

GREAT LAKES ST. LAWRENCE SEAWAY STUDY



December 7, 2006

Great Lakes Navigation Stakeholder Workshop



ENG

Navigation-Related Infrastructure Engineering

- Infrastructure Condition, Comparison and Categorization
- Reliability Modeling and Risk Analysis
- Performance Mapping
- Maintenance/Capital Cost Projections



ECON

Transportation Policy and Economics

- Marine Network Database and Port Profiles
- Traffic/Fleet Analysis and Forecasts
- Shipper/Carrier Survey and Rates/Costs Analysis
- Economic Modeling and Policy/Impact Analysis



ENV

Environmental Factors

- Baseline Conditions and Water Level Regimes
- Navigation-Related Impacts and Framework to Cumulative Effects
- Review of Economics and Engineering Aspects

Ongoing Engineering Activities

- ❑ **Finalization of Time Dependent Reliability Analyses for Critical GLSLS Components**
 - Combination of Analytical Models and Expert Elicitation
- ❑ **Integration of Engineering Reliability Analysis into Systems Economic Model**
 - Probabilities of Failure through Time
 - Probabilities Developed for Multiple Maintenance Scenarios
 - Consequence Event Trees Given a Failure Occurs
- ❑ **Projected Maintenance Costs Across System and Closures**
 - Focus is Only on Existing System and Existing Configuration
 - Baseline Maintenance (Fix-as-Fails)
 - Advance Maintenance (Example: Implementation of Asset Renewal Plan)
 - Replacement-in-Kind if Necessary

Ongoing Economic Activities

❑ **Data Collection and Integration**

- Marine Network Database – complete integration of data (multiple sources/formats)
- Port Profiles – complete data collection & finalize profiles

❑ **Data Analysis and Forecasting**

- Traffic/Fleet Forecasts for New Vessel/New Cargoes initiated
Complete Phase II of study
- Integrate future traffic forecasts with engineering reliability models

❑ **Economic Modeling and Impact/Policy Analysis**

- Complete Vessel Trip Cost Simulator Model Runs
- Complete links to/from engineering model and analyses
- Test Policy Analysis Model on Various Future O&M Scenarios

Ongoing Environmental Activities

□ **Finalizing Environmental Appendix, incorporating...**

- System Wide Issues
 - Invasive Species
 - Contaminants/Pollution
- Environmental Impact Assessment
- Development and Qualitative Assessment of O&M Scenarios
- Environmental Approach to Future Work
- Setting the Stage for Possible Future Bi-National Cumulative Impact Assessment

GLSLS STUDY

NCNV - Purpose

“To Assess New Cargoes in Relation to Both Shippers Demand Requirements and the Potential of Carriers to Meet those Requirements using the system.”

