

US ARMY CORPS OF ENGINEERS – CIVIL WORKS

AGENDA (10 minutes):

1. Review USACE Civil Works
2. Review Civil Works Monitoring
3. Review Civil Works Risk Management
4. Review Civil Works prioritization



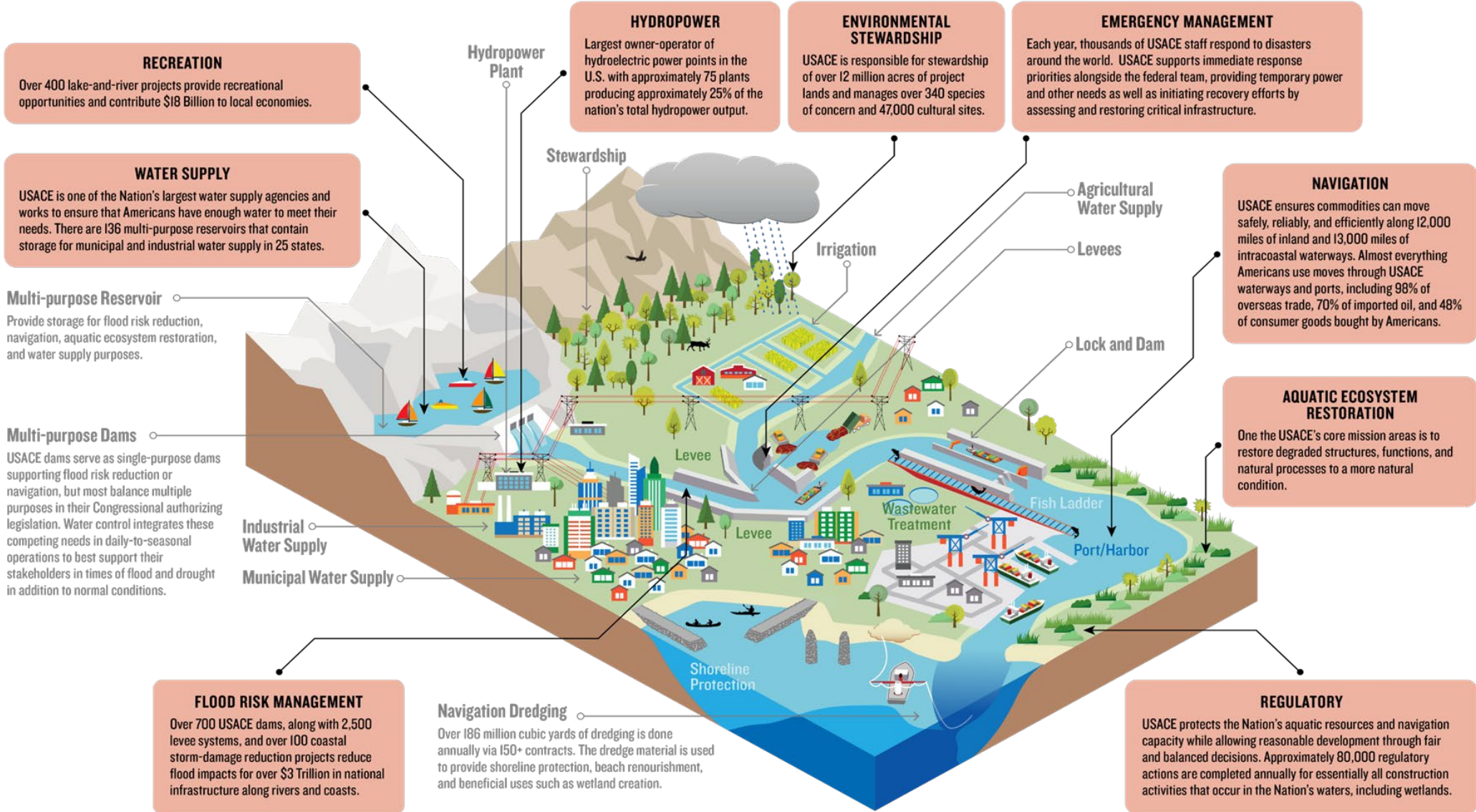
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INTEGRATED WATER RESOURCE SYSTEM



For additional information visit: <https://www.iwr.usace.army.mil/Missions/Value-to-the-Nation/>

CIVIL WORK INFRASTRUCTURE

Operates and maintains 25,000 miles of navigable waterways, channels and harbors, including 237 lock chambers at 192 sites and 1,072 harbors that directly serve 45 states.

Army Corps operates and maintains nearly 750 dams and 129 levee systems for flood risk.

Army Corps is the largest producer of hydroelectric power in the United States

- owns 75 hydropower facilities
- generating capacity of approximately 24,000 MW



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CIVIL WORK INFRASTRUCTURE - CONTINUED

Army Corps is one of the leading Federal providers of outdoor recreation with 270 million visits at more than 400 lake and river projects in 43 states. Army Corps and non-Federal entities manage over 4,800 developed recreation areas on more than 12 million acres.

