The U.S. Army Corps of Engineers Navigation Program

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Presentation to
Navigation Performance Measures Workshop
May 6, 2004

WHY ARE WE HERE?

- **To ensure our partners, stakeholders, and users have an opportunity to participate in the development of performance measures for the Navigation Program.**
- **To begin a dialogue about the current and future state of Navigation**
- **To better understand the issues, operational constraints, and impacts to our partners, stakeholders, and users.**

THE PROCESS

- **Informal dialogue**
- **Learning process**
  - **Want to listen to your concerns and issues**
  - **Want to share our perception of the current state of our waterborne transportation system**
  - **Better understand the future demands on this system**
- **Develop Performance Measure**
- **Identify Strategic Challenges**

Agenda -Today

- Current and Future State of Navigation
- Dialogue
- Challenges
- Industry Dialogue
- Remarks
  - MG Carl Strock
  - Robert Shea, OMB
- Performance Based Budgeting
- Breakout Sessions

Agenda - Tomorrow

- **Expert Choice Introduction**
- **Optimize Performance Measures**
- **Dialogue**
- **Conclusions**
- **Adjourn 1200**

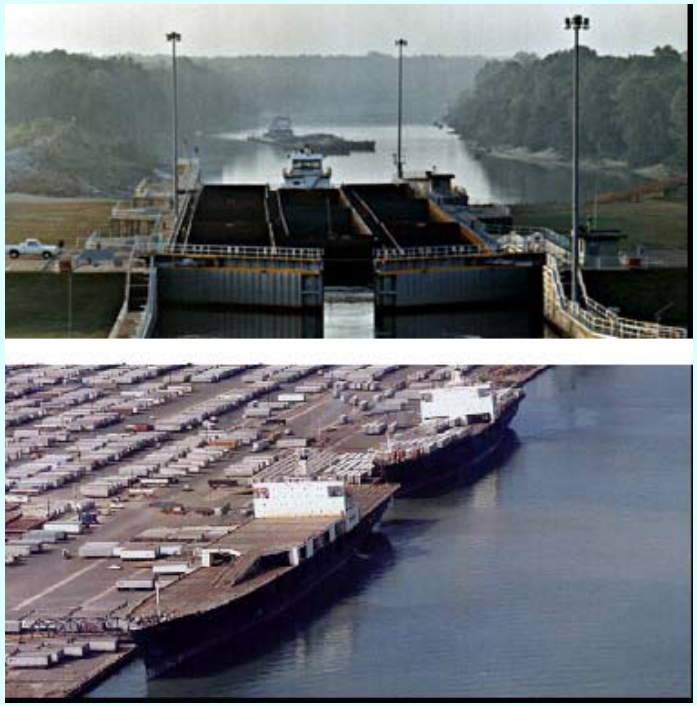
Corps Navigation Mission

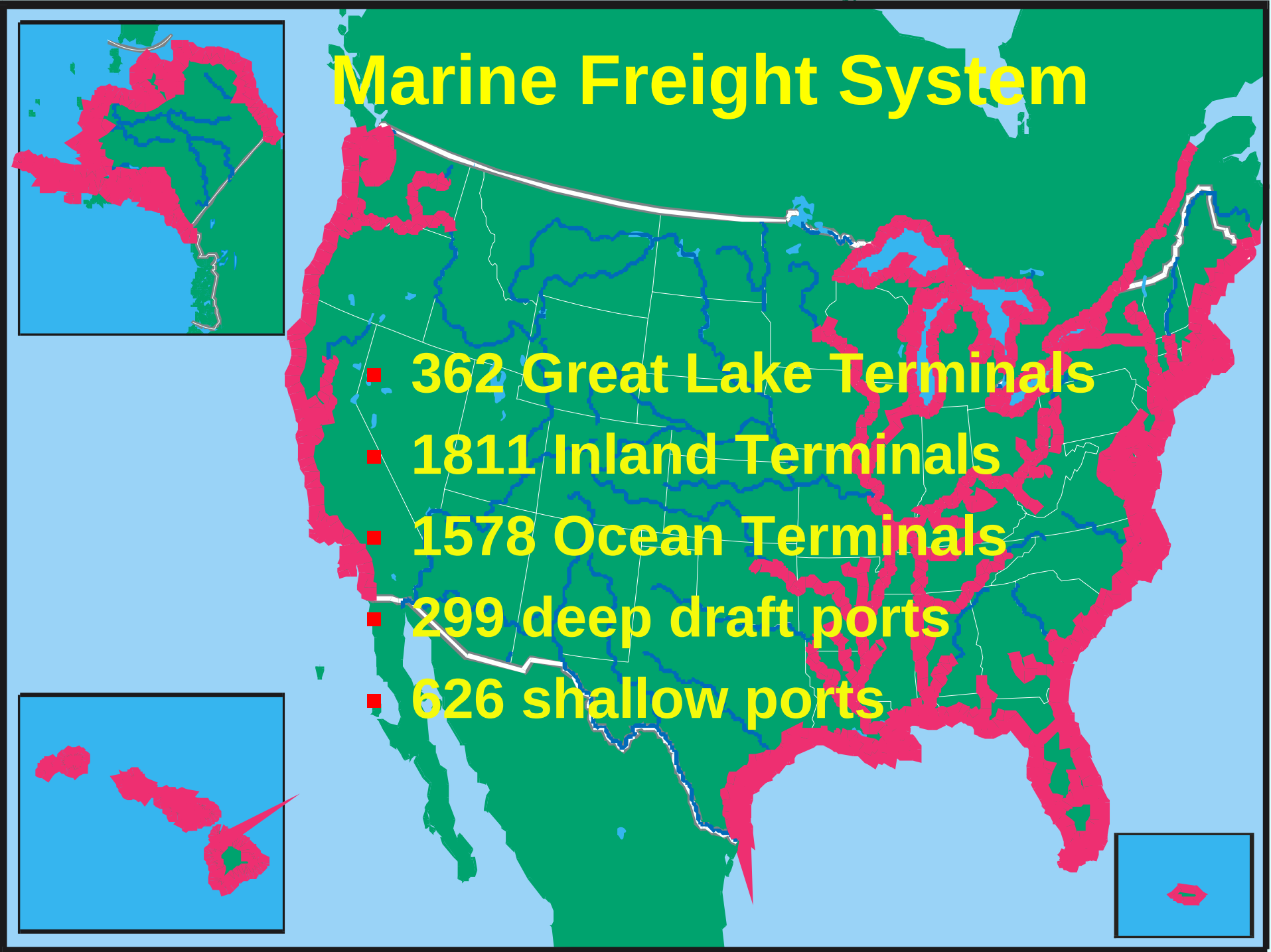
Provide safe,reliable,efficient,effective and environmentally sustainable waterborne transportation systems for movement of commerce, national security needs, and recreation.

Listening Session Comments on Water Transportation System

At Listening Sessions we heard:

- **Aged marine transportation system**
- **Loss of benefits due to lack of funding - Invest in channel deepening, waterway improvements, and port development to keep pace with growth of commerce**
- **Balance environmental with economic concerns**
    - **Dredged material disposal, sediment management key issues**




Marine Freight System
362 Great Lake Terminals
1811 Inland Terminals
1578 Ocean Terminals
299 deep draft ports
626 shallow ports

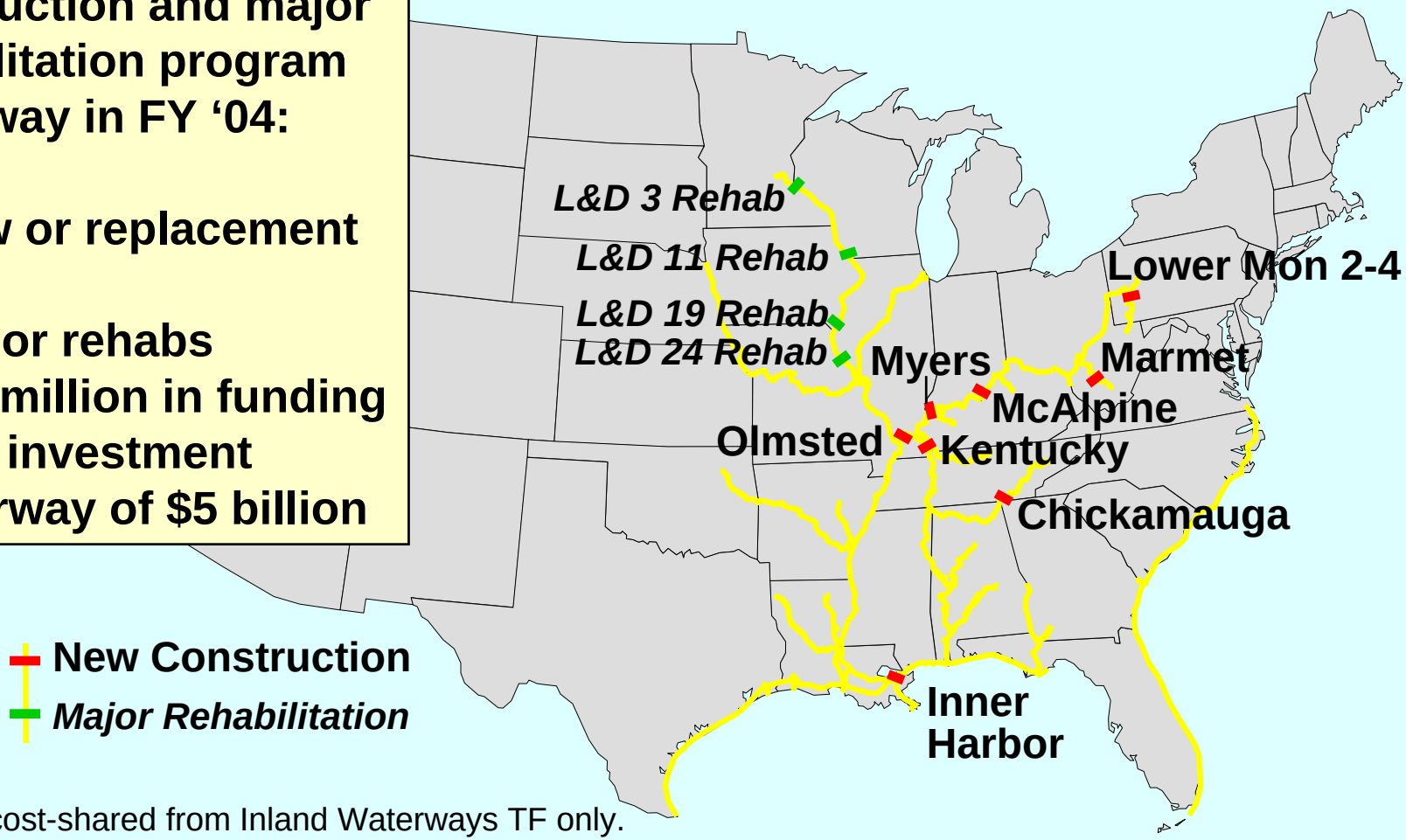

Inland Waterway System
237 lock chambers at 192 sites
12,000 commercially navigable miles

New Construction Program: Major Navigation Projects Underway

February 2004*

Active new lock construction and major rehabilitation program underway in FY '04:

- **8 new or replacement locks**
- **4 major rehabs**
- **$266 million in funding**
- **Total investment underway of $5 billion**



* Projects cost-shared from Inland Waterways TF only.

