Great Lakes Navigation Update

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“The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation.”
A non-linear navigation system with 60 federal commercial projects and 80 federal shallow draft/recreational projects.
Great Lakes Navigation System
Economic Data

• A non-linear interdependent system of 140 deep and shallow draft projects; commercial ports are dependent on each other for the efficiency and health of the system.

• 145M tons (5-year average) – (USACE Waterborne Commerce Statistics)

• GLNS saves the country $3.6 billion per year compared to the next least costly mode of transportation (USACE Inland Nav Center of Expertise)
Key Challenges

- Balancing System Requirements
- Dredging
- Dredged Material Management
- Harbor Infrastructure
- Soo Locks

- HQ metrics focus on tonnage – system approach recognized but not used in metrics
GL NAVIGATION FUNDING HISTORY

Navigable O&M and CDF Funds (in $000's)

- Executable – Backlog Reduction Funding Range
- Sustainable Funding Range

Fiscal Year

- ARRA
- Adds and National Provisions
- President's Budget
DREDGING
FY17 DREDGING FUNDING AND DREDGING REQUIREMENTS
DREDGING FUNDING TRENDS
2007 – 2017

- Appropriation - Add'l Funds for Ongoing Work
- ARRA (Stimulus)
- L. Superior Regional Provisions
- Michigan Regional Provisions
- Commercial Regional Provisions
- Energy & Water Adds
- President's Budget

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Quantity Dredged (millions of cubic yards)</th>
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<tbody>
<tr>
<td>FY07</td>
<td>2.0</td>
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<tr>
<td>FY09</td>
<td>5.0</td>
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<tr>
<td>FY11</td>
<td>3.0</td>
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<tr>
<td>FY13</td>
<td>2.0</td>
</tr>
<tr>
<td>FY15</td>
<td>5.0</td>
</tr>
<tr>
<td>FY17</td>
<td>4.0</td>
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</table>

3.3M Annual Req'mt
HISTORICAL FUNDING
GREAT LAKES LOW USE PROJECTS (<1M TONS)
FY 17 GREAT LAKES NAVIGATION
PRESIDENT’S BUDGET

$102.8M  Great Lakes Navigation Operations & Maintenance

Key Items
$38.4M in Dredging (20 projects – 3.2M cubic yards)
$8.2M in Dredged Material Management
$5.9M in Soo Asset Renewal
DREDGED MATERIAL MANAGEMENT
CAT ISLAND DMDF

Successes:
- Improved dredging & disposal efficiencies (increased dredge quantities for same budget pkg, reduction in backlog)
- Quick establishment of diverse habitats (exterior stone dikes, placed material, protected shallows)
- Attracting/supporting new species

Challenges:
- 20 Year of disposal & maintenance activities still required
- Control of vegetation (none on dikes, remove if bigger than 3” in diameter)
- Fill management will be required almost annually to achieve ultimate contours
- Restrictions on periods when disposal and maintenance activities can occur
Vegetation quickly established within the area of initial placement.
Vegetation growth after two years (primarily dense cottonwood). Vegetation in cell needs to be dozed as practical and wave barrier vegetation treated with herbicide.
Piping Plover (endangered species)
21ST AVENUE RESTORATION SITE
DETAILED DESIGN - EVALUATE SEDIMENT
START CONSTRUCTION
DETAILED ENGINEERING PLANS AND SPECIFICATIONS
DEFINE WHAT SUCCESS LOOKS LIKE – 21ST AVENUE
SHALLOW WATER HABITAT DEVELOPMENT
LOCK RELIABILITY
Today

It has been nearly 50 years since a new lock was built at the Soo.
THE SOO LOCKS
LYNCH PIN OF THE GREAT LAKES NAVIGATION SYSTEM

- 85% of the commercial commodities transiting the Soo Locks are limited by size to the Poe Lock
  - Aging and deteriorating infrastructure; unscheduled outages increasing
  - There is currently no redundancy for the Poe Lock
  - The economic impact of a 30-day unscheduled closure of the Soo Locks = $160M

- Two major efforts are underway to improve reliability of the Soo Locks
  1. Maintain existing infrastructure through Asset Renewal Plan
  2. New lock with the same dimensions as the Poe Lock – Economic reevaluation required.
## CORPS LOCKS:
### VALUE AND ECONOMIC CONSEQUENCES

