day 2	John Malone – Vice Chair, PDMT Panel
5:45 – 6:45	Reception	
6:45 – 8:30	Dinner	

NSRP S3 Workshop – Agenda, April 20

7:00 – 7:30	Continental Breakfast	
7:30 – 7:45	Overview of Day 2 Agenda	John Malone – Vice Chair, PDMT Panel
7:45 – 8:30	Regulatory and Legislative Considerations	Stephen Flott – SeaBridge, Inc. David Sanford – American Assn of Port Authorities
8:30 – 9:15	Labor Considerations	Richard Berkowitz – Transportation Institute
9:15 – 9:30	Break	
9:30 – 11:30	Building Short Sea Shipping	Harvey Walpert – Bender Shipbuilding Brian Carter – General Dynamics NASSCO H. Clayton Cook – Seward & Kissel LLP
11:30 – 12:15	Port Infrastructure	Jay Reichgott, McLaren Engineering Group
12:15 – 1:15	Lunch Public Benefits of Short Sea Shipping	 Dr. Robert Latorre, University of New Orleans
1:15 – 3:15	Economics of Short Sea Shipping	Mark Yonge – Maritime Advisors Dr. Matthew Tedesco – Consultant
3:15 – 3:30	Break	John Malone – Vice Chair, PDMT Panel
3:30 – 5:00	Conclusions and Roadmap	Dr. Matthew Tedesco – Consultant John Malone – Vice Chair, PDMT Panel

Markets for Short Sea Shipping

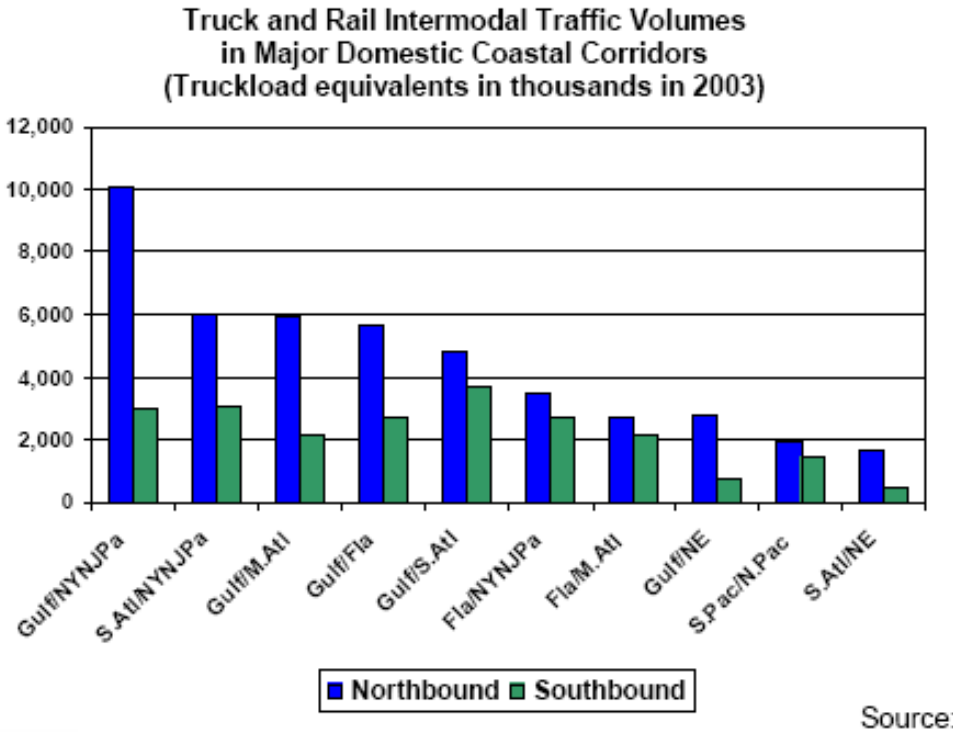


Markets for Short Sea Shipping, Cont.

Almost 80 million trailer loads of road freight move along U.S. coasts

- 78.2 million trailer loads of ground freight moved between coastal origins and destinations over 500 miles apart along the U.S. contiguous coasts in 2003 (15% of total US intercity market)

- Flows are significantly imbalanced – northbound flows of 51.8 million trailer-loads versus 26.4 million trailer-loads southbound



Source: Global Insight

Markets for Short Sea Shipping, Cont.

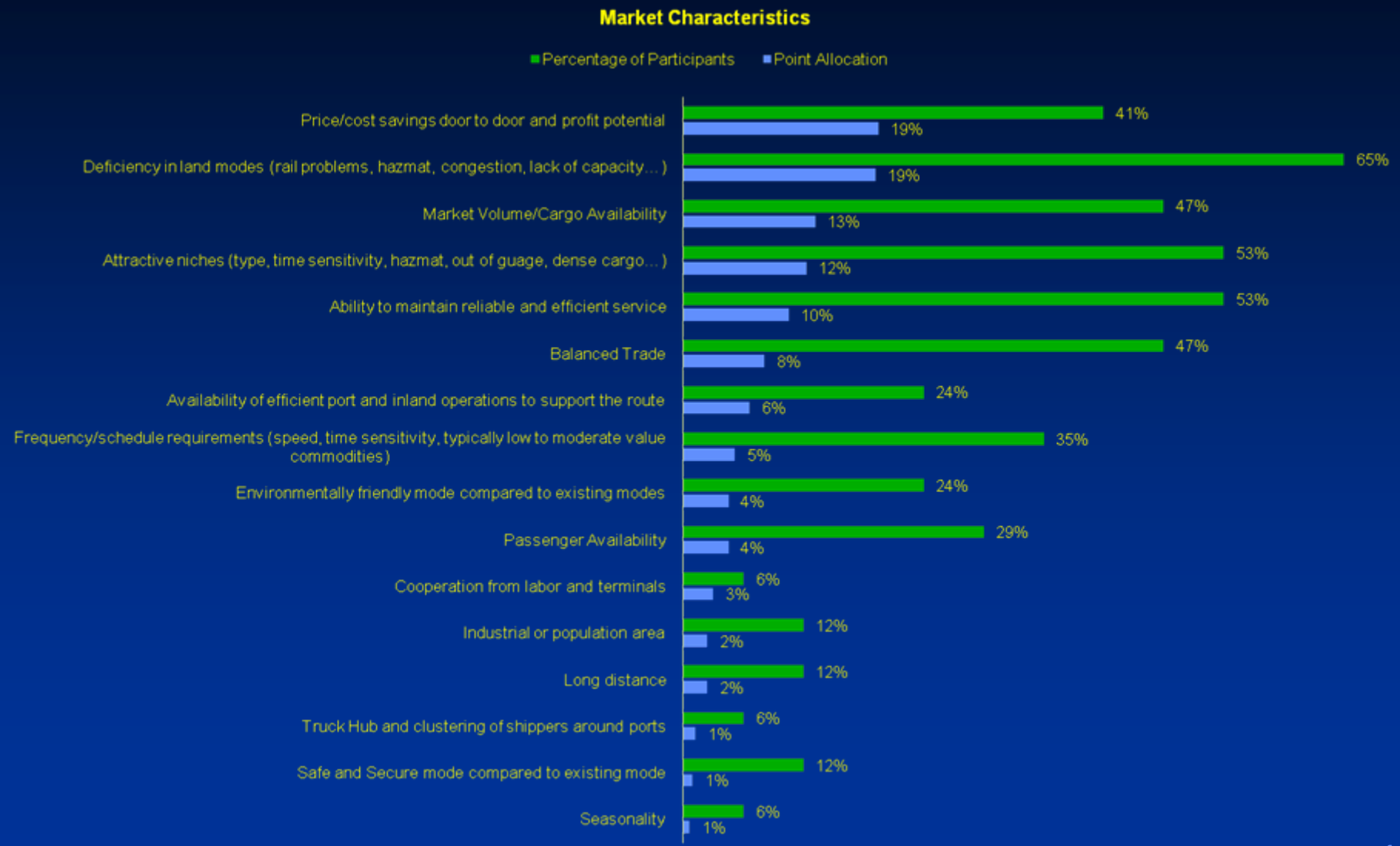
2004 Estimated "Filtered" Truckload (000's) Flows by Origin / Destination

Destination BEA	Origin BEA								
	Los Angeles, CA	San Francisco, CA	San Diego, CA	Seattle, WA	Sacramento, CA	Portland, OR	Richland, WA	Other	Total
Boise, City, ID	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Eugene, OR	35.5	9.1	2.0	203.5	4.3	61.5	1.5	1.1	318.5
Fresno, CA	0.0	0.0	12.6	25.2	0.0	19.4	93.9	18.4	169.6
Los Angeles, CA	146.5	7,160.0	1,382.9	444.6	1,355.8	416.6	110.8	439.5	11,456.7
Pendleton, OR	89.5	1.8	0.2	0.0	0.5	0.0	0.0	0.5	92.4
Portland, OR	102.4	143.3	8.3	396.8	23.2	0.0	0.0	136.7	810.7
Redding, CA	218.2	0.0	21.7	40.1	0.0	3.6	0.0	0.0	283.6
Reno, NV	17.5	0.0	6.9	0.4	0.0	0.6	0.0	0.0	25.5
Richland, WA	17.6	17.7	0.6	0.0	2.6	0.0	0.0	6.8	45.3
Sacramento, CA	1,327.9	0.0	142.7	29.6	0.0	25.4	17.8	17.5	1,560.8
San Diego, CA	1,020.8	734.6	0.0	29.6	126.2	26.4	4.5	46.4	1,988.6
San Francisco, CA	7,218.4	0.0	799.1	240.3	0.0	132.2	266.1	109.9	8,765.9
Seattle, WA	238.8	97.9	10.3	252.0	27.7	233.0	0.0	96.1	955.7
Spokane, WA	33.5	9.8	0.7	0.0	2.7	0.0	0.0	2.5	49.2
Grand Total	10,467.5	8,174.3	2,388.1	1,662.3	1,542.8	918.7	494.5	875.3	26,523.5