Major Inland Navigation Studies

Potentially Leading to Projects Cost-Shared from IWTF

February 2004

Much more work in the pipeline…but will there be support to start any of them?

Inland WW Systems – Ohio River

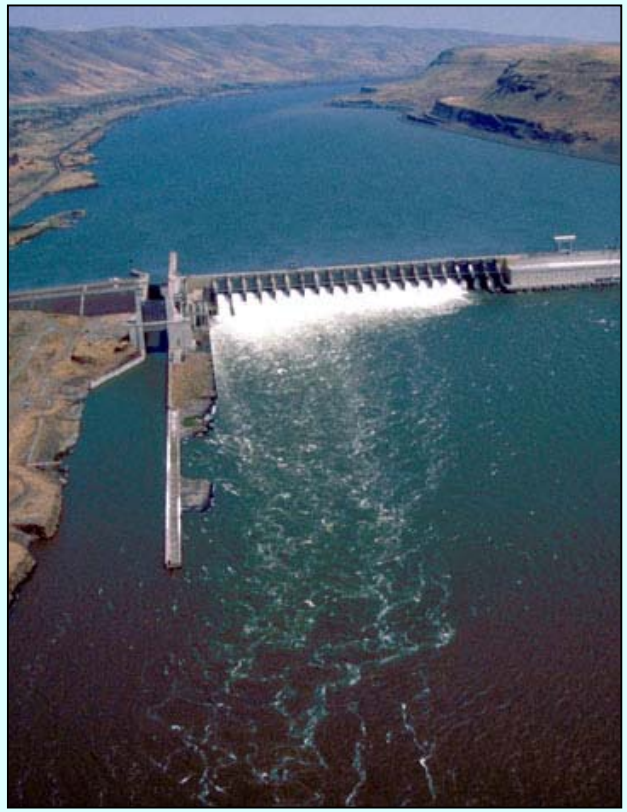
- Risk management on a systems basis
  - Prolonged construction time frames
  - Locks 52-53 repairs
  - “modern era” nav locks 50 years old
  - 70% moveable steel is on dam – tainter gates
  - Concrete erosion
  - Ohio system 365 days per year/high ton locks
  - Work in low water

•Planned preemptive work to avoid long or unscheduled Closures is key to system reliability

•Regional/watershed systems approaches are essential to cost effective maintenance management

Columbia-Snake O&M Issues

- **Over $50 million in looming O&M and major rehabilitation needs on the Columbia-Snake system**
- **John Day Lock & Dam**
  - **Major gate failure in late 2002 disrupted traffic for months.**
  - **Dam foundation is leaking and lock monolith has cracked. Intermittent repair closures.**
- **Gate rehab or replacements needed at McNary, Ice Harbor, Lower Monumental and Little Goose over next few years.**
- **Snake River maintenance dredging delays from court challenges and environmental issues**



John Day L&D: Gate failure , cracked monolith

GIWW O&M Issues

- **Shortfall in ’04 funds for dredging and other navigation-related O&M likely to carry over into ’05 program**
- **Galveston anticipates funding at about 45% of needs, including $59 million carried over from unmet ’04 program needs**
- **Operators reporting more groundings and damage – shoaling continues to increase in both deep draft channels and along GIWW**
- **New Orleans has nearly $9 million in backlog along GIWW and over $47 million throughout district for unfunded O&M navigation needs**

Upper Miss O&M Issues

- **Rock Island District: Over $100 million in high priority navigation backlog on the Upper Miss River and Illinois Waterway**
- **About $26 million of O&M backlog could be accomplished in FY05 if funding available - $16 million for top 10 highest priority**
- **St. Paul District: About $24 million in O&M backlog could be accomplished in FY05 if funded**
- **Key projects**
  - **Rehab work at L&Ds 11 and 12 ($11 million in FY05)**
  - **Hydraulic system replacements at Peoria and LaGrange ($2 million)**
  - **Concrete repairs at Lockport**
  - **Major maintenance at locks 3-6 and 10**
  - **Replace gate at Lock 27 ($6.1 million)**

Lock & Dam 11: backlog of needed rehab work

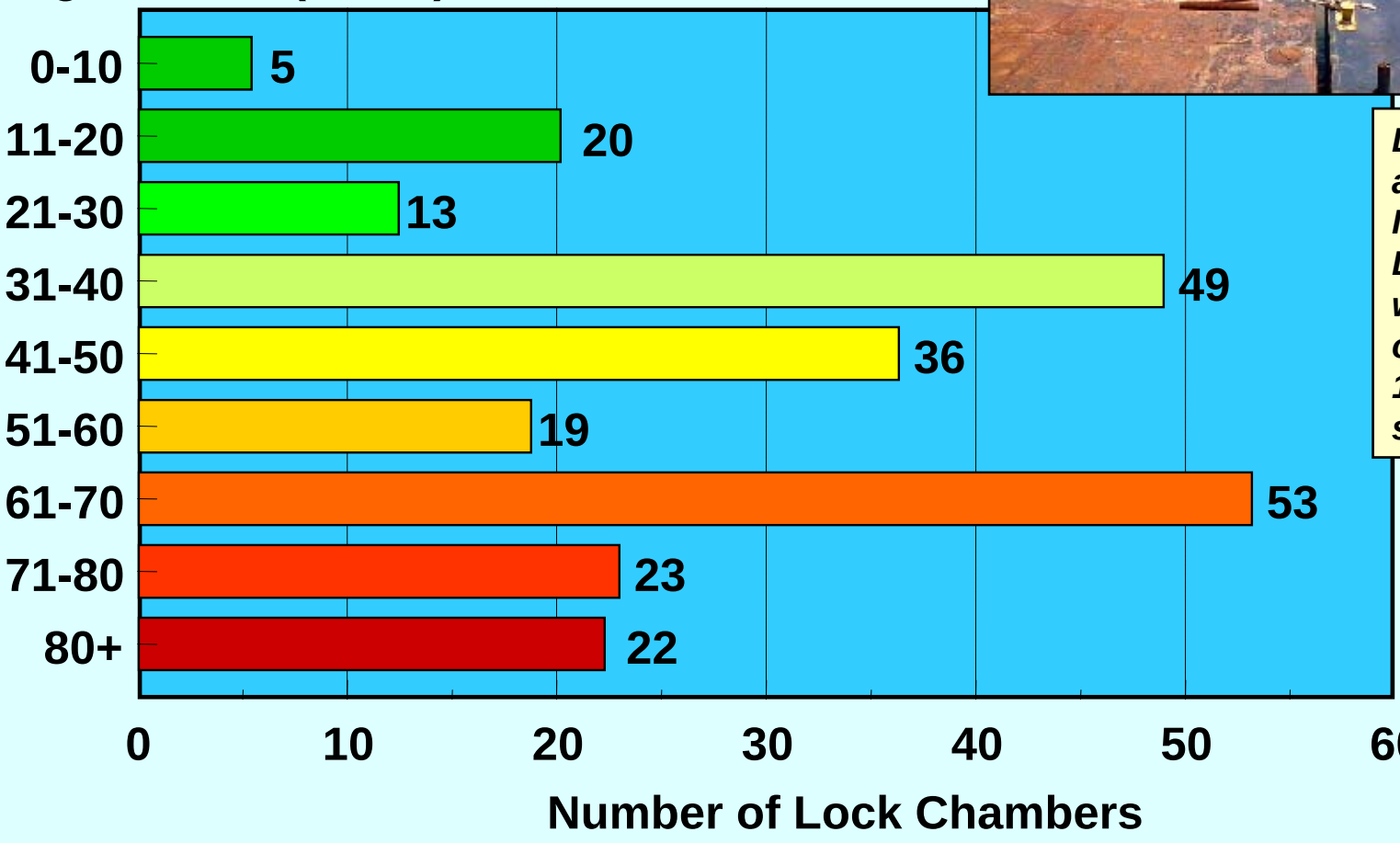
Lock 27: replace vertical lift gates

Inland WW Systems-Arkansas

- **SWL and SWT work system regionally**
  - **Dewater two lock structures annually**
  - **10 day down time for dewatering**
- **Structures in pretty good shape**
- **Dredging required 2M CY annually**

Challenge: Aging Lock Inventory*

Age in 2004 (Years)

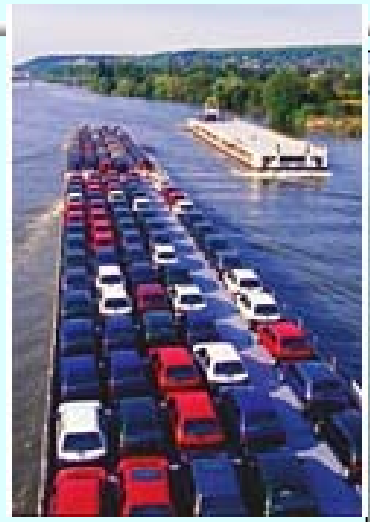


Dewatering and repairs of Inner Harbor Lock, GIWW, which opened in 1923 for steamboats.

