PLANNING FOR INNOVATION IN THE CIVIL WORKS PROJECT DEVELOPMENT PROCESS

As of 07 September 2023

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Strategic Integration Office of ERDC
Congressional Authorizations via Water Resources Development Act (WRDA)

New Science & Technology Innovation Insertion

- More Options?
- Less Time (3x3x3)
- Less $$$ (GI)

More Options?
- Conditions are “Set”
- More Time (no “3x3x3”)
- Diminishing Returns on Beneficial Effect of New Technology?

Is There a Better Way?
- More “Left of Bang” S&T Considerations?
- Account for Technological Innovation during Planning?
HOW DO YOU DEFINE INNOVATION?

Type your response in the Chat and send to “Everyone”
CIVIL WORKS PROJECT DEVELOPMENT PHASES

A. Initiation Phase
B. Feasibility Phase
C. Design Phase
D. Construction Phase
E. Operation, Maintenance, Repair, Replacement, and Rehabilitation Phase (OMRR&R)
CIVIL WORKS DEVELOPMENT PHASES

1. Identify a Problem
2. Obtain Federal Study Authority
3. Letter of Intent from Sponsor
4. Congress Appropriates Study Funds

Initiation Phase
1st Opportunity to Consider S&T Innovation.
The Earlier the Innovation Needs are Identified the Better!
CIVIL WORKS DEVELOPMENT PHASES

5. Execute Feasibility Cost Share Agreement (FCSA) and Secure Sponsor Study Funding
6. Scope and Conduct Study
8. Complete Final Feasibility Report for Coordination and Submission
10. Federal and State Agency Review
11. Sign Chief of Engineers Report
12. Administration Review of Chief of Engineers Report

Feasibility

2nd Opportunity to Consider S&T Innovation.
FIVE PARALLEL PATHWAYS FOR INNOVATION CONSIDERATION

1. Negotiate Innovation Opportunities with Non-Federal Sponsor prior to signing the FCSA
2. Water Operations Technical Support (WOTS)
3. Dredging Operations Technical Support (DOTS)
4. Statements of Need Processes
5. Request 3x3x3 Waiver
WHICH OF THE PARALLEL PATHWAYS TO FUND INNOVATION HAVE YOU USED BEFORE?

Type your response in the Chat and send to “Everyone”
WHAT ROADBLOCKS DO YOU THINK PDTs FACE WHEN IT COMES TO BEING INNOVATIVE?

Type your response in the Chat and send to “Everyone”
FEASIBILITY PHASE

Scoping and the 6-Step Risk-Informed Planning Process
RISK-INFORMED PLANNING PROCESS

- Scoping
  (1) Problems & Opportunities
  Evidence Gathering & Risk Management

- Formulation
  (2) Inventory & Forecast
  Evidence Gathering & Risk Management

- Implementation
  (3) Selection
  Implementation

- Evaluation
  (4) Evaluation & Comparison
  Sponsor, Stakeholder, Vertical Team Involvement

- Comparison
  (5) Comparison
  Deciding

- Sponsor, Stakeholder, Vertical Team Involvement

U.S. ARMY
ITERATE THE 6-STEP PLANNING PROCESS AND GATHER EVIDENCE TO REDUCE UNCERTAINTY AND MANAGE STUDY AND PROJECT RISK

Scoping

- Alternative Evaluation & Analysis
- Feasibility Analysis of Selected Plan
- Washington-level Review

Key:
- Project Management Requirements
- Decision Milestone
- Product Milestone
- FCSA Signed
- Project Management Plan, including Review Plan
- Updated throughout study as needed
- Alternatives Milestone
- Tentatively Selected Plan Milestone
- Agency Decision Milestone
- Draft Report Released for Concurrent Review
- District Final Report Transmittal to MSC
- MSC Final Report Transmittal to HQ
- Chief's Report Signed
FIRST 30 DAYS: 1ST ITERATION, UTILIZE THE KNOWLEDGE ON THE TEAM

We’ll ID our Biggest Data Gaps, Plug ‘em, then do it all again.

