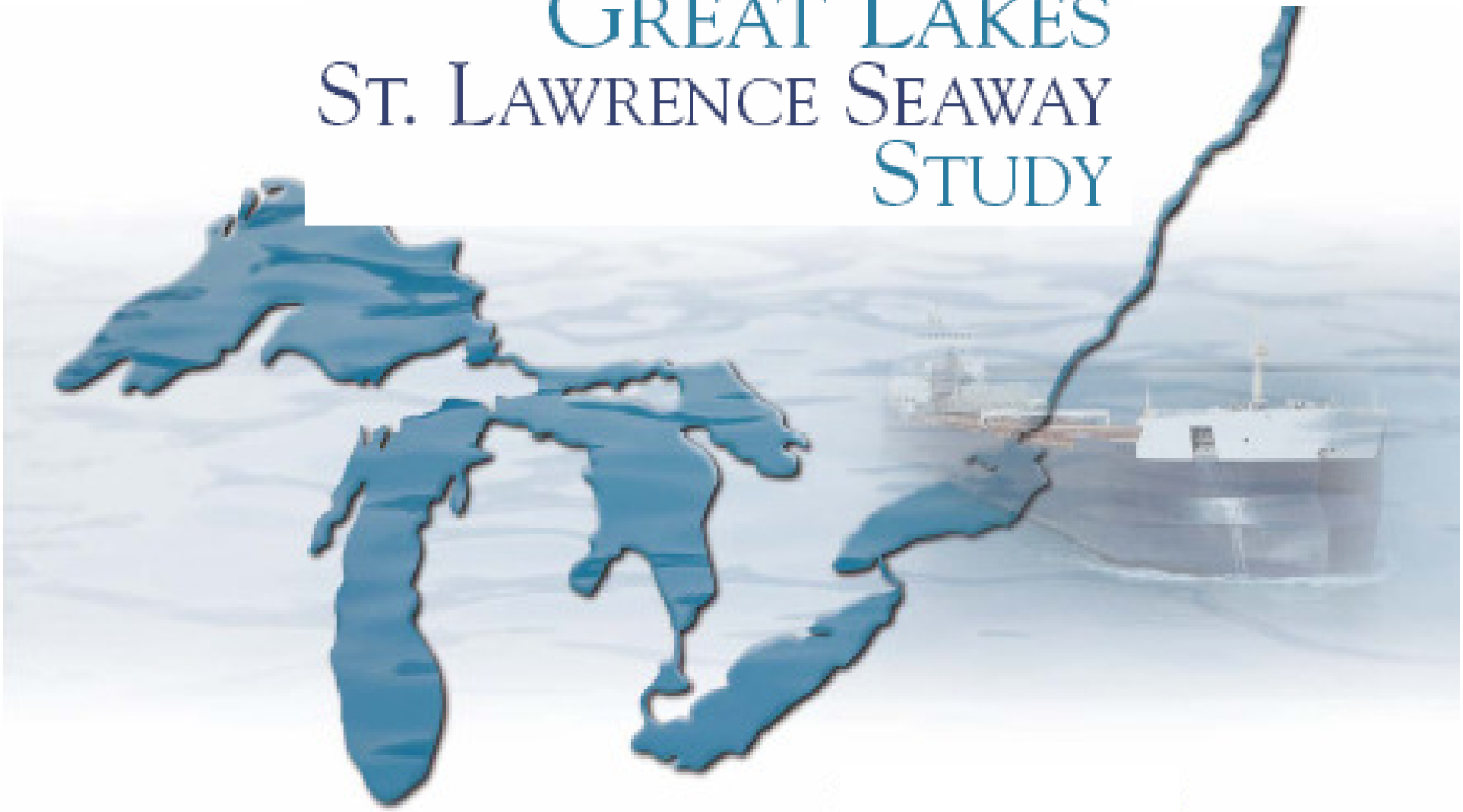
Great Lakes St. Lawrence Seaway Study



Great Lakes Navigation Stakeholders Meeting

Detroit, MI – Nov 27, 2007

Outline

- Study Context
- Study Highlights
  - Economics
  - Environment
  - Engineering
- Summary/Recap and Final Report Status