Source: Global Insight, Reebie Transearch Database, 2004, Manalytics International

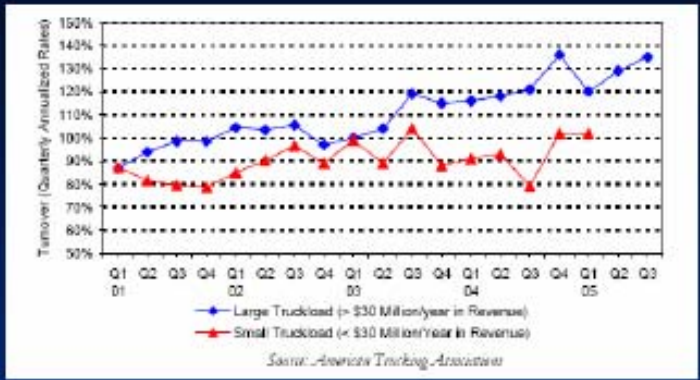
- **Promising West Coast volumes**
- **Diversion may be impacted by shipper receptivity**
  - Only 43% of respondents in recent CCDOTT study were receptive

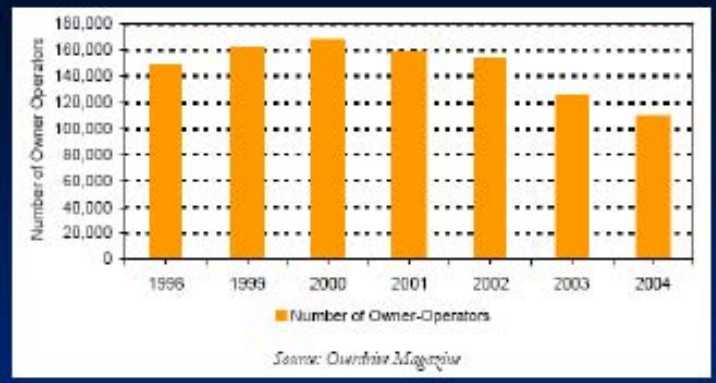
Markets for Short Sea Shipping



Operator and Stakeholder Perspectives

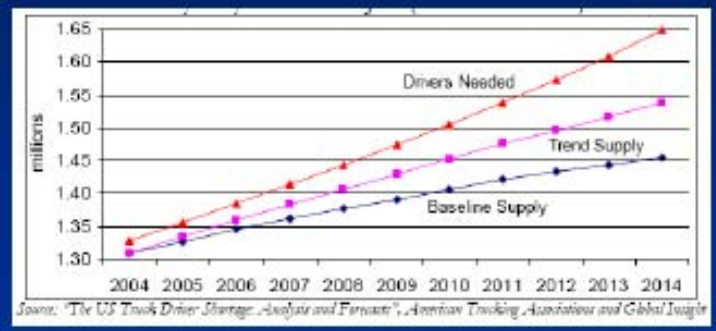
Trucking Interest in SSS





Component	Pre-2004 Rules	2004 Rules
Total On-Duty Hours	15 non-consecutive hours	14 consecutive hours
Driving Hours	10	11
Consecutive Hours Off-Duty	8	10
Activity Counted as On-Duty Time	Driving time and planning time	All time except sleeper berth
Weekly Hours	60/70 hours on-duty in 7/8 days; no restart provision	60/70 hours on-duty in 7/8 days; restart after 34 hours

Source: Federal Motor Carrier Safety Administration



- **Driver turn-over and shortages**
- **Congestion**
- **Hours of service**

Operator and Stakeholder Perspectives, Cont.

Technical, Legal and Economic Barriers

CROWLEY
People Who Know

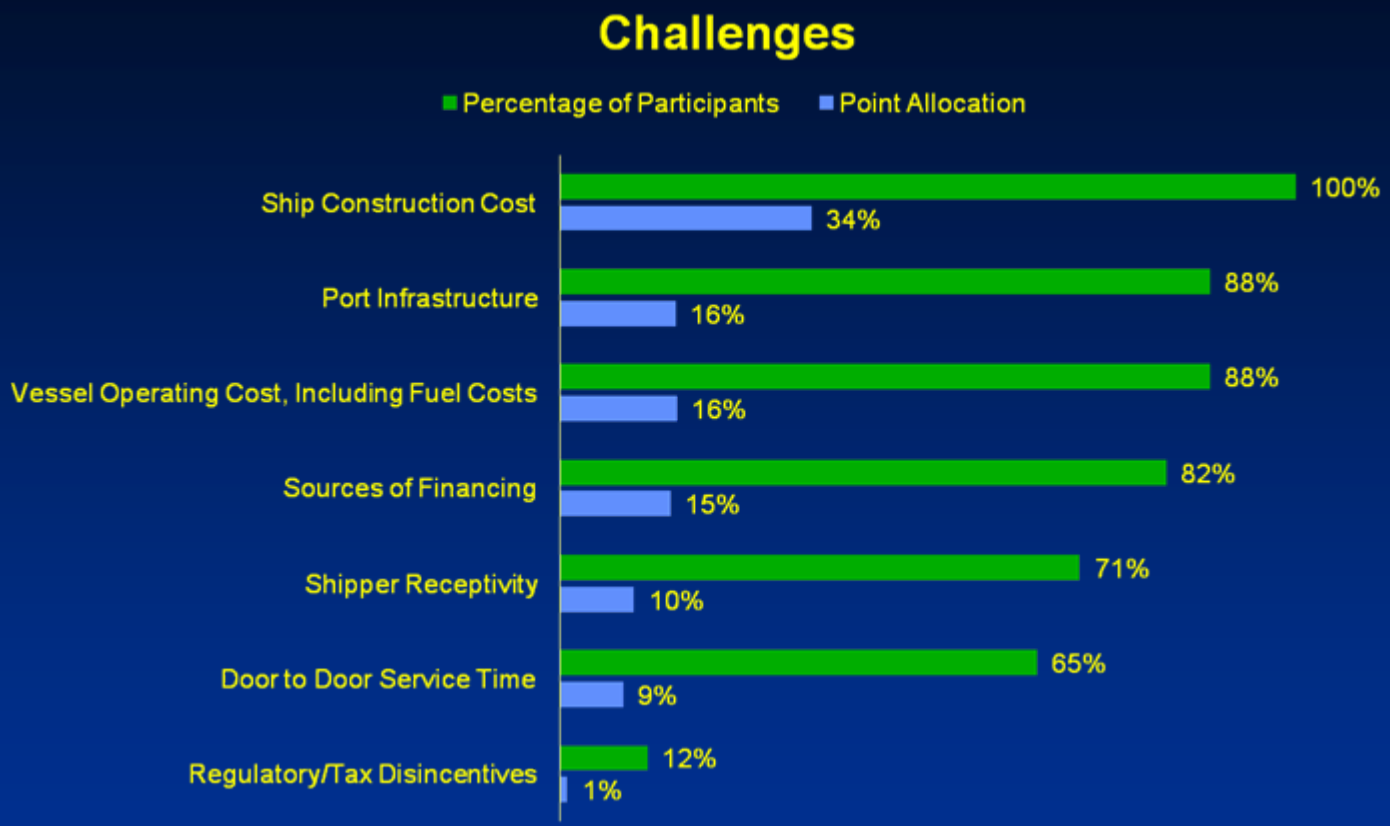
Operator and Stakeholder Perspectives, Cont.

Short Sea Opportunities

- Hazardous Materials
- Enhanced Cargo Security
- Highway Sustainability
- Intermodal standardization
- OG / large volume - low value cargo
- Minimize environmental pollutants
- Decrease metropolitan congestion
- Reduce highway fatalities

CROWLEY
People Who Know

Operator and Stakeholder Perspectives, Cont.



