

# USACE Civil Works Infrastructure Investment Trends: Glide-Path to Benign Neglect?

California Marine Affairs and  
Navigation Conference (CMANC)

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US Army Corps of Engineers  
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# ***The Bottom Line:***

- ***USACE's Civil Works mission provides a key foundational component of the Nation's public infrastructure that facilitates economic growth, quality of life, environmental health and national security for the American people!***
- CW infrastructure is deteriorating (declining engineering condition).
- CW infrastructure is underperforming (declining service performance).
- U.S. is under-investing in its public works infrastructure overall.
- U.S. lags other developed nations in its maintenance of prior public infrastructure investments.
- We stand to squander the international competitive advantage provided by the Nation's public works due to our inattention to the needs of aging infrastructure, shifting demand, climate change, and underinvestment.
- At risk is U.S.'s economic prosperity, quality of life & environmental health.
- ***USACE CW infrastructure is on unsustainable glide-path of benign neglect. Devolving from a paradigm of "preventing failure", to one of "fixing after failure", and towards even "failing to fix!"***







# The Value of Past Investments

An illustration of the relationship between services yielded by ecosystems, infrastructure, and the economic activities they support.

The value of natural and constructed systems was viewed as being greater than the sum of their intertwined parts, not only for the present generations, but also for those that would follow.

From: "A Multiple-Purpose River Basin Development", A Water Policy for the American People The Report for the President's Water Resources Policy Commission (1950)



# USACE CW's Economic Benefits & Revenues to the Treasury

## 2010

**Each dollar spent on the USACE Civil Works program generated  
~ \$9.00 in economic benefits and \$2.70 in revenues to the U.S. Treasury.**

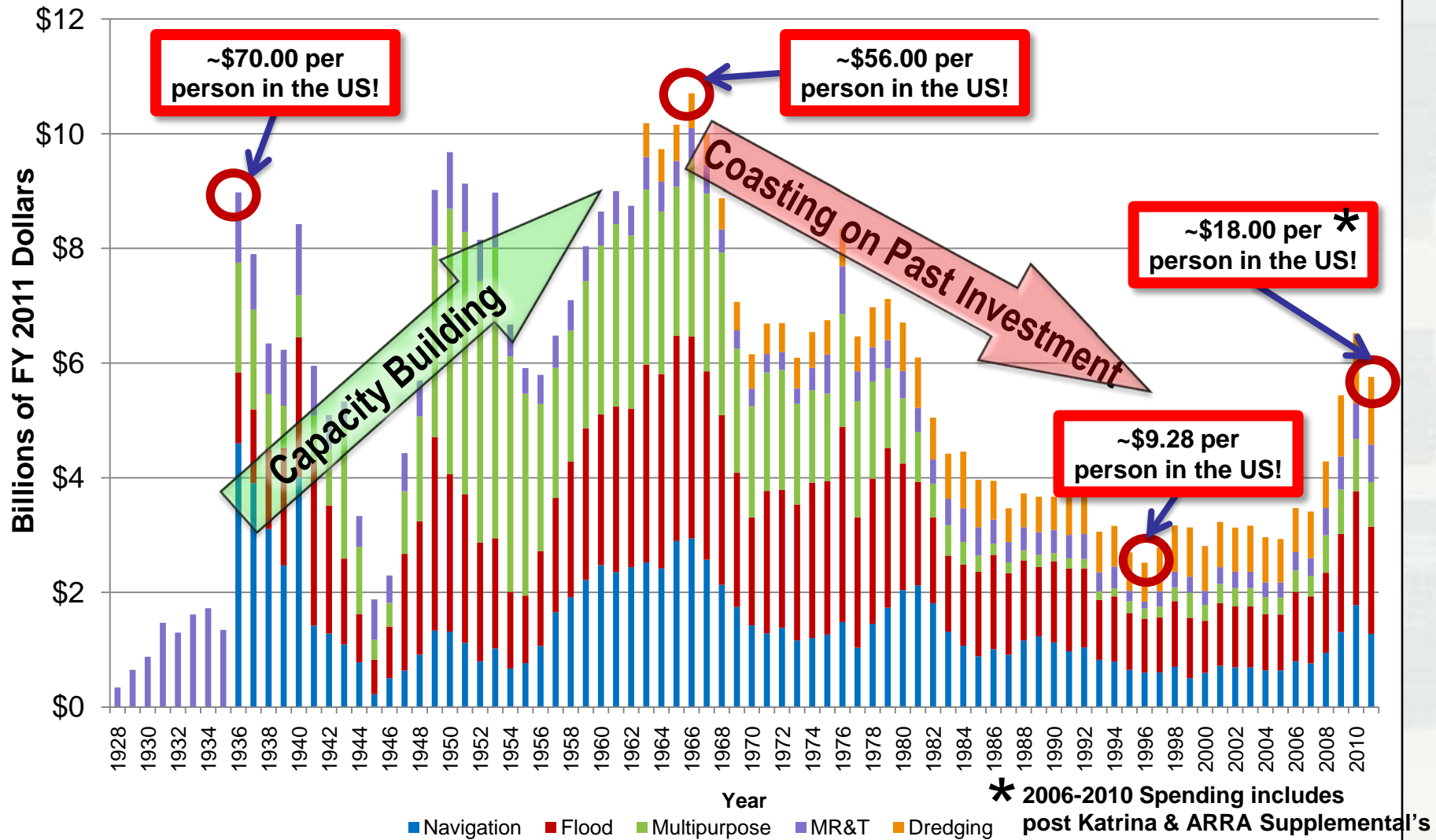
<b>Program</b>	<b>NED Benefits (Billions of Dollars)</b>	<b>Net NED Benefits (Billions of Dollars)</b>	<b>U.S. Treasury Revenues (Billions of Dollars)</b>
Flood Risk Management	\$23.1	\$22.5	\$7.3
Coastal Navigation	\$8.7	\$7.9	\$3.3
Inland Navigation	\$7.6	\$7.0	\$1.9
Water Supply	\$6.5	\$6.5	\$0.1
Hydropower	\$2.2	\$2.0	\$1.1
Recreation	\$3.3	\$3.0	\$1.1
Leases and Sales			\$0.1
<b>Total Annual NED</b>	<b>\$51.4</b>	<b>\$48.9</b>	<b>\$14.8</b>

