

USACE Civil Works Headquarters Perspective

California Marine Affairs and Navigation Conference Pismo Beach, CA

Edward E. Belk, Jr., P.E.
Chief, Operations & Regulatory Division
Directorate of Civil Works
HQ, U.S. Army Corps of Engineers

September 19, 2016



Securing Our Nation's Future Through Water



Navigation - Moving Goods to Market

USACE Operates 13,000 miles of Commercial Inland Waterways; Generates \$18 B / 500,000 Jobs, Annually

Flood and Disaster Risk Reduction

USACE Prevents > \$8 in Flood Damages for Every \$1 Invested

Hydropower - Inexpensive and Sustainable

USACE is the Nation's Largest Renewable Energy Producer

Drinking Water

USACE Produces 6.5 Billion Gallons per Day

Quality of Life

USACE is the No. 1 Federal Provider of Outdoor Recreation, Contributing > \$16 B to Local Economies



Delivering Civil Works Programs

U.S. Army Corps of Engineers



Workforce Size Varies with Workload
Workforce = 821 Military + 33,000 Civilians



The United States Is A Maritime Nation

Inland Marine Transportation System + Ports: Vital to U.S. Trade and National Economy

*Over 2 Billion Tons
of Domestic and
Import/Export
Cargo Annually*



BUILDING STRONG®

USACE Navigation System Assets

INLAND NAVIGATION

27 Inland River Systems

228 Lock Chambers @ 186
Lock Sites

12,000 Miles of Inland River
Channels



COASTAL NAVIGATION

1,067 Navigation Projects

13 Lock Chambers

929 Navigation Structures



13,000 Miles of Channels

844 Bridges



Navigation Facts

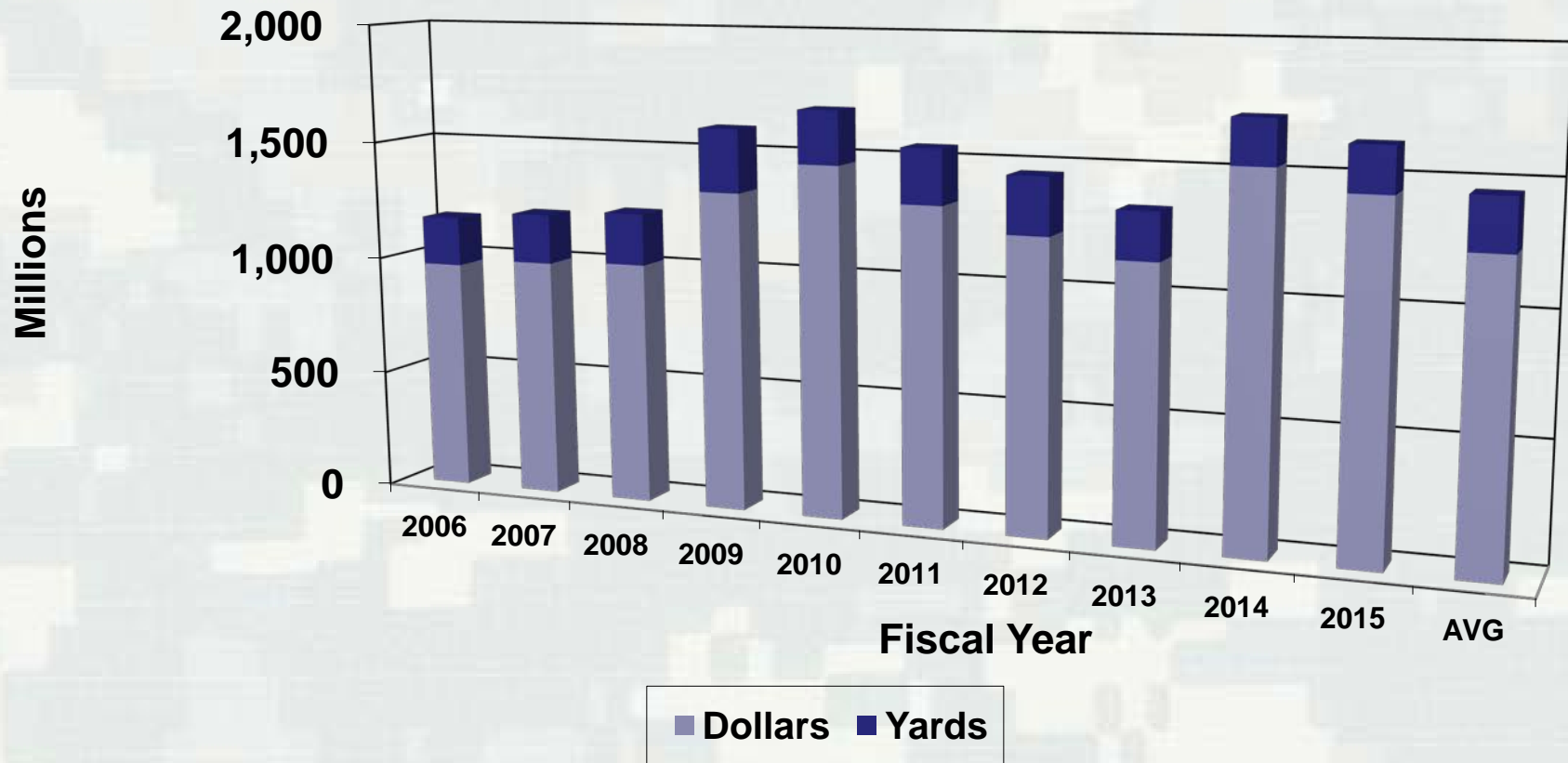
- 99.6% of U.S. overseas trade volume moves through coastal channels maintained by USACE
- The U.S. marine transportation industry supports ~ \$2 trillion in commerce.
- Panama Canal new locks opened in 2016 - Worldwide numbers of post-Panamax vessels expected to increase
- More than 60% of farm exports move on inland waterways to downstream ports.
- One barge can carry as much freight as 15 rail cars or 58 trucks. This reduces traffic congestion and air pollution.