- **Ship construction costs perceived to be a significant challenge to advancement of S3**
  - 100% of respondents identified construction costs
  - Greatest allocation of "priority" among challenges identified
- **Ship construction cost, vessel operating cost, and door to door service time considered to be within the NSRP scope and charter to address**

Lessons Learned Overseas

Short Sea Shipping
Comparison to other markets

U.S.	Europe/UK	Asia
Road and rail infrastructure has been preeminent	Long history of inter-European freight movements on sea and river routes	Long history of freight movements on sea and river routes
Little geographic impetus for coastwise shipping	Earlier pressure due to inadequacy of road system and congestion	Hub and spoke feeder ship traffic used extensively – fallout of E/W line-haul containership services
Niche markets exist	EU backs services (including start-ups) with subsidies	Many locations have non- existent or underdeveloped road/ rail alternatives
Worsening congestion and larger vessels on E/W trades may impel development	Many sea routes have historically faced no land-based competition	
Cabotage laws protect some trades		

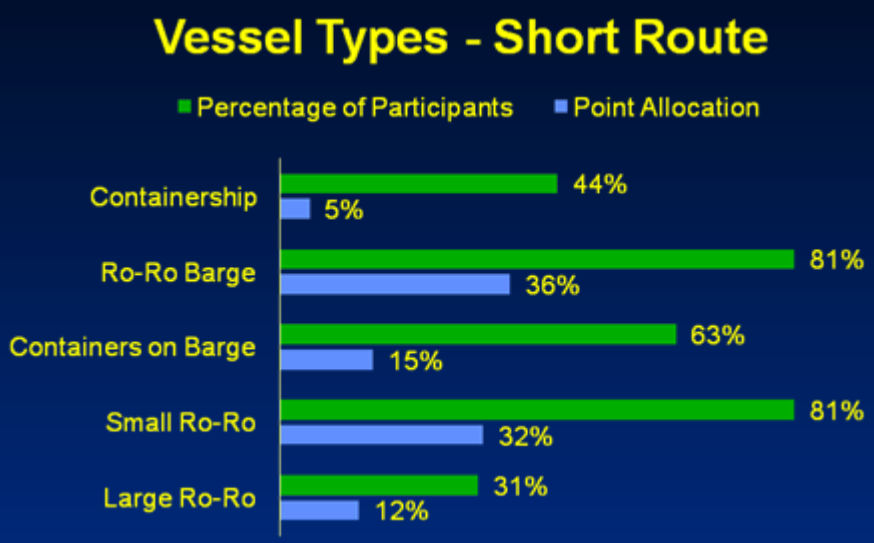
Source: The Economics of Domestic Short Sea Shipping Workshop, Transportation Research Board, Washington DC, Sept. 28, 2004.

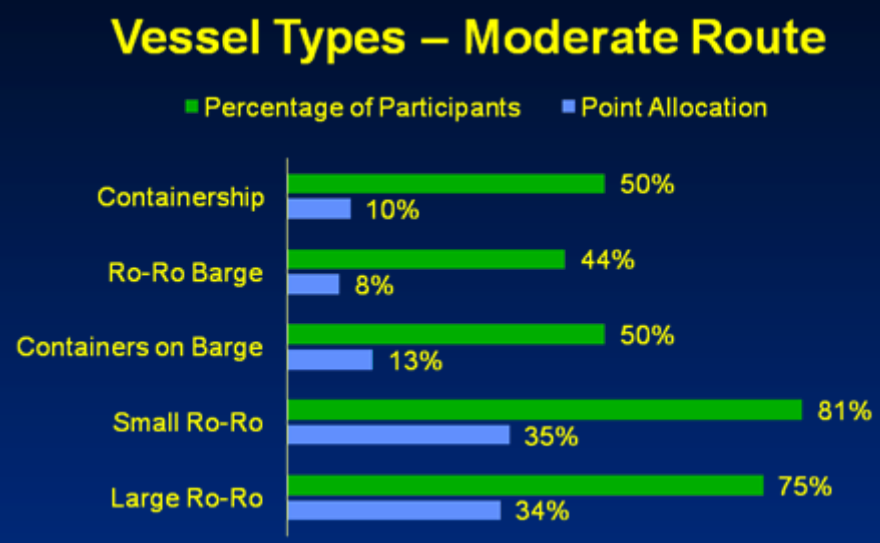
- **EU has made S3 a policy issue**
- **Several programs exist to further S3 in Europe**

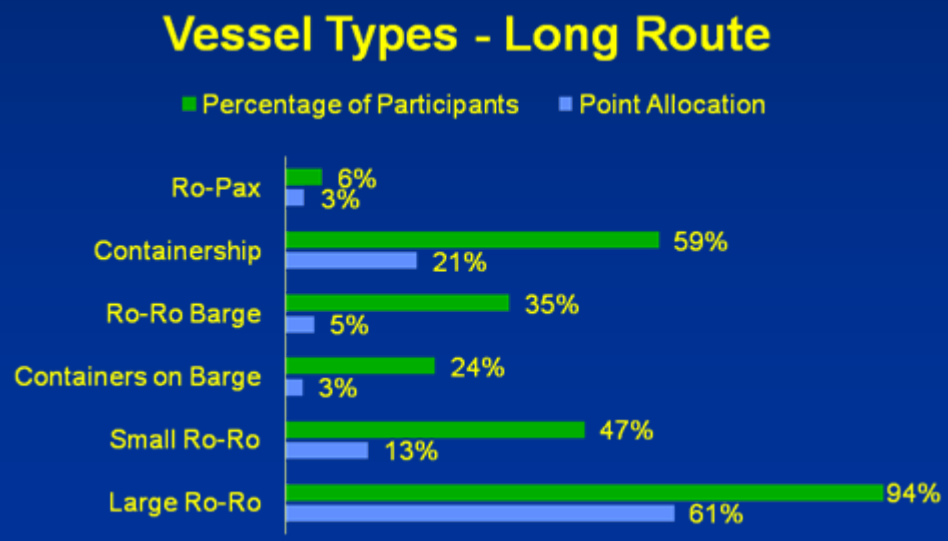
Foreign (EU) Case Studies

- CREATE3S (Creative concepts REalised by Advanced design and production to improve Total Efficiency of new generation Short Sea Shipping) – 2006-2009
- SAFEDOR (Design, Operation and Regulation for Safety) – 2005-2009
- INTERSHIP (Integrated Collaborative Design and Production of Cruise Vessels, Passenger Ships and Ro-Pax) – 2003-2007)
- LOGBASED (Logistics-based design) – 2004-2007
- INTEGRATION (Integration of Sea Land technologies for an Efficient Intermodal Door-to-Door Transport)
- REALISE (Regional Action for Logistical Integration of Shipping) – 2003-2005
- UN RoRo group – Since 1994
- MERIKE Project -- 2003-2007