*Includes all operational deep and shallow draft Corps and TVA navigation locks.

Inland Waterway Alternative

- More freight could shift to barge
- Europeans promoting waterways as environmentally-friendly alternative to highways and rail
- Container-on-barge highly developed in Europe
- Examples in US: Columbia-Snake; Gulf Coast service; Coastal movements along Atlantic
- More in the future?



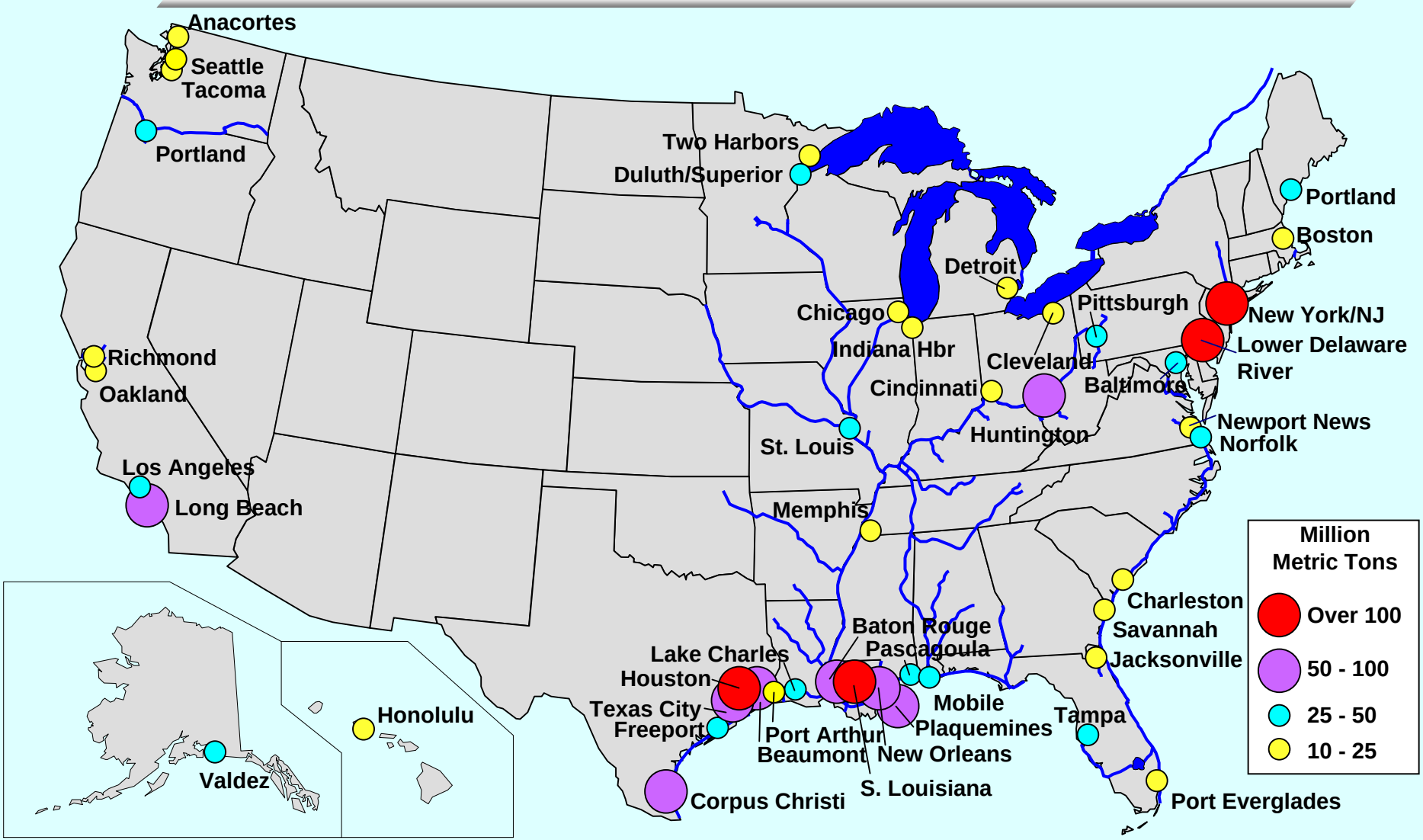
Low-Use Waterway Segments

- **Segments with <1 million tons on waterways with < 1 billion system ton-miles**

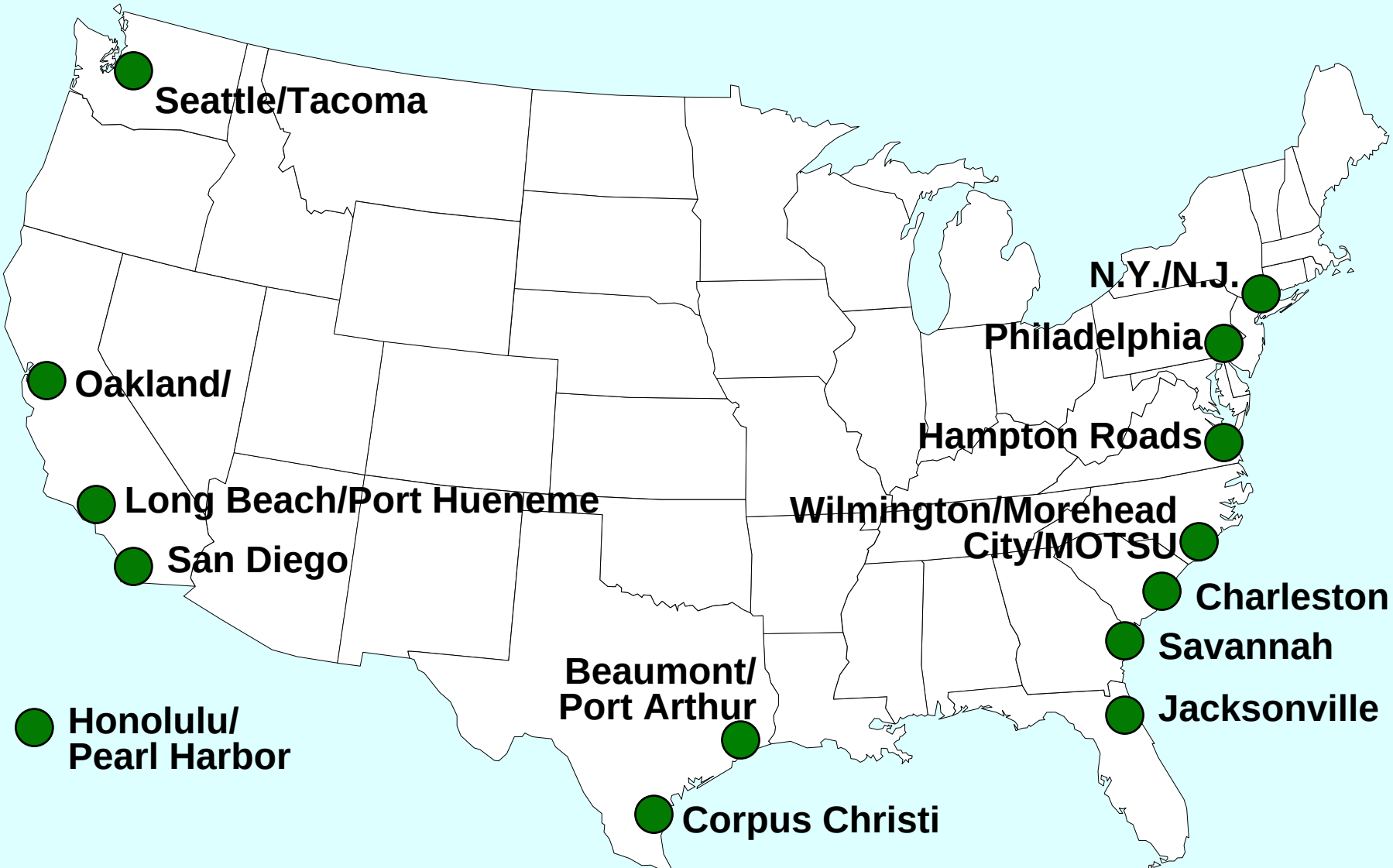
The future mode

Coastal Ports

U.S. Harbors Handling over 10 Million Metric Tons in 2002



Strategic Ports



Dredging & Disposal Issues

Not just "Spoil"

- More demand for beneficial use of dredged material
- Scarcity of disposal sites
- Contaminated sediments
- Dredging "windows" for protection of species
- Need for tools to predict shoaling, dredging requirements

Dredging

Future Trends - Changing Vessel Size & Type

- Bigger ships
- More containers
- Inter-modal challenges

Major Construction Projects in FY 04 Appropriation

The FUTURE

- **Tonnage will double by 2020!**
- **Port Expansion issues**
- **Air Quality**
- **Disposal Challenges**
- **Environmental balance**