Study Tools

Vessel Movement Database

Cargo Forecasts

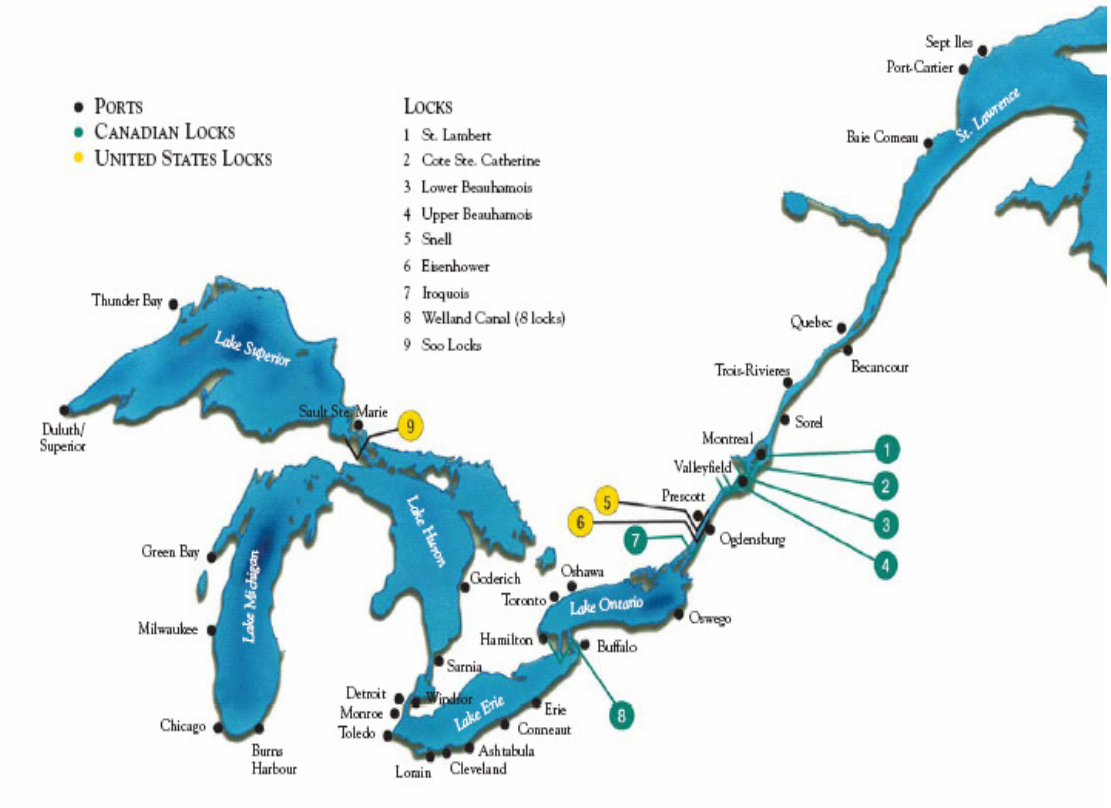
Existing Infrastructure Conditions

Component Risk Model

Vessel Trip Cost Simulator

Shipper Survey/Transportation Rate

GLSLS System



Waterway carries upwards of 260 million metric tons of cargo each year:

- 40% of Canada's total domestic marine trade volume
- 50% of Canada's total transborder marine trade volume with U.S.
- 10% of all U.S. waterborne domestic traffic

Prosperity of numerous sectors depends on reliable, low-cost waterborne transportation – including the steel, agriculture, construction, electrical generation, salt and petroleum industries