Vehicle	Capacity	Truck Equivalency
 Barge	1500 Tons 52,500 Bushels 453,600 Gallons	57.7 (865.4 for 15 barges in tow)
 Hopper car	100 Tons 3,500 Bushels 30,240 Gallons	3.8



National Dredging Program Trends

Total Dredging FY 2006-2015



Fiscal Year 2015 Total Dredging: 186 MCY @ \$1,441 Million (\$7.76/CY)

Maintenance Work:	165 MCY (89%) @ \$923 Million (64%)
Hurricane Sandy & Emergency:	13 MCY (7%) @ \$265 million (18%)
New Work:	8 MCY (4%) @ \$253 million (18%)



BUILDING STRONG®

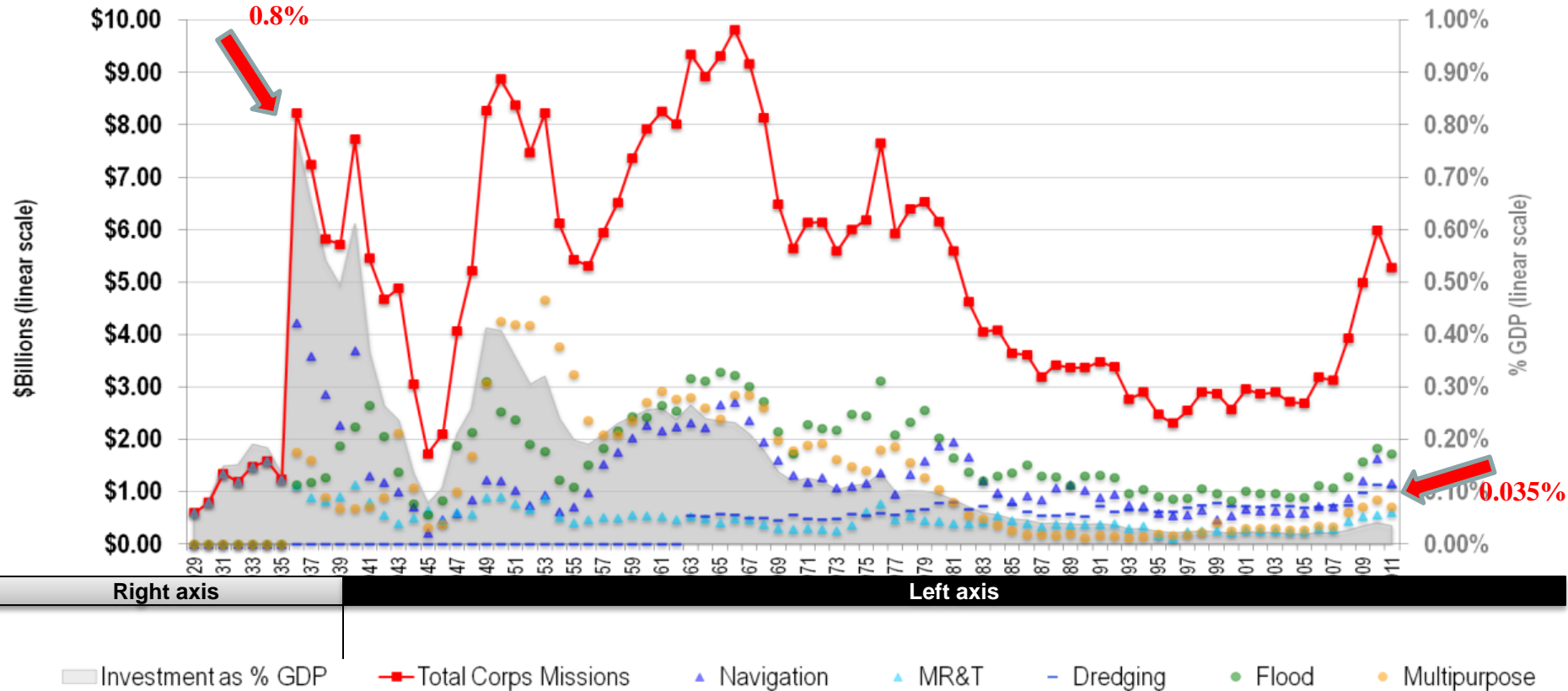
Challenges and Opportunities

- **Infrastructure Investment = Global Challenge**
- **Corps Civil Works Portfolio: 3,000+ Operational Projects, with Replacement Value of Approx **\$268B****
- **Corps Civil Works Asset Classes are Diverse**
 - Flood & Coastal Storm Damage
 - Coastal and Inland Harbors
 - Inland Waterways
 - Hydropower
 - Dam & Levee Safety Programs
 - Water Storage
 - Aquatic Ecosystems
 - Water-Based Recreation
- **Demands for CW Infrastructure Maintenance, Operations, and Capital Investment are Expanding**
 - Civil Works New Construction Backlog → \$ 60B
 - ASCE: Dams, Levees, IWW's = "D" → \$140B
- **CW Infrastructure Systems Aging, Experiencing Negative Performance Trends Across Portfolio (Serviced by ~\$4.6B Annual Budget Nationally....)**



CW Spending as a Percent of GDP

Corps Mission-Related Investments Relative to GDP
(GDP in Chained \$2009; Investments in \$2009)