**Notes:**

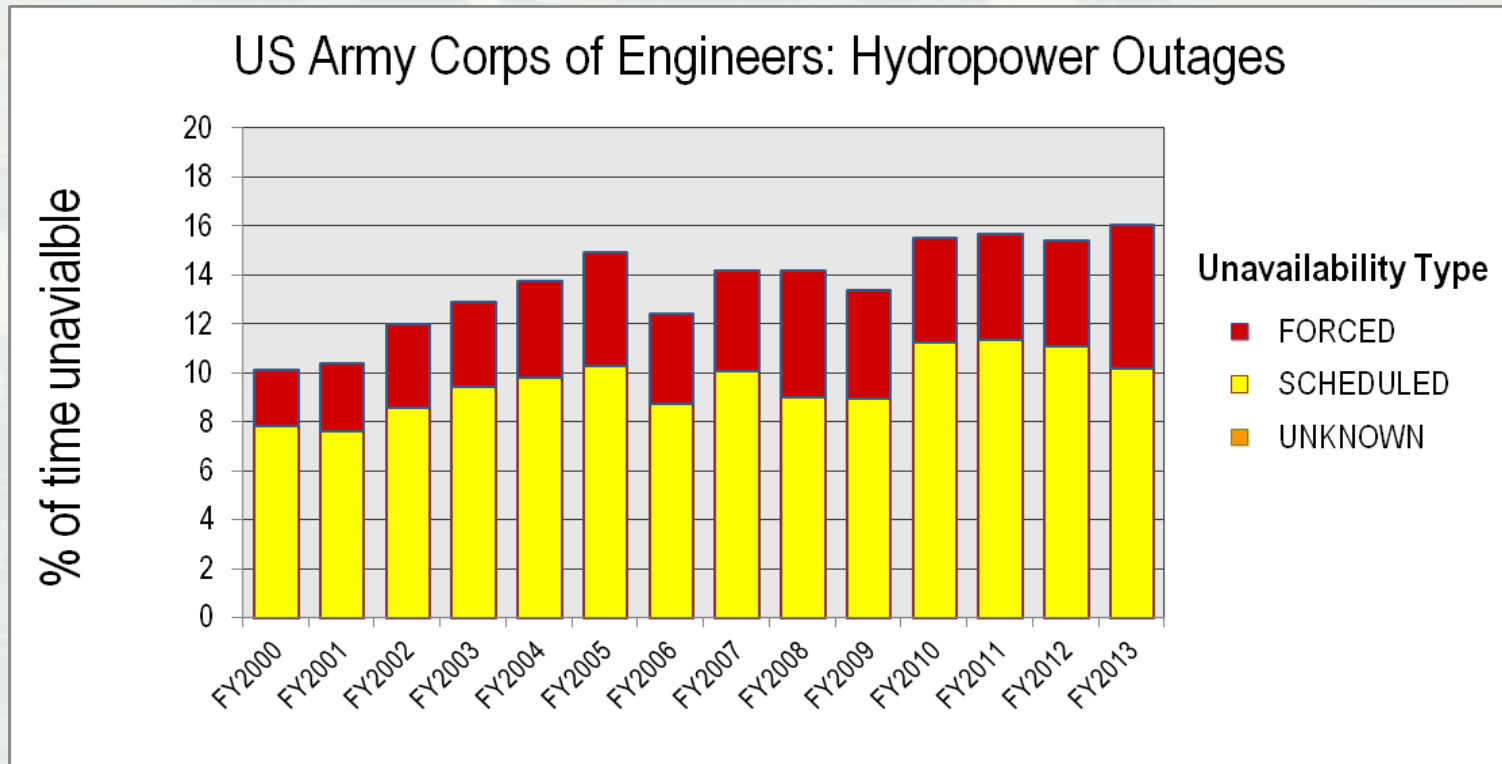
- (1) Net NED Benefits represent total NED benefits minus the costs of operations, maintenance, expenses, the USACE Regulatory program, FUSRAP, oversight by ASA(CW) and other USACE Civil Works programs.
- (2) The Benefits and Revenues numbers are not additive.