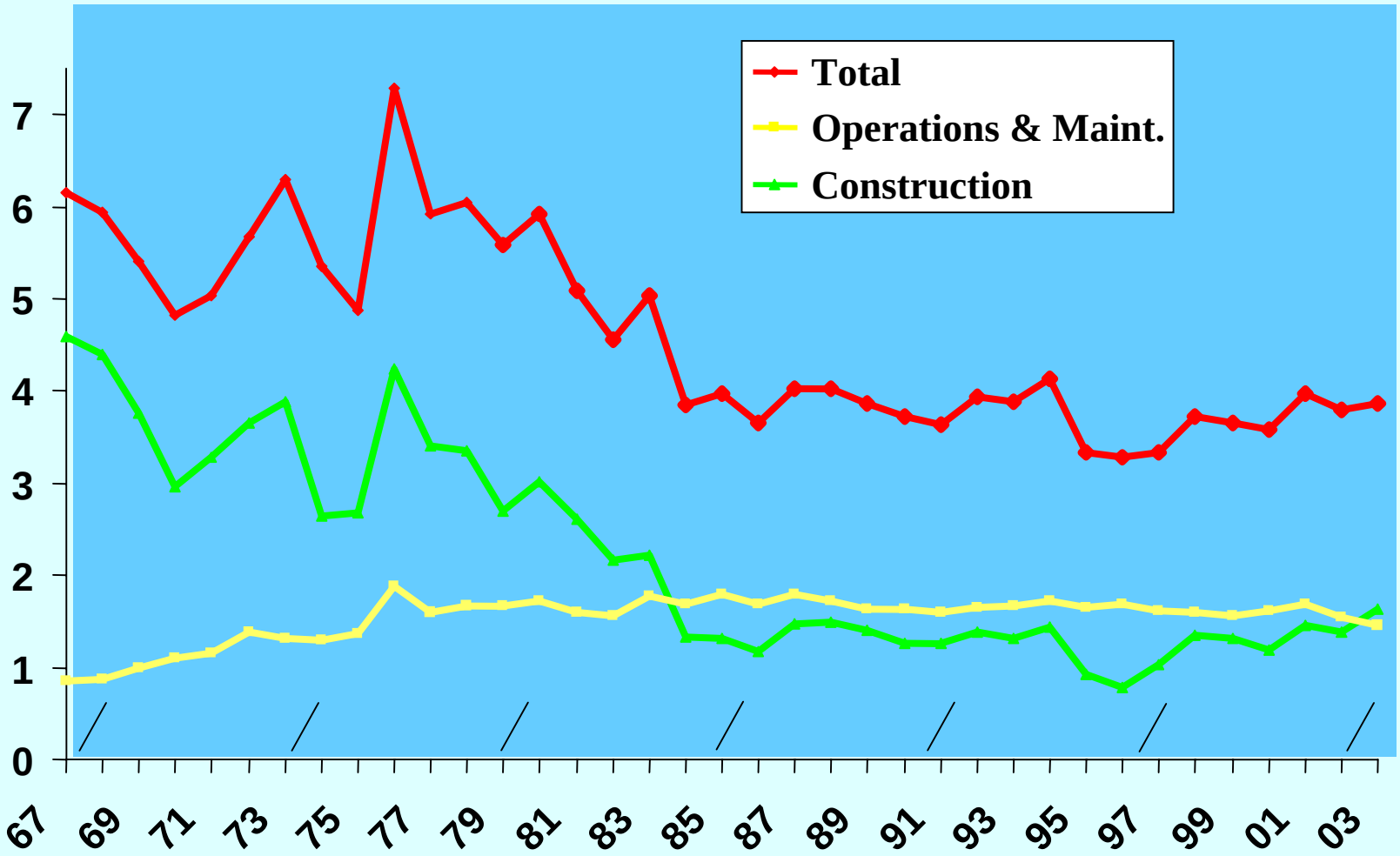
Shallow Harbors

- **< 1 million tons of commerce**
- **14 or less, coastal and inland harbors**

CHALLENGES

Civil Works Appropriations

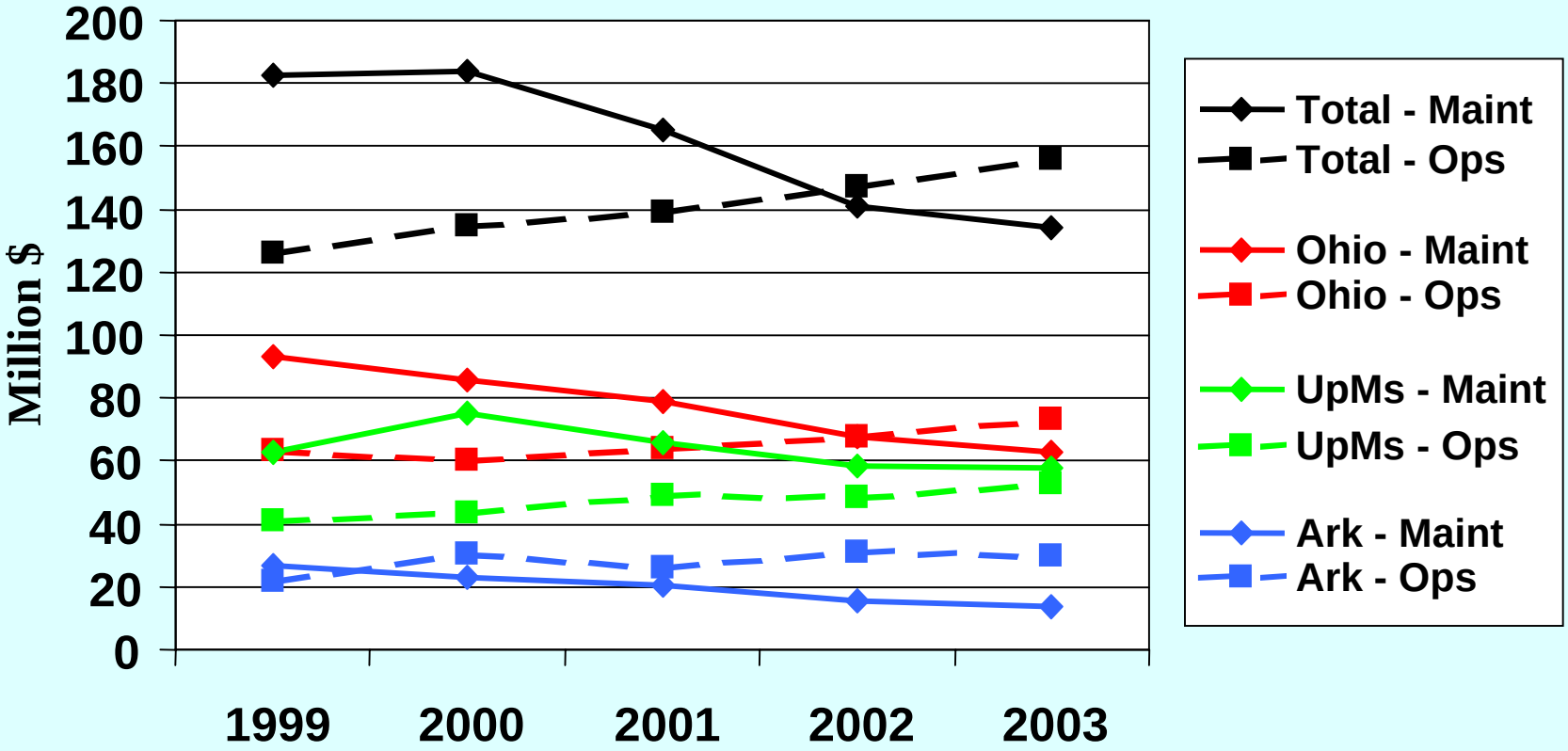
Constant (FY 95) $ Billions



Challenge: Inland Navigation Maintenance vs Operations Funding*

1999 - 2003

Another impact of flat O&M funding…day to day operations begin to consume an ever larger share of the budget, leaving less for needed maintenance…

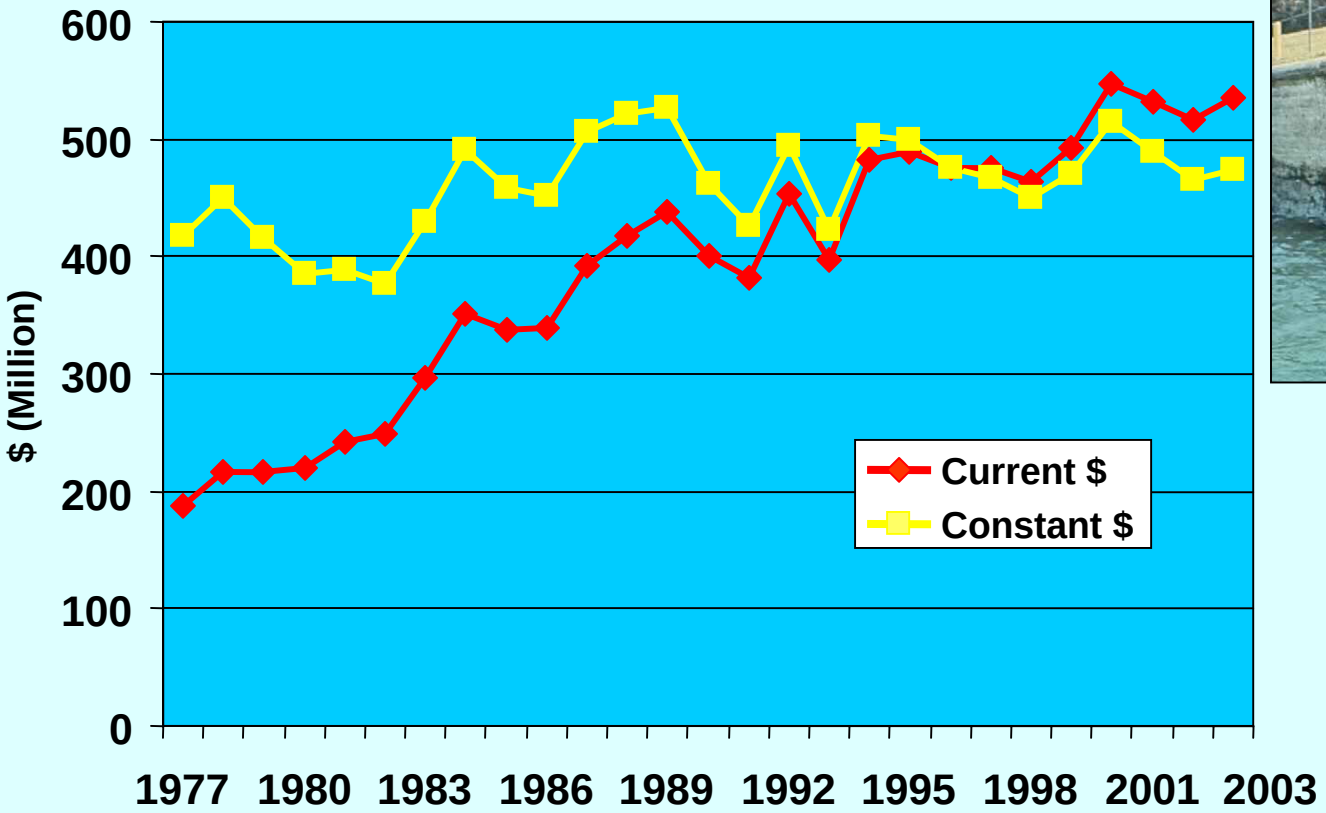


*Actual Dollars. Selected Inland Navigation Districts with Locks and Dams: Ohio: LRP, LRH, LRL, LRN; Upper Miss: LMS, LMR; Ark/Red: LMV, SWL, SWT. Source: OMBIL data system, USACE.