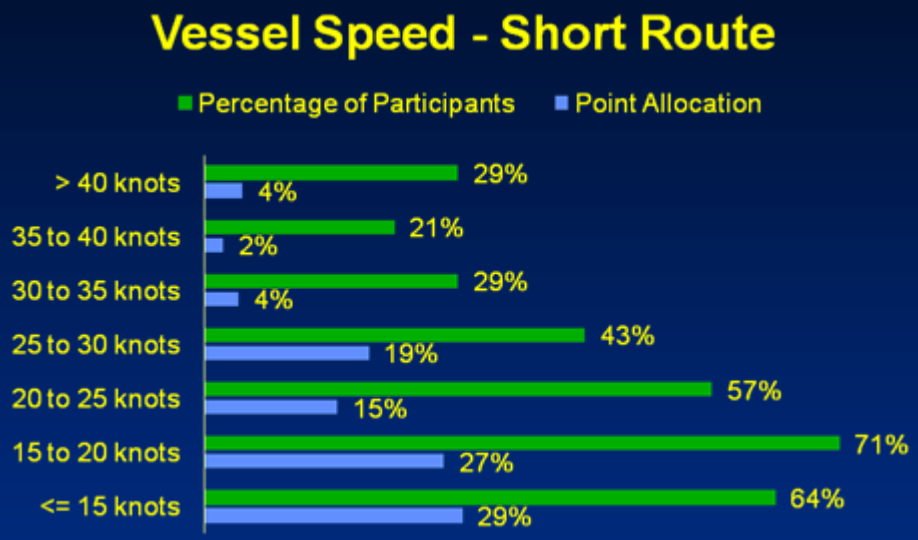
Short Sea Shipping Vessels

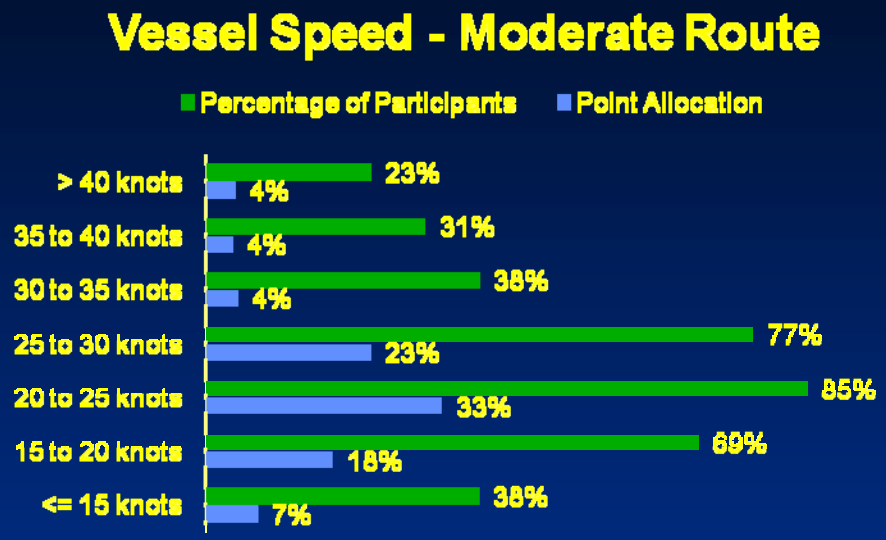


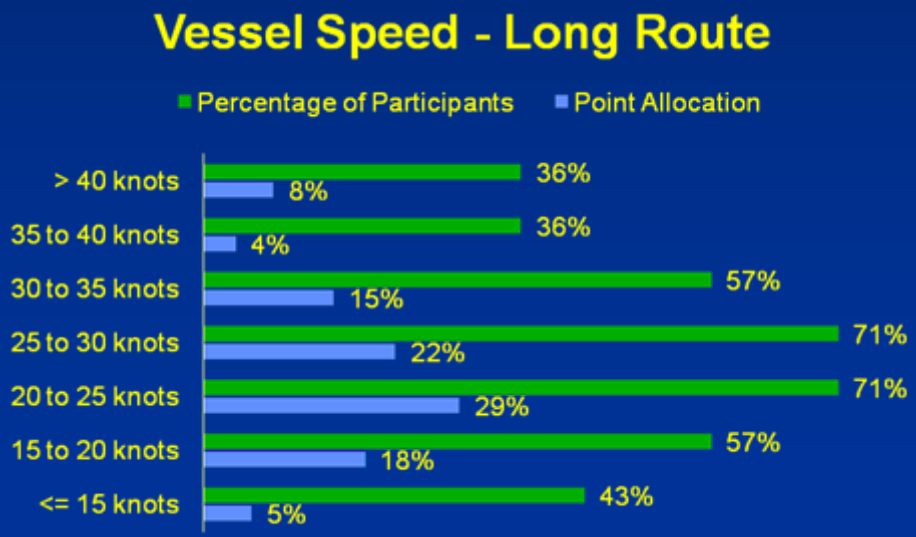




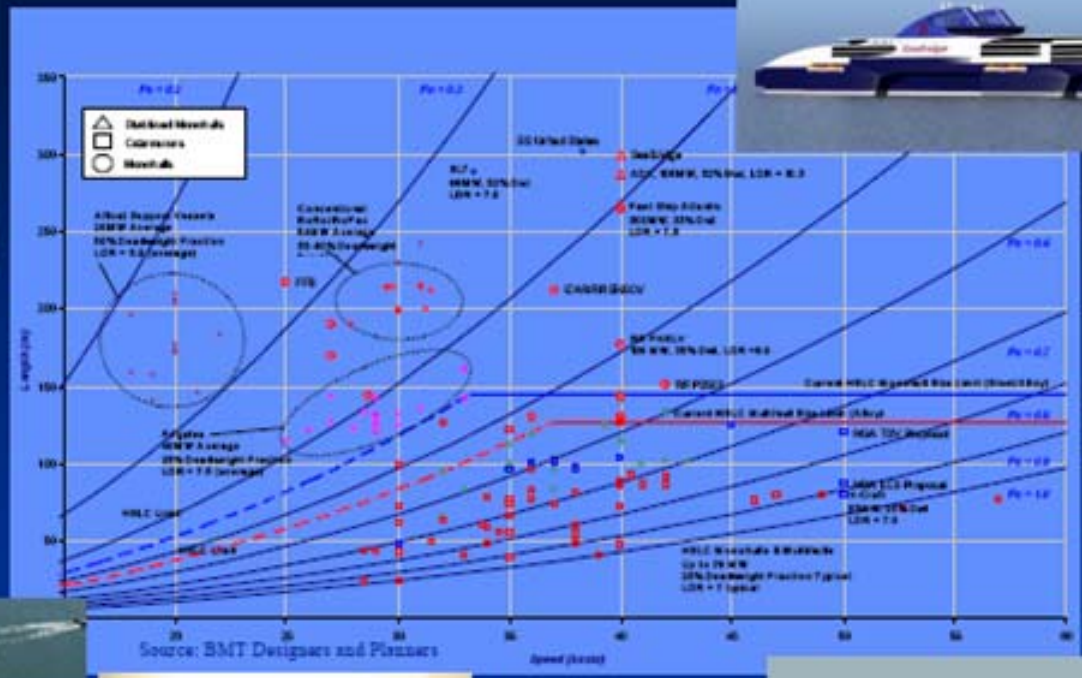
Short Sea Shipping Vessels, Cont.







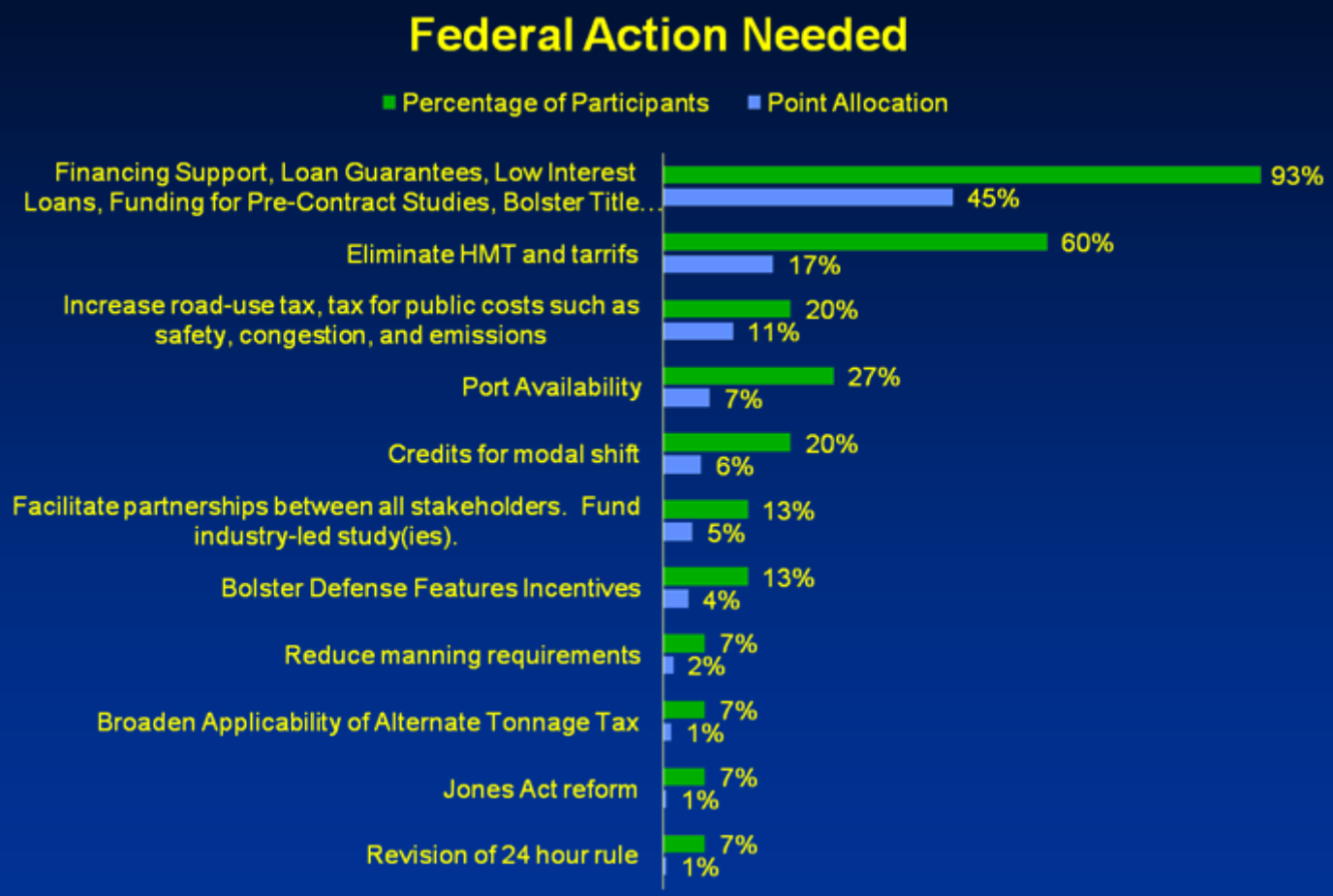
Short Sea Shipping Vessels, Cont.