Are your S&T SMEs at the Table?
PROJECT INNOVATION CONSIDERATIONS

Technical Drivers

✓ **Dynamic Landscape** - Are there any technical areas or aspects of the project that could clearly benefit from incorporating science and technology advances regarding new approaches, new materials, new processes, or innovative solutions not previously considered or implemented?

✓ **Uncertainties** - Are there any technical areas or aspects of the project that are associated with significant uncertainties or based on assumptions not previously validated?

✓ **Range of Applicability** - Are there any technical areas or aspects of the project for which there are no currently applicable engineering guidelines, or the methods used in practice are outdated?

✓ **Technical Risks** - Are there any technical areas or aspects of the project that rely on technologies not yet fully validated or approaches still subject to debate by the scientific community?
PROJECT INNOVATION CONSIDERATIONS

Technical Drivers

✓ Historical Performance - Are there any technical areas or aspects of the project that are known to have triggered repeated disruptions impacting execution and delivery in circumstances similar to the ones under consideration?

✓ Stakeholder Requirements - Are there any technical areas or aspects of the project currently or potentially leading to positive interest or negative attention from external stakeholders or communities that could be addressed by alternative or modified technologies?

✓ Interdependencies - Are there any technical areas or aspects of the project that could be potentially affected by emerging technologies, global trends, interdependencies, or supply chain disruptions?

✓ Potential Benefits
  Will the incorporation of science and technology advances could yield positive outcomes by addressing key problems, opportunities, or gaps along the critical path of the project, activity, or function?
WHAT IS SCOPING?

Task 1 of Risk-Informed Planning Process

- Objectives & Constraints
- Problems & Opportunities
- Uncertainty

Scoping
Initial PDT Meeting

Hold **first planning iteration** to identify POOCs, Existing Conditions, Future Without Project Condition, Measures, Alternatives, and Key Uncertainties

Document the results in the **6 pieces of paper**

Send out scoping letters; invite **Cooperating Agencies**
30-60 DAYS: 2\textsuperscript{ND} ITERATION, UTILIZE WHAT OTHERS KNOW

This is Planning with Other People's Knowledge
SCOPING PHASE – **DAY 30-60**
(AFTER SIGNING FCSA)

- Conduct literature reviews and additional research to help reduce uncertainties.
- Hold an **Interagency Coordination Meeting**
- Hold **Planning Charrette / 2\textsuperscript{nd} Iteration**
- Fill out **Risk Register**
- Draft **Review Plan** in coordination with PCX and MSC
Establish PMP including scope of work, budget and schedule for study

What information / analyses do we need to resolve uncertainties, select a plan, and complete feasibility level design?

Hold Alternatives Milestone Meeting

Develop Vertical Team Alignment Memo (signed within 120 days)
INNOVATION EXAMPLES

USACE R&D Priorities that align with ERDC Innovations

Mitigate and Adapt Climate Change

Modernize out Nation’s Infrastructure

Support Resilient Communities

Ensure Environmental Sustainability and Resilience

Revolutionize and Accelerate Decision Making

Improve Cyber and Physical Security

Protect and Defend the Arctic

Forecast-Informed Reservoir Operations (FIRO)

Structural Health Monitoring

Coastal Hazards Rapid Prediction System

Engineering with Nature®—Lagoon created at Deer Island, Mississippi Sound

Dredging Optimization

Security Systems to Support System Authorization

H&H Modeling of Snowpack Thaw & Runoff
HOW CAN PLANNING LEADERSHIP SUPPORT AND EMPOWER PDTs TO BE MORE INNOVATIVE?

Type your response in the Chat and send to “Everyone”
CAN YOU NAME YOUR MSC S&T CADRE LEAD?

