

STATUS OF INLAND WATERWAYS 2020 CAPITAL INVESTMENT STRATEGY

Inland Waterways Users Board
Meeting No. 94 (virtual)

Michael E. Ott
Chief, Navigation Branch

22 July 2020



Upper Ohio River Montgomery lock & dam



Upper Mississippi River Lock & Dam 22



Olmsted lock & dam construction photo

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REPORT HISTORY & AUTHORITY



Capital Project Business Model, USACE in partnership with IWUB prepared the report to “identify ways to improve the Corps business model, together with developing an investment strategy designed to improve and ensure the long-term viability of the IMTS.” Many of the recommendations made in the 2010 IMTS CPBM report were codified in WRRDA 2014, Section 2002.

WRRDA 2014, Section 2002, “in coordination with the Users Board, to develop and submit to Congress a report describing a 20-year strategy for making capital investments on the inland and intracoastal waterways based on the application of objective, national project selection prioritization criteria”

WRRDA 2014 also required: (4) STRATEGIC REVIEW AND UPDATE – “once every 5 years thereafter, the Secretary, in coordination with the Users Board shall (A) submit to Congress and make publicly available a strategic review of the 20-year program, which shall identify and explain any changes to the project-specific recommendations contained in the previous 20-year program.”



2010 CPBM



Initial 20-yr Report drafted in 2015 & published in March 2016.



5-yr Strategic Review / Update

The 2020 Capital Investment Strategy is a statutory requirement which began with the Capital Project Business Model in 2010



TEAM MEMBERS



☐ CIS Team Members

<i>Michael Ott</i> , HQUSACE	<i>Daniel Cox</i> , Regional Asset Manager, LRD	Patrick Donovan, PCXIN-RED	<i>Kevin (Joe) Dziuk</i> , Asset Management, HQUSACE
Cody Eckhardt, MVD	<i>Douglas Ellsworth</i> , Senior Asset Management Specialist (retired)	Kareem El-Naggar, LRD	<i>David Frantz</i> , HQUSACE
Kevin Hace, NWP	<i>Jeanine Hoey</i> , LRP	Stephen Hrabovsky, SAM	Michael Jacobs, Cost MCX
James Nowlin, PCXIN-RED	Elaine Newbaker-London, SWD	<i>Mark Pointon</i> , IWR	<i>Michael Tarpey</i> , HQ & INDC
Pauline Thorndike, HQUSACE			

Names in *italics* are core team members

☐ Select Stakeholders

Rob Innis, IWUB Chairman, LafargeHolcom	Tracey Zea, WCI	Mike Toohey, WCI	Marty Hettel, ACBL, IWUB Chairman Emeritus
Matt Woodruff, Kirby Corp	John Doyle, Jones Walker	Mike Monahan, IWUB Vice Chair, Campbell Transportation	Amy Larson, National Waterways Conference

USACE developed the Capital Investment Strategy using an enterprise team from within USACE and in consultation with industry and the IWUB.



REPORT DEVELOPMENT PROCESS & TIMELINE



☐ **USACE & Stakeholder coordination:**

- ☐ USACE Senior Leader Interaction. Meetings “one-on-one” used to inform & educate stakeholders
- ☐ IWUB Briefings: Formal briefings at regular IWUB meeting.
- ☐ Webinars/Teleconferences: Regular (several times per month) 1-hour working meetings with stakeholders which provided an opportunity for feedback.
- ☐ Face-to-Face Meetings: The F2F meetings (1/2 or day) had in-depth briefings and provided the extended opportunity to coordinate, and collaborate which were extremely useful in developing the prioritization methodology, project planning, and sequencing.

☐ **Key Meetings:**

- ☐ January 2019 USACE team formation
- ☐ May 2019 CIS briefing at IWUB Meeting #91
- ☐ July 2019 face to face meeting with stakeholders
- ☐ August 2019 face to face meeting with stakeholders
- ☐ September 2019 CIS briefing at IWUB Meeting #92
- ☐ October 2019 F2F/virtual meeting with stakeholders
- ☐ February 2020 CIS briefing at IWUB Meeting #93
- ☐ April 2020 virtual information meeting with IWUB members

USACE formally partnered with and briefed the IWUB on the outcomes of the strategy as required by statute.