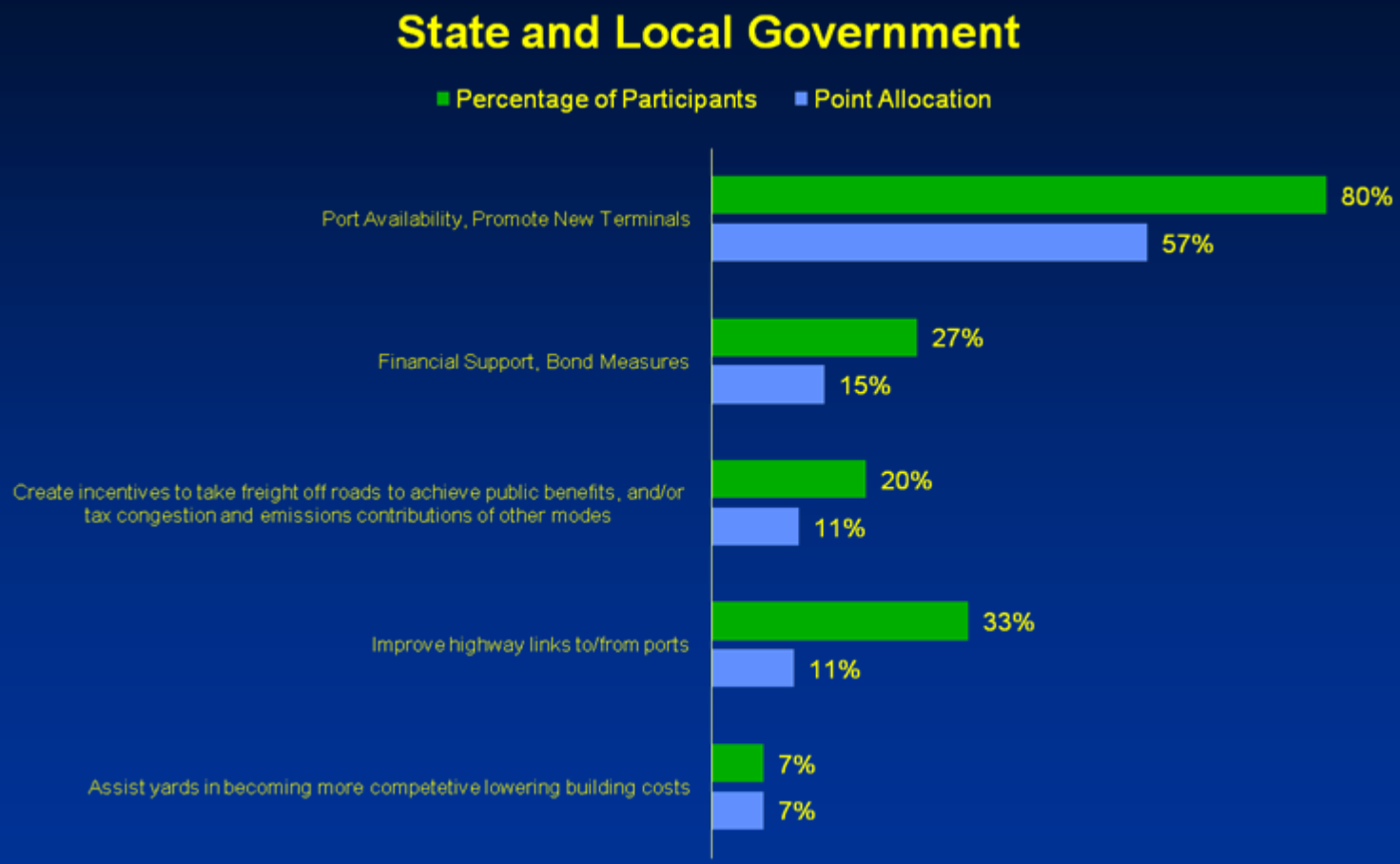
Military Considerations

- **Navy briefs provided on JHSV and JHSS programs**
  - Available on website
- **Commercial and military requirements dictate different design solutions**
- **Opportunities exist to leverage specific design elements and technologies**
  - For example power, propulsion, emissions mitigation, fuel efficiency, and cargo handling
- **Uncertain if sufficient incentive exists for incorporation of militarily useful features on S3 vessels**

Regulatory and Legislative Considerations



Regulatory and Legislative Considerations, Cont.



Regulatory Update

- **Subsequent to the workshop, HR 3221 was passed by the House**
- **Still must be reconciled in the Senate and requires appropriations to implement**
  - Authority To Make Loan Guarantee - subject to the availability of appropriations, may make a loan guarantee for the financing of the construction, reconstruction, or reconditioning of a vessel that will be used for a short sea transportation project designated under section 55601
  - The Secretary of Transportation shall establish a short sea transportation program and designate short sea transportation projects to be conducted under the program to mitigate landside congestion
  - The Secretary, in consultation with Federal entities and State and local governments, shall develop strategies to encourage the use of short sea transportation for transportation of passengers and cargo
  - Short-Term Incentives- The Secretary shall consult shippers and other participants in transportation logistics and develop proposals for short-term incentives to encourage the use of short sea transportation
  - Establish a board to identify and seek solutions to impediments hindering effective use of short sea transportation. The board shall include representatives of the Environmental Protection Agency and other Federal, State, and local governmental entities and private sector entities
  - The Secretary of Transportation, in consultation with the Administrator of the Environmental Protection Agency, may conduct research on short sea transportation

Labor Considerations

- **Includes trucking, in-port, and shipboard labor**
- **It is believed that labor will be supportive if brought in as partners early**
  - Need to be presented with a compelling business case
  - Needs to be new business, not competitive business
- **Can be an ally in lobbying for S3**

Building Short Sea Shipping

- **Ship construction costs are perceived to be a significant roadblock for S3 in the U.S.**
  - Broad support for follow-on NSRP projects that target reduction of ship construction costs for Short Sea Shipping vessels
  - Perception that shipbuilders overseas have designs, construction methods, and supply chain practices that may be leveraged
  - While on a percentage basis, ship construction costs are not the driver of S3 economics, they are a disincentive to investment
- **Two strategies explored**
  - "Virtual Shipyard"
  - Collaboration with foreign shipyards
- **Series construction is required to manage costs**
- **Financing perceived to be a roadblock**
  - Lack of continued support for Title XI
  - Need to extent CCF to contiguous U.S. trades

Virtual Shipbuilding

- **Definition: A combination of two or more ship construction entities with capable management & technical staff to organize the planning, scheduling, budgeting, design & engineering, procurement, production control, testing and program management for the design & construction of ships.**
- **Key elements of a suggested VS approach for S3:**
  - Good business relationship between ship owner/operator & the shipper customer
  - Significant participation by the ship owner/operator in the program planning and ship design process
  - Program Management Organization (PMO) staffed by experienced commercial shipbuilders, designers/engineers, planners & managers
  - Technically sound contract design developed specifically for Virtual Shipbuilding
  - Experienced commercial vessel detail design organization (in-house or outsourced)
  - Well conceived outsourcing plan utilizing high labor productivity and low overhead mid-tier yards and proven marine contractors (system suppliers and fabricators

Virtual Shipbuilding

- **Strengths**
  - Cost reduction by using more labor productive and lower overhead fabrication & sub-assembly facilities than fully integrated traditional shipyards
  - Accelerated production schedule by distributing the production work
- **Weaknesses**
  - Additional layer of contracting
  - Requires greater program management attention & expertise
  - Added cost of transporting interim products from fab sites to assembly facility
- **Risks**
  - Poor management, planning and/or technical direction
  - Subcontractors not meeting schedule or technical requirements
  - Misunderstanding between ship buyer and shipbuilder, i.e., poor quality contract design, which can result in error-prone and/or late detail design (PI)
- **Benefits**
  - 15-30% cost reduction over large commercial U.S. yards, and much more over naval combatant yards
  - Cost reduction benefit shared by buyer, shipbuilder & other VS team members
  - Shorter delivery time
  - Shipbuilder has better understanding of buyer's needs, and buyer has better understanding of shipbuilder's constraints & issues

Virtual Shipbuilding Examples

Commercial

- U.S. Shipping Partners LP ATB Barge
- Heavy Airlifter Seabasing Ship (HALSS)
- AHL Shipping Co. Chemical/Product Tanker

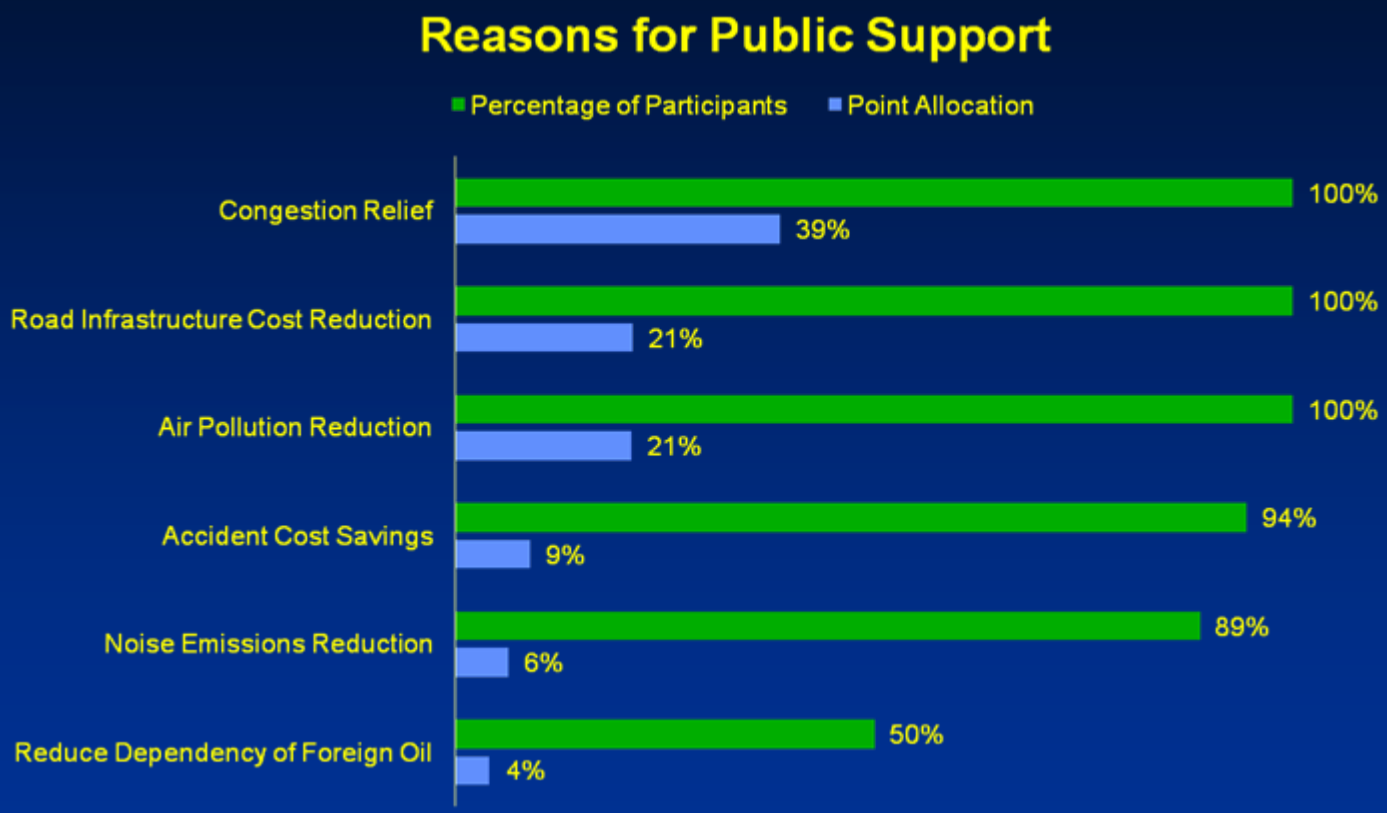
Navy

- Northrop Grumman Ship Systems (NGSS) DDG 103 Deckhouse
- Lockheed Martin Co. (LMCO) Littoral Combat Ship (LCS 1)