Challenge: Inland Waterway O&M Trends

1977-2003 Current $ and 1996 Constant $ *

Challenge: Flat O&M funding in constant dollars, even as project portfolio grows and ages…



Lock wall, Lower Mon 3

Lock wall deterioration, Chickamauga

** Fuel-Taxed Waterways Only*

Post 9-11 Security Priorities

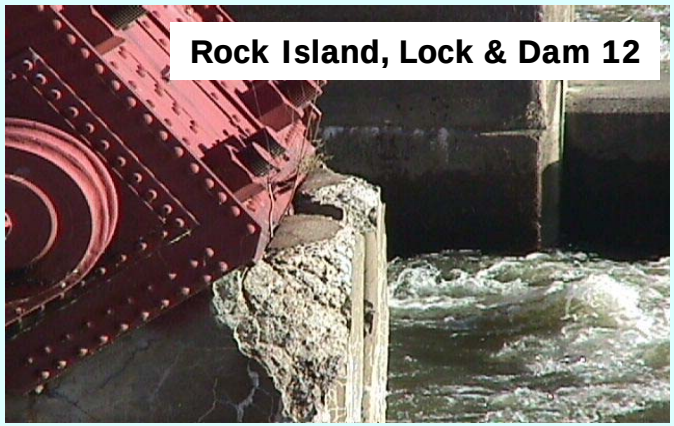
- **Critical Projects Security Plan funding (O&M, Gen)**

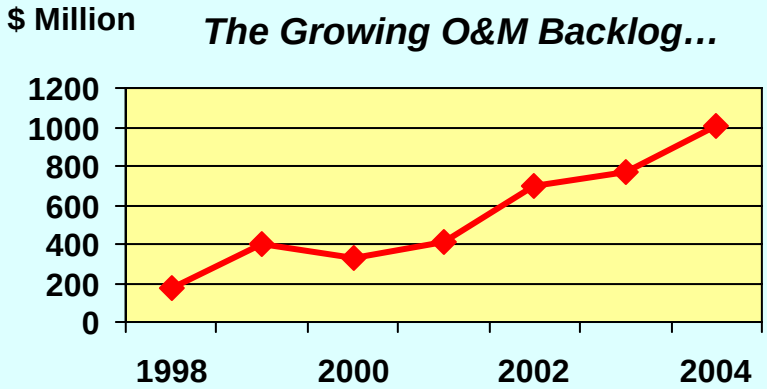
FY02 Allocation: $139M ***(Supplemental)***
FY03 Allocation: $ 39M ***(Supplemental)***
FY04 Allocation: $104M

- **Important AND competes with O&M Gen bottom line**

- **Assessment of project vulnerability and response to begin**

Challenge: O&M Backlog





- **FY 04 Critical backlog $1.01 Billion**
  - **Increase of $127 million from previous year**
  - **About 62% of backlog for navigation (coastal & inland)**
  - **Has grown from less than $200 million in FY98**
  - **Will grow to $1.1 billion in FY05 under Budget Request**
- **$1.9 billion in other O&M work, not as time-sensitive**
- **Deferred O&M will accelerate "break-down" repairs and degrade project performance**

Managing the Risks – Greenup

Locks & Dam, Fall 2003

Sep – Oct 2003: A 3-week scheduled closure of the main lock chamber at Greenup for gate inspection and repair was extended to **8 weeks** because of the extensive damage found and risk of gate failure.

Tows queue up on the Ohio waiting to transit Greenup 600-ft auxiliary lock chamber

Impacts

- Tows sized for the larger main chamber were forced to use the smaller auxiliary chamber.
- The average tow delay during the 8-week outage was **38.4 hrs**.
- Delays caused an estimated $14 Million loss to the towing industry.

Managing the Risks – Greenup L&D (cont'd)

- Shippers dependent upon rapid delivery of cargo through Greenup had to draw on supplies on-hand or rely upon other, higher cost modes of transport resulting in **$10-$15 million in increased transport costs**.

- Corps' Huntington District repair fleet had to focus on lock gate repairs rather than on high priority repairs at other projects. If the lower gate had failed, the main chamber might have been closed **6 months** with delays costing **$75M**.

Challenge: Aging Water Resources Infrastructure

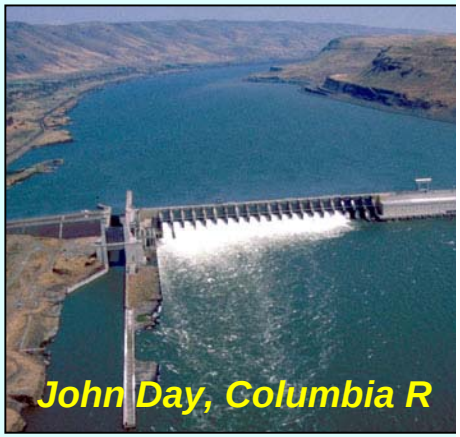
- **Investments in water resources infrastructure have declined in real terms**
- **Aging infrastructure results in more frequent closures for repairs, decreased performance and costly delays**

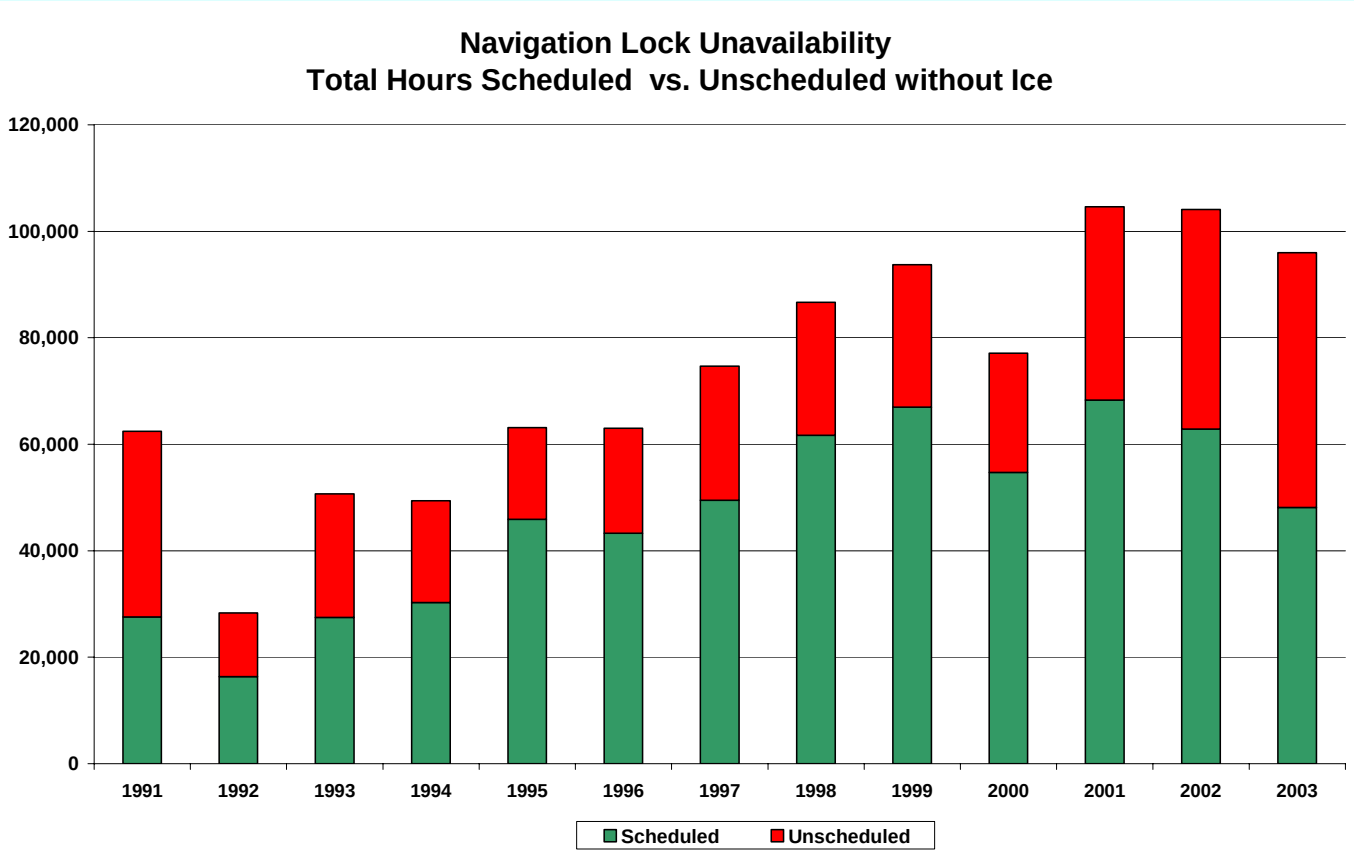
Leaking spare miter gates, Upper Miss Lock 19

Crumbling lock wall, Lower Mon 3, opened in 1907

Concrete deterioration at Chickamauga could result in lock failure

Challenge: Aging Infrastructure + O&M Backlog = Increasing "Downtime" at Locks





- *John Day L&D, gate failure in 2002, delays*
- *Greenup L&D, gate deterioration extended lock closure by weeks in 2003, major delays*
- *Such incidents may become more common on an aging system with inadequate maintenance.*