CIS METHODOLOGY



Categorize



Filter



Prioritize

Category	Description	Tools
1	Ongoing Construction	Weighted Analysis / Expert Elicitation
2	New Construction Authorized	Weighted Analysis/ Expert Elicitation
3	Ongoing Studies	Planning policy & processes
4	Future Potential Projects	Operational Risk Exposure

Attribute	Sub-Attribute
1 Economic	
	1.1 RBRCR (Remaining Benefit to Remaining Cost Ratio)
	1.2 BCR (Benefit Cost Ratio)
2 Reliability & Condition	
	2.1 Reliability
	2.2 Condition
3 Lock Utilization	
	3.1 Redundancy
	3.2 Delays
	3.3 Lockages
4 National Significance	N/A

Attribute	Attribute Name	Weight
1	Economic	9%
2	Reliability and Condition	38%
3	Lock Utilization	17%
4	National Significance	36%



ATTRIBUTE DEFINITIONS



<u>Attribute</u>	<u>Sub-Attribute</u>	<u>Description</u>
Economic	RBRCR	Remaining Benefit - Remaining Cost Ratio
	BCR	Benefit - Cost Ratio
Reliability and Condition	Reliability	Average number of closure days per year for maintenance (scheduled & unscheduled) over the last 10 years. This was the average annual duration (hours) the lock was out of service due to: maintenance of lock or equipment, lock hardware or equipment malfunction, debris clearance, repair of lock or hardware, inspection or testing, lock staff attending to other duties, or ice on lock equipment.
	Condition	Based on Operational Condition Assessment data
Lock Utilization	Redundancy	The site has no 2 nd lock, 2 nd lock chamber (full sized or smaller), or an alternate route.
	Delays	LPMS data. This reflects all delays (hours) regardless of weather, maintenance, etc. Due to inconsistencies with how and why delay is reported this attribute was left in aggregate form.
	Lockages	LPMS data. This attribute was taken from evaluating the average number of all lockages per year at each location to include commercial and recreation.
National Significance	N/A	The national significance attribute is qualitative based on “expert elicitation”. It purpose is to ensure that high importance projects are not excluded from consideration by primary indicators such as tonnage or economic value. Some key considerations for this attribute include: transit of strategic cargo, export of energy and agricultural products, and waterways which are the most economic mode of transport.



CATEGORY 1 AND 2 PRIORITIZED RESULTS



Category 1

<u>Group</u>	<u>Project Title</u>	<u>Project Location</u>	<u>State</u>
A	Olmsted Locks and Dam	Ohio River	IL
B	Locks and Dams 2, 3, and 4, Monongahela River Navigation Project	Monongahela River	PA
C	Kentucky Lock Addition	Tennessee River	KY
D	Chickamauga Lock	Tennessee River	TN

Category 2

<u>Group</u>	<u>Project Title</u>	<u>Project Location</u>	<u>State</u>
A	Upper Mississippi River - Illinois Waterway System Navigation and Ecosystem Sustainability Program (NESP)	Lock & Dam 25 (Mississippi River)	MO
A	Three Rivers	MKARNS	AR
A	Upper Ohio Navigation Locks & Dams Improvements	Montgomery Locks and Dam	PA
A	Upper Mississippi River - Illinois Waterway System Navigation and Ecosystem Sustainability Program (NESP)	LaGrange Lock & Dam (Illinois Waterway)	IL
B	Upper Mississippi River - Illinois Waterway System Navigation and Ecosystem Sustainability Program (NESP)	Lock & Dam 24 (Mississippi River)	MO
B	MKARNS 12 ft. channel	MKARNS	AR / OK
B	Upper Ohio Navigation Locks & Dams Improvements	Emsworth Locks and Dam	PA
B	Upper Mississippi River - Illinois Waterway System Navigation and Ecosystem Sustainability Program (NESP)	Lock & Dam 22 (Mississippi River)	MO
C	Upper Mississippi River - Illinois Waterway System Navigation and Ecosystem Sustainability Program (NESP)	Lock & Dam 21 (Mississippi River)	IL
C	Upper Mississippi River - Illinois Waterway System Navigation and Ecosystem Sustainability Program (NESP)	Peoria Lock & Dam (Illinois Waterway)	MO
C	Upper Ohio Navigation Locks & Dams Improvements	Dashields Locks and Dam	PA
D	Upper Mississippi River - Illinois Waterway System Navigation and Ecosystem Sustainability Program (NESP)	Lock & Dam 20 (Mississippi River)	MO
D	Thomas O'Brien Lock & Dam major rehabilitation	Illinois Waterway	IL