GLSLS Marketplace

Competitive Environment and Analytical Issues

Vessel Technology Assessment

Evaluation Frameworks and Transport Strategies

GLSLS Demand and Market Analysis

GLSLS Vessel and Port Operations

GLSLS STUDY

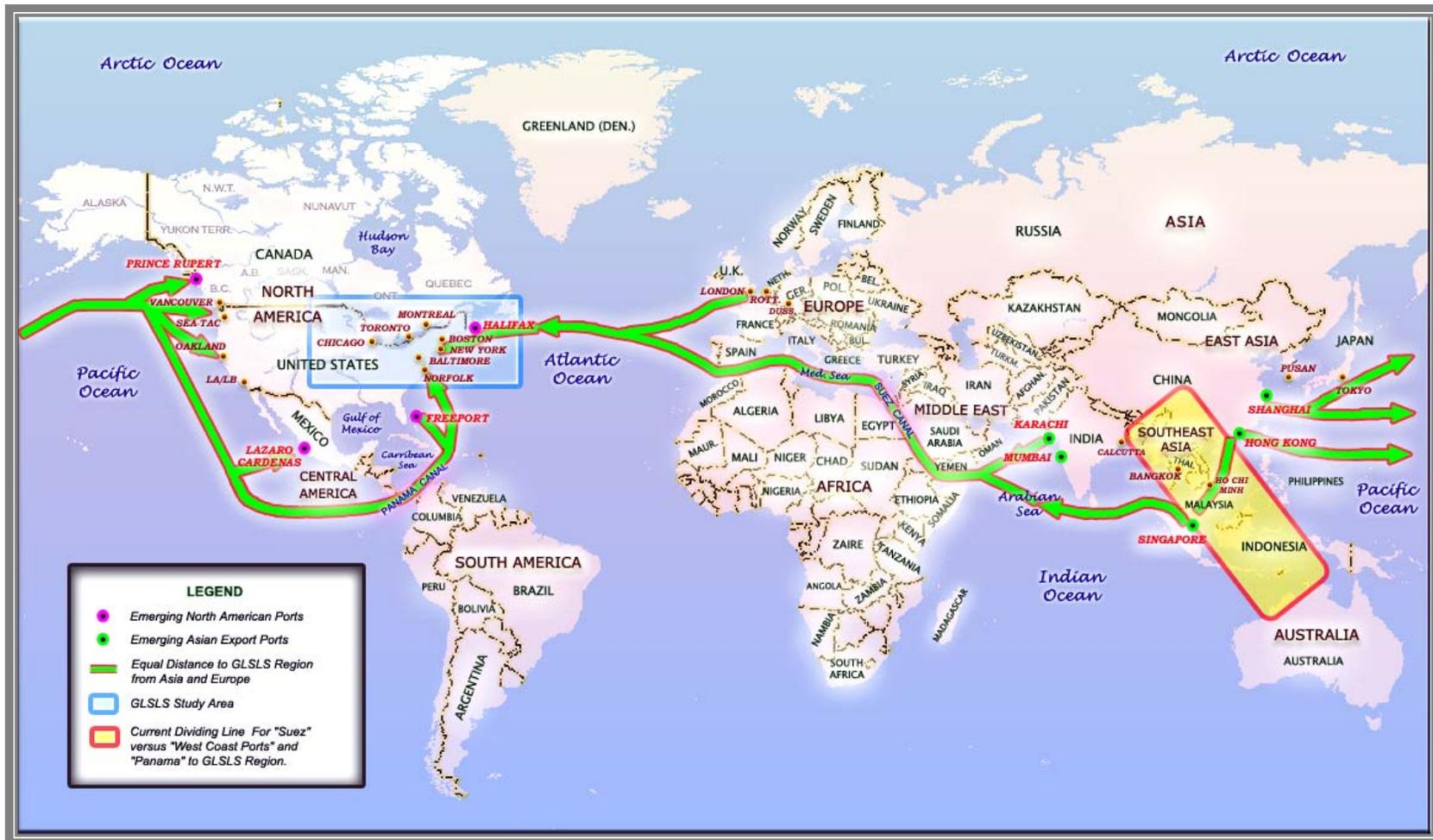
NCNV – Competitive Environment

Economic Future and Scenarios Dependent on the Projection of Long-Term Socioeconomic Trends, including Population, Employment, Income, GDP and Trade Factors