Type your response in the Chat and send to “Everyone”
## MSC, DEPUTY MSC AND ERDC DISTRICT LIAISONS
Connecting USACE MSCs and Districts to ERDC Expertise

### Great Lakes and Ohio River Division (LRD)
- **MSC Liaison:** Dr. Edmond Russo
- **Deputy MSC Liaison:** Dr. Jennifer Seiter-Moser
- **Buffalo District (LRB):** Mr. Michael Greer
- **Chicago District (LRC):** Dr. Brook Herman
- **Detroit District (LRE):** Dr. Dave Smith
- **Huntington District (LRH):** Dr. Christine VanZomeren
- **Louisville District (LRL):** Dr. Rich Fischer
- **Nashville District (LRN):** Dr. Andrew McQueen
- **Pittsburgh District (LRP):** Dr. Tony Bednar

### North Atlantic Division (NAD)
- **MSC Liaison:** Dr. Joseph (Joe) Corriveau
- **Deputy MSC Liaison:** Dr. Robert (Bert) E. Davis
- **Baltimore District (NAB):** Dr. Julie Rosati
- **New England District (NAE):** Dr. Igor Linkov
- **New York District (NAN):** Dr. Kyle McKay
- **Norfolk District (NAO):** Mr. Dave Finnegan
- **Philadelphia District (NAP):** Dr. Cary Talbot
- **Europe District (NAU):** Mr. Andy Margules

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- **Deputy MSC Liaison:** Mr. Eddie Wiggins
- **St. Paul District (MVP):** Dr. Gaurav Savant
- **Rock Island District (MVR):** Dr. Gaurav Savant
- **St. Louis District (MVS):** Mr. Eddie Wiggins
- **Memphis District (MVM):** Mr. Eddie Wiggins
- **Vicksburg District (MVK):** Mr. Keith Flowers
- **New Orleans District (MVN):** Dr. Julie Rosati

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- **MSC Liaison:** Dr. Andy Nelson
- **Deputy MSC Liaison:** Dr. Robert (Rob) M. Wallace
- **Kansas City District (NWK):** Dr. George Calfas
- **Omaha District (NWO):** Dr. George Calfas
- **Portland District (NWP):** Mr. Quincy Alexander
- **Seattle District (NWS):** Mr. Quincy Alexander
- **Walla Walla District (NWW):** Mr. Quincy Alexander

As of 07 SEP 2023
# MSC, DEPUTY MSC AND ERDC DISTRICT LIAISONS

Connecting USACE MSCs and Districts to ERDC Expertise

### Pacific Ocean Division (POD)
- MSC Liaison: Mr. Bartley (Bart) Durst
- Deputy MSC Liaison: Dr. Elizabeth Ferguson
- Alaska District (POA): Dr. Tom Douglas
- Far East District (POF): Mr. James L. Davis, Dr. Jason Roth, ST
- Honolulu District (POH): Dr. Elizabeth Ferguson
- Japan District (POJ): Dr. Elizabeth Ferguson

### South Pacific Division (SPD)
- MSC Liaison: Dr. David Horner
- Deputy MSC Liaison: Dr. Cary Talbot
- Albuquerque District (SPA): Dr. Jackie Pettway
- Sacramento District (SPK): Dr. Robert (Rob) M. Wallace
- Los Angeles District (SPL): Mr. Ivan Beckman
- San Francisco District (SPN): Mr. Ken Pathak

### South Atlantic Division (SAD)
- MSC Liaison: Dr. Ty Wamsley
- Deputy MSC Liaison: Dr. Julie Rosati
- Charleston District (SAC): Dr. Ned Mitchell
- Mobile District (SAM): Mr. Eddie Wiggins
- Jacksonville District (SAJ): Ms. Ashley Frey
- Savannah District (SAS): Dr. Ned Mitchell
- Wilmington District (SAW): Dr. Julie Rosati

### Southwestern Division (SWD)
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- Deputy MSC Liaison: Dr. Patrick (Pat) Deliman
- Fort Worth District (SWF): Dr. Rumanda Young
- Galveston District (SWG): Ms. Susan Wolters
- Little Rock District (SWL): Dr. Eric Britzke
- Tulsa District (SWT): Dr. Mandy Michalsen