Port Infrastructure

- **Availability on West Coast a major challenge**
- **Port throughput and velocity a key determinant in economic viability of S3**
- **Port access, constraints and characteristics will be a driver of S3 designs in alternative markets**
- **Port infrastructure considerations:**
  - Environmental forces
  - Landside operational support
  - Waterside operational support
  - Port structures
  - Permitting

Public Benefits of Short Sea Shipping

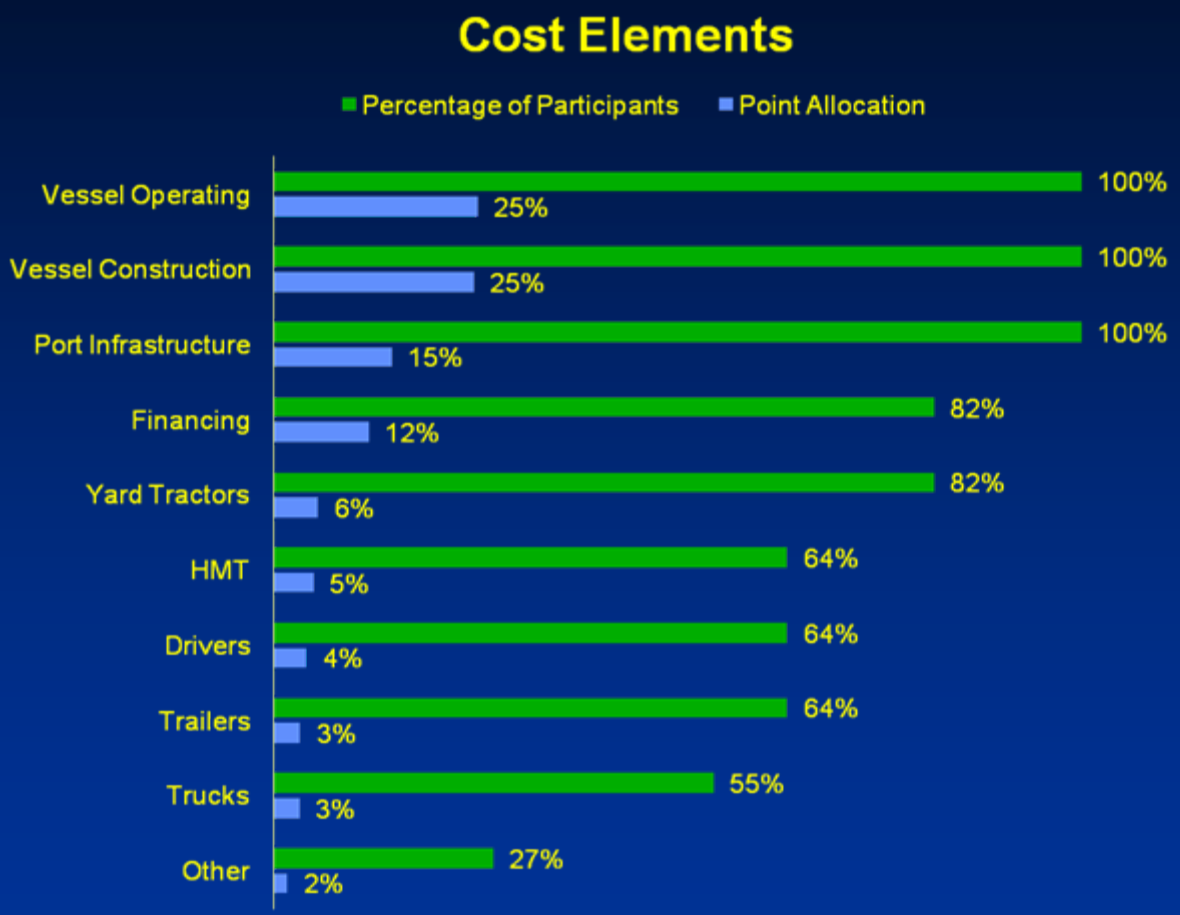


Public Benefits of Short Sea Shipping, Cont.

External Costs	NYC-Boston		
	Per truck trip	Per truck-mile	Cost Share
	Dollars		(%)
Infrastructure	20.52	0.09	16
Air pollution	12.53	0.06	10
Congestion	77.08	0.34	59
Noise	5.64	0.03	4
Accidents	14.94	0.04	11
Fuel cost savings	0.46	0.002	---
Total	131.17	0.56	100

Source: The Public Benefits of the Short Sea Intermodal System

Economics of Short Sea Shipping



Economics of Short Sea Shipping, Cont.

Figure 1: Cost per Load by Category, Northern California to Southern California

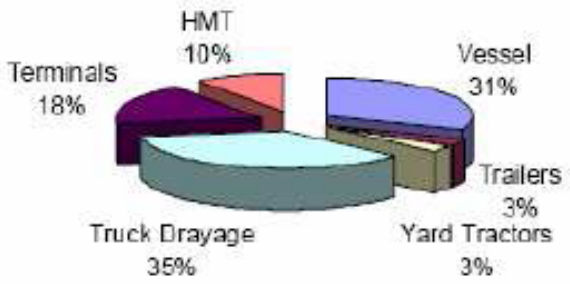


Figure 2: Cost per Load by Category, Northern California to Pacific Northwest

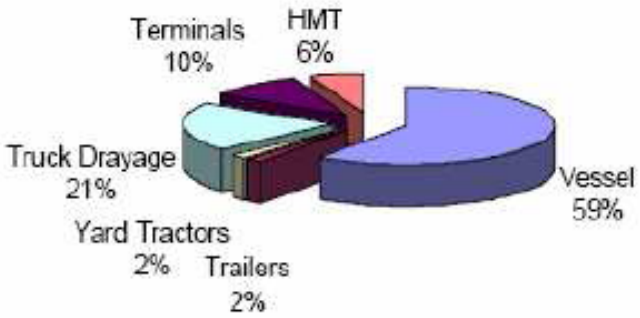
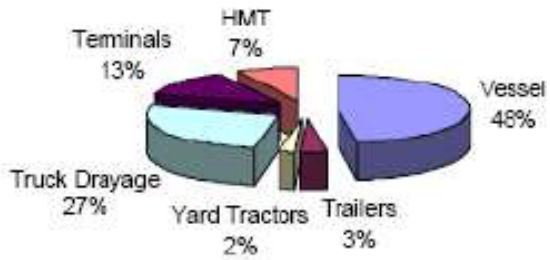


Figure 3: Cost per Load by Category, Southern California to Pacific Northwest



Source: Feasibility Assessment of Short Sea Shipping to Service the Pacific Coast; CCDOTT Manalytics, CDI Marine, Westar Transport, M.P. Tedesco

Economics of Short Sea Shipping, Cont.

Figure 4: Vessel Cost by Category, Northern California to Southern California

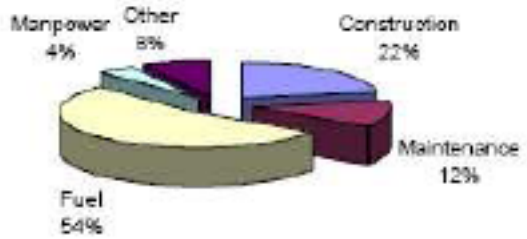


Figure 5: Vessel Cost by Category, Northern California to Pacific Northwest

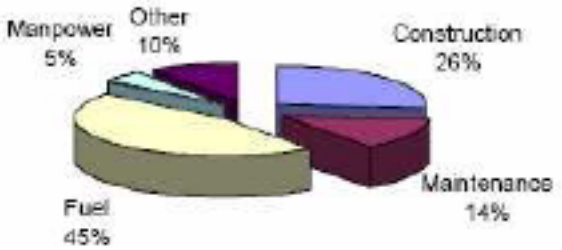
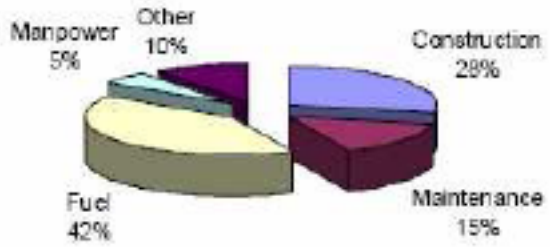


Figure 6: Vessel Cost by Category, Southern California to Pacific Northwest



Source: Feasibility Assessment of Short Sea Shipping to Service the Pacific Coast; CCDOTT Manalytics, CDI Marine, Westar Transport, M.P. Tedesco

Workshop Observations

- **Ship construction costs are perceived to be a significant roadblock for S3 in the U.S.**
  - Broad support for follow-on NSRP projects that target reduction of ship construction costs for Short Sea Shipping vessels
  - Perception that shipbuilders overseas have designs, construction methods, and supply chain practices that may be leveraged
- **Promising markets are most characterized by:**
  - Recognized deficiencies in the existing land-mode (congestion, lack of capacity)
  - Rates that permit S3 to be price competitive
- **East coast and West coast are perceived to be the best targets for S3, however the East Coast is perceived to be more likely in the near term**
  - Primarily driven by lack of port availability on the West Coast and the perception that congestion and lack of capacity is worse on the East Coast
- **General consensus that "one size will not fit all"**
  - However, there are significant series production opportunities for a number of vessel types and designs in a number of markets
- **General consensus that Ro-Ro's and Ro-Ro barges will be most prevalent for S3**

Workshop Observations, Cont.