# Historical Investments by USACE Functional Category 1928 to 2011



# ***Effects of Constrained Investments – Outages at Hydropower Facilities are Increasing***

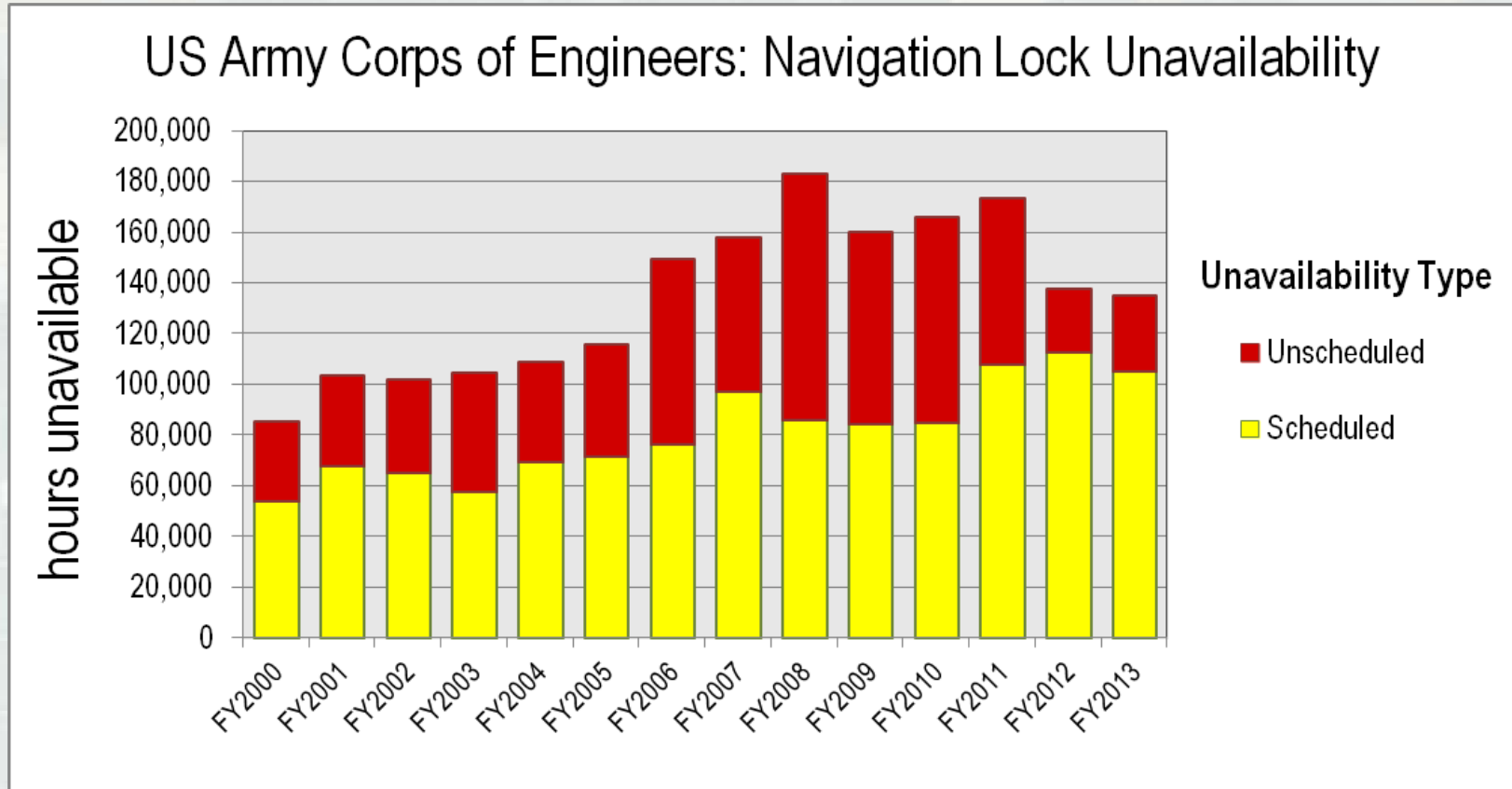


**Since 2000:**

- ~50% increase in down time
- **Threefold** increase in forced outages!



# ***Effects of Constrained Investments – System Reliability is Suffering as Outages are Increasing at Navigation Locks***



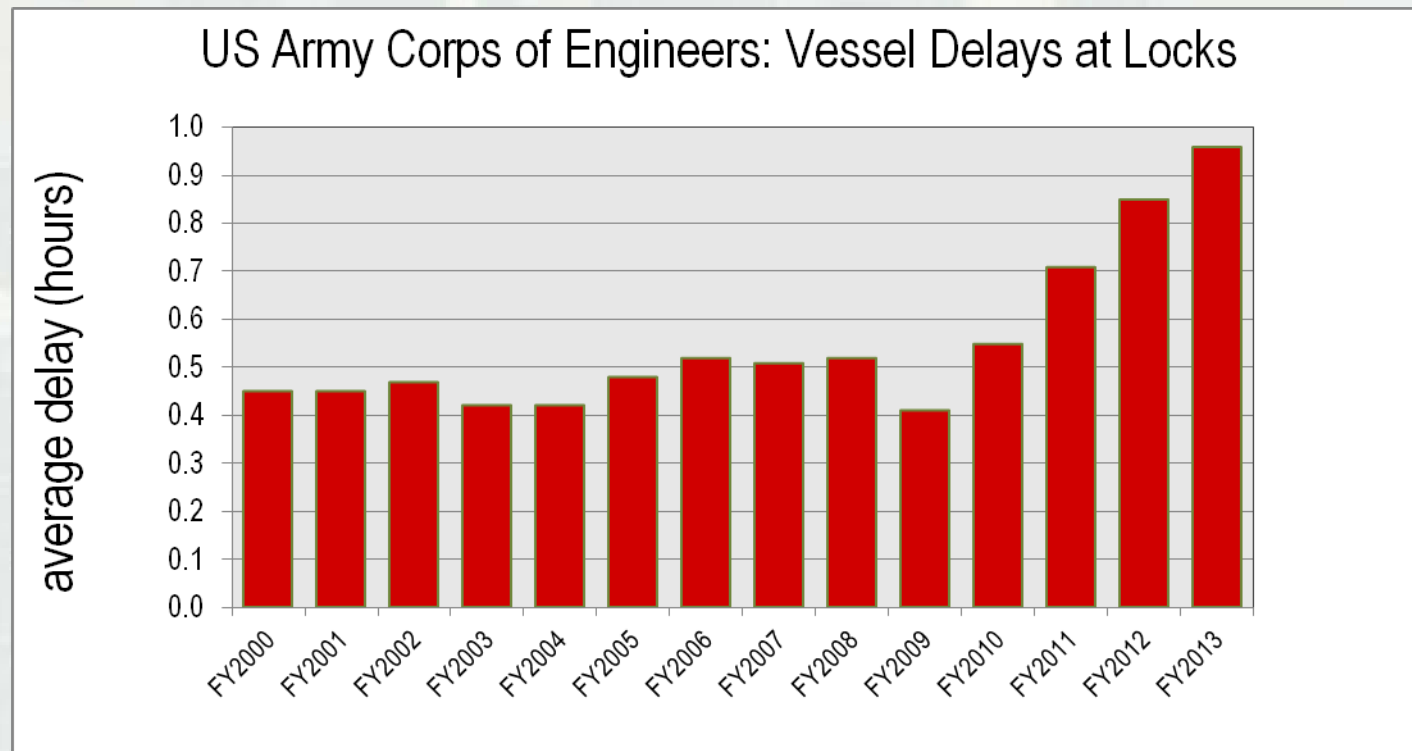
## **Since 2000:**

- ~50% increase in unavailability
- Twofold increase in scheduled outages!