Study Context

Objective

To evaluate the infrastructure needs of the Great Lakes St. Lawrence Seaway system as currently configured (footprint and dimensions) and to assess the economic, environmental and engineering implications of those needs as they pertain to commercial navigation

Aging Infrastructure Problematic

GLSLS System – 17 Lock Sites

- Montreal-Lake Ontario – 5 Canadian and 2 US locks (1959)
- Welland Canal – 8 Canadian locks (1932)
- Soo Locks – 2 US locks; Poe (1968) and MacArthur (1943)

Study Partners

Basis

Memorandum of Cooperation between Transport Canada and the U.S. Department of Transportation in May 2003

Agencies Involved

Transport Canada / Transports Canada

U.S. Department of Transportation

Saint Lawrence Seaway Development Corporation

U.S. Fish and Wildlife Service

U.S. Army Corps of Engineers

The St. Lawrence Seaway Management Corporation

Environment Canada / Environnement Canada

Fundamental Questions

- How can efficient movement of goods be achieved through the waterway, and through the integrated North American transportation network?
- What transportation solutions are available to guarantee a dynamic future for the waterway?
- What measures need to be taken to optimize the many different components of the system's infrastructure?
- How can change be affected in a manner that is environmentally sound?

Economics Highlights

Commodity Forecasts

- Existing marine traffic will experience slow but steady growth

Competitiveness

- Waterway routing offers significant transportation rate savings; and lock delays/closures have negative impacts and implications

New Cargoes New Vessels

- Real opportunities for potential movement of containers and neobulks

Commodity Forecasts

Volume projections – slow but steady growth to 2050

	MLO section						Welland Canal						Soo Locks					
	Grain	Iron ore	Coal	Steel	All other	Total	Grain	Iron ore	Coal	Steel	All other	Total	Grain	Iron ore	Coal	Stone	All other	Total
2005	9.5	9.0	0.7	3.0	9.0	31.3	9.4	7.4	3.7	1.9	11.8	34.2	9.6	42.7	21.7	4.1	3.6	81.6
2010	9.8	9.6	0.4	3.5	9.0	32.3	10.7	6.4	3.9	2.8	10.6	34.3	12.5	46.1	24.2	5.5	1.2	89.5
2020	11.8	10.1	0.5	5.9	9.3	37.6	11.5	5.9	3.8	4.3	12.7	38.2	12.5	41.7	29.7	6.5	1.3	91.8
2030	12.0	11.1	0.7	6.1	9.5	39.5	12.6	5.9	3.7	4.3	13.6	40.1	12.5	39.1	33.5	7.6	1.3	94.0
2040	12.1	11.6	0.7	6.7	9.6	40.8	12.5	5.9	3.6	4.4	14.9	41.3	12.5	39.1	40.7	8.6	1.4	102.3
2050	12.2	11.8	0.7	7.0	10.4	42.1	12.4	5.9	3.5	4.5	16.2	42.4	12.5	39.1	44.7	9.6	1.4	107.3

Competitiveness

Marine transportation saves shippers some $3.2B

Commodity Group	Sample size Tonnes	Savings C$/Tonne	*Total savings C$
Aggregates and Slag	*34,375,000*	*$21.15*	*727,186,000*
Metallic Minerals and Ores	*56,723,000*	*$12.34*	*700,157,000*
Coal, Coke, Pet Coke	*37,076,000*	*$17.64*	*653,953,000*
Iron, Steel and Other Metals	*11,702,000*	*$42.89*	*501,863,000*
Non-metallic Minerals	*8,076,000*	*$25.74*	*207,869,000*
Wheat	*7,315,000*	*$22.93*	*167,731,000*
Petroleum Products	*3,575,000*	*$24.55*	*87,764,000*
Other Grains and Feed Ingredients	*1,654,000*	*$37.24*	*61,596,000*
Soybeans	*1,538,000*	*$29.39*	*45,200,000*
Corn	*1,063,000*	*$31.17*	*33,137,000*
Total	*163,097,000*	*$19.54*	*$3,186,432,000*

