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Spend a Little, Save a Lot

Why Piloting a PFAS Treatment System Makes Good Financial Sense

- **AI in Utility Construction**
- **Securing External Funding**
- **Tips for Replacing Lead Service Lines**
- **Anti-Stagnation Valves**

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Collaborative Delivery and You

How to Decide Which Method is Best for Your PFAS Treatment Project

By Andy Sterling

Over the past decade, Collaborative Delivery Methods have made a splash in the water sector. Professionals across the industry are telling stories of shorter timelines, lower costs, and reduced owner risk in industry publications, technical sessions, and utility water coolers. While the concept has been around for some time, the acronyms, jargon, and roles are enough to keep uninitiated public works departments wondering how these delivery systems serve their construction projects.

Collaborative Delivery Methods, including Construction Manager at Risk and Design-Build, offer novel approaches to designing, procuring, and building public works projects by modifying the roles that design firms, owners, and contractors assume in traditional Design-Bid-Build projects. Based on owner and management preferences, industry relationships, budget, schedule, and risk tolerance, there's a Collaborative Delivery Method that can best suit a utility's needs while

reducing setbacks, accelerating construction and design phases, and completing projects more cost-effectively.

DEFINING COLLABORATIVE DELIVERY

While collaborative delivery can take many forms and be adjusted and hybridized to fit an owner's needs, they typically derive from delivery methods like Design-Bid-Build, Design-Build, and Construction Manager at Risk.

Design-Bid-Build (DBB) – This traditional delivery method involves three consecutive project phases.

1. Design: Owners begin the project by selecting a design firm to generate the project's specifications
2. Bid: Once the design is complete, owners publish the job and contractors bid a price based on the specifications.
3. Build: The selected contractor constructs the project as the design firm holds them to the specifications.

This sequence usually leads to a fixed-price contract between the owner and contractor, while the design firm holds a separate contract with the owner. This method may work best for utilities where procurement and approval guidelines are structured around DBB. However, the back-and-forth between designers and contractors who operate on separate contracts leaves the owner in the middle of two parties with different goals.

Construction Management at Risk (CMAR) – This delivery method commits a construction manager (CM), typically a contractor, to deliver the project within defined milestones, price, and performance metrics. Contracts are either a fixed lump sum or a guaranteed maximum price (GMP). The CM consults the owner and designer during the design phase and often becomes the general contractor during construction.

Like DBB, the owner holds two separate contracts: one with the CM and one with the design firm.

However, unlike DBB, the CM is chosen before the designer and gives construction input in the design phase. This alternative order of operations reduces back-and-forth and results in a more considerate design from the beginning to avoid significant changes and adjustments during construction. This in turn cuts delivery timelines and change order frequency.

Design-Build (DB) – This project delivery method features one entity, the design-build team, that holds a single contract with the owner to provide architectural, engineering design, and construction services. The process integrates the three steps seen in DBB and CMAR.

Like CMAR, DB involves the construction manager earlier in the process to inform the design stage. The traditional players – owner, contractor, and designer – unite under one design-build entity to align goals, anticipate discrepancies between stages, and begin the procurement process earlier than other delivery methods. Expedient design allows the DB team to involve regulators early as well to foresee permitting issues and gain permissions in a timelier manner.

Unique to DB, equipment can be selected during the design phase, which opens the opportunity for pre-procurement when desired. As pandemic supply chain disruptions continue to elongate public works projects, pre-procurement can reduce project timelines and finalize construction earlier than other delivery methods. DB also puts more risk on the DB entity instead of the owner, allowing the owner to focus on their day-to-day duties and take a supervisory role in construction management.

ADVANTAGES AND DISADVANTAGES

Each Collaborative Delivery Method comes with its own set of advantages and disadvantages. Internal expertise,

By considering Collaborative Delivery Method structures and advantages, owners can make informed decisions on which methods match their utility’s budget, timeline and resources to bring PFAS compliance projects to fruition.

industry relationships, and budget typically dictate which method best suits the utility and project.

DESIGN-BID-BUILD (DBB)

Advantages

- City council familiarity
- Fits most procurement protocols
- More owner control

Disadvantages

- Owner takes on most responsibility and risk
- Must select lowest bid price
- Siloed design and construction phases
- Construction doesn’t begin until design and procurement are complete
- Total cost is difficult to determine before commitment
- Delivery speed almost 50% slower than DB Construction Management at Risk (CMAR) Advantages
- Limited owner risk
- CM acts as owner’s advocate
- CM manages, coordinates, and supervises for the owner
- Design phase receives construction expertise
- Owner receives total cost before bid
- Lowest bid isn’t automatically selected

Disadvantages

- The owner must manage separate contracts with designer and contractor
- Can be more costly than DBB and DB
- Inexperienced CM can cause inefficiencies
- Delivery speed is 30% slower than DB

DESIGN-BUILD (DB)

Advantages

- Total cost determined early in process
- Fastest delivery speed
- Simplified line of communication

- Minimal schedule and cost growth
- Owner can specify performance instead of prescriptive specifications
- Requires less owner coordination
- Owner carries less risk than DBB

Disadvantages

- Fewer savings for small-scale projects
- Requires assembling trusted DB team
- Construction and design overlap can complicate changes

With these pros and cons in mind, a utility can decide which Collaborative Delivery Method would best suit each construction project. However, one aspect that remains the same throughout all delivery methods is the need for funding.