Results – Ranked by Cost 30-day MAIN CHAMBER CLOSURE

<table>
<thead>
<tr>
<th>Lock</th>
<th>Mmttons</th>
<th>Tons</th>
<th>30-day Conseq</th>
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<tbody>
<tr>
<td>Soo Locks</td>
<td>71.4</td>
<td>5</td>
<td>1</td>
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<tr>
<td>Calcasieu L, GIWW</td>
<td>36.7</td>
<td>19</td>
<td>2</td>
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<tr>
<td>Bowman L, GIWW</td>
<td>36.1</td>
<td>20</td>
<td>3</td>
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<tr>
<td>Lagrange L&amp;D</td>
<td>25.4</td>
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<tr>
<td>Peoria LD</td>
<td>22.6</td>
<td>31</td>
<td>5</td>
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<tr>
<td>Bayou Boeuf Lock</td>
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<td>24</td>
<td>6</td>
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<td>Miss River LD24</td>
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<td>27</td>
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<td>Miss River LD25</td>
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<td>10</td>
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SOO LOCKS ASSET RENEWAL PLAN

Asset Renewal Plan will maximize reliability and reduce risk through 2035

$76.4M funded to date through FY16.
- New hydraulics, stop logs, utilities. (Complete)
- Compressed Air System. (Complete)
- Poe Gate Anchorage Replacement. (In progress)
- Mac and Poe Electrical System Replacement. (In progress)
- Poe Miter and Quoin Block Replacement (FY17 Award)

Remaining key priorities.
- Poe Lock Gate 1 Replacement.
- Pier rehabilitation
- Davis Pump Well
2ND POE-SIZED LOCK

- Authorized for construction of a redundant Poe-size lock in WRDA 1986; WRDA 2007: Construction at 100% federal expense
- Inconsistent with Administration policy due to BCR of 0.73 computed in 2005 Limited Reevaluation Report (LRR)
- Currently working on Economic Reevaluation Report to recalculate BCR
- Team includes all three GL Districts, Planning Center of Expertise for Inland Navigation (Huntington) and the Civil Works Cost Engineering MCX (Walla Walla)
2005 LRR - ISSUES

• Unmet Demand Changes
  • Assumed 100% of commodities could be delivered in the event of a lock outage, using existing infrastructure; not possible for this facility
  • Rail capacity was assumed sufficient to handle traffic during an extended outage, without additional capital expense; not possible as noted by the rail industry

• Reliability Changes
  • Assumed major overhaul to the Poe Lock complete in 2017; will not occur under current fiscal constraints
  • Probabilities of component failures are outdated:
    ➢ 2014 SQRA found 4 additional failure modes that would have significant economic impacts and one with loss of life
  • Gate failure outage was not included

• Assumed new vessels would be built to Mac Lock dimensions; not accurate as new Canadian fleet is Poe restricted
Integrated Steel Mills - Reliant on Waterborne Transportation

- 13 of 14 North American Mills are dependent on the Soo Locks for iron ore transported from MN and MI.

- 9 of the 14 mills are on the shores of the Great Lakes.

- The likelihood of a primary steel mill being shut down has been proportional to its distance from the Great Lakes.

- Typical Great Lakes mill layout receives taconite by ship; most mills do not have infrastructure to receive taconite by rail.

- This steel is specifically required for production of auto, appliance, construction, farm, and mining equipment, rail car and locomotive industries.
The auto industry is one of the most important industries in the U.S. economy:

- Over 7 million private sector jobs supported by auto manufacturers, suppliers and dealers in the United States
- Every vehicle manufacturer job creates almost 7 other jobs in industries across the economy
- A typical automobile made in North America contains steel from the 9 Integrated Steel Mills that produce automotive quality steel.
- Competition and efficiency have spurred just-in-time delivery (minimized inventories) at every stage in the supply chain.
- Interruptions to any part of the supply chain quickly ripple down to the final product. Today the North American Manufacturing Industries remain reliant on the Soo Locks

Source: Center for Automotive Research, Jan 2015
NORTH AMERICAN AUTOMAKER AND SUPPLIER LOCATIONS
ECONOMIC REEVALUATION REPORT

- **Reliability**: Information will be leveraged from recent detailed inspections to update reliability and projected outage model
- **Forecast**: Commodity forecasts are being updated
- **Alternate Modes of Transportation**: Alternate modes are being developed for various outage lengths
- **Updated Cost**: The risk-based cost estimate for construction of the new lock will be updated
- Agency Technical Review and Independent External Peer Reviews will be conducted
- The entire ERR process is expected to take 24 months
ECONOMIC REEVALUATION
PATH FORWARD

• Complete economic report and submit for HQ review Dec 2017
• New authorization increase for higher construction cost – submitted concurrently
• PACR requires ASA (CW) and OMB review before submittal to Congress
• Can continue design efforts in FY18, if funded, while awaiting reauthorization
• Pending a budgetable BCR, could include construction request for FY20 PBUD
Questions?