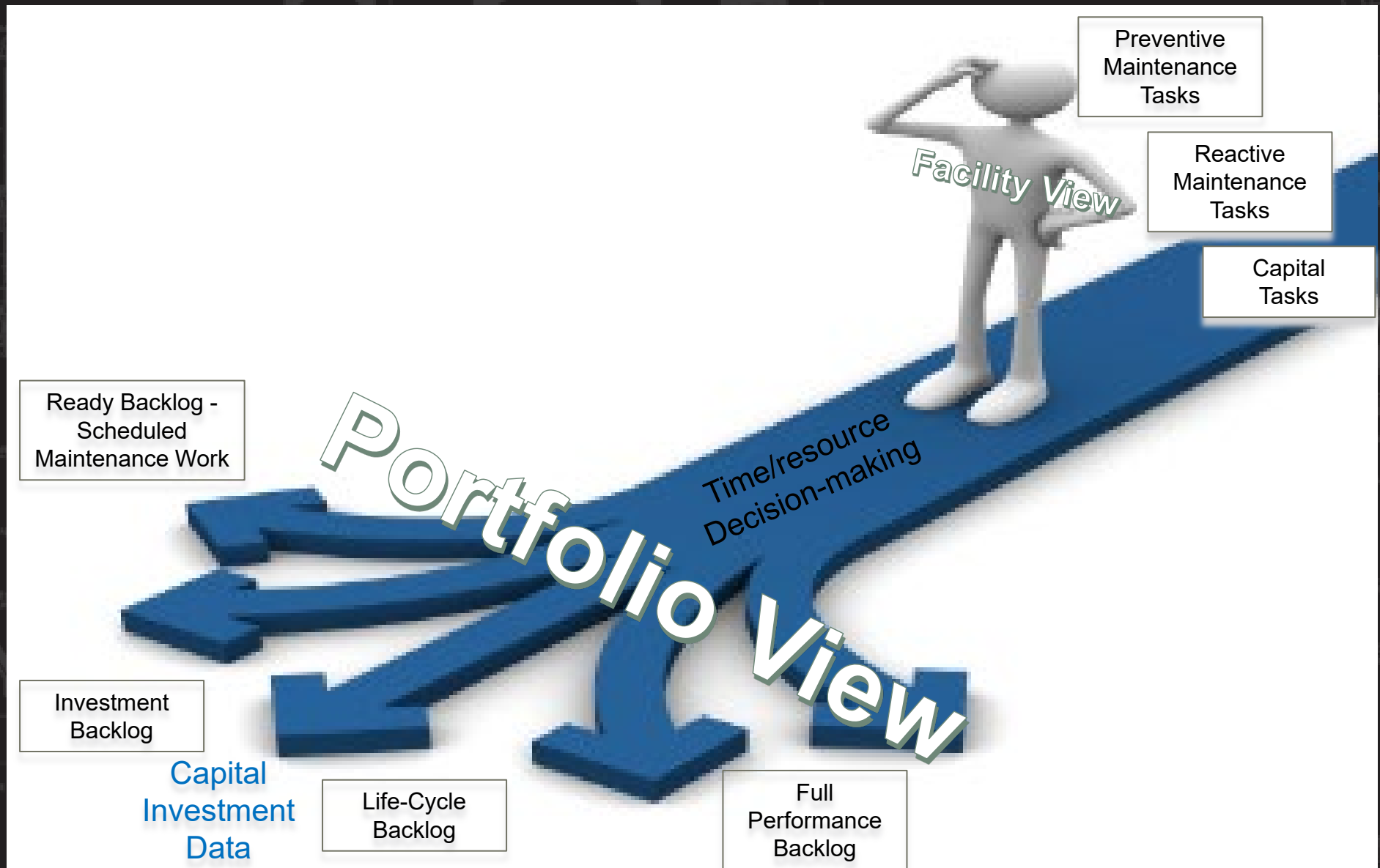
Army Corps has a total of 997 bridges. Average age is over 60 years. Four percent are over 100 years old



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CIVIL WORK INFRASTRUCTURE MONITORING



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STRATEGIC MONITORING

Maintenance Management Policy

- Portfolio needs addressed (complementing local drivers for FEM use)
- Life-cycle needs inventory
- Maintenance QA/QC