# ***Effects of Constrained Investments – Vessel Delays at Our Locks are Increasing***



**Since 2009:**

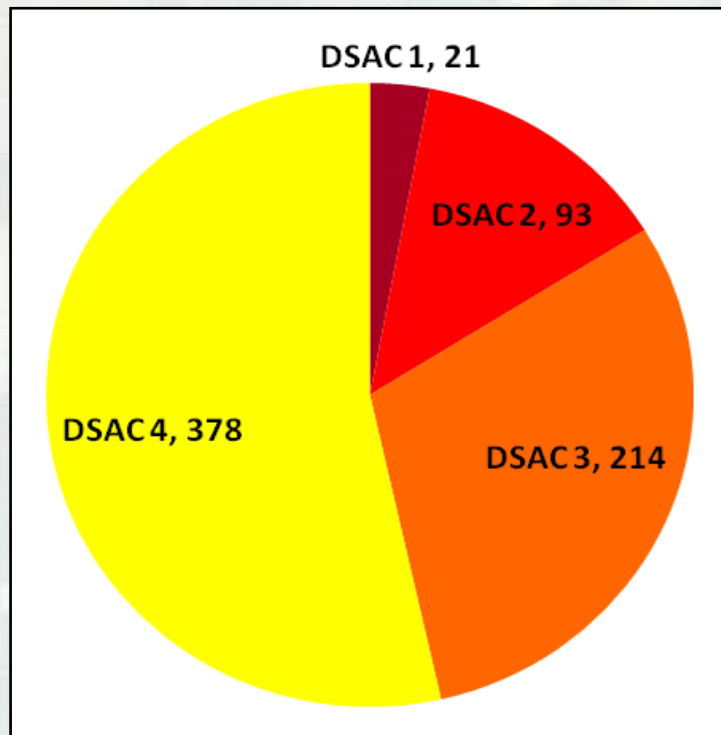
- more than a doubling in delays!
- Roughly 770,000 hours of delays in 2013

**These are actual delays experienced by vessels!**





# Effects of Constrained Investments – USACE Dams are Aging and the Urgency of Dam Safety Actions is Increasing



## USACE Dam Safety Action Classifications (DSAC's)

- 707 dams at 557 projects
- DSAC chart includes all USACE dams except one newly constructed dam that has not been assigned a DSAC value.

Dam Safety Action Class	Characteristics of this class
<b>I</b> <b>URGENT AND COMPELLING</b> (Unsafe)	<b>CRITICALLY NEAR FAILURE</b> Progression toward failure is confirmed to be taking place under normal operations. Almost certain to fail under normal operations from immediately to within a few years without intervention. <b>OR EXTREMELY HIGH RISK</b> Combination of life or economic consequences with probability of failure is extremely high.
<b>II</b> <b>URGENT</b> (Unsafe or Potentially Unsafe)	<b>FAILURE INITIATION FORESEEN</b> For confirmed (unsafe) and unconfirmed (potentially unsafe) dam safety issues, failure could begin during normal operations or be initiated as the consequence of an event. The likelihood of failure from one of these occurrences, prior to remediation, is too high to assure public safety. <b>OR VERY HIGH RISK</b> The combination of life or economic consequences with probability of failure is very high.
<b>III</b> <b>HIGH PRIORITY</b> (Conditionally Unsafe)	<b>SIGNIFICANTLY INADEQUATE OR MODERATE TO HIGH RISK</b> For confirmed and unconfirmed dam safety issues, the combination of life, economic, or environmental consequences with probability of failure is moderate to high.
<b>IV</b> <b>PRIORITY</b> (Marginally Safe)	<b>INADEQUATE WITH LOW RISK</b> For confirmed and unconfirmed dam safety issues, the combination of life, economic, or environmental consequences with probability of failure is low and may not meet all essential USACE guidelines.



- Data source: DSPMT, 16 Oct 2013

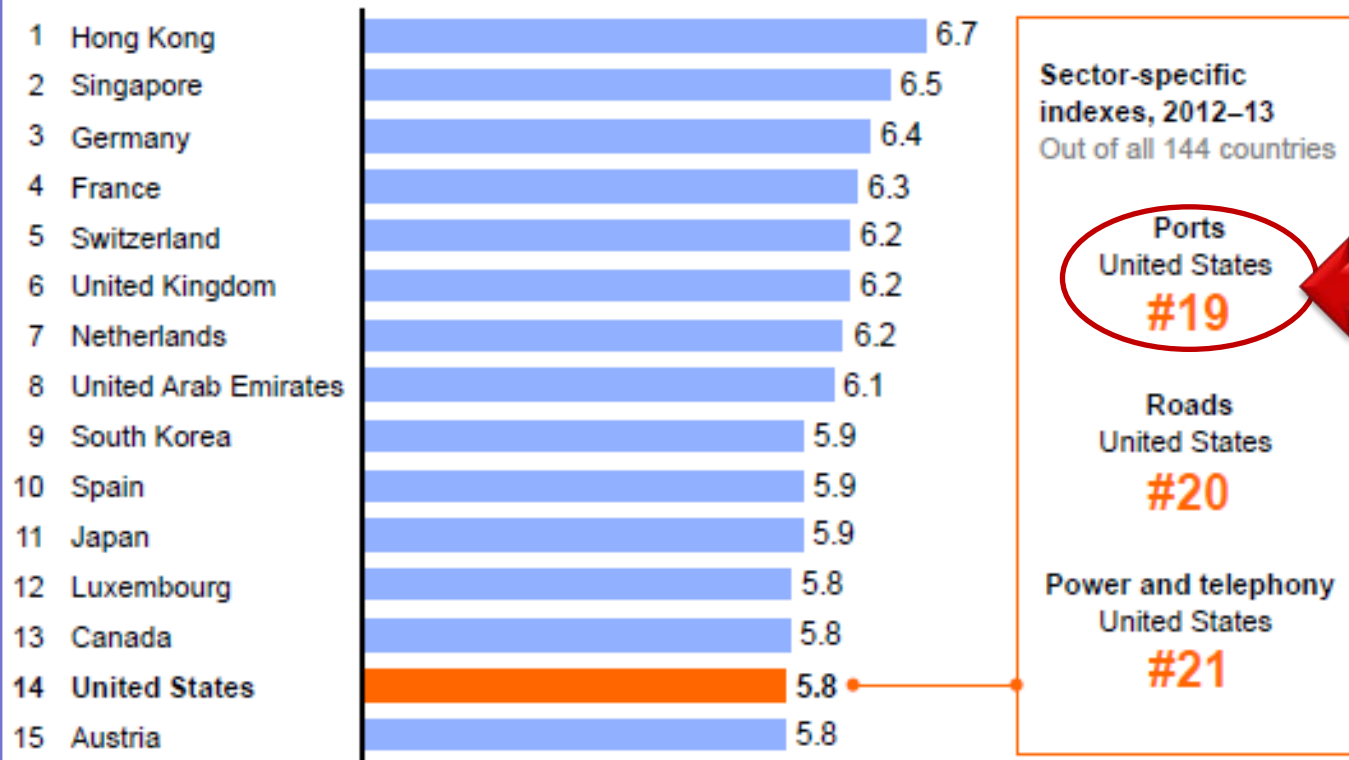
# Relative Quality of US Infrastructure is Declining