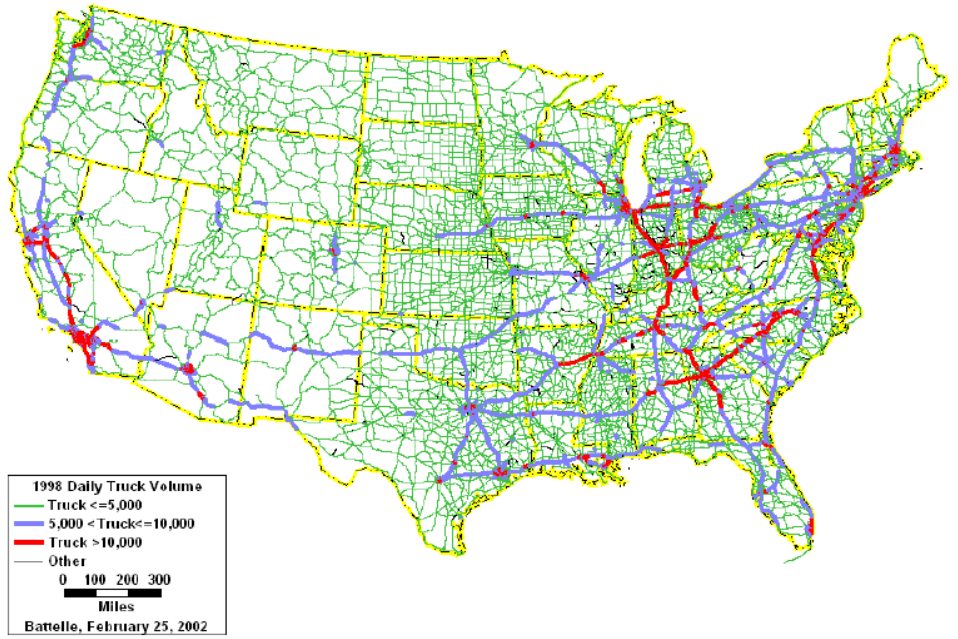
This erodes the effective capacity of the navigation system over time…


Environmental Stewardship

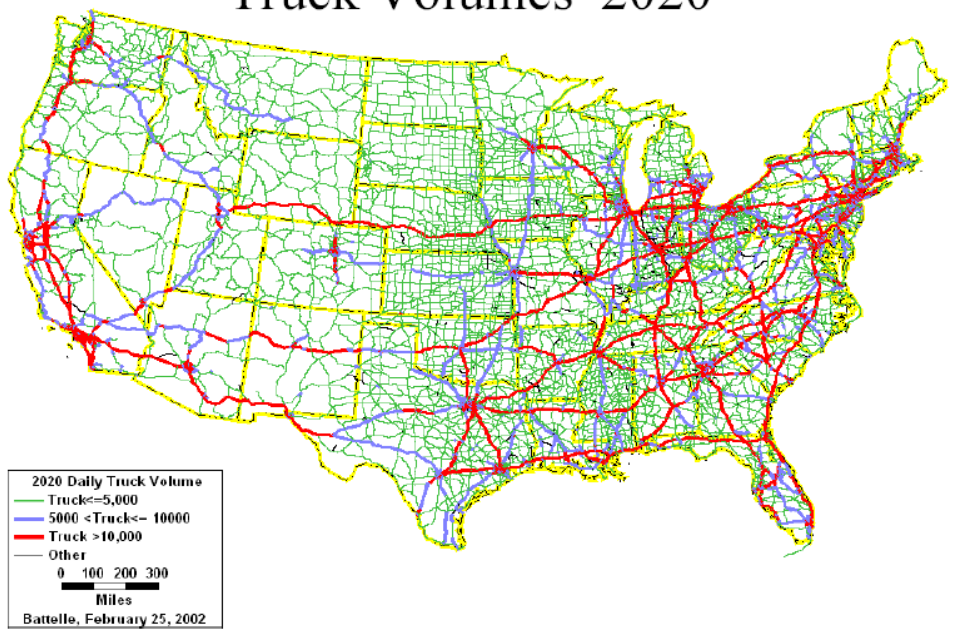
Future Freight Demand

- **Freight traffic expected to increase by 67%**
- **General cargo freight by 113%**
- **Highway traffic grows from 11 billion to 19 billion tons (17.2 billion metric tons)**
- **Rail grows from 2 to 3.7 billion tons (3.4 billion metric tons)**
- **How is this cargo going to move?**
  - **Little room left to expand highways, especially in urban areas**
  - **Rail mileage has been decreasing; much former right-of-way has been developed**
  - **Rail capacity constraints in urban areas, tunnel clearances, single-track bridges**

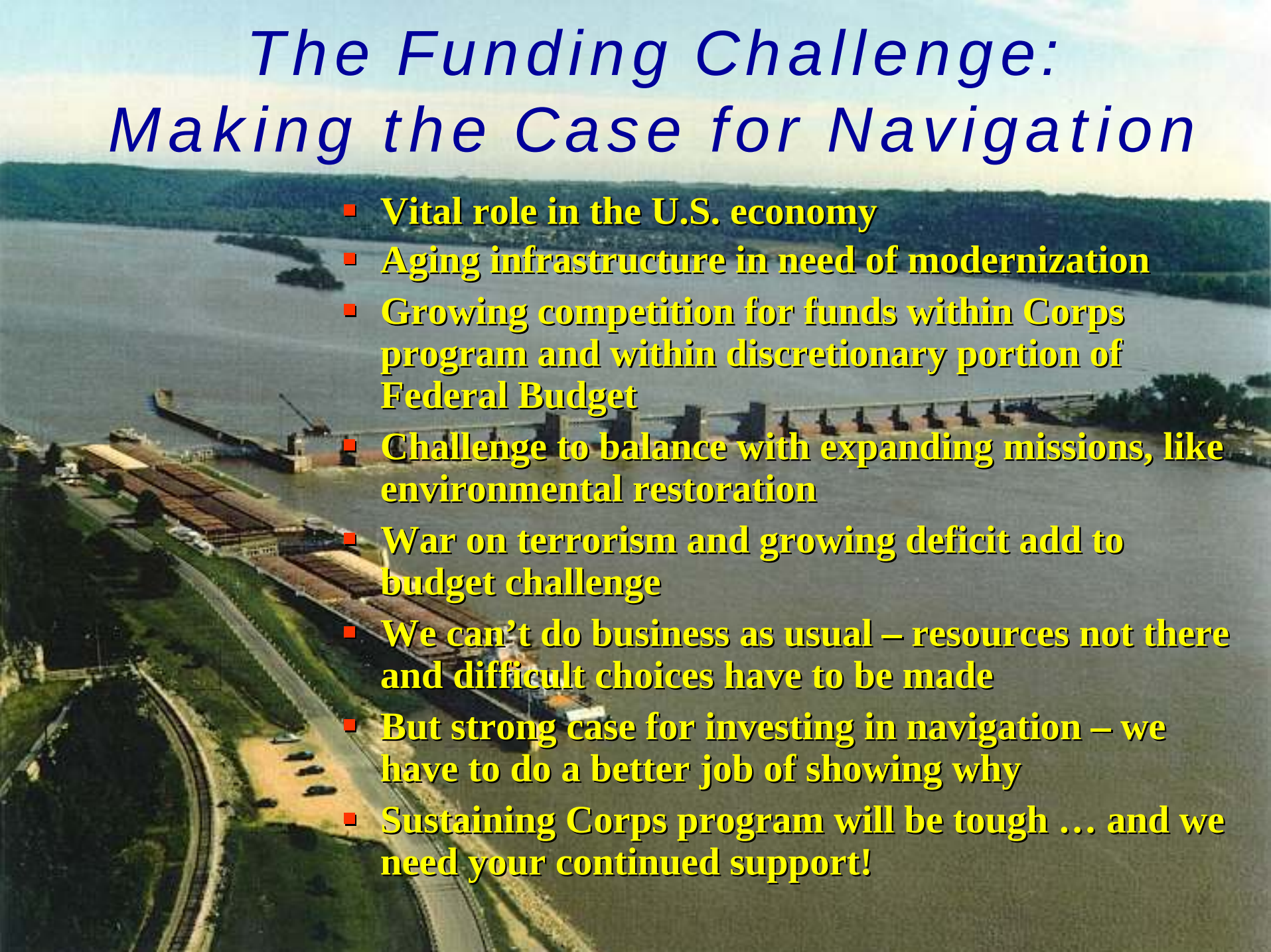
Truck Volumes –1998



Truck Volumes–2020



The Funding Challenge: Making the Case for Navigation



- Vital role in the U.S. economy
- Aging infrastructure in need of modernization
- Growing competition for funds within Corps program and within discretionary portion of Federal Budget
- Challenge to balance with expanding missions, like environmental restoration
- War on terrorism and growing deficit add to budget challenge
- We can't do business as usual – resources not there and difficult choices have to be made
- But strong case for investing in navigation – we have to do a better job of showing why
- Sustaining Corps program will be tough … and we need your continued support!