Facility inspection and condition awareness

Asset Registry

- Data integration
- Cross-functional integration





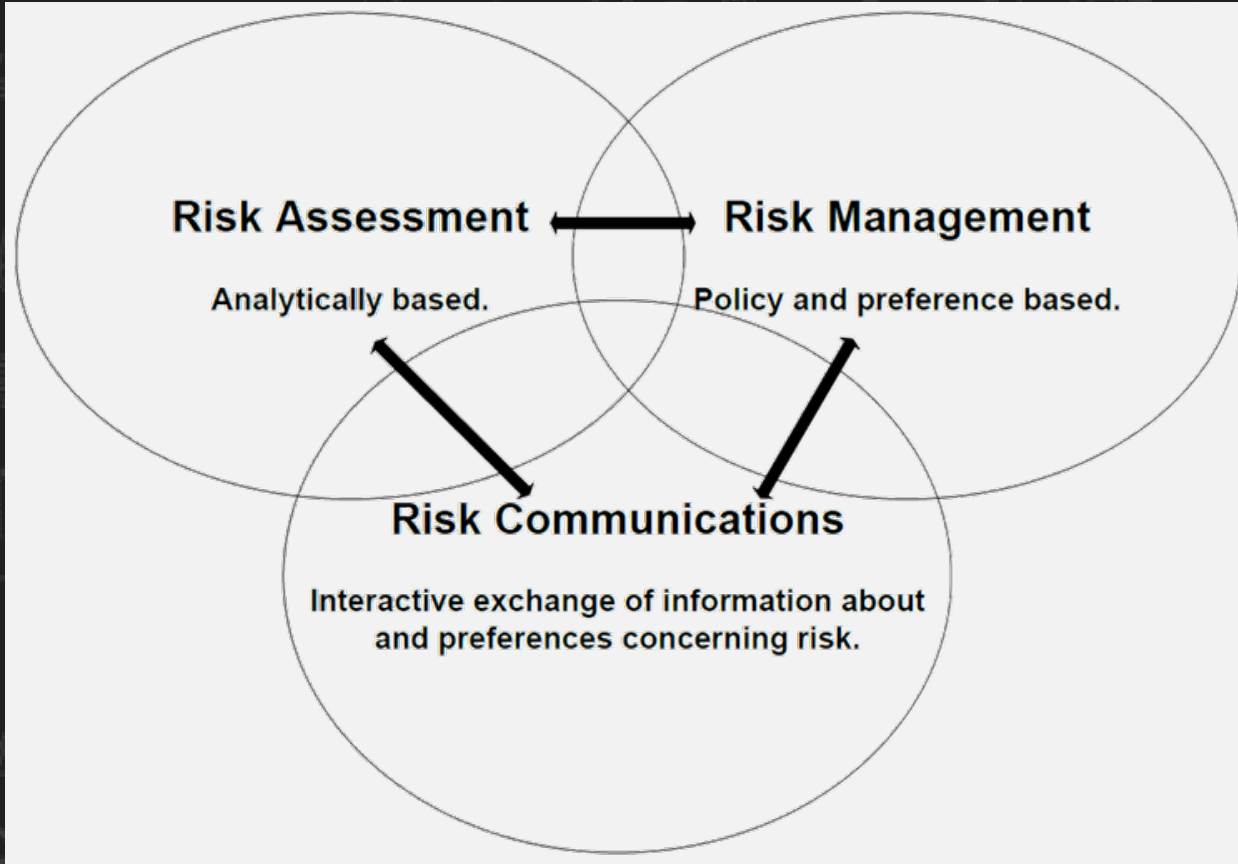
OPERATIONAL CONDITION ASSESSMENT

Rate components with school-style ratings: A, B, C, D, F & CF
 First step and basis of a risk informed budget development.
 Provides probability of failure information to compare conditions.

What's a component?

Transfer Switching (Offsite Backup Source) Lock (or Main Service)	3
Trash Racks - Culvert Intakes	149
Utility Bridge	18
Utility Crossovers/Tunnels	215
Valve Anchorage	1479
Valve Interlock Controls	658
Valve Maintenance Bulkheads	456
Vehicular Bridge (Bascule)	29
Vehicular Bridge (Fixed)	260
Vehicular Bridge (Lift)	21
Vehicular Bridge (Swing)	8
Vertical Lift Gate	864
Vertical Lift Type Gate	116
Wall Armor and Fenders	506

CIVIL WORKS RISK MANAGEMENT



		CONDITION ASSESSMENT CLASSIFICATION				
		F	D	C	B	A
CONSEQUENCE CATEGORY	I	1	3	6	10	15
	II	2	5	9	14	19
	III	4	8	13	18	22
	IV	7	12	17	21	24
	V	11	16	20	23	25