**Trade growth and changing trade patterns
Container traffic growth
Increasing congestion
Tightening capacity**

GLSLS STUDY

NCNV – GLSLS Links International Trade



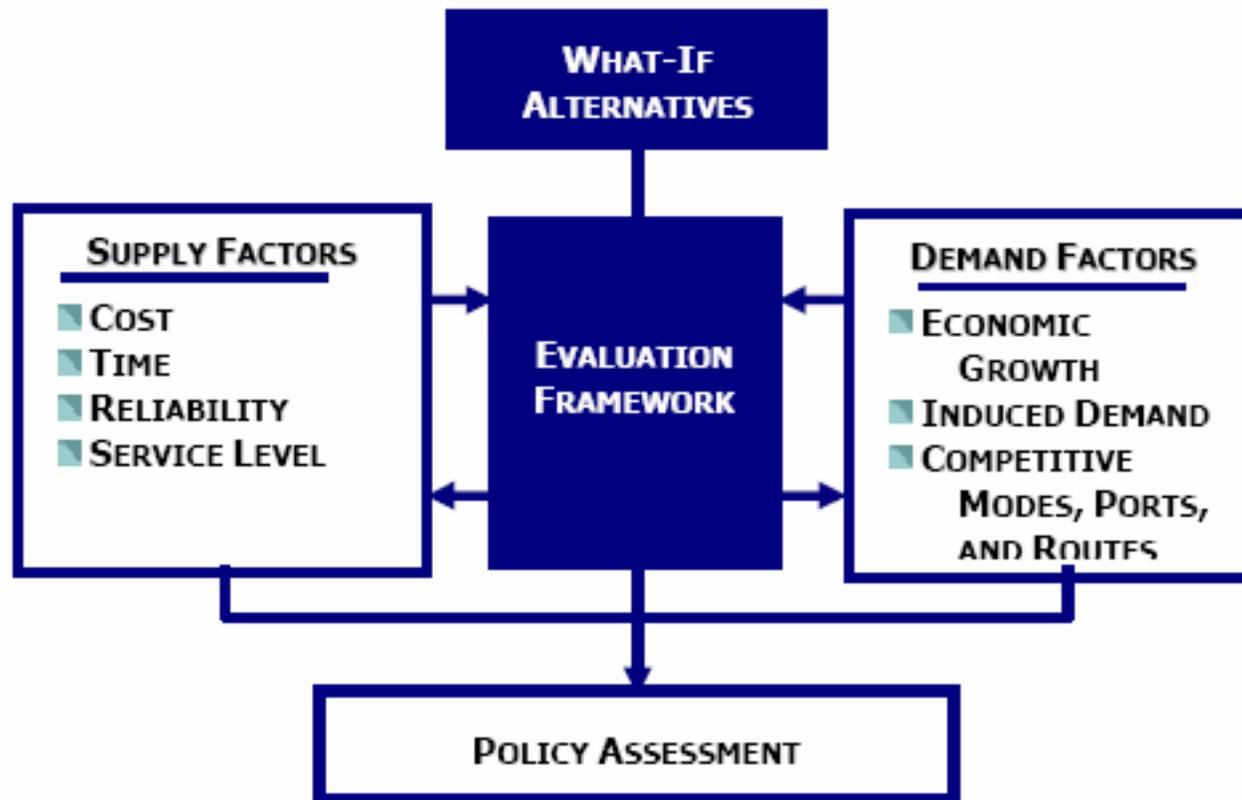
GLSLS STUDY

NCNV – Analytical Issues

Supply	Demand
Price	Economic Growth
Transit Time	Market Accessibility
Drayage/Access-Egress	Modal Competition
Dwell Time	Route Competition
Frequency of Service	Capacity Constraints
Reliability of Service	
Security of Shipment	
Shipment Characteristics	
Capacity	
Seasonality	

GLSLS STUDY

NCNV – Evaluation Framework



GLSLS STUDY

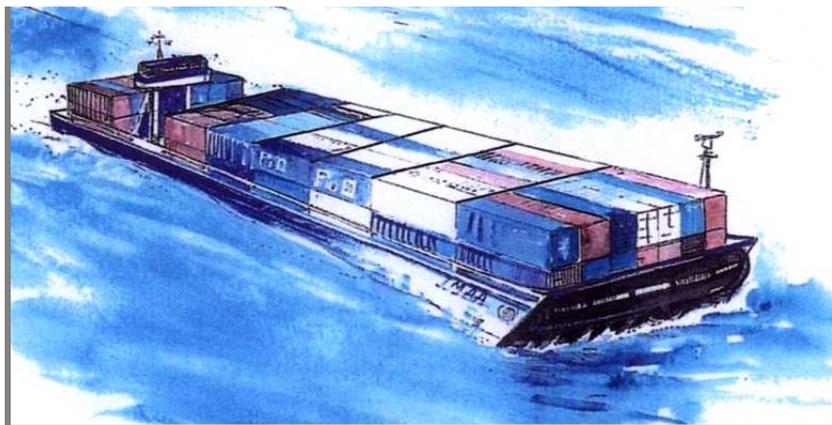
NCNV – Vessel Technology Assessment



Containers on Barge



GLSLS Container Ship



PACSCAT



Fast Freighter

GLSLS STUDY

NCNV –Vessel Technology Assessment

GLSLS Container Ship

Streamlined hullform proposed compared to traditional GLSLS bulk laker designs – “Seaway Max” vessel

Can go up to 20 kts with reasonable fuel consumption

More energy efficient than barge in spite of faster speed

Typical for all vessels, energy requirement increases rapidly as maximum speed is approached