Action: Inland Waterway Lock Modernization Program

FY 2003-2005 ($ Millions)

Budget request for '05 supports key priorities, but is still far below our capability level at many projects…

	Cumulative Thru FY2003	FY04 Appropriation	FY05 Budget Request	FY05 Capability	*Difference*
Olmsted	**600**	**63**	**75**	**110**	***35***
Inner Harbor	**94**	**12**	**10**	**24**	***14***
Mon Locks 2 - 4	**250**	**37**	**31**	**60**	***29***
Marmet	**114**	**65**	**50**	**75**	***25***
McAlpine	**109**	**35**	**58**	**120**	***62***
Kentucky	**112**	**30**	**25**	**55**	***30***
Chickamauga	**2.5**	**5.4**	**0**	**17**	***17***
J.T. Myers	**4.9**	**0.5**	**0.7**	**2.0**	***1.3***
Key Major Rehabs	**114**	**18**	**14**	**35**	***21***
Totals	**1,401**	**266**	**264**	**498**	***234***

Major Rehabs in the Queue

APPROVED PROJECTS PENDING FUNDS

Markland Ls & D, OHR, KY	**FY02**
Chicago Harbor Lock, ILWW, IL	**FY02**
Emsworth Ls & D, OHR,PA	**FY03**
Ls & D 27, MSR, IL	**FY04**

Major Rehabs in the Queue (cont'd)

BUDGETED PROJECTS

L&D 11, MSR, IA

L&D 3, MSR, MN

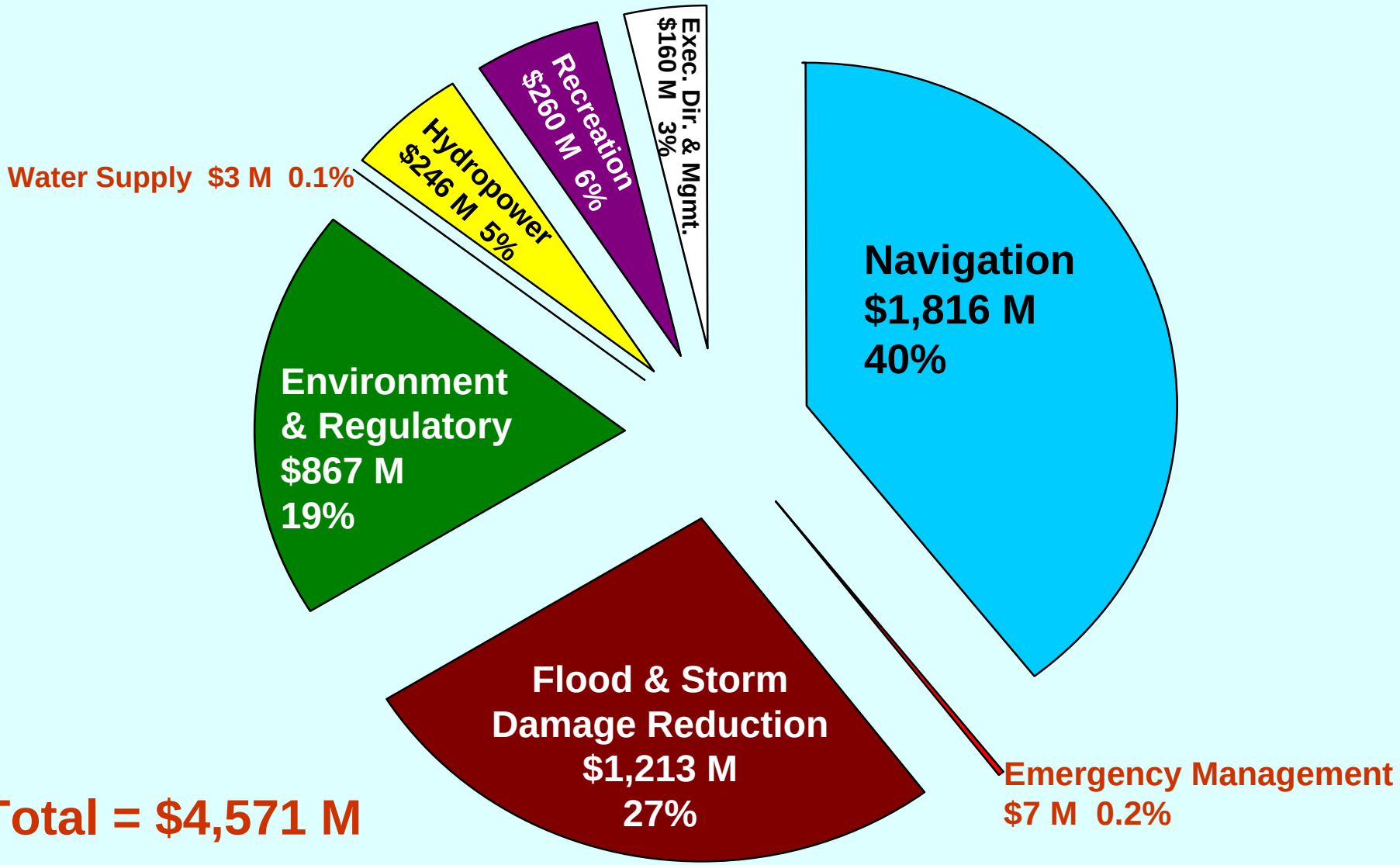
NEAR FUTURE

L&D 19, MSR, IA

L&D 24, MSR. IL

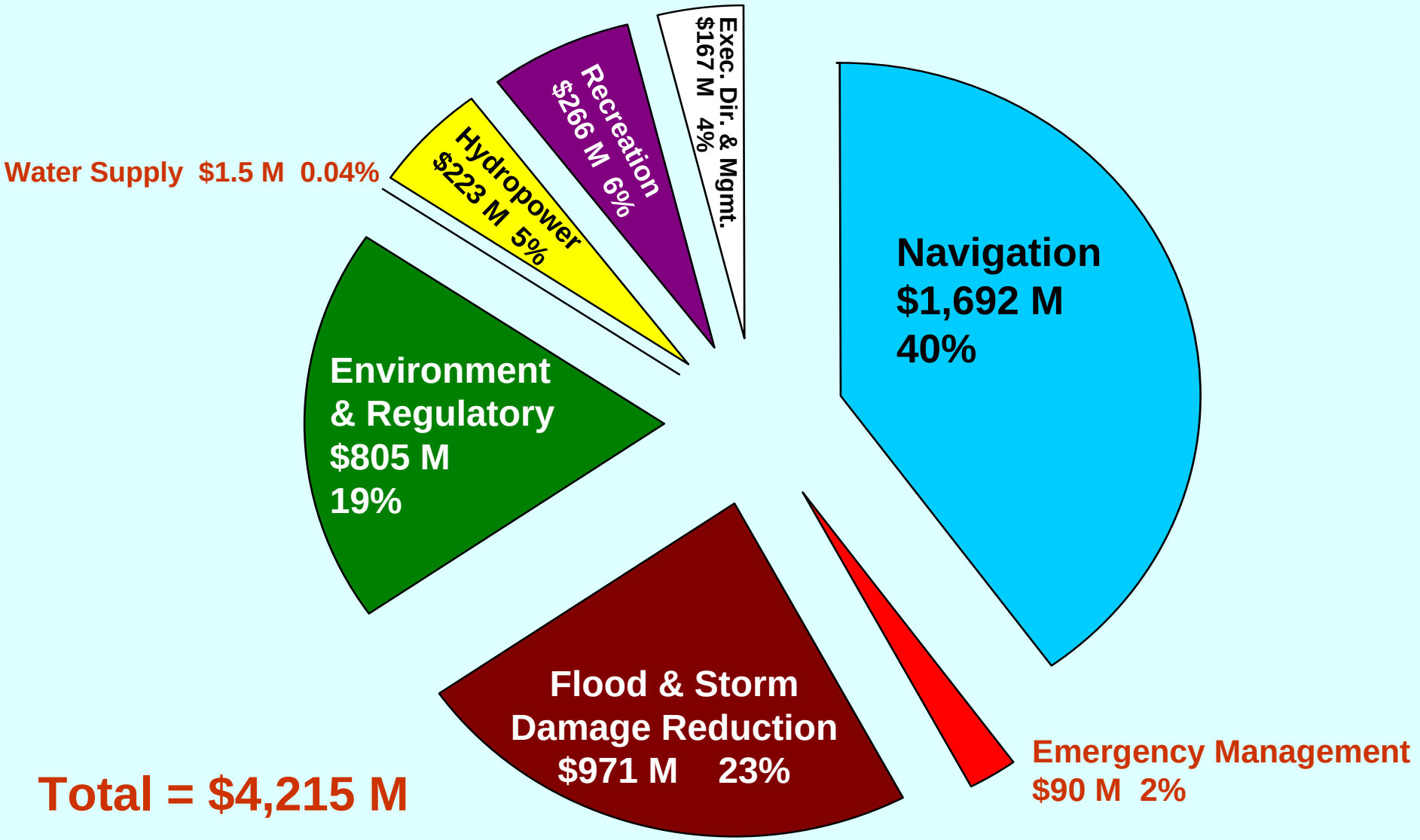
PERFORMANCE

FY 04 Appropriation by Business Program



Total = $4,571 M

FY 05 Budget by Business Program



Total = $4,215 M

NAVIGATION O&M BUDGET

Navigation Segment	FY04 Budget	Conference (thousands $)	FY 05 Budget
Deep Draft	506,198	517,823	539,484
Shallow Draft	22, 981	57,047	28,222
IWW > 5 billion ton-miles	- -	316,877	327,514
IWW < 5 billion ton-miles	(481,089)	110,179	83,818
IWW < 1 billion ton-miles	- -	67,825	49,321
Total Navigation	$1,010,268	$1,069,751	$1,028,359

Navigation Objectives and Performance Measures

Program Objectives	Performance Measures
Obj.1: Invest in navigation infrastructure when the benefits exceed the costs.	- Remaining BCR - Annual net benefits
Obj. 2: Support sustainable regional, basin-wide, or watershed planning and activities in partnership with others.	- % of projects recommended in Chief's reports that apply watershed principles
Obj. 3: Fund high-priority O&M.	% change in $ amount of essential backlog at key facilities.
Obj. 4: Operate and manage the navigation infrastructure so as to maintain justified levels of service in terms of the availability to commercial traffic of high-use navigation infrastructure (waterways, harbors, channels).	- % of time navigation infrastructure with high levels of commercial traffic sustains its functional purpose.