The World Economic Forum ranks US infrastructure behind that of most other comparable advanced nations

Overall infrastructure quality index, 2012–13

Top 15 of 144 countries

Scale: 1 = Extremely underdeveloped; 7 = Extensive and efficient by international standards



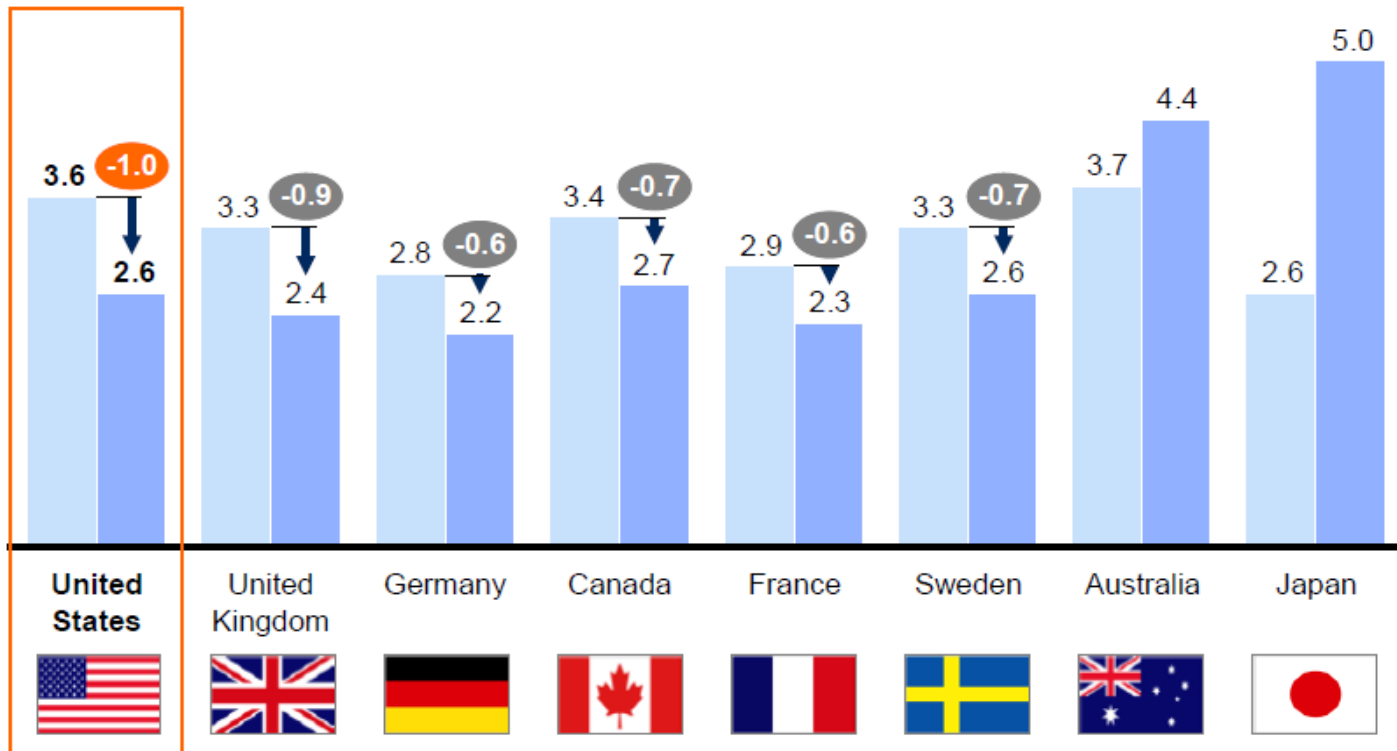
SOURCE: World Economic Forum; McKinsey Global Institute analysis