As % of GDP, USACE CW spending has declined from 0.8% (1935) to ~ 0.035% today

Today's spending represents a decline by a factor >20 as % of GDP

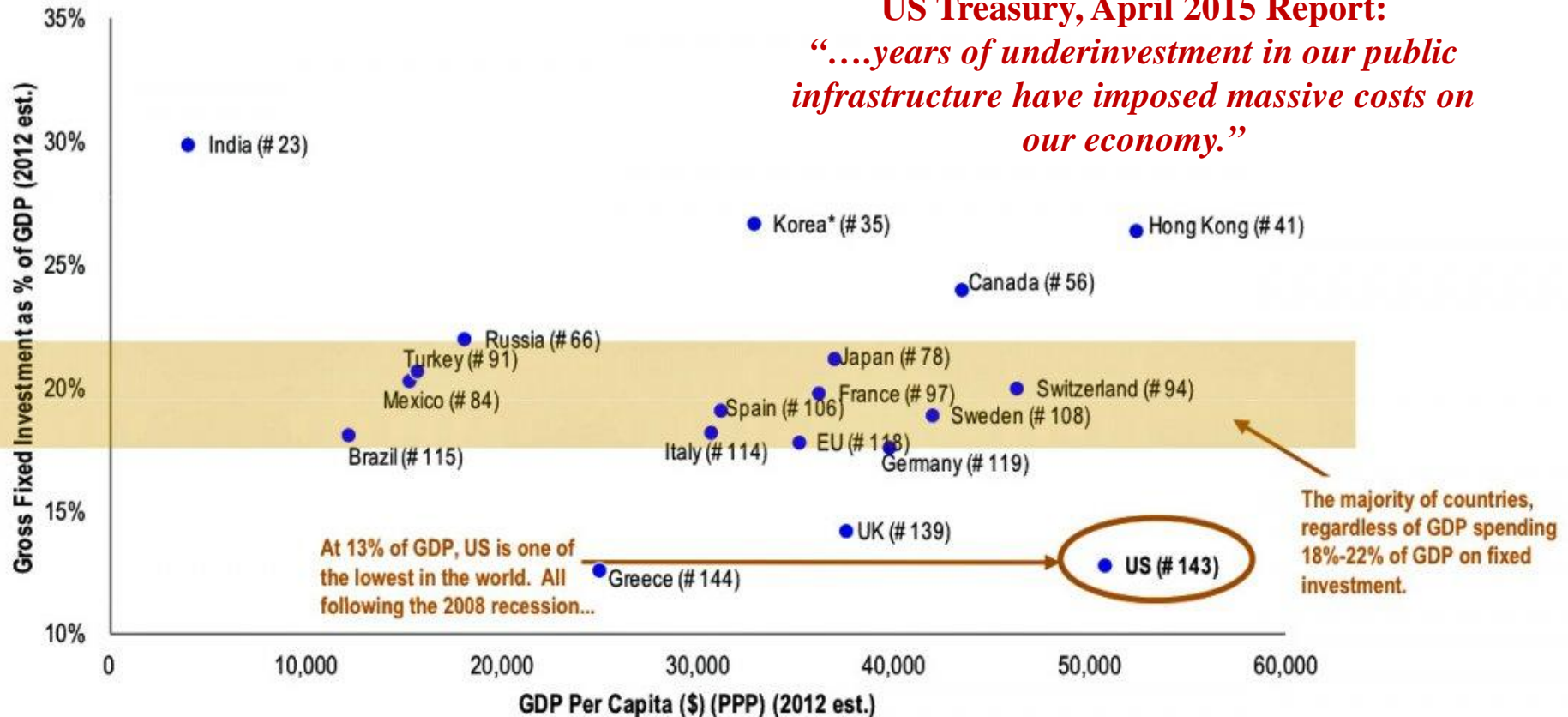
Current spending levels will not sustain services levels



United States Relative to Other Nations

Figure: GDP Per Capita versus Gross Fixed Investment as a % of GDP: Underinvestment in the US

Estimates for 2012 The rank of Gross fixed investment as % of GDP is in the parenthesis.



US Treasury, April 2015 Report:
"...years of underinvestment in our public infrastructure have imposed massive costs on our economy."