Environment Highlights

Valued Ecosystem Components (VECs)

- Establishes trends in 8 VECs and stressors acting on them from both a navigation and non-navigation perspective

Stressor Analysis

- Navigation-related and non-navigation-related impacts are a mix of positives and negatives

Priority Management Issues

- VEC-centered approach provides sound basis to develop and maintain cumulative effects framework for commercial navigation

Navigation-Related Stresses

A mix of positives and negatives

Positives	***Negatives***
GHG Emissions (tonnes/km)	Introduction of NIS (Ballast Water)
Relief to Urban Congestion (infrastructures)	Air Emissions (NOx, SOx)
Less Risk of Accidents and Spills	Ship Wakes (shoreline erosion)

Key stakeholder concerns:

- Preventing introduction/transmittal of NIS
- Minimizing the impact of ship emissions
- Dredging and dredged material placement
- Water level management
- Icebreaking

Engineering Highlights

System-Wide Criticality Assessment

- Provides a definitive process to compare relative importance and condition of various features across the three lock systems

Reliability Analysis

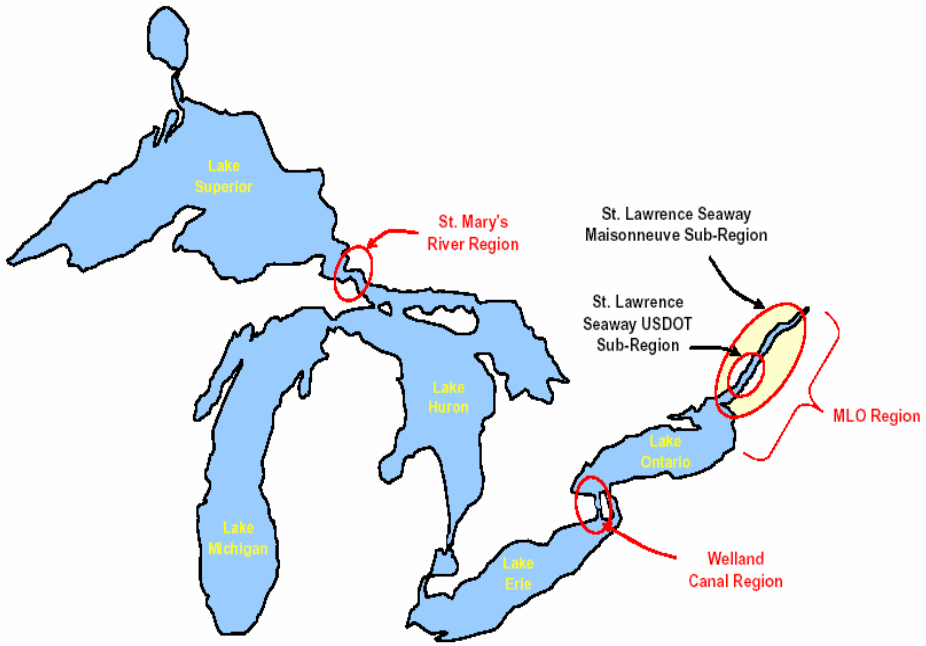
- State-of-the-art reliability modeling undertaken for the most critical infrastructure components