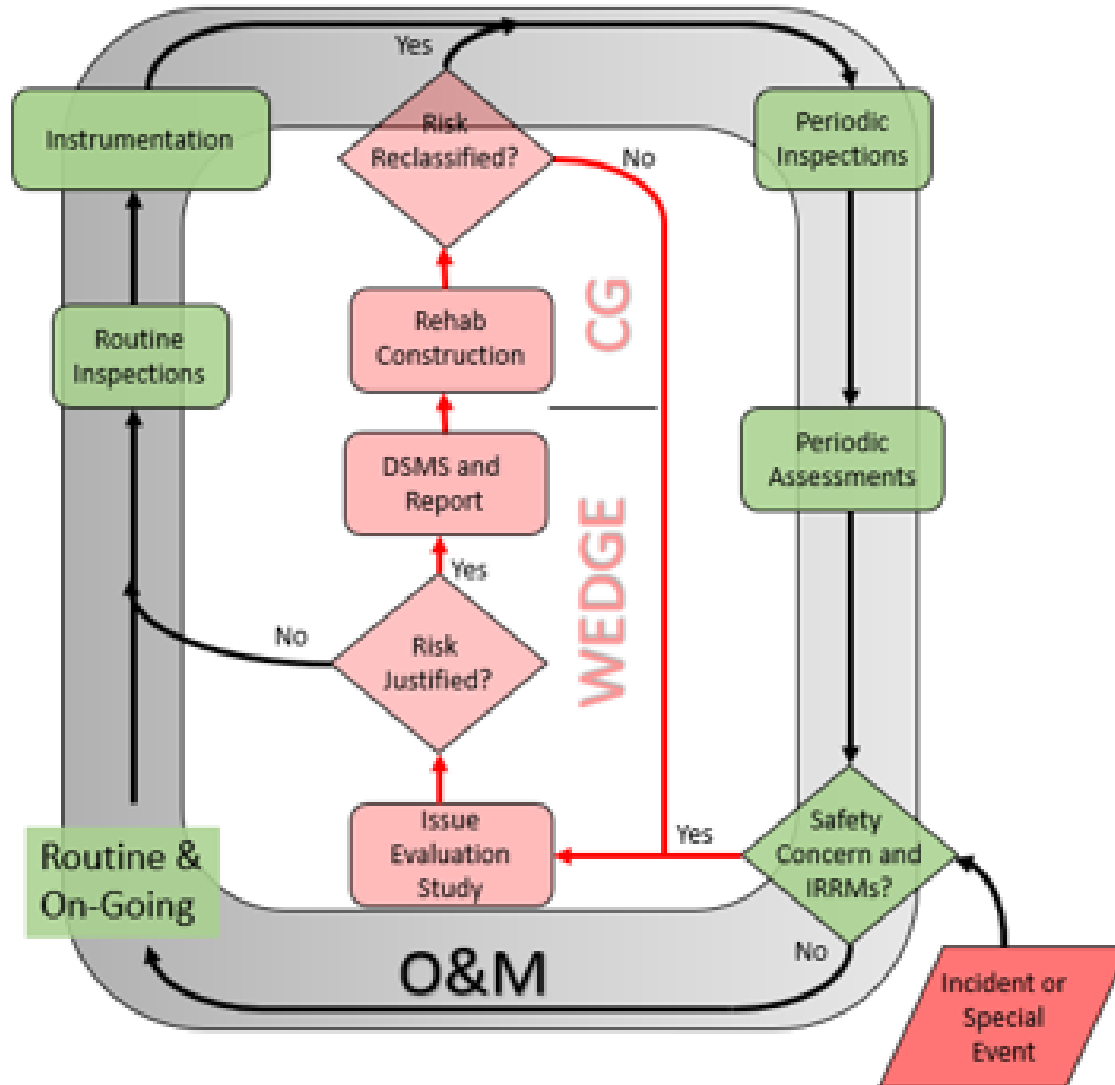


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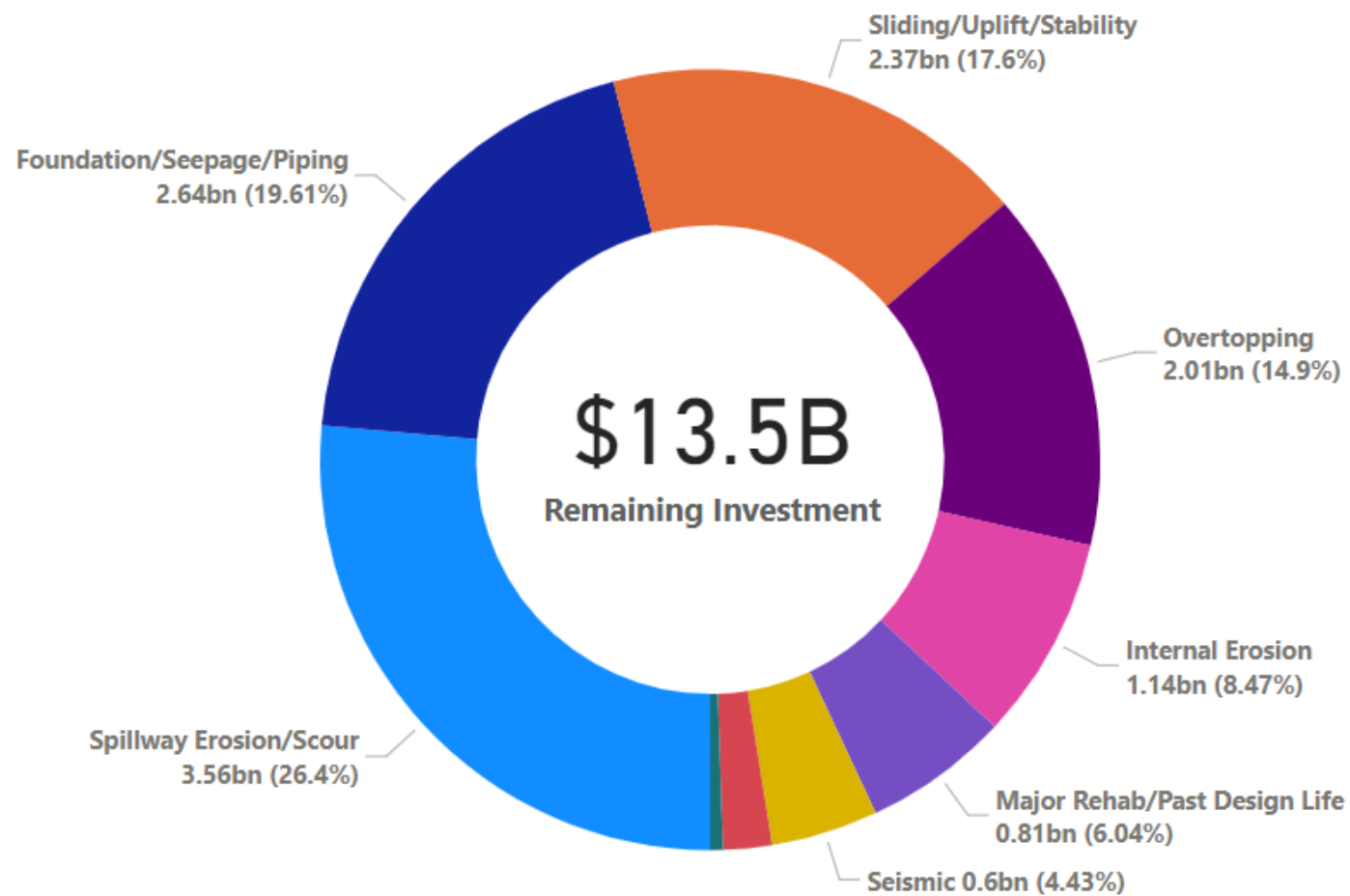
Portfolio Risk Management