Low Investment in Infrastructure



BUILDING STRONG®

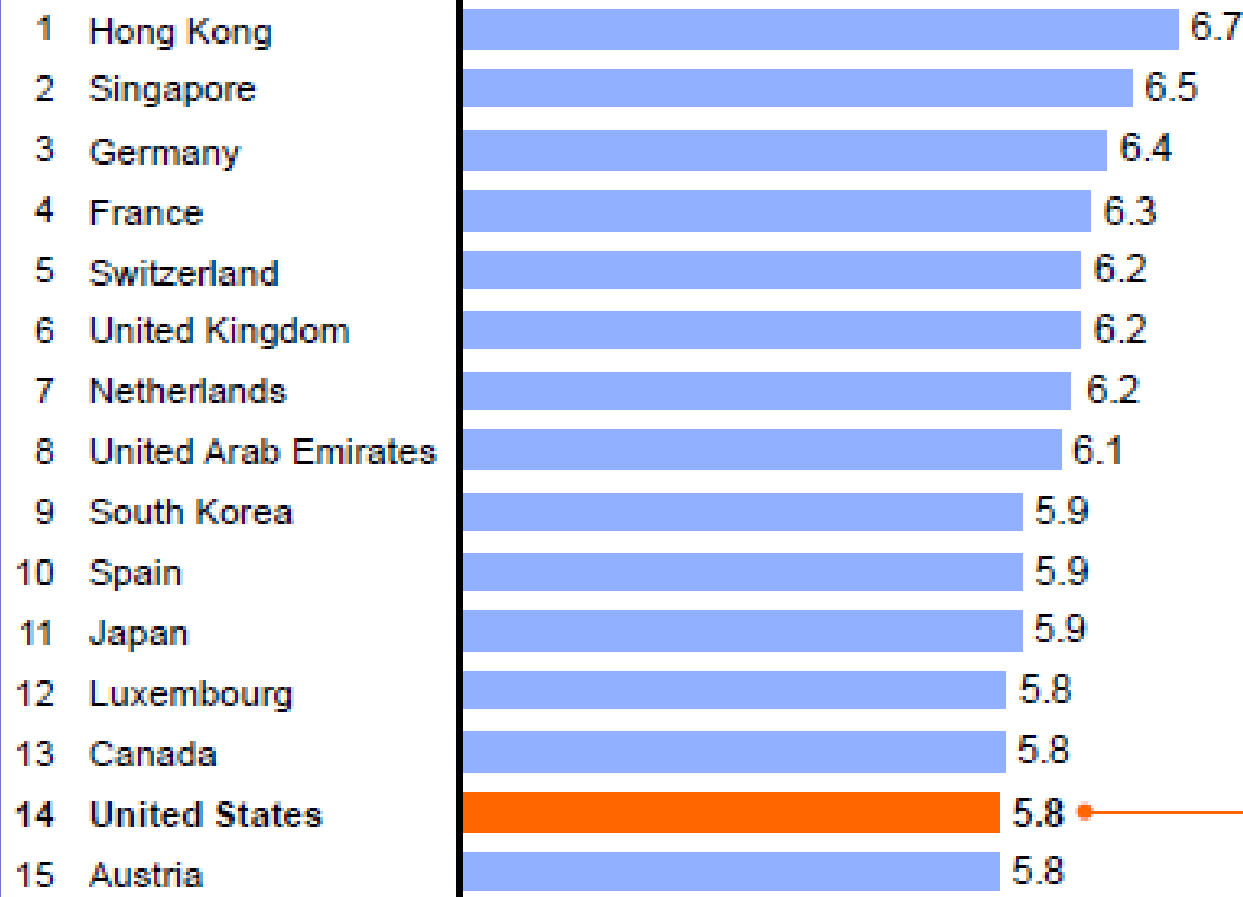
Relative Quality of US Infrastructure

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



Sector-specific indexes, 2012–13

Out of all 144 countries

Ports
United States
#19

Roads
United States
#20

Power and telephony
United States
#21

Inland Waterways

2013
GRADE D⁻

Our nation's inland waterways and rivers are the hidden backbone of our freight network – they carry the equivalent of about 51 million truck trips each year. In many cases, the inland waterways system has not been updated since the 1950s, and more than half of the locks are over 50 years old. Barges are stopped for hours each day with unscheduled delays, preventing goods from getting to market and driving up costs. There is an average of 52 service interruptions a day throughout the system. Projects to repair and replace aging locks and dredge channels take decades to approve and complete, exacerbating the problem further.