**U.S. Port Infrastructure not even among the top 15 in World!**



# Patterns in Global Spending in Infrastructure

**As a fraction of GDP, the U.S. Lags other Developed Nations in Infrastructure Investment**

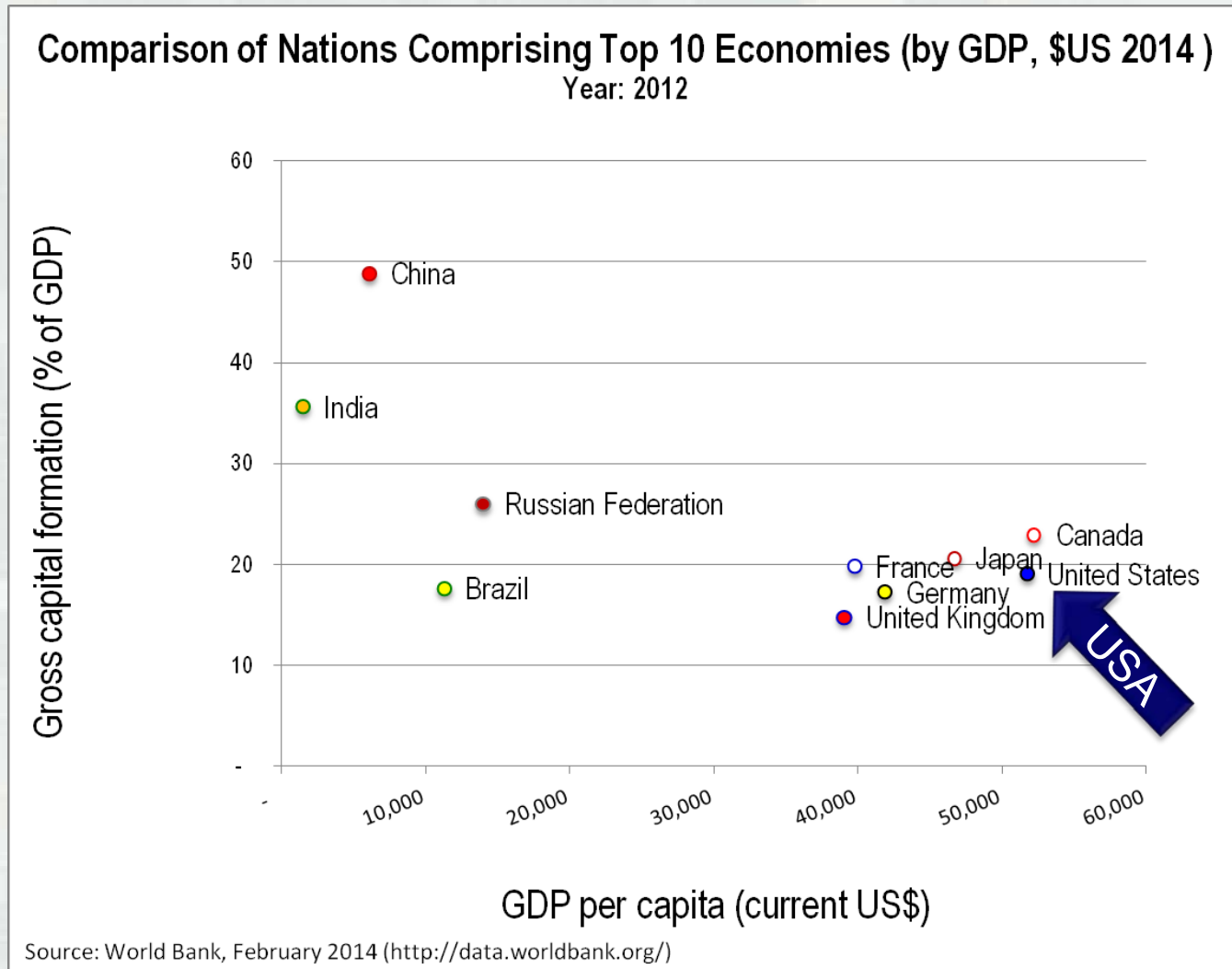


1 Actual spend calculated as weighted average annual expenditure over years of available data, 1992–2011. Estimated need based on projected growth, 2013–30.