Civil Works Program
FY 2002-2005 ($ Millions)

	FY02 Approp*	FY03 Approp	FY04 Approp	FY05 Request
Construction, Gen.	1,713	1,745	1,722	1,422
Operation & Maint., Gen.	2,014	1,967	1,968	1,926
Gen. Investigations	154	134	117	91
Mississippi R. & Trib	346	342	324	270
Regulatory	127	138	140	140
Flood & Coastal Emrgncy	-25	75*	0*	50
FUSRAP	140	145	140	140
Gen. Expenses	153	154	160	167
Total Appropriation	4,623	4,698	4,571	4,215

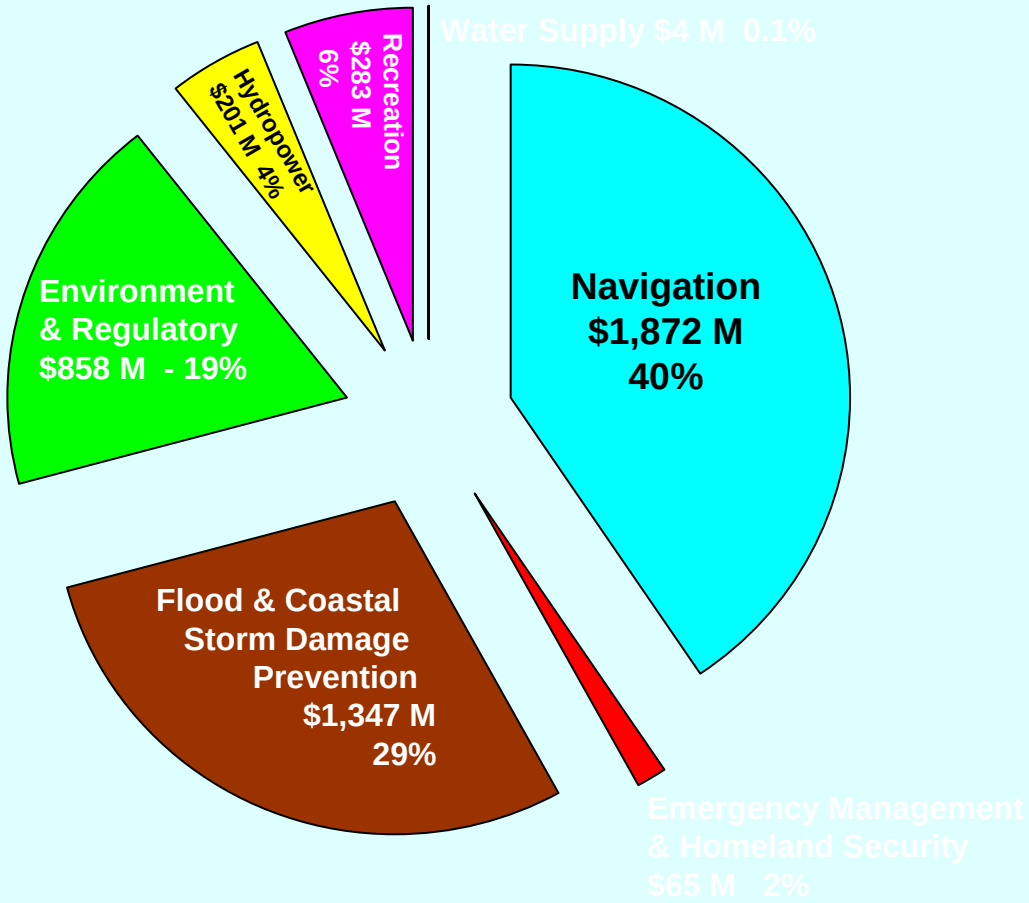
*FY02 amounts include supplemental appropriations

*FC&C Emergencies includes $60M FY03 supplemental, partially carried over into FY04.

New for FY05: Performance-Based Budgeting

OUT

- **Geographic budgeting**
- **Budgeting by account**
- **Business line balance**



Ramifications

- **Funding stream and prioritization listing, as well as amounts going to various projects and activities, will vary greatly from that traditionally seen in prior budgets.**
- **No business, account or regional element guaranteed a "pot".**
- **Therefore all activities will live by their performance.**

Performance Metrics

- **BCR - the benefit cost ratio for project RB/RC - the remaining benefit / remaining cost ratio**
- **Com ton - commercial tonnage impacted**
- **Percent red in delay costs - % reduction in delay costs (inland only)**
- **Sys Ton-mi - the total tons X the total distance from origin to destination**
- **Proj annual benefits -total (all purposes) NED benefits for (proposed) project**

Performance Metrics (cont)

- **Proj annual costs -total (all purposes) NED costs for (proposed) project**
- **Net benefits - estimated benefits of this budget request**
- **Yrs to complete - years required to complete this budget request's phase (study, PED, construction contract, etc)**
- **Other proj. purpose - list other purposes (outputs) associated with this project (study) -**

Performance Metrics (cont)

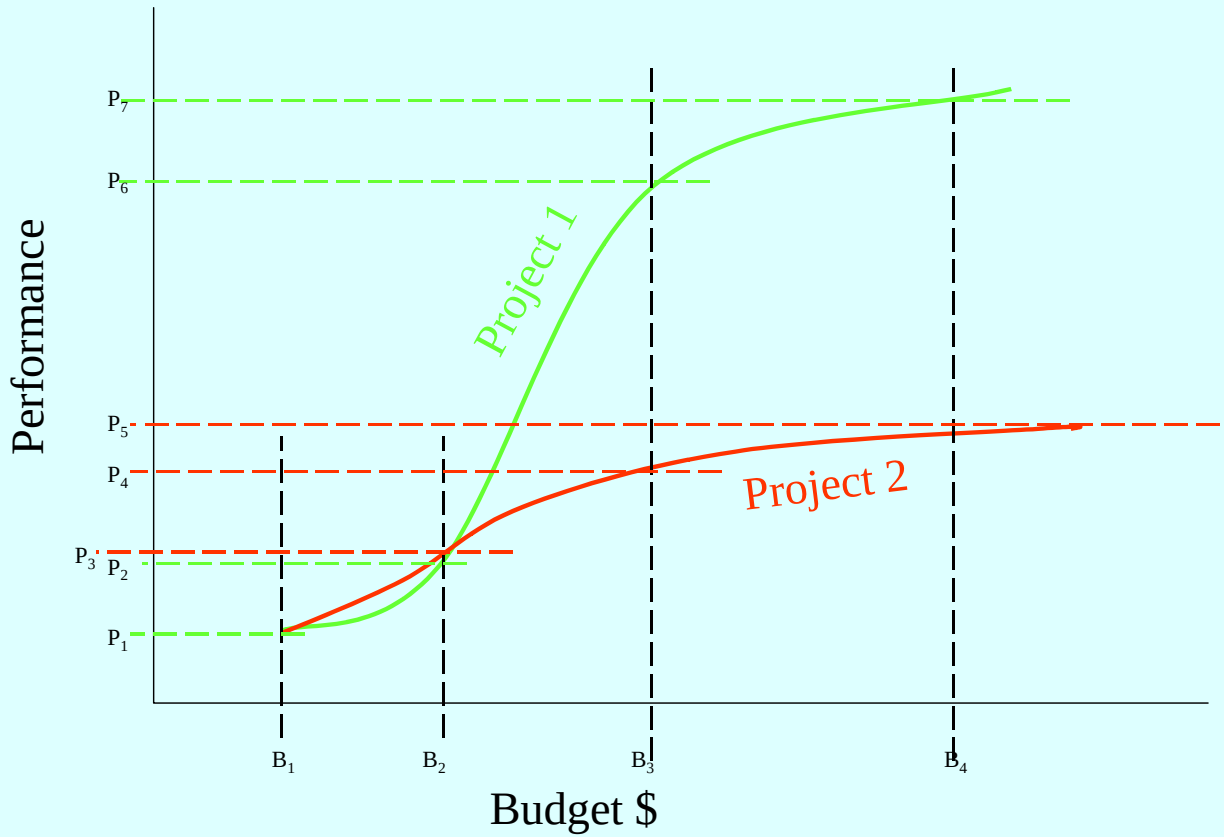
- percentage of time project is available to perform as designed without limits from deferred maintenance, etc
- cumulative NED benefits for project from in service date in current dollars
- cumulative NED costs for project from in service date in current dollars for same features as benefits (separable and joint)
- Pub Health/Safety - critical hazardous situation, imminent failure resulting in severe consequences to public

Performance Metrics (cont)

- **Consequences - budget request needed to comply with safety, settlements, etc - what is penalty if not funded this PY**
- **Purpose - what the budget amount accomplishes. E.g. initiate, continue, complete recon, feas, PED, contract, ensure justified level of service**
- **Remarks - additional information to support budget request that is not in the other fields**

Performance Based Budgeting

Considerations in Developing
Budget Increments



Low Use Wedge

Sub-program		**SCREEN** Minimum	**Indicators**	**Indicators**	**Indicators**	**Indicators**	**Indicators**
Shallow draft nav projects		<1 million tons	commercial fishery outputs	Return on investment	Public health and safety	Public transportation	Purpose
Low-use waterway segments		< 1 million tons on systems with < 1 billion system ton-miles	BCR based on savings per ton table	Multipurpose values	Public health and safety	Caretaker	Investment issues

Low-Use Waterway Segments

- **Segments with <1 million tons on waterways with < 1 billion system ton-miles**
- **Multipurpose benefits**
- **Investment benefits**
- **Growth trend**
- **Other values**
- **Caretaker costs**

Shallow Harbors

- < 1 million tons
- Supports some fisheries output
- Investment Benefits
  - Jobs created or retained in distressed communities as a result of shallow draft harbor investments (outcome)
- Public transportation (Channel Islands)
- Boater safety (hazardous inlet)

Performance Examples

Infrastructure Management
Condition of priority inland waterway infrastructure as measured by a Facility Condition Index (FCI) (a ratio of the cost of remedying maintenance deficiencies to the current replacement value, commonly used by private firms to monitor conditions of facilities). *(Outcome)*

Percent of construction acquisition and upgrade projects with negative cost and schedule variances of less than 10% of the approved project plan *(Efficiency)*

Percent of operational facilities that keep scheduled operating time lost to less than 10% *(Efficiency)*

Percent of high-use deep draft ports nationwide with improved reliability *(Outcome)*

Jobs created or retained in distressed communities as a result of shallow draft harbor investments (outcome)