Cost Matrices

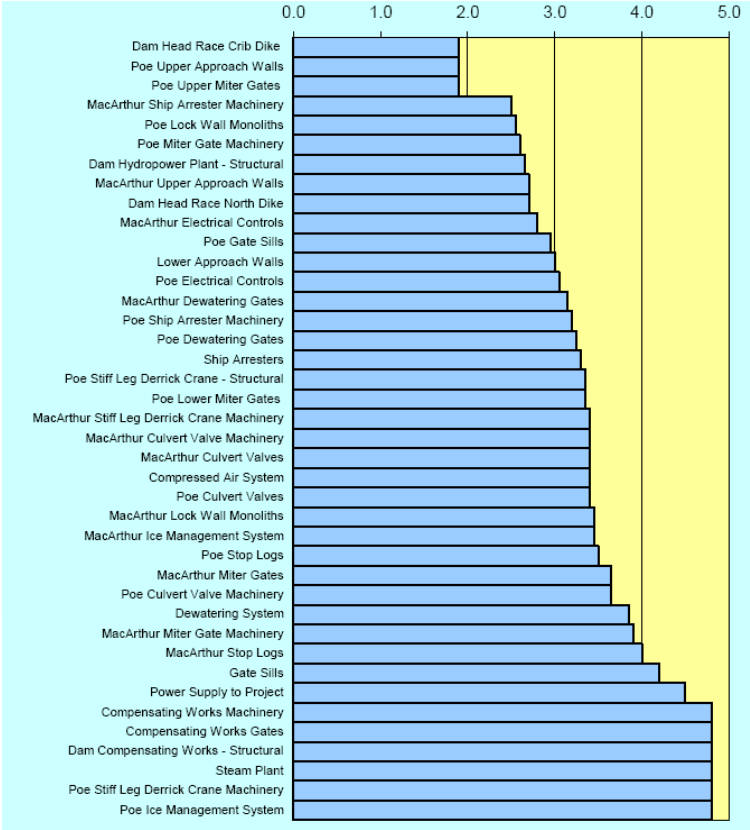
- Maintenance-specific cost and consequence matrices help evaluate projected operations and maintenance costs