Group A

Group 2

Group C

Group D

Groups represent projects with similar priority



CATEGORY 3 PROJECTS



<u>Project Title</u>	<u>Project Location</u>	<u>Status</u>
Bayou Sorrel Lock	GIWW	Study inactive. Benefits need to be re-evaluated using current waterborne data.
Calcasieu Lock	GIWW	Study closed due to lack of benefits. No further action planned.
GIWW, Brazos River Floodgates	GIWW	Study complete. Awaiting WRDA construction authorization.
GIWW, Colorado River Locks	GIWW	Study complete. Awaiting WRDA construction authorization.
GIWW, High Island to Brazos River, TX	GIWW	Study ongoing, expected completion in 2020.
GIWW, Port O'Connor to Corpus Christi Bay, TX	GIWW	Inactive study; awaiting funding to restart.
Inner Harbor Navigation Canal Lock	New Orleans, LA	Study ongoing. Additional work required to address review comments. Revised scheduled completion in 2022.
The Dalles Major Rehabilitation Study	Columbia River	Ongoing MRR study.

Note: Studies are funded by Investigations for specifically authorized studies and O&M for major rehabilitations

- Calcasieu Lock & Inner Harbor Navigation Canal (IHNC) Lock, while authorized for construction, require additional study work before starting PED. Therefore, these project are included Category 3 in 2020 CIS.
- Projects are NOT listed in priority order.



CATEGORY 4 POTENTIAL STUDIES



Program Name	Project Name	Site Name
Ohio River Locks And Dams, WV, KY & OH	Ohio River Locks and Dams	Greenup Lock
Illinois Waterway, IL & IN	Illinois Waterway IL and IN	Starved Rock
McClellan-Kerr Arkansas River Navigation System, AR	McClellan-Kerr Arkansas River Navigation System	David D. Terry
McClellan-Kerr Arkansas River Navigation System, AR	McClellan-Kerr Arkansas River Navigation System	Ozark-Jeta Taylor
McClellan-Kerr Arkansas River Navigation System, AR	McClellan-Kerr Arkansas River Navigation System	Webbers Falls
Ohio River Locks and Dams, PA, OH & WV	Ohio River Locks and Dams	Pike Island
Mississippi River Between Missouri River and Minneapolis, IL	Mississippi River Between Missouri River and Minneapolis	Melvin Price
McClellan-Kerr Arkansas River Navigation System, AR	McClellan-Kerr Arkansas River Navigation System	Lock No. 2 & Mills Dam
McClellan-Kerr Arkansas River Navigation System, OK	McClellan-Kerr Arkansas River Navigation System	Robert S. Kerr Lock & Dam
Ohio River Locks And Dams, WV, KY & OH	Ohio River Locks and Dams	Meldahl Locks & Dam
Illinois Waterway, IL & IN	Illinois Waterway IL and IN (NDC)	Dresden Island Lock
Monongahela River, PA		Braddock Lock & Dam
Ohio River Locks and Dams, PA, OH & WV	Ohio River Locks and Dams	New Cumberland
Ohio River Locks and Dams, WV, KY & OH	Ohio River Locks and Dams	Racine Lock
Ohio River Locks and Dams, WV, KY & OH	Ohio River Locks and Dams	Belleville Lock
Ohio River Locks and Dams, WV, KY & OH	Ohio River Locks and Dams	Willow Island Lock
Kanawha River Locks and Dams, WV	Kanawha River Locks and Dams	London Lock
Kanawha River Locks and Dams, WV	Kanawha River Locks and Dams	Marmet Dam
Kanawha River Locks and Dams, WV	Kanawha River Locks and Dams	Winfield Lock
Ohio River Locks and Dams, PA, OH & WV	Ohio River Locks and Dams	Hannibal Lock
Illinois Waterway, IL & IN	Illinois Waterway IL and IN	Brandon Road Lock
Upper Mississippi River	Upper Mississippi River	Lock No. 18

- Projects are NOT listed in priority order.