1. One-time initial and coarse screening of risk assigns classification.
2. All projects remain in the outer loop, except those undergoing construction for modification. Risk assessments updated ~10 years.
3. Projects with Moderate, High, or Very High risk enter a study phase. Prioritization of studies are tied to the risk class – work on worst first.
4. If study justifies high risk, proceed to Modification study and Construction.
5. After construction, reevaluate risk and reclassify.



DAM SAFETY RISK ASSESSMENT



Identification of risk drivers

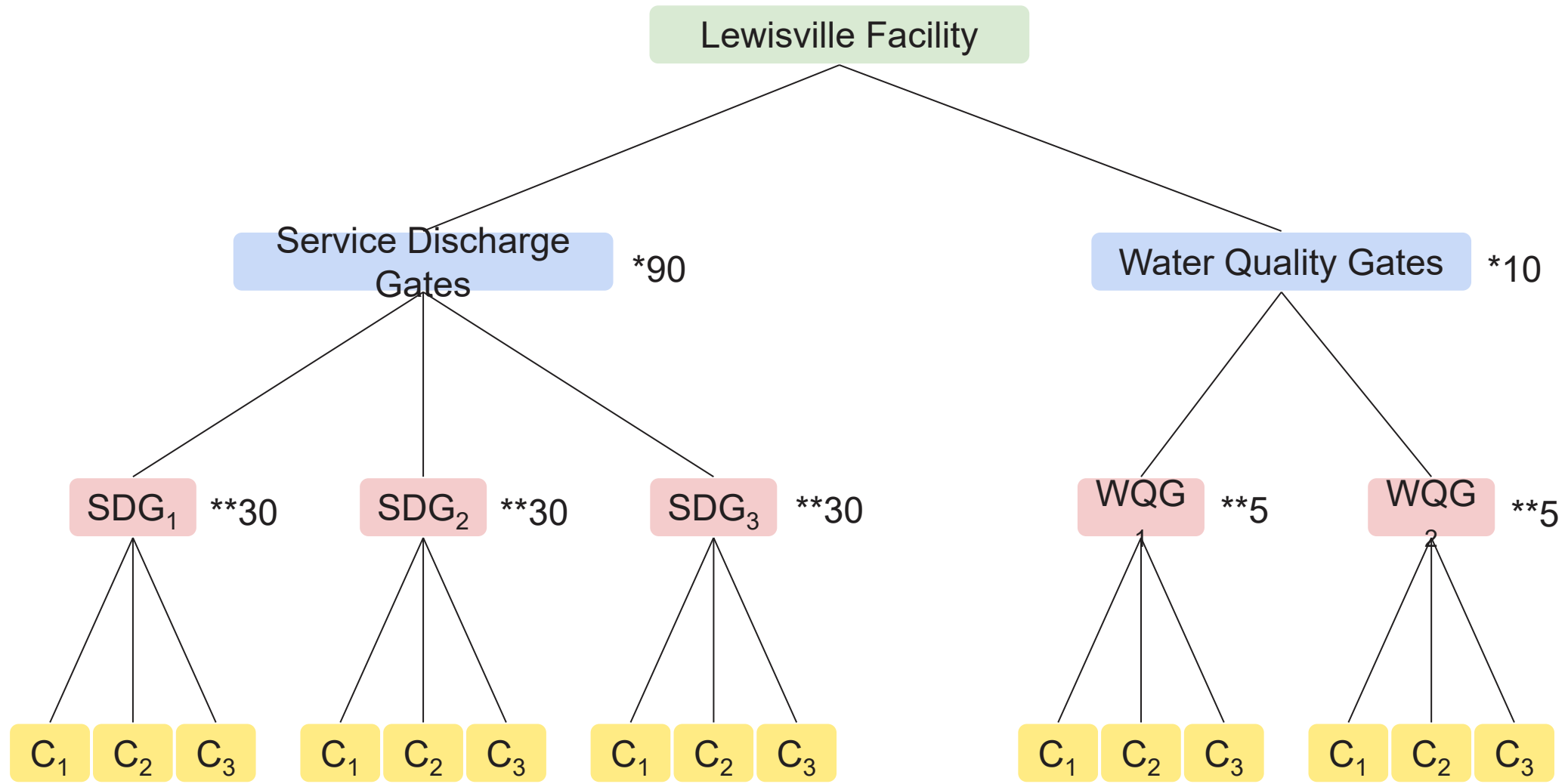
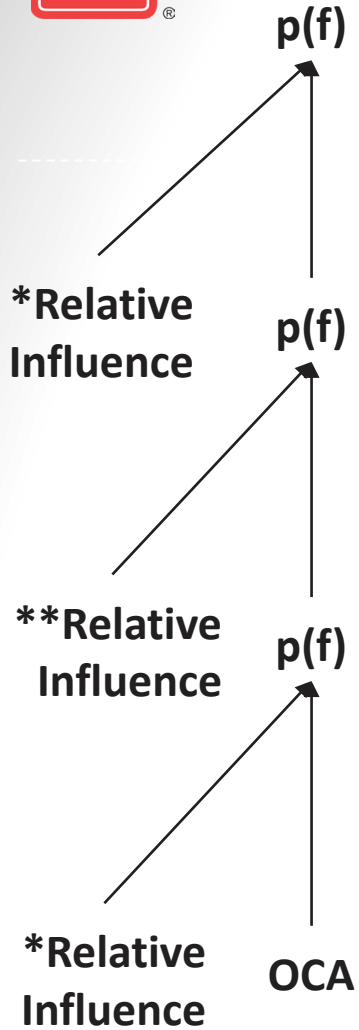
Failure mode description