- **Speeds from 20 to 30 knots are believed to be required, except in short routes where feeder vessels may operate at slower speeds below 15 knots**
  - Service standards of trucking being competed with in a given market, and port location and landside throughput, will dictate required vessel speed
- **Survey respondents are optimistic about opportunities for series construction**
  - Series up to 30 vessels for long routes
  - Series up to 20 vessels for moderate routes
  - Series up to 10 vessels for shorter routes which may be more “niche”
- **Vessel construction, vessel operating, and port infrastructure costs are perceived to be the most significant contributors to S3 required rates**
- **Strong consensus that Federal action is required to further S3**
  - Revitalized Title XI, application of CCF to contiguous trades, elimination of HMT
- **Role for State and Local Government is facilitating availability of ports and landside infrastructure**
  - State and local support may be required to ensure access

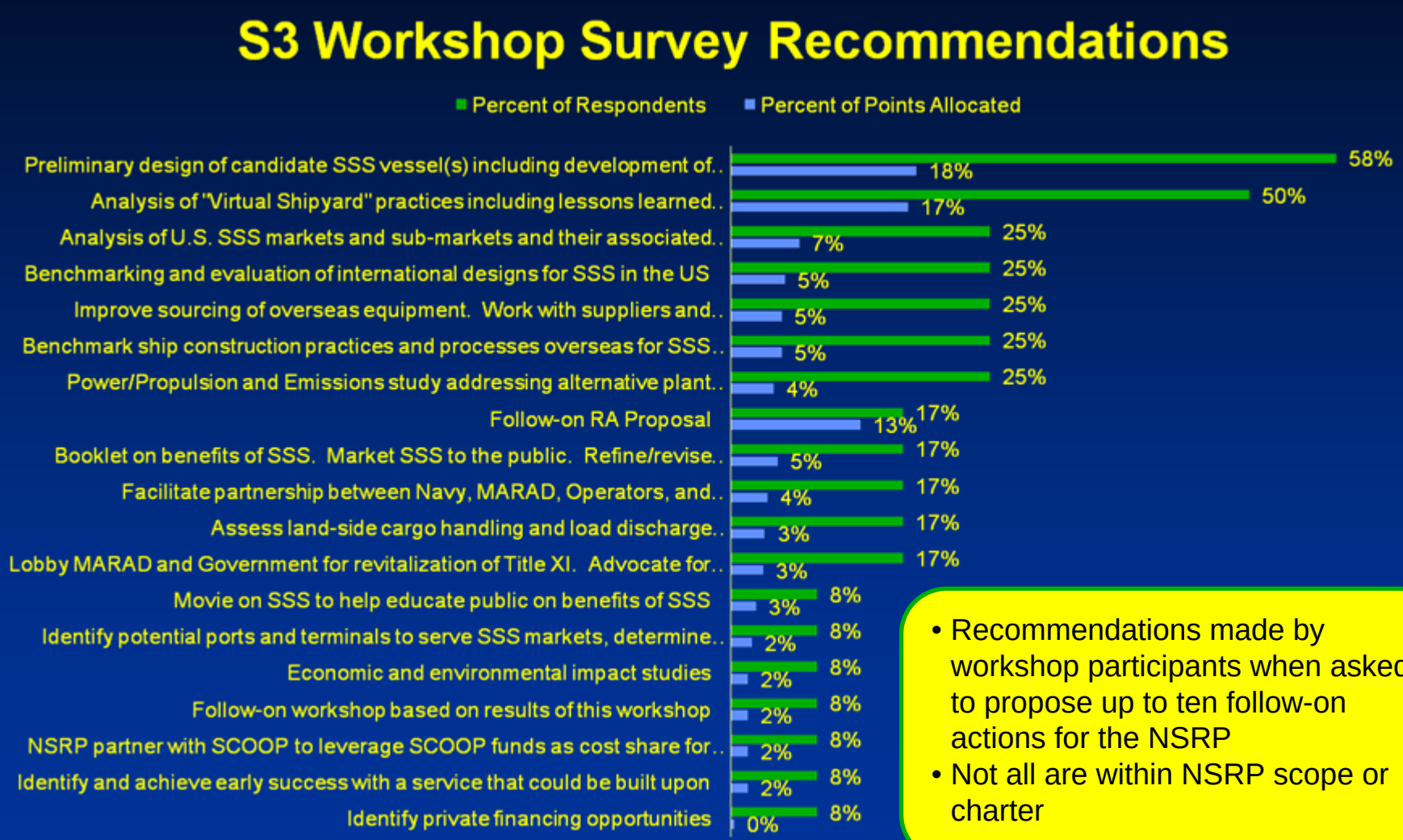
Workshop Observations, Cont.

- **Congestion relief, road infrastructure cost mitigation, and air pollution reduction are believed to be the most compelling public benefits**
  - Congestion relief is perceived to be the most certain benefit
- **Broad support for follow-on NSRP investment in S3, including:**
  - Analysis of application of “Virtual Shipyard” partnering and construction methods
  - Development of S3 designs applicable to multiple markets
    - » Analysis of markets and development of S3 vessel requirements
  - Leveraging of foreign designs for S3
  - Leveraging of foreign case studies for construction methods, supply chain management for S3, and partnership with foreign shipyards
  - Analysis of power and propulsion options for S3, means to mitigate fuel costs, and means to mitigate vessel emissions

Purpose of Roadmap

- Propose a portfolio of investment areas (tasks) within the NSRP scope and charter to engage U.S. shipbuilders in the advancement of S3
- Proposed tasks derived from challenges and recommendations identified as a result of the NSRP PDMT S3 workshop conducted April 19-20, 2007
- Develop a project plan that prioritizes and sequences proposed tasks

Workshop Survey Recommendations



- Recommendations made by workshop participants when asked to propose up to ten follow-on actions for the NSRP
- Not all are within NSRP scope or charter

Roadmap Focus Areas

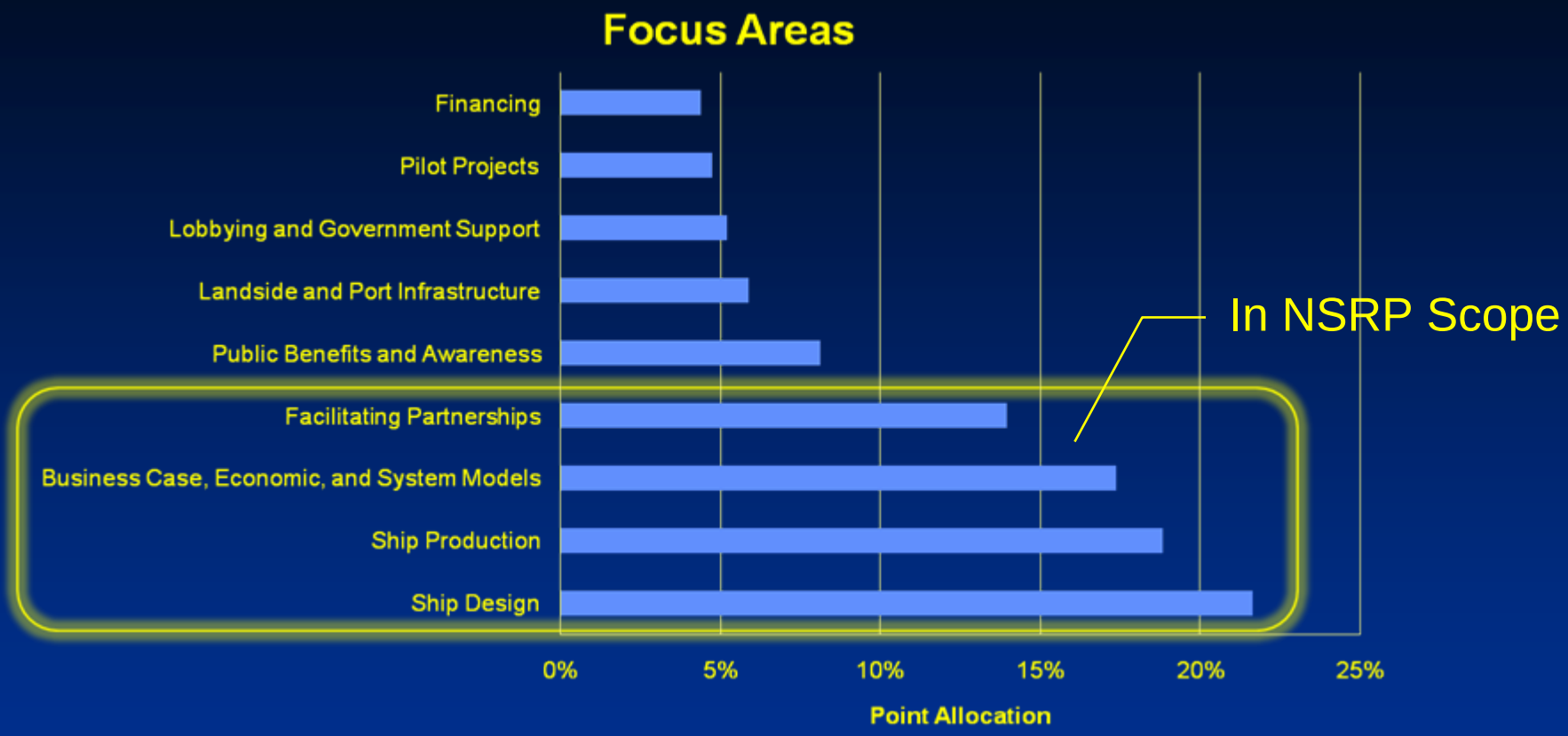
Recommendations suggest nine major focus areas:

Focus Area	Within NSRP Scope	Comments
Ship Production	Strong	Primary scope of the NSRP
Ship Design	Strong	Primary scope of the NSRP
Facilitating Partnerships	Strong	Facilitating partnerships would be a desired outcome of any S3 activity sponsored by the NSRP.
Business Case, Economics, and Systems Modeling	Strong	Tasks addressing the business case, the economics, and door to door systems modeling for S3 are necessary to verify ship design alternatives for potential S3 markets
Landside and Port Infrastructure	Moderate	While not directly in the scope of the NSRP, understanding landside infrastructure requirements will influence vessel designs and the business case.
Public Benefits and Awareness	Moderate	While not directly in the scope of the NSRP, data generated by other tasks may be used to help demonstrate public benefits.
Lobbying and Government Support	No	While important, this is not deemed to be within the scope of the NSRP.
Pilot Projects	No	A pilot project might evolve out of an NSRP activity, but it would not be within the NSRP scope to develop a pilot project.
Financing	No	While important, this is not deemed to be within the scope of the NSRP.

Map Recommendations to Focus Areas

Recommendation	Ship Design	Ship Production	Business Case, Economic, and System Models	Facilitating Partnerships	Public Benefits and Awareness	Landside and Port Infrastructure	Lobbying and Government Support	Pilot Projects	Financing
Identify private financing opportunities									■
Identify and achieve early success with a service that could be built upon								■	
NSRP partner with SCOOP to leverage SCOOP funds as cost share for studies.				■					
Follow-on workshop based on results of this workshop	■	■	■	■	■	■	■	■	■
Economic and environmental impact studies					■				
Identify potential ports and terminals to serve SSS markets, determine terminal costs, determine their desire and support for SSS business			■			■			
Movie on SSS to help educate public on benefits of SSS					■				
Lobby MARAD and Government for revitalization of Title XI. Advocate for CCF applicability to coastwise trades and for CCF in shipyards for use to finance ship construction projects.							■		
Assess land-side cargo handling and load discharge requirements, techniques, and throughput and the impacts of these characteristics on vessel requirements	■					■			
Facilitate partnership between Navy, MARAD, Operators, and Shipbuilders to successfully implement SSS. Follow on with Navy and MARAD to ensure support.	■	■		■					
Booklet on benefits of SSS. Market SSS to the public. Refine/revise public benefits study.					■				
Follow-on RA Proposal	■	■	■	■	■	■	■	■	■
Power/Propulsion and Emissions study addressing alternative plant configurations, fuels, fuel economy, and emissions mitigation technology and associated costs. Evaluation of low fuel cost or low fuel consumption technologies for SSS.	■				■				
Benchmark ship construction practices and processes overseas for SSS vessels and assess application of "international model" to U.S. yards. Conduct workshop bringing in foreign yards to share lessons learned and approach.		■		■					
Improve sourcing of overseas equipment. Work with suppliers and supply chain. Supplier/Builder Integration.		■		■					
Benchmarking and evaluation of international designs for SSS in the US	■								
Analysis of U.S. SSS markets and sub-markets and their associated vessel requirements. Survey truckers and shippers. Get potential customer buy-in.	■		■						
Analysis of "Virtual Shipyard" practices including lessons learned overseas, case studies of SSS vessel construction, and planning for Virtual Shipbuilding in the U.S.	■	■	■	■					
Preliminary design of candidate SSS vessel(s) including development of one or more "standard" designs with sufficient fidelity for ROM cost estimating. Economic assessment of candidate designs in representative markets.	■	■	■						

Focus Area Weighting



- **Based on mapping of recommendations to focus areas and respondents allocation of points to recommendations**
- **Strong preference for NSRP S3 activity addressing ship design, ship production, demonstrating the business case and S3 system models, and facilitating partnerships**

Recommended S3 Investment Portfolio: Best Practices S3 Workshop

- **Evaluate ship construction practices and processes overseas, including supply chain management, for S3 vessels**
  - Assess the application of the "international model" to U.S. yards.
  - Conduct workshop bringing in foreign yards
  - Assess potential to reduce ship construction costs
- **Benchmarking and evaluation of proven international designs**
- **Analysis of "virtual shipyard" or collaborative construction as an approach for S3 vessels**

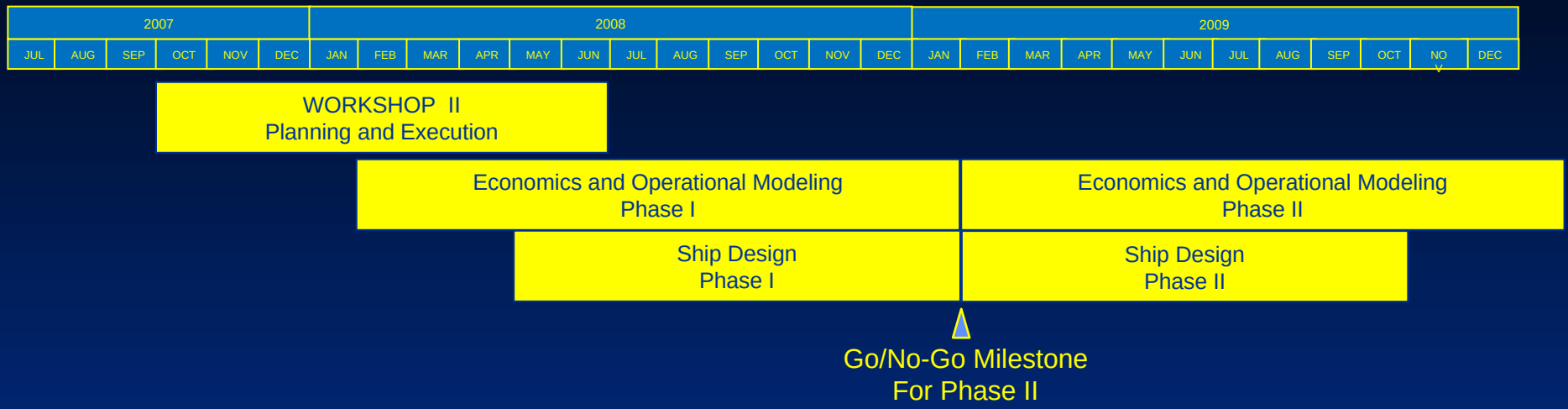
Recommended S3 Investment Portfolio: Ship Design

- **Development of vessel requirements and preliminary design of candidate S3 vessels for representative markets with sufficient fidelity for ROM cost estimating**
- **Assessment of power and propulsion alternatives and the means to reduce fuel consumption**
  - Fuel costs are the predominant driver of S3 costs
- **Assessment of S3 emissions and the means to mitigate vessel emissions**
- **Continue to engage the Navy in S3 to leverage common interests at the technology level**
  - E.g.; hull form, power and propulsion

Recommended S3 Investment Portfolio: Economic and Operational Modeling

- **Document market estimates and assumptions for use in developing candidate designs**
  - Draw on existing work in this area to document assumptions for volumes and commodity mix
- **Development of economic and door to door service models for S3 in representative markets**
  - Economic assessment of candidate designs in representative markets to assess price competitiveness
  - Throughput modeling and simulation to assess service time competitiveness
- **Document port and terminal restrictions and throughput capabilities in representative markets and their impact upon vessel requirements**

Investment Plan



- **Extend ECB initiative with a second workshop**
  - Address ship cost challenge and ship production focus area
  - Serve as a bridge to a broader RA project addressing remaining tasks and focus areas
- **Recommend NSRP support major RA initiative addressing economics, operational modeling and ship design tasks**
- **Roadmap further details the sequence of tasks within each major element of the investment plan**

Workshop II

PROGRAM INFORMATION	OBJECTIVE
Prime/Lead: Bender Shipbuilding Team Members: NASSCO, Bollinger, VT Halter, Malone Consulting, Matt Tedesco, Herbert Engineering Duration: 10 months	Accelerate Short Sea Shipping operations by analyzing the application of the "Virtual Shipyard" concept and leveraging foreign partnerships and overseas successes through a multi-day S3 workshop
DELIVERABLES/BENEFITS/ROI	**FINANCIAL**
• Identify best in class practices for S3 design and production • Generic design, business practice and build strategies • Realization of design & construction contracts for U.S.-built S3 vessels • Strengthening the shipbuilding industrial base	Program Funds: $99,000 (Note 1) Cost Share: $7,500 (Note 2) Notes: 1. Program funding includes travel allowance for key foreign participants 2. Additional cost share will result from non-team U.S. shipyards and other workshop attendees participating without labor or travel compensation

- **Second workshop proposed as PDMT panel project**
- **Selected by ECB for FY 08**