CONSTRUCTION SCENARIOS



☐ **Assumptions:**

- ☐ Ongoing construction funding represents efficient funding profile
- ☐ Costs are inflated following USACE published rates
- ☐ IWTF revenue in 2020 estimated at \$120M and grows 1.5% annually
- ☐ IWTF minimum balance is \$20M. New construction was not started if IWTF balance would drop below \$20M.

☐ **Baseline Scenario:** \$240M per year (\$120M Fed / \$120M IWTF) which grows 1.5%/year

- ☐ Construction complete on 9 projects and 2 projects construction is ongoing. Expend \$5.696B in 20-year analysis.
- ☐ Completed construction on all 15 projects in 2053 and cost \$9.23B.

☐ **Enhanced Scenario:** \$400M per year which grows 1.5%/year

- ☐ Complete construction on 15 projects in 2039 and cost \$7.80B.

☐ **Accelerated Scenario:** 10-yr construction completion

- ☐ Complete construction on all 15 projects in 2033 and cost \$7.05B.

Scenarios shows impact that different funding has on schedule and costs.



“BASELINE” \$240 MILLION



20-YR DESIGN TOTAL:	\$ 348.81	Design Cost:	\$ 6.7	\$ 10.6	\$ 29.4	\$ 13.5	\$ 1.2	\$ -	\$ 9.2	\$ 25.3	\$ 29.4	\$ 26.9	\$ 10.4	\$ 9.3	\$ 14.7	\$ 28.6	\$ 20.1	\$ 22.3	\$ 12.4	\$ 21.3	\$ 35.1	\$ 22.6
20-YR CONSTRUCTION TOTAL:	\$ 5,696.14	Construction Cost:	\$ 247.7	\$ 248.5	\$ 281.7	\$ 275.0	\$ 180.7	\$ 260.1	\$ 306.5	\$ 299.2	\$ 228.4	\$ 247.4	\$ 258.4	\$ 305.8	\$ 315.0	\$ 324.5	\$ 356.9	\$ 199.9	\$ 250.4	\$ 308.0	\$ 390.5	\$ 411.3

Project	Project Description	Waterway	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039	FY2040
Olmsted Locks & Dam	New locks and dam.	Ohio																				
Locks & Dams 2, 3, & 4 Monongahela River Navigation	New Lock	Monongahela																				
Kentucky Lock Addition	New Lock	Tennessee	169.4	169.1	186.3	121.0																
Chickamauga Lock	New Lock	Tennessee	78.3	79.4	95.4	47.0																
NESP Upper Miss. River L&D 25	New 1200ft lock	Mississippi	6.7	10.6	6.6	107.0	110.2	113.5	116.9	120.4	23.9											
Three Rivers	channel protection	MKARNS			5.5	5.6	70.5	84.5	87.1	11.1												
Upper Ohio - Montgomery L&D	New 600 ft lock	Ohio			17.4	7.9	1.2	62.1	102.6	167.7	204.6	145.1	26.4									
NESP IWW LaGrange L&D	New 1200ft lock	Illinois							9.2	15.8	13.0	102.3	105.3	108.5	111.8	115.1	38.1					
NESP Upper Miss. River L&D 24	New 1200ft lock	Mississippi							9.5	16.3	16.8	126.7	130.5	134.4	138.4	142.6	42.6					
MKARNS 12' Channel	channel deepening	MKARNS										10.1	10.4	66.8	68.8	70.9	73.1	51.0	20.5			
NESP Upper Miss. River L&D 22	New 1200ft lock	Mississippi												9.3	14.7	9.1	103.2	106.3	109.5	112.7	116.1	33.0
Upper Ohio - Emsworth L&D	New 600 ft lock	Ohio														19.5	20.1	22.3	120.5	195.3	274.4	207.2
NESP Upper Miss. River L&D 21	New 1200ft lock	Mississippi																	12.4	21.3	21.9	171.1
NESP IWW Peoria L&D	New 1200ft lock	Illinois																			13.2	22.6
Upper Ohio - Dashields L&D	New 600 ft lock	Ohio																				
NESP Upper Miss. River L&D 20	New 1200ft lock	Mississippi																				
TJ O'Brien	Major Rehabilitation	Illinois																				

Key points:

- In 20-yr planning window, Baseline scenario will complete construction on 9 projects and partial construct 2 projects and expend \$5.696B.
- All Category 1 and Category 2 projects will be completed in 2053 and cost \$9.23B.