Failure likelihood and categorization

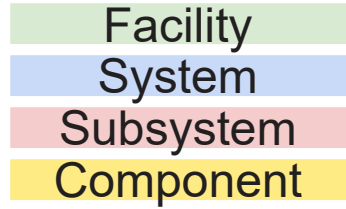
Consequence scale and categorization

Confidence estimates

Determining incremental risk and relationship to tolerable risk guidelines



*SME-elicited relative influence
 **Derived relative influence where system relative influence is spread equally across its subsystems

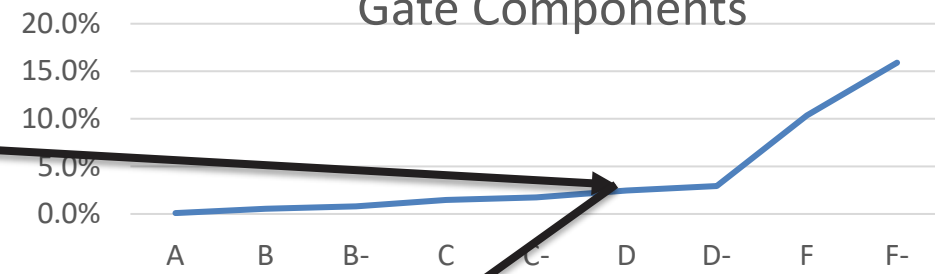




OPERATIONAL RISK ASSESSMENT

OCA:	Lindy Claiborne Boggs		Assessment Team:
Report Date	INAV	MVD>Vicksburg>Lindy Claiborne Boggs	Dziuk Kevin; Tomlinson Andrew;
9/2/2022		Last Assesment Creation: 10/16/2018	
		Last Update: 10/30/2018	
Dam Gates and Operating Machinery			
Dam Gate Structures			
Tainter Gate 1			
Horizontal Girders (Corrosion) D			
<p>The girder bracing and diaphragm bracing members below the middle girder are in critical condition due to the severe section loss and severe knife edging. The girder bracing and diaphragm bracing are in poor condition above the middle girder. Some of the bracing members have failed due to damage by debris, others are near failure due to significant loss of section.</p> <p>Component deficiencies related to corrosion have advanced to the point that function may be impaired and the HSS program manager states that the gates condition warrants a structural review. At this point the HSS PM has determined that a deficiency is significant such that a clear mode of failure can be substantiated.</p>			