Both Ro/Ro and Lo/Lo versions under consideration



Performance Parameter	Prototype Vessel
Cruise Speed (km/h)	37.0
Fuel consumption at cruise speed (kg/hr)	2,680
Fuel economy at cruise speed (kg/TEU-km)	.054
Loaded FEU capacity	665 and 350
Crew	14

GLSLS STUDY

NCNV – GLSLS potential vessel routes



GLSLS STUDY

NCNV – Water Mode Share

Uncongested:

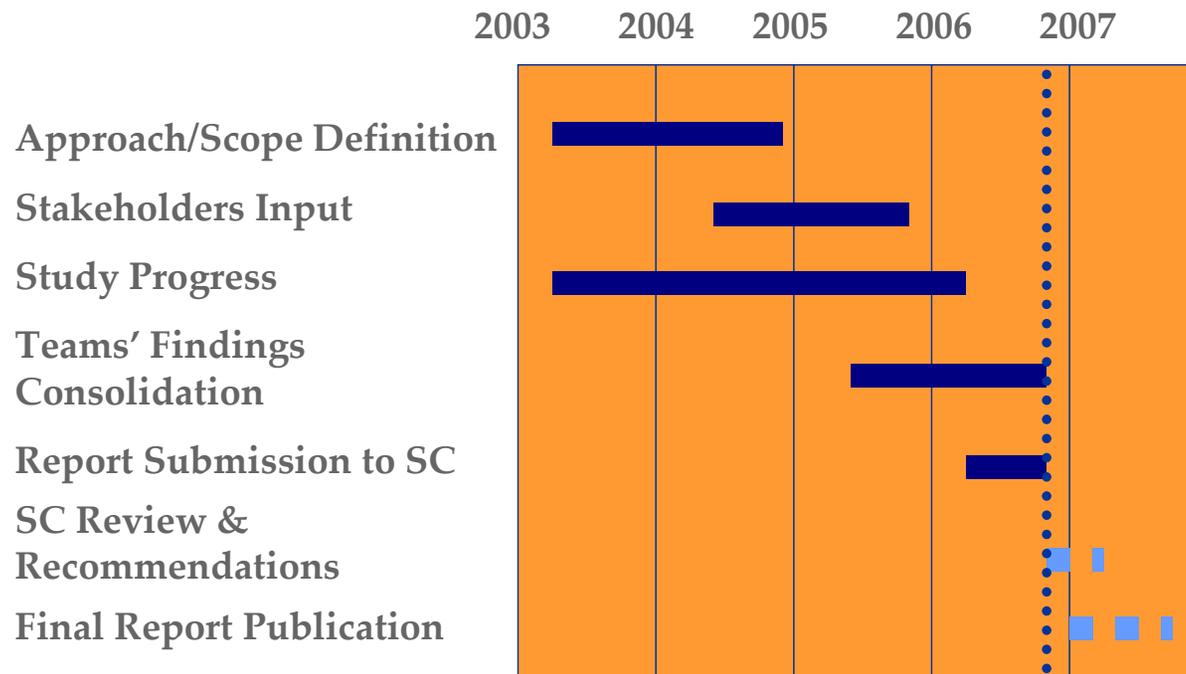
Water can achieve 2 percent of market in 2010 and 3 percent by 2050 using GLSLS max Ro/Ro vessel

Congested:

Water can achieve 2 percent in 2010 and 4 percent by 2050 of market using GLSLS max Ro/Ro vessel similar to Intermodal Rail.

With appropriate ships water can play as large a role as Intermodal Rail by 2030

Current Status - Where is the Study Now?



Corps Will Still Need to Complete Supplemental Reconnaissance Report

- ❑ Original recon report approved in 2002 subject to additional efforts to establish system-wide baseline conditions
- ❑ Supplemental efforts to include stakeholder input and USDOT/Canadian coordination
- ❑ Ongoing bi-national effort will provide much of the detailed baseline conditions
- ❑ Will need to revisit original conclusions/recommendations. Original alternatives included seaway deepening/expansion and selected port deepening, and also other navigation related enhancements (navigation aides, etc.)
- ❑ FY07 funding needed for completion of the bi-national system review and the Corps' supplemental recon
- ❑ Any follow-on feasibility studies would depend upon receipt of future Federal funding and identification of a non-Federal sponsor.

FY07 FUNDING!