Criticality Assessment

Lock system corridors

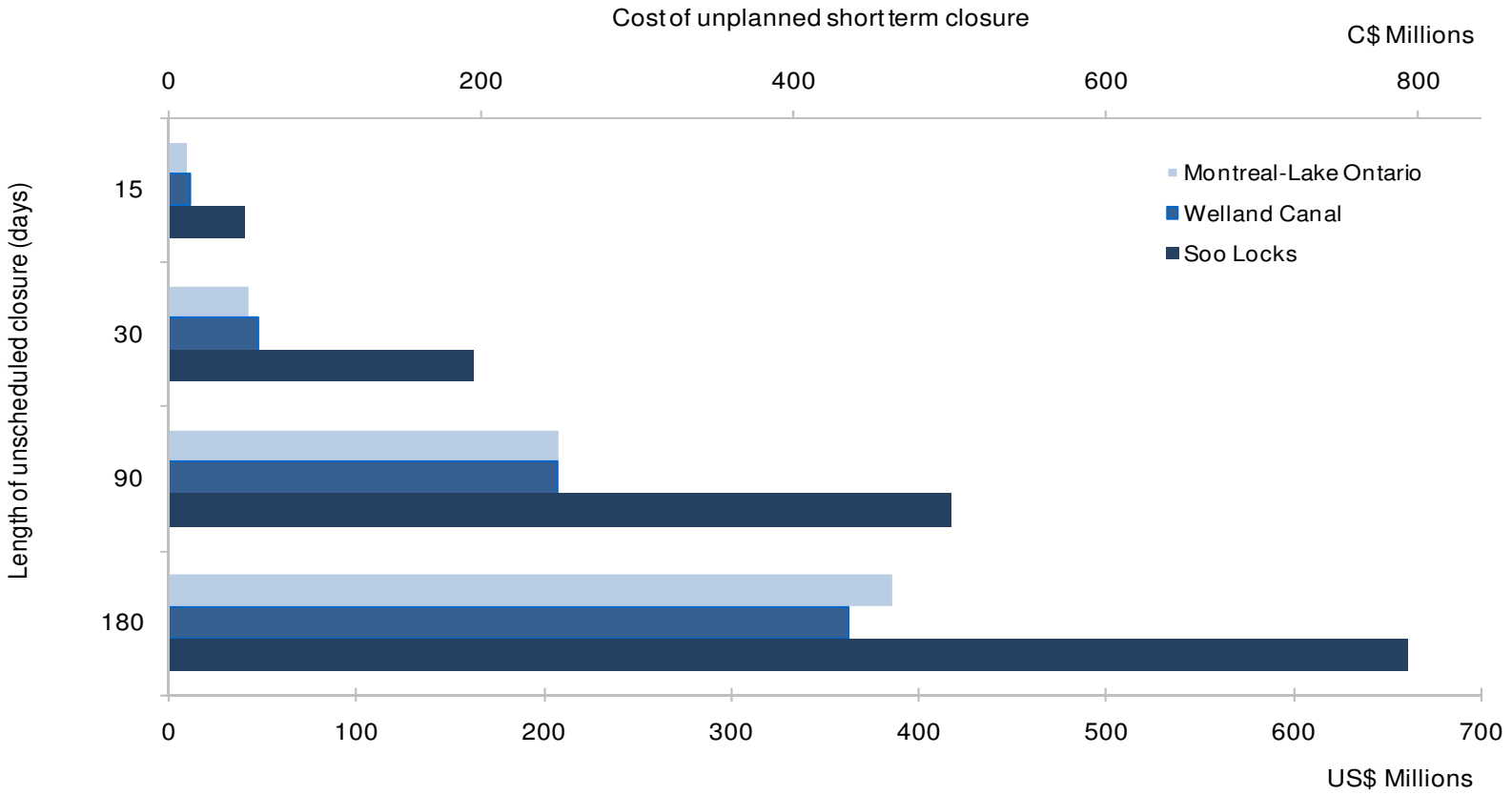


Ranking of USACE Components at SOO Locks



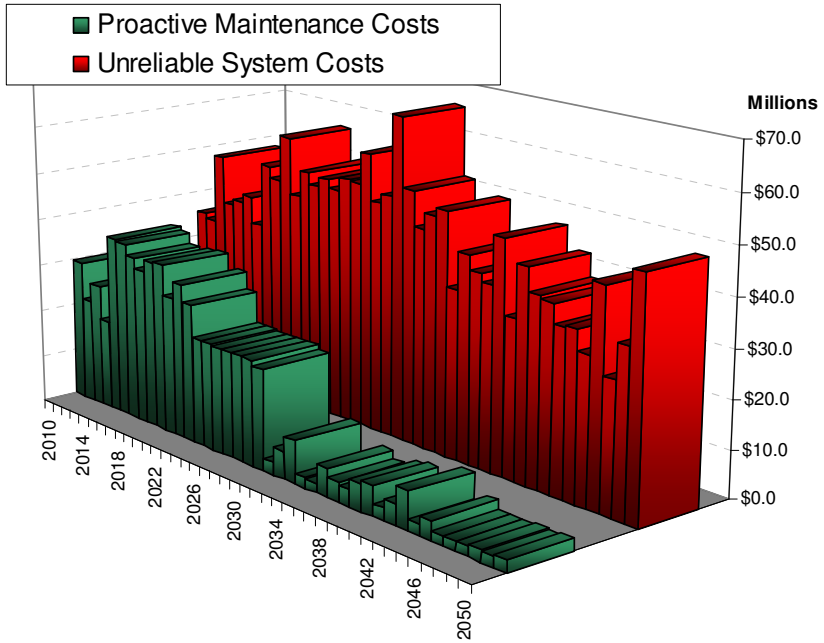
Competitiveness

Significant cost associated with lock delay/closure



Cost Projections

Maintaining System Reliability



Priority Components:

Total proactive maintenance costs (2010-2050) = $ 632,800,000

Total unreliable system costs (2010-2050) = $ 1,818,700,000

Key Take Aways

- Economic Data developed in study will support value of investing in Great Lakes infrastructure

- Risk & Reliability data provides fact based data for infrastructure condition assessment and consequences of failure

- Commodity forecasts substantiate need for Soo Recapitalization and Replacement Lock