Weibull Function for Lock and Dam Gate Components



P(f)	Boggs SCC	Economic Risk
2.5%	\$ 846,000.00	\$ 21,150.00

Rank	Division	District	River	Facility	8 day closure SCC
1	MVD	MVK	Red	John H Overton L&D	\$ 858,000.00
2	MVD	MVK	Red	Lindy Claiborne Boggs L&D	\$ 846,000.00
3	MVD	MVK	Red	Red River L&D 3	\$ 201,000.00
4	MVD	MVK	Red	Russell B Long L&D	\$ 138,000.00
5	MVD	MVK	Ouachita & Black	Jonesville L&D	\$ 111,000.00
6	MVD	MVK	Red	Joe D Waggoner L&D	\$ 66,000.00
7	MVD	MVK	Ouachita & Black	Columbia L&D	\$ 61,000.00
8	MVD	MVK	Ouachita & Black	Felsenthal L&D	\$ 2,000.00
9	MVD	MVK	Ouachita & Black	H K Thatcher L&D	\$ -

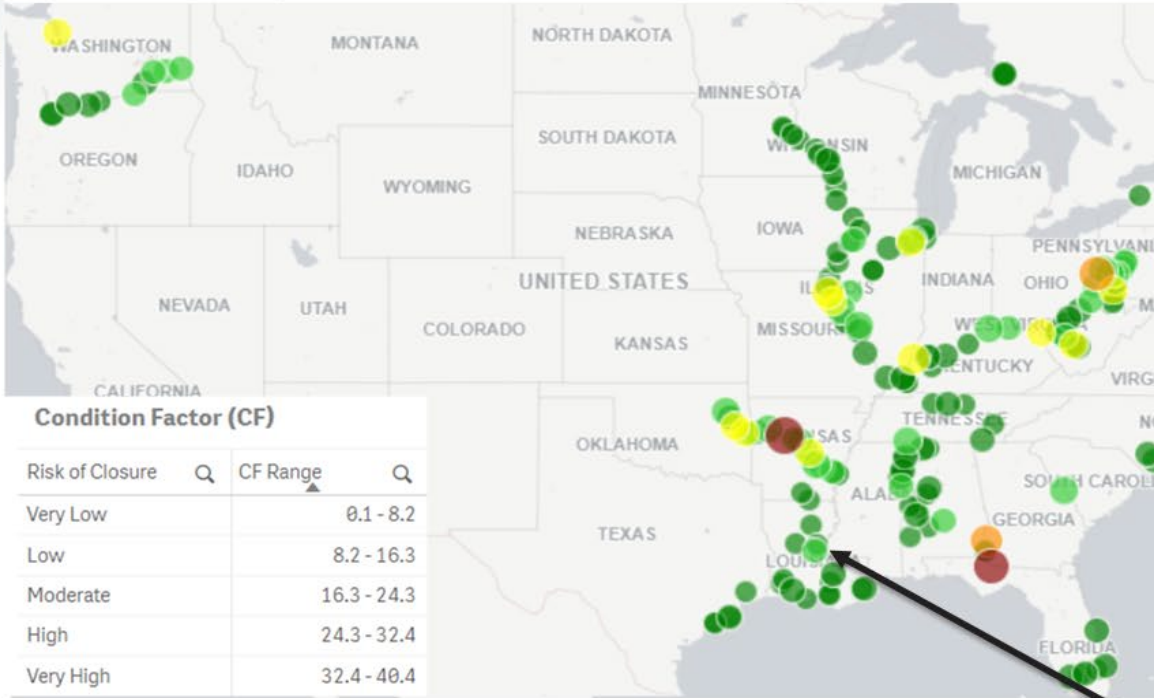
Shipper Carrier Cost (SCC), the statistical economic consequence, for an 8 day closure at these Locks and Dams



CIVIL WORKS PRIORITIZATION



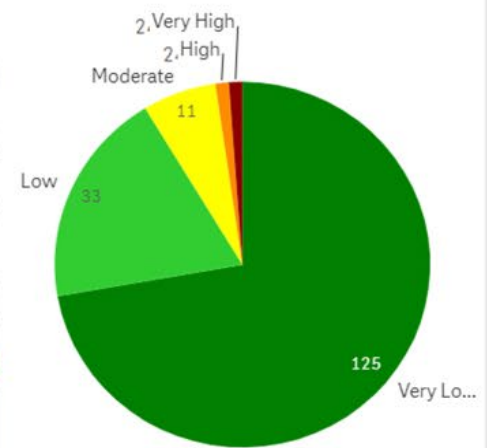
Project Risk of Closure Map



Condition Factor (CF)

Risk of Closure	CF Range
Very Low	0.1 - 8.2
Low	8.2 - 16.3
Moderate	16.3 - 24.3
High	24.3 - 32.4
Very High	32.4 - 40.4