A = Exceptional
B = Good
C = Mediocre
D = Poor
F = Failing

AMERICA'S GPA:
D⁺
GRADING METHODOLOGY



Add'l Total
Investment
by 2020

Protects \$B
in Exports

Protects \$B
in GDP

Protects
Jobs

Protects
Personal
Income

Waterways

\$16B

\$270B

\$697B

738,000

\$872B

Airports

\$39B

\$54B

\$313B

350,000

\$361B

Electricity

\$107B

\$51B

\$496B

529,000

\$656B

Water/Wastewater

\$84B

\$20B

\$416B

669,000

\$541B

Roads

\$846B

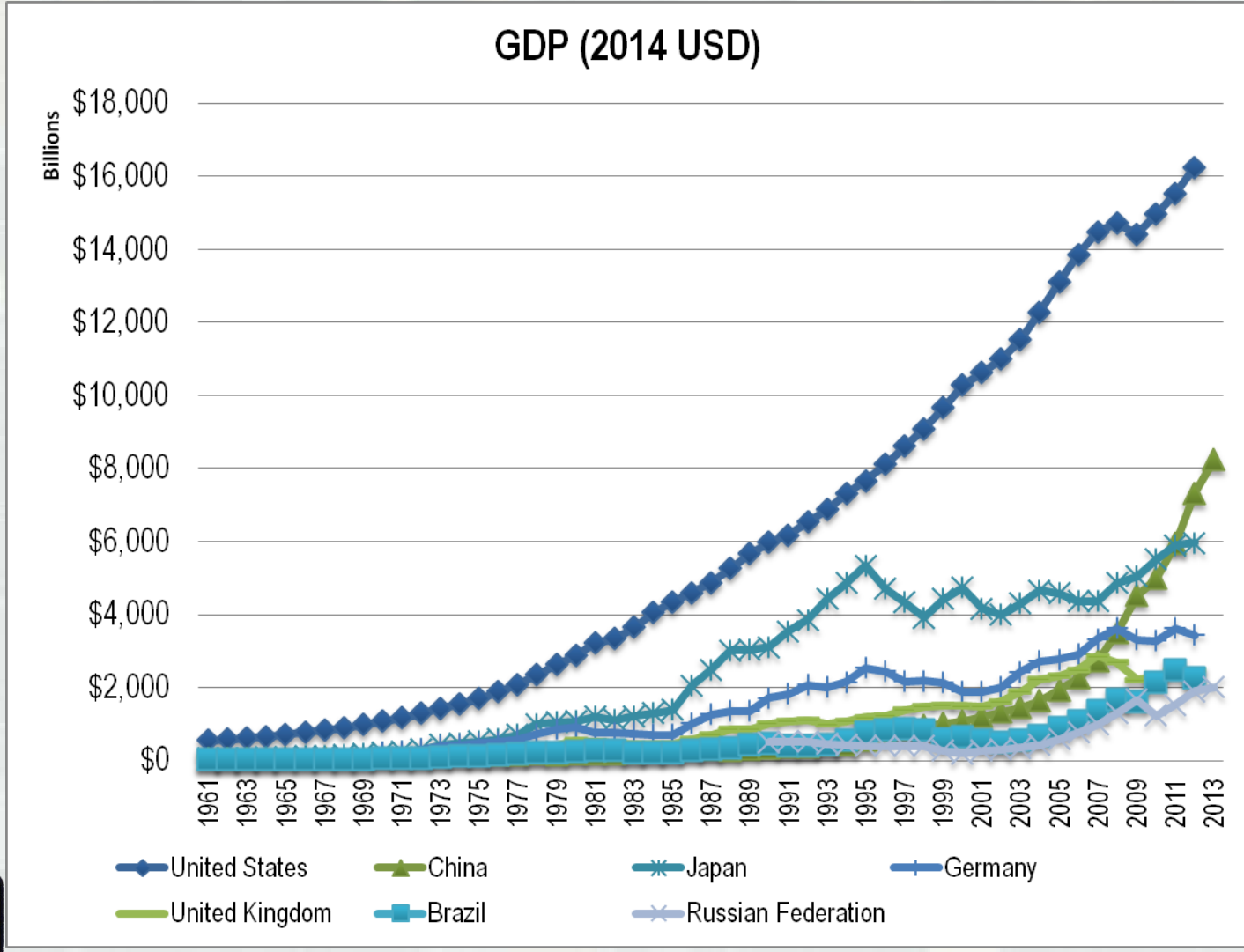
\$114B

\$897B

877,000

\$930B

Comparison of Gross Domestic Product



BUILDING STRONG®

Economic Benefits & Revenues to Treasury

(2010-2013 Average)

**Each Dollar Invested in the Corps Civil Works Program Generated
~ \$22 in Economic Benefits and \$7 in Revenues to the U.S. Treasury**

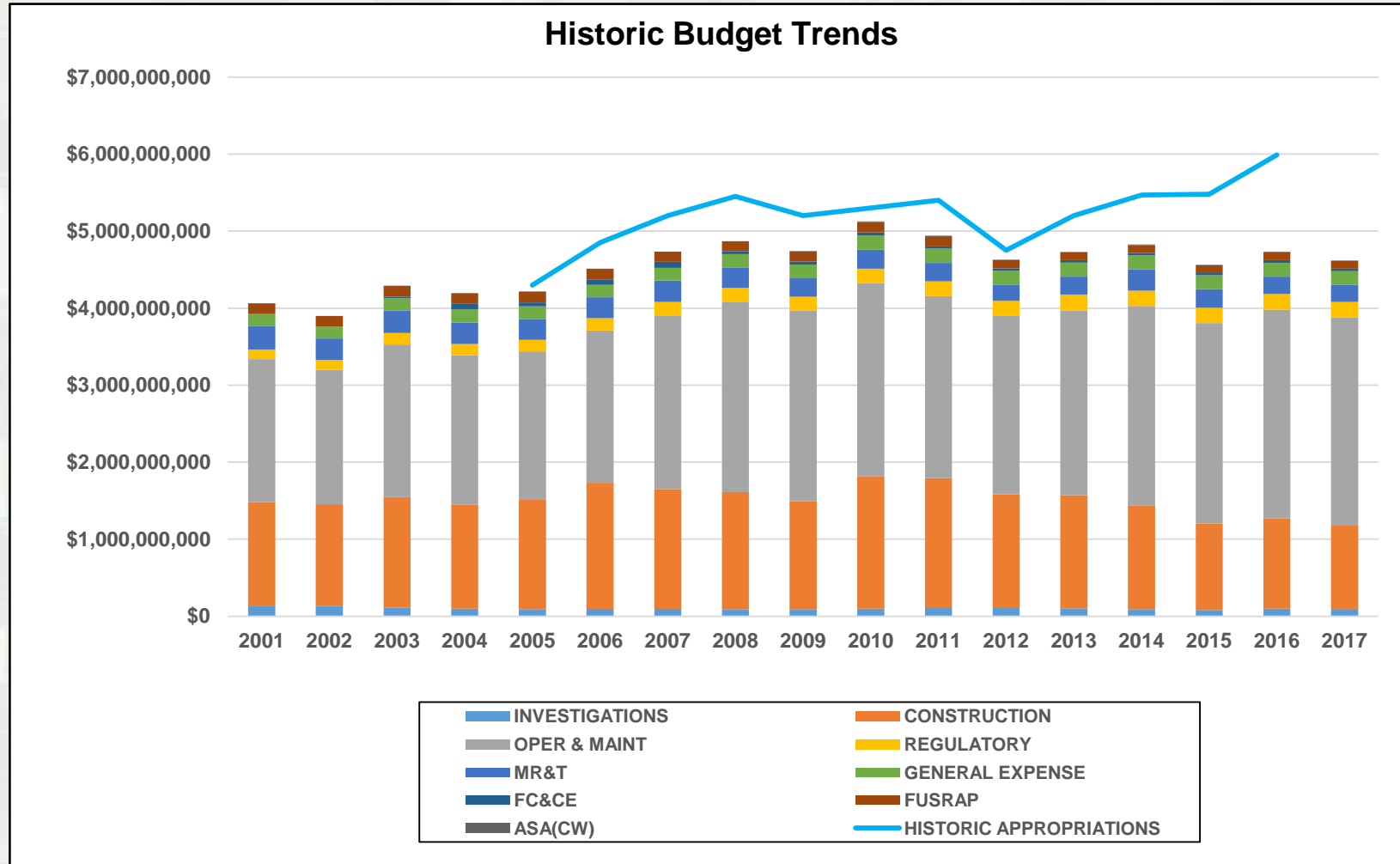
Program	NED Benefits (Billions of Dollars)	Net NED Benefits (Billions of Dollars)	U.S. Treasury Revenues (Billions of Dollars)
Flood Risk Management	\$79.83	\$79.19	\$25.30
Coastal Navigation	\$9.47	\$9.07	\$3.88
Inland Navigation	\$8.84	\$8.24	\$2.27
Water Supply	\$7.61	\$7.59	\$0.08
Hydropower	\$2.92	\$2.73	\$1.43
Recreation	\$3.31	\$3.01	\$1.17
Leases and Sales			\$0.03
Total Annual NED	\$112.38	\$109.83	\$34.16