SOURCE: McKinsey Global Institute analysis

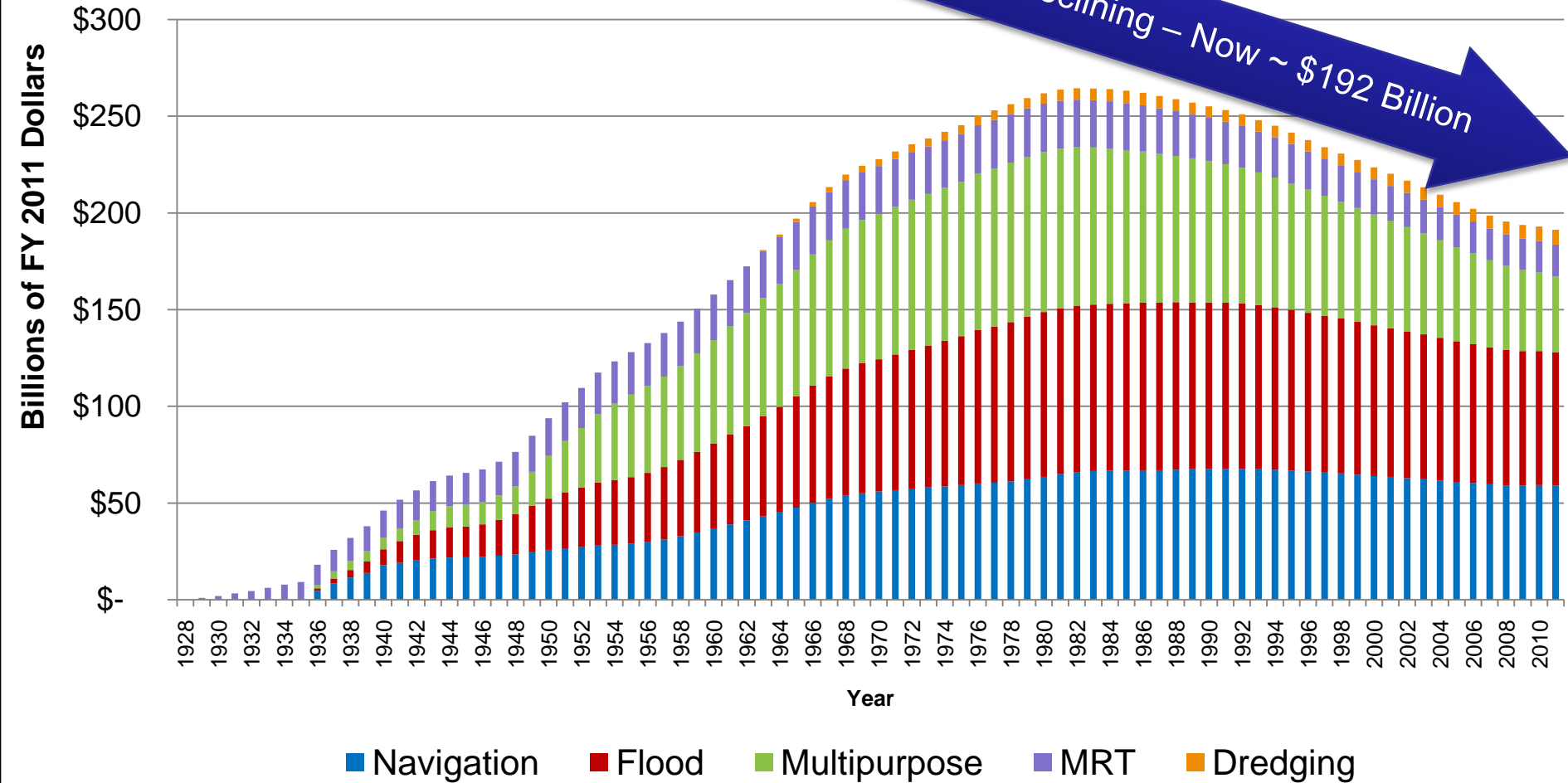


# Relative Differences in Global Infrastructure Spending – U.S. High GDP, Relatively Low Infrastructure Investment



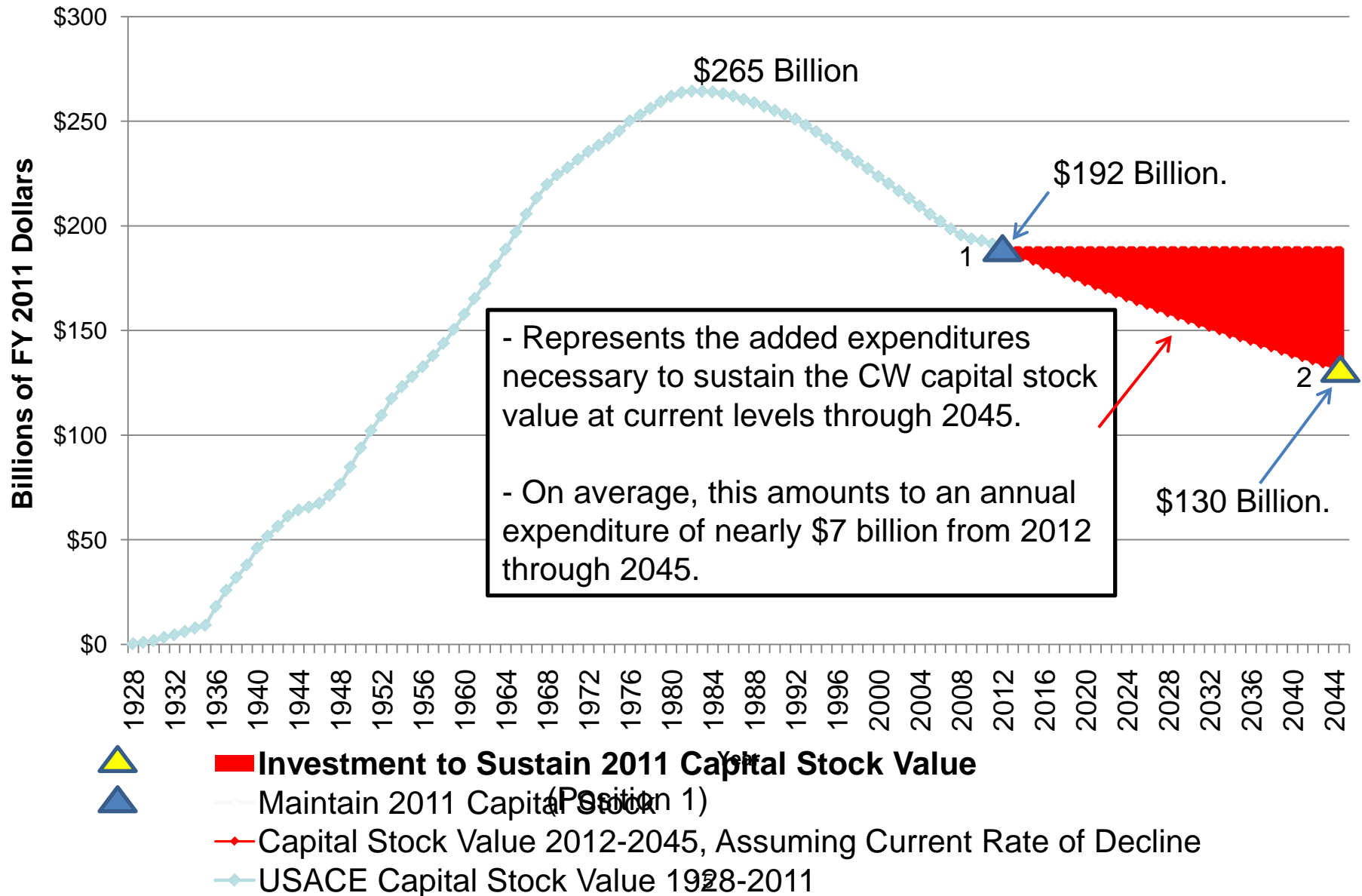
# USACE Capital Stock Value by Functional Category 1928 to 2011