ENHANCED \$400 MILLION



20-YR DESIGN TOTAL:	\$ 406.39	Design Cost:	\$ 22.7	\$ 12.7	\$ -	\$ 8.4	\$ 30.7	\$ 47.8	\$ 32.0	\$ -	\$ 26.6	\$ 34.1	\$ 74.9	\$ 53.8	\$ 62.7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
20-YR CONSTRUCTION TOTAL:	\$ 7,800.43	Construction Cost:	\$ 247.7	\$ 248.5	\$ 508.8	\$ 448.6	\$ 345.7	\$ 311.2	\$ 343.3	\$ 403.0	\$ 366.3	\$ 377.3	\$ 388.6	\$ 544.1	\$ 391.6	\$ 747.2	\$ 695.3	\$ 642.6	\$ 429.2	\$ 268.3	\$ 93.1	\$ -	\$ -

Project	Project Description	Waterway	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039	FY2040
Olmsted Locks & Dam	New locks and dam.	Ohio																				
Locks & Dams 2, 3, & 4 Monongahela River Navigation	New Lock	Monongahela																				
Kentucky Lock Addition	New Lock	Tennessee	169.4	169.1	185.3	121.0																
Chickamauga Lock	New Lock	Tennessee	78.3	79.4	95.4	47.0																
NESP Upper Miss. River L&D 25	New 1200ft lock	Mississippi		6.4	103.8	107.0	110.2	113.5	116.9	23.2												
Three Rivers	channel protection	MKARNS	5.2	5.3	66.4	79.7	82.1	10.5														
Upper Ohio - Montgomery L&D	New 600 ft lock	Ohio			56.8	93.9	153.5	187.2	132.8	24.2												
NESP IWW LaGrange L&D	New 1200ft lock	Illinois			14.5	11.9	93.6	96.4	99.3	102.3	105.3	34.9										
NESP Upper Miss. River L&D 24	New 1200ft lock	Mississippi			8.7	14.9	15.4	115.9	119.4	123.0	126.7	130.5	39.0									
MKARNS 12' Channel	channel deepening	MKARNS					10.0	9.2	59.4	61.2	63.0	64.9	45.3	18.2								
NESP Upper Miss. River L&D 22	New 1200ft lock	Mississippi					7.5	17.4	7.4	86.4	89.0	91.7	94.4	26.9								
Upper Ohio - Emsworth L&D	New 600 ft lock	Ohio						16.8	17.3	19.2	103.9	168.4	236.7	178.7	53.4							
NESP Upper Miss. River L&D 21	New 1200ft lock	Mississippi							17.3	135.1	139.1	143.3	147.6	152.0	43.9							
NESP IWW Peoria L&D	New 1200ft lock	Illinois								18.4	93.8	96.7	99.6	102.5	105.6	46.6						
Upper Ohio - Dashields L&D	New 600 ft lock	Ohio									18.1	20.1	104.2	168.6	236.9	179.0	55.8					
NESP Upper Miss. River L&D 20	New 1200ft lock	Mississippi									10.4	17.8	18.4	95.0	97.8	100.8	103.8	106.9	46.6			
TJ O'Brien	Major Rehabilitation	Illinois											5.9	74.1	5.9							

Key points:

- In 20-yr planning window, \$400M scenario will complete construction on 15 projects and cost \$7.80B.

[illegible]

- In 20-yr planning window, Accelerated Construction scenario will complete construction on all 15 projects and cost \$7.05B.



KEY REPORT RECOMMENDATIONS



- ☐ Annual update of project-specific data for CIS
- ☐ Adopting 5-year budgeting of inland navigation with Continuing Contracts Clause or Fully Funding projects
- ☐ Develop & Implement Strategic, System-based Lifecycle Inland Navigation Framework which includes Revised Major Rehabilitation criteria, Risk Framework, & Standardization
- ☐ Develop National Navigation Model
- ☐ Conduct WRRDA 2014, Section 2004 Inland Waterways Revenue Studies

Recommendations will transform Corps' execution of inland navigation



QUESTIONS