Notes:

- (1) Net NED benefits are defined as NED benefits less the costs of operations, maintenance, and investigations. Since the costs associated with expenses and oversight by the Assistant Secretary of the Army (ASA) serve all Corps programs, including those we did not calculate benefits for in this report, this report does not account for those costs.
- (2) The Benefits and Revenues numbers are not additive.



Civil Works Budget Trends



USACE = Infrastructure Agency = O&M

National Research Council Recommendation:

- ▶ *NRC Suggests Appropriate Maintenance Investment Range of 2-4% PRV*

What this means in a real world (USACE) example:

- ▶ FY 15 USACE Infrastructure Plant Replacement Value (PRV) = \$268B

Est FY15 PRV =	\$268,000,000,000	% PRV	
NRC "High" (4%) =	\$10,720,000,000	4.00%	← Fiscally Impossible
NRC "Low" (2%) =	\$5,360,000,000	2.00%	← Exceeds Corps TOTAL Budget
TOTAL FY15 O&M Budget =	\$2,600,000,000	0.97%	← < 1%, Incl "O"
O&M Allocated for Just Maintenance =	\$618,500,000	0.23%	← Current Reality
(from Maintenance Work Packages in budget, not including ~\$1B in dredging maintenance)			Akin to buying a \$30,000 car and spending \$69 annually on maintenance and repair for its life, with no warranty service

Like Other Agencies, the Corps is Not Close to NRC Recommendations... EVEN IF O&M is Optimized...this is a National Infrastructure Priority



Civil Works Transformation

Infrastructure Strategy Components








- **Asset Management:** Assets identification, assessment of conditions/reliability, categorization
- **Life Cycle Portfolio Management:** Ensure future systems' viability through risk assessment and management, funding prioritization in a systems decision making process
- **Alternative Financing:** Identify alternative financing mechanism and options to leverage funding to increase infrastructure investments



Investment Metric: Risk to Performance

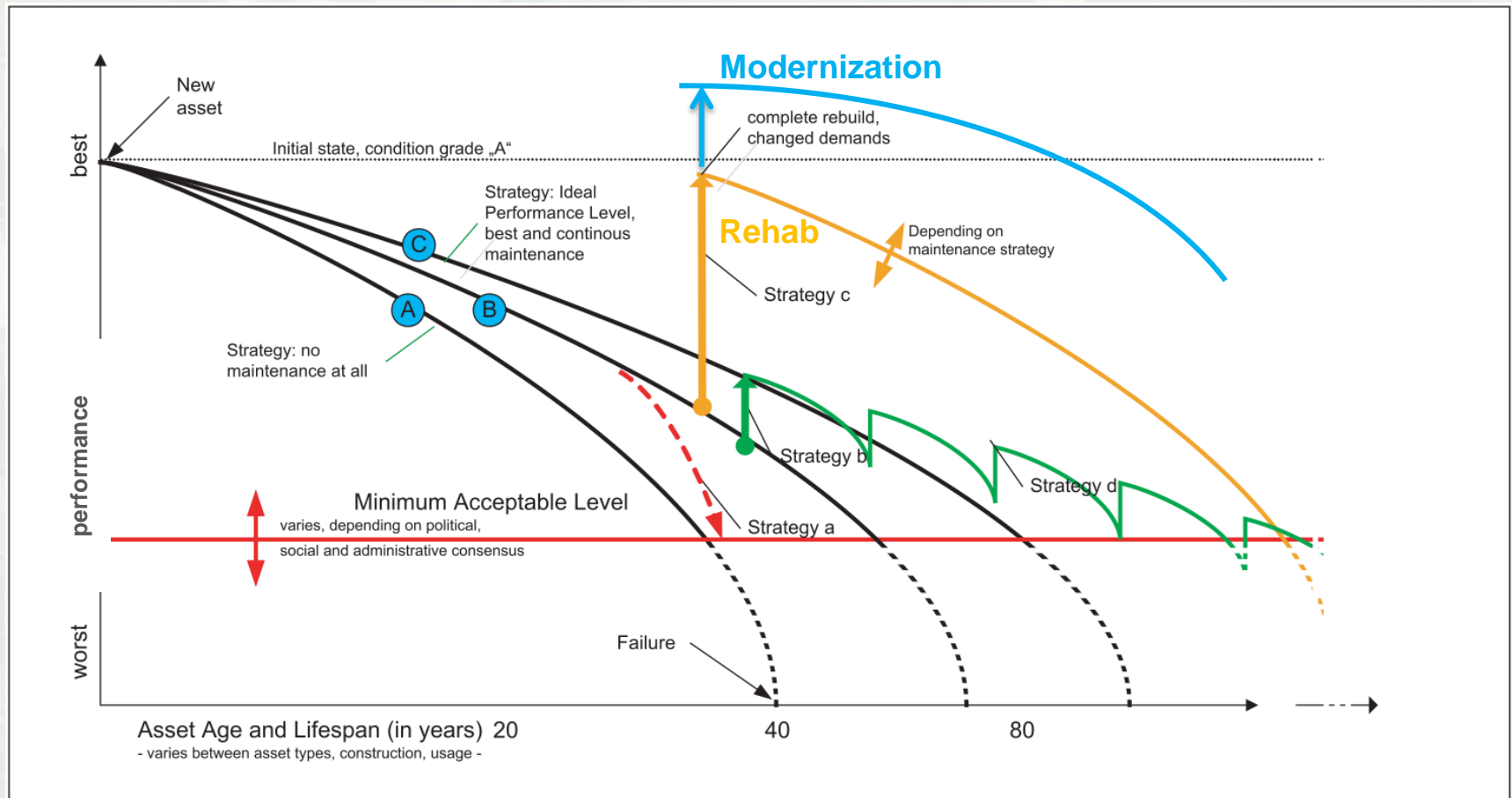
Risk = Probability of Failure x Consequences → Investment Priority