Value of CW Capital Stock is Declining – Now ~ \$192 Billion

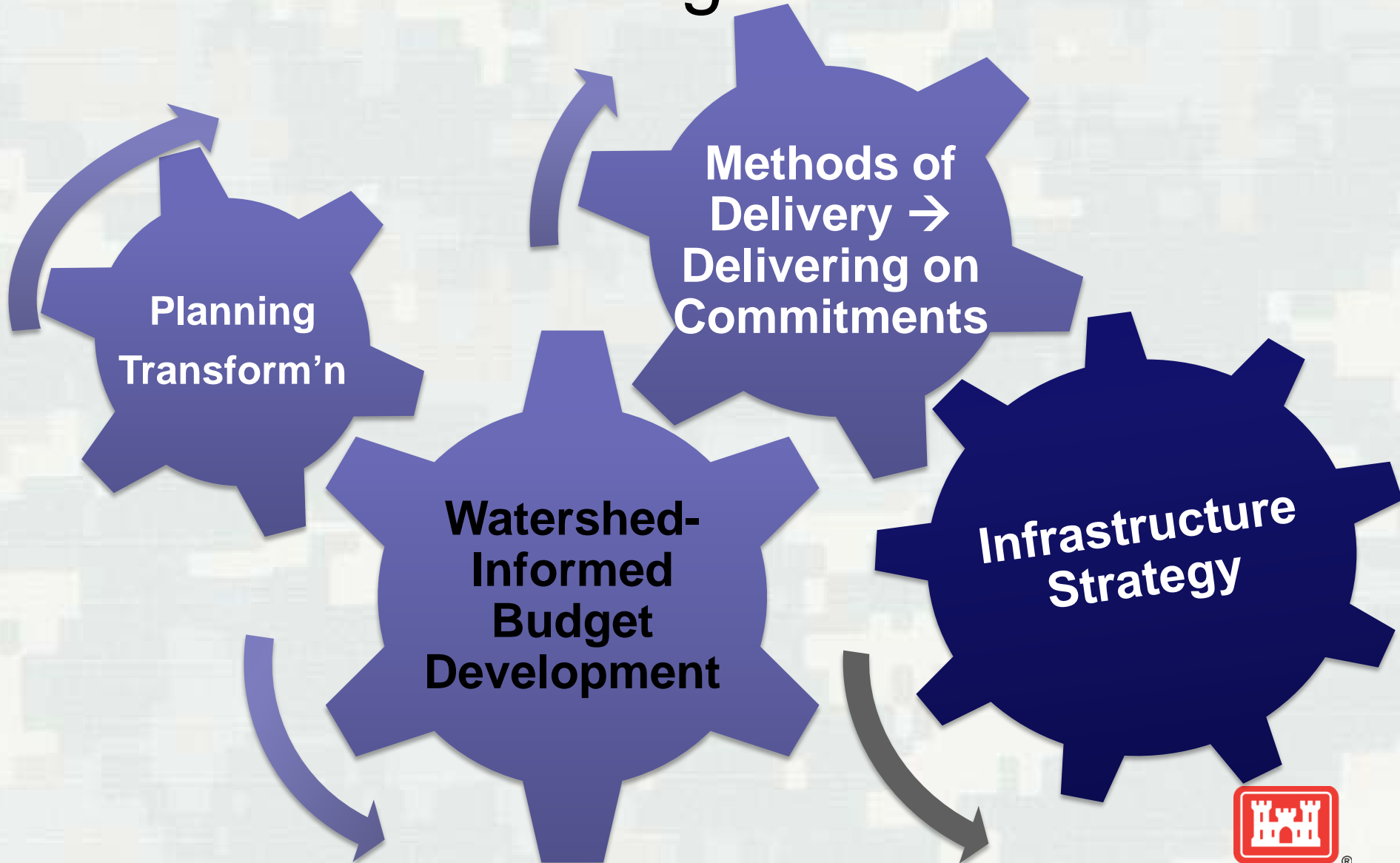




# USACE Capital Stock Value, 1928 to 2011 & Trends Based on Investment Levels Reflecting a Continuation of the 1982-2011 Decline versus Sustainment of 2011 Capital Stock Value



# Transforming Civil Works



# Planning Modernization

Report of the  
chief of  
engineers U.S.  
army

United States  
Army Corps of  
Engineers

- Determine Federal Interest
- Authorization Backlog
- Follow-on Work

Chief's  
Reports

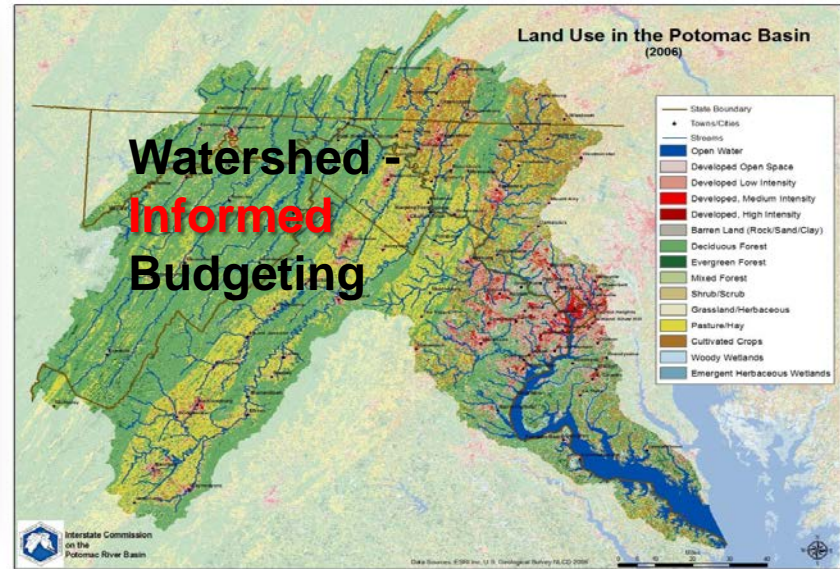


# Budget Development

## Engaging Stakeholders



## Watershed - Informed Budgeting



## Smart Investments



## Management Controls





# Methods of Delivery = *Deliver on Commitments*





# Infrastructure Strategy

## Asset Management

Replacement Value=  
**\$250 B**

## Life Cycle Management



Kentucky River Lock #2, in service since 1839

- Accelerate Execution
- Pilots
- Obstacles
- Authorities
- Re-Invent Operations



## Alternative Financing



# What Can You Do?

- ***Tell the Story*** - Preach CW Value to Nation
- Leverage Efforts - ***Collaborate*** with ALL stakeholders and beneficiaries of the Civil Works Program
- Find ***consensus*** for major initiatives
  - Identify funding to reach outcomes
  - Engage in dialogue
- Be mutually supportive
- Involve & engage end-users
- Seek to ***influence decision-makers***
- Help us ***transform Civil Works***
- Facilitate a ***Watershed-Informed*** approach
- Help the Nation ***prioritize*** efforts, programs, and projects
- Support innovative approaches for ***alternative resourcing***

# Other Items of Interest

- Waters of the United States Rulemaking
- Water Supply Rulemaking
- Rehabilitation and Inspection Program (PL 84-99) Eligibility Criteria





# Questions & Discussion



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