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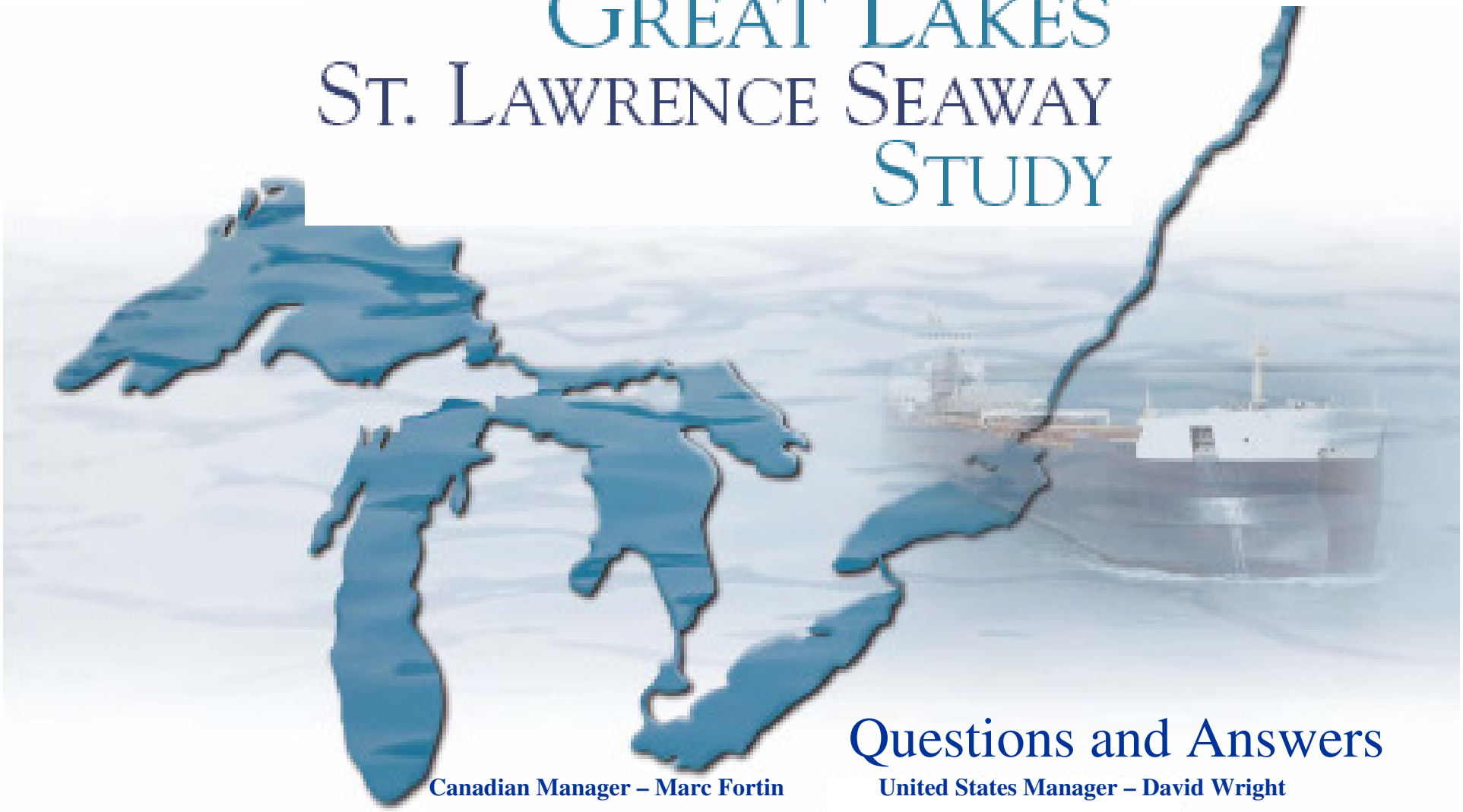

Questions and Answers

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