### Transatlantic Division (TAD)
- MSC Liaison: Mr. Bartley (Bart) Durst
- Deputy MSC Liaison: Mr. Nicholas (Nick) Boone
- Transatlantic Expeditionary District (TAE) and Middle East District (TAM): Mr. Nicholas (Nick) Boone

### Huntsville Engineering Center (HNC)
- MSC Liaison: Dr. Andy Nelson
- Deputy MSC Liaison: Dr. Elizabeth Ferguson

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As of 07 SEP 2023
U.S. Army Corps of Engineers
RESEARCH & DEVELOPMENT

Laying the Foundation for a New Bold Era of USACE R&D
Questions?

Comments?
Project Management Plans

✓ Manage all projects with a Project Management Plan (PMP). To meet mission objectives, each project is managed under a project management plan (PMP). A PMP is a roadmap for quality project delivery. The PM and the PDT work with the stakeholder early in the project planning process to determine the stakeholder’s needs, and to refine those requirements in light of quality, safety, fiscal, schedule, legal, communications, change management and other constraints. The PDT measures its success against the expectations documented in the PMP, which is an agreement between USACE and the stakeholder that defines project objectives and project-specific quality control procedures appropriate to the size, complexity, acquisition strategy, project delivery, and nature of each product. It should be signed by all PDT members, including the stakeholder, to document their commitment to project success.

1. Scope
2. Team Identification
3. Critical Assumptions and Constraints
4. Work Breakdown Structure (WBS)
5. Schedule
6. Project Cost
7. Change Management
8. Value Engineering
9. Communications and Reporting
10. Risk Management
11. Quality Management
12. Acquisition Strategy
13. Safety
14. Data Management
15. Closeout
Content:

1. Follow the VTAM template provided via e-mail on 5 May 2022.

2. In accordance with the VTAM template, the VTAM will cover the following information:

- References
- Purpose
- Background
- Study Scope
- Plan Formulation
- Risk and Uncertainty
- Numerical Modeling Tools and Software
- Project Management Plan (PMP)
- Environmental Justice (EJ)
- Study Schedule and Funding Stream
- 3x3x3 Rule Compliance
- Vertical Team Alignment
...I’ve asked Dr. Pittman to assign ERDC LNOs to all of our MSCs and Districts. I expect that you’ll “hug” them as one of your own and treat them as valued members of your extended, virtual staff. You should develop them as you would any one of your team, so they know your missions as well as you. They’ll start by asking, “How can I support you?” and, with your help, they’ll eventually proactively come to you, before you know to ask, with solutions you couldn’t know existed. And in the process, you’ll learn the right questions to ask of our R&D team. Only this type of partnership and relationship can make us successful.

How to Join the ERDC Liaisons MS Teams Page

To join the ERDC Liaisons MS public Teams page:
1. Log into USACE MS Teams
2. Select the “Teams” icon on the left-hand side
3. Select “Join or create a team”

4. Use Search Box in upper right corner to search for TDL-CEERD-ZBS-ERDC LIAISONS. It is case sensitive, so use all caps.
5. Move your mouse over the Team site.
6. Select “Join team”

The ERDC Liaisons Teams site is officially titled: TDL-CEERD-ZBS-ERDC LIAISONS

ERDC Liaisons MS Teams Page
12 CHANNELS / GENERAL TAB POSTS

Delivering Solutions
ERDC SUPPORTS USACE’S TOP 10 RESEARCH & DEVELOPMENT PRIORITIES

1. Mitigate and Adapt to Climate Change
2. Win Future Wars
3. Modernize our Nation’s Infrastructure
4. Support Resilient Communities
5. Enable Smart and Resilient Installations
6. Ensure Environmental Sustainability and Resilience
7. Secure Reliable Installation Energy
8. Revolutionize and Accelerate Decision Making
9. Improve Cyber and Physical Security
10. Protect and Defend the Arctic