			Condition				
			F (1)	D (2)	C (3)	B (4)	A (5)
Consequence			Failed	Poor	Fair	Good	Excellent
Consequence Category	1	High	1	2	6	10	15
	2	Medium High	3	5	9	14	19
	3	Medium	4	8	13	18	22
	4	Low	7	12	17	21	24
	5	Minimal	11	16	20	23	25

	High Relative Risk
	Med-High Relative Risk
	Medium Relative Risk
	Low Relative Risk
	Minimal Relative Risk



Lifecycle Portfolio Management



Report of PIANC Working Group 25 InCom

8

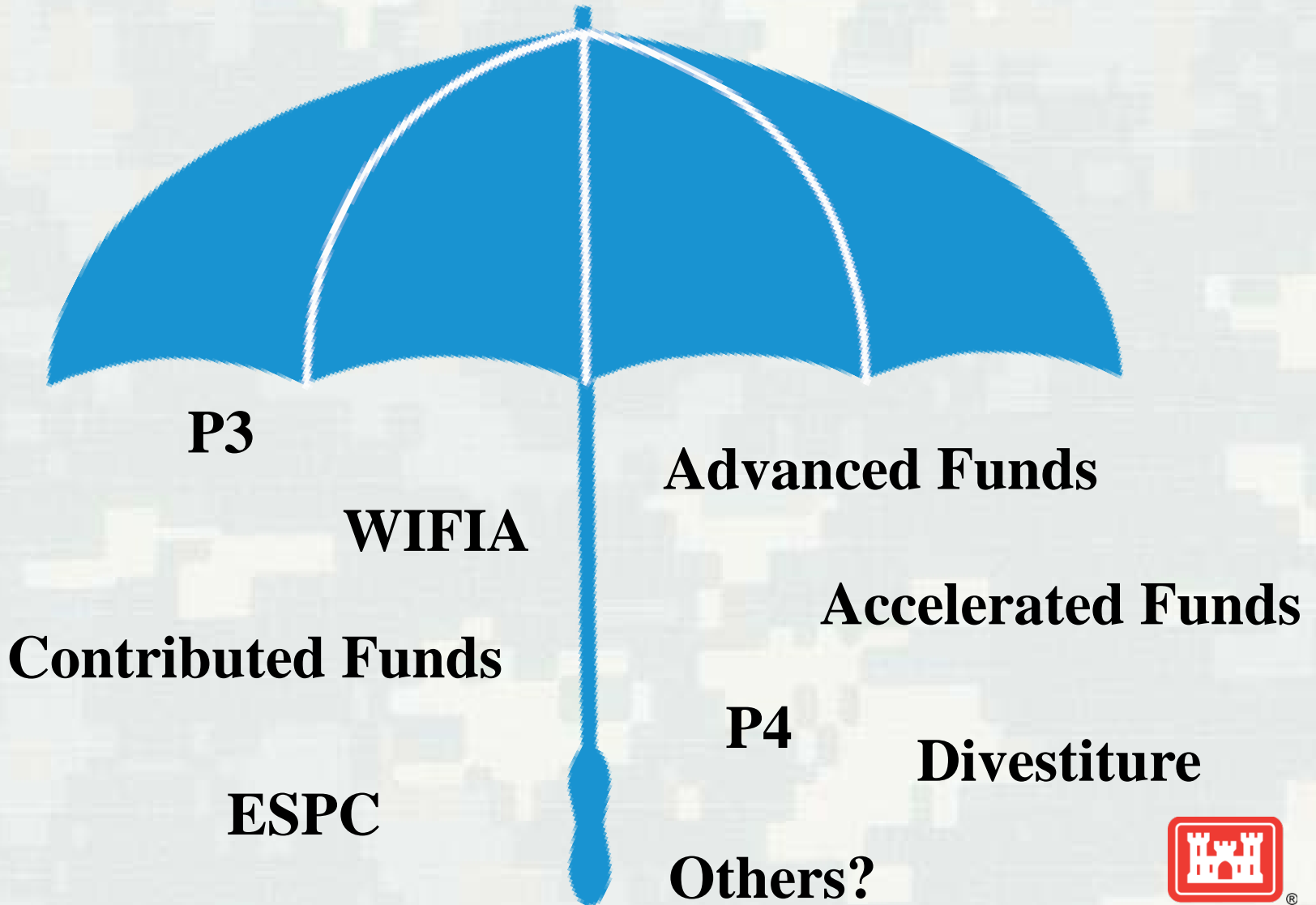
Fig. 1

InCom_ReportWG25.indd 8

28/03/2006 10:12:37



Alternative Financing



Key P3/P4 Principles

- **Federal P3/P4 Background and Operating Context**

- ▶ P3/P4 Not as Mature in US: Municipal Bond Market, Unique US Risk Profile
- ▶ P3/P3 is Essentially Another Acquisition Tool, Though Complex & Longer Term
- ▶ P3/P4 Cost of Money and Investor ROI, and Primacy of Federal/Taxpayer Equities
- ▶ P3/P4 Application in Water Resources Context Presents Challenges