Project Count



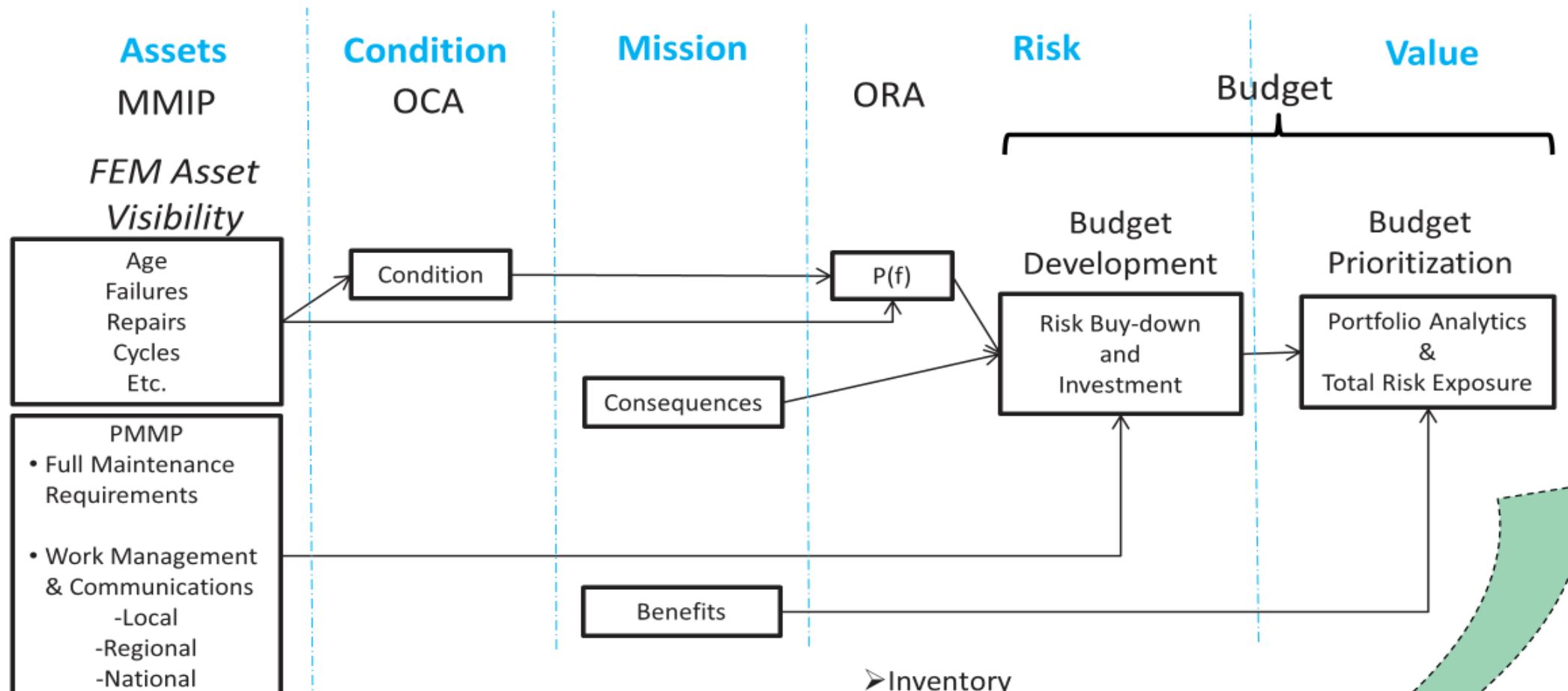
Rollup Summary as of 09/18/2022

Division	District	Project	CF Rank	CF Value	Risk of Closure	EF Rank*	EF Value
LRD	Huntington	Meldahl	34	10.4	Low	24	6,079,336
SWD	Little Rock	Toad Suck Ferry	35	10.3	Low	26	5,493,397
LRD	Pittsburgh	Allegheny 8	36	10.2	Low	0	0
LRD	Pittsburgh	Hannibal	37	10.2	Low	28	4,972,215
LRD	Pittsburgh	Allegheny 6	38	10.1	Low	146	257
NWD	Walla Walla	Lower Monumental	39	9.9	Low	92	570,013
MVD	Vicksburg	Lindy Claiborne Boggs	40	9.8	Low	53	3,014,751

Lindy Claiborne Boggs L&D is 40th in real risk across the nation. 39 other facilities have components with higher consequences of failure.



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6 information elements required for effective Lifecycle Portfolio Management:

- Inventory
- Condition
- Consequences
- Requirements
- Prioritization
- Execution

Budget Execution



FACILITY DATA NEED IN BUDGET DEVELOPMENT

- The INAV ORA webtool populates Economic Risk Reduction data to CW-IFD that is being incorporated directly into Nav budget prioritization.
- Asset downtime as reported in FEM will be useful in identifying maintenance needs that have already caused outages.
- FEM Work Order Calculated Priority is being considered as a maintenance data point useful in understanding maintenance needs.
- Continuing work, identified as PFV – A, for critical assets where maintenance has been started is a high priority to BLMs.
- O&M efficiency improvements a.k.a. sustainability
- Asset divestitures reducing O&M costs
- Environmental/legal requirements that are must fund such as fish passage or avoidance of emptying raw sewage into lakes/rivers

- As we continue to improve our asset data (maintenance history, condition, consequence, risk, downtime...) these data points will be more valuable in identifying highest priority maintenance needs.