- **P3/P4 Can Help the Corps/Sponsors Address Two Critical National CW Infrastructure Challenges**

- ▶ Existing Infrastructure: Sustain Performance, Extend Service Life, and/or Buy Down Risk for the Nation
- ▶ New Infrastructure: Accelerate Delivery, Reduce Life Cycle Costs and Achieve Earlier Accrual of Project Benefits to the Nation

- **Three Primary P3 Revenue Generation Mechanisms**

- ▶ User Payments
- ▶ Availability Payments (Federal Budget)
- ▶ Commercial/Ancillary Revenues



Federal P3/P4 Challenges

- **Payment Mechanisms, Availability Payments**
 - ▶ Inability to Make Commitments on Future Appropriations
- **Budget Scoring**
 - ▶ Scores Full Federal Project Cost Up Front in First Year
- **Revenue Generation and Ring-Fencing**
 - ▶ Ability to Collect, Retain and Reinvest Fees/Charges
- **Budgetability**
 - ▶ Prioritization of Projects Within Current Budget Policy (Benefit-Cost Ratio)



RSM/Beneficial Use = Sustainable Solutions for.....

**Navigation/
Dredging**



**Flood Risk
Management**



**Environmental
Restoration**



RSM Operating Principles

- Recognize sediment as a regional resource
- Balanced, economically viable, environmentally sustainable solutions
- Improve economic performance by linking multiple projects
- Optimize operational efficiencies & natural exchange of sediments
- Local actions with regional benefits
- Apply/develop technology & tools to optimize system
- Share information & data, reduce data duplication
- Coordinate/Communicate/Collaborate



Stakeholders and Partnering are Key



- Leverage Efforts Through Partnerships
- Understand and communicate Civil Works Value to Nation
- Find consensus on Major Initiatives
 - Identify Funding to Reach Outcomes
 - Engage in Dialogue
- Be mutually supportive
- Shared Messages
- Involve & Engage End-Users
- Seek to Influence Decision-Makers



BUILDING STRONG®

WRRDA 2014 Section 2106

- Focus: Donor and Energy Port rebates
 - Section 2106 involves the provision of funds to ports for work that is traditionally a non-Federal responsibility
 - California eligible ports: Long Beach and Los Angeles (Donor) with % determined by the amount of HMTF project contribution
 - Up to \$25M total for Donor and \$25M for Energy Transfer Ports (depends on Appropriation). \$12.5M for all Donor in FY16WP.
 - Can be provided as rebate payment directly to shippers directly by Customs
 - Can be used for non traditional, expanded uses such as berth dredging, dredging and placement of legacy contaminated sediment and environmental remediation related to berths and Federal navigation channels

Work done by Corps or Port directly



Closing Thoughts

- Addressing the Nation's Infrastructure Investment Gap is a Shared Federal, State and Local Responsibility
- The Corps Doesn't Deliver Anything by Itself... Critical that We Not Lose Focus on Our Partners and Our Commitments
- Navigation Investment is Essential for the Nation's Global Trade and International Competitiveness
- Navigation Investment is Key to Economy, Jobs, and Exports
- Infrast Investment: Financial (and Generational...) Challenge
- Crucial that Infrastructure Investment Shift to More of a National Policy Priority



What are **YOUR** ideas?

BUILDING STRONG®

Questions ???



BUILDING STRONG[®]

As of: <date>
POC: <name>

USACE Heritage

241 Years of Service to the Nation

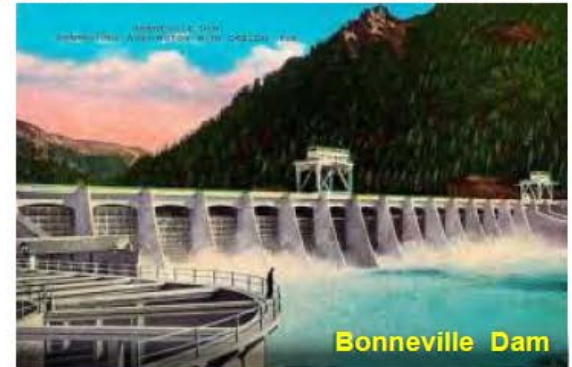
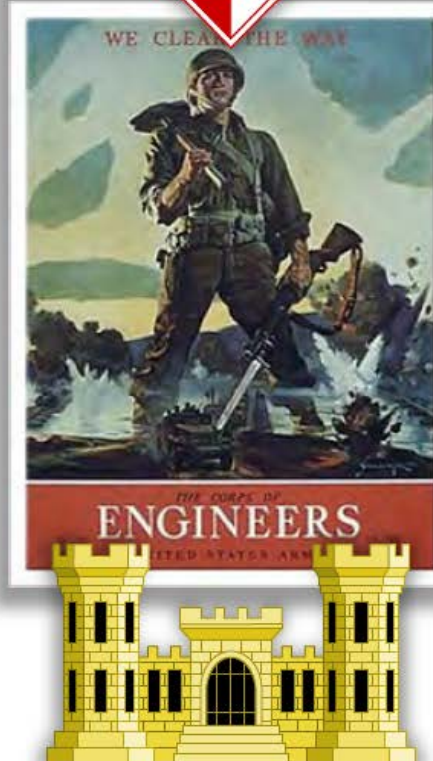
Washington Monument
Lincoln Memorial
U.S. Capitol



Panama Canal



Wankel T. Rex



Bonneville Dam



The Pentagon



Kennedy Space Center