FUNDING COLLABORATIVE DELIVERY

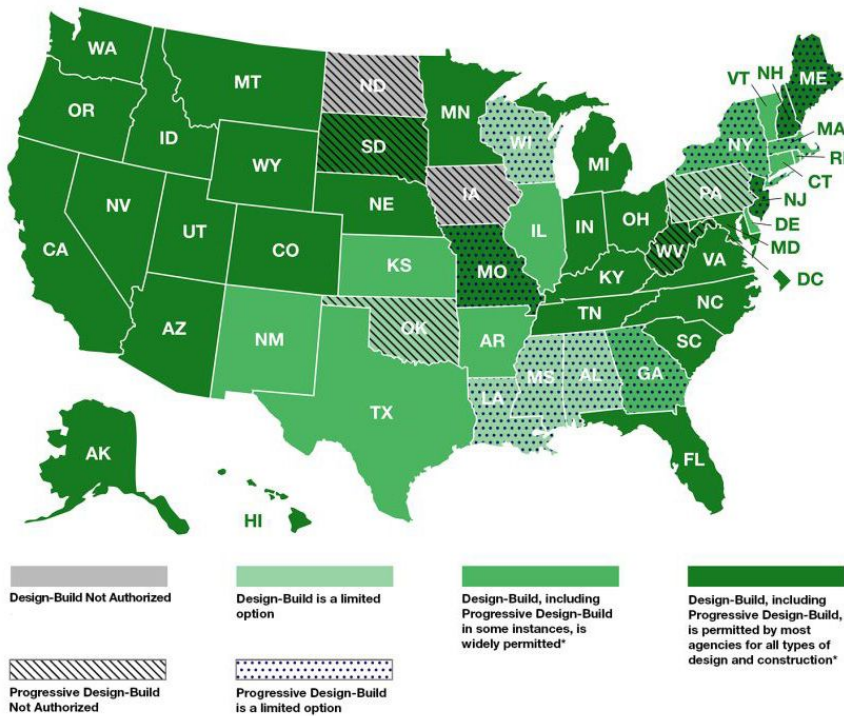
It’s no secret that PFAS removal is costly. Across the country, water providers are trying to fit high-tech treatment equipment into their budget without issuing bonds or raising rates.

Fortunately, infrastructure-related monies have been made available through the Infrastructure Investment and Jobs Act (IIJA) via contributions to traditional Clean Water State Revolving Funds (CWSRF), Drinking Water State Revolving Funds (DWSRF) and PFAS SRF programs.

The IIJA is a five-year funding program that allocates billions of dollars to infrastructure projects nationwide. For water and wastewater utilities, over \$33 billion has been earmarked for state and federal CWSRF, DWSRF, and a PFAS and Emerging Contaminant program. In addition to public funds, litigators



Design-Build State Authorization



won a historic settlement against big-name PFAS manufacturers 3M, DuPont, Chemours, and others in 2023, making another \$12 billion available to affected water providers.

The purpose of SRFs is to provide federal and state guaranteed funds to towns, cities, and water/wastewater utilities to complete infrastructure projects through low interest loans and grants. Owners can apply for SRF funding every year through their state offices, and funding can be used early on planning and design work if it's reasonable to expect a resulting capital project. Monitoring, preliminary engineering, and alternative analysis documents are all examples of eligible pre-project work.

As utilities employ Collaborative Delivery Methods to ease pressure on capital expense budgets, most can rely on state and federal revolving funds to make their project a reality. The Design-Build State Authorization map below shows the degree of

acceptance for using SRF money to fund design-build projects. The Design-Build Institute of America (DBIA) also provides further guidance for owners to explore how to fund collaborative delivery projects.

CMR IN ACTION

Although a large wave of PFAS infrastructure investment is set to hit the nation, proactive water utilities have already begun to show the way for using Collaborative Delivery to quickly remove PFAS from drinking water.

Following an adjustment to California's PFAS regulations in 2020, Orange County Water District (OCWD) conducted a system-wide audit and found Perfluoro-octane-sulfonic acid (PFOA) and Perfluoro-octane-sulfonic sulfonate (PFOS) in the Orange County Groundwater Basin, which provides 77 percent of the district's water supply. OCWD moved swiftly to protect its customers and selected AqueoUS Vets

(AV) to build 27 ion exchange (IX) resin systems for PFAS treatment.

Yorba Linda Water District (YLWD) in Placentia, California, received 11 of the 27 systems after detecting PFAS in each of its groundwater wells. Teaming with OCWD and Tetra Tech, AV assisted in the design phase, and then manufactured and delivered a 25 million gallons per day solution, the largest IX PFAS treatment plant in the country. Thanks to the progressive CMR approach taken by OCWD, the team completed this project within 12 months.

THE FUTURE OF CONSTRUCTION

Collaborative Delivery Methods reshape the roles, risks, and order of operations to make construction fit the owner's situation, instead of the other way around. To learn which method best fits your utility, resources like the Design Build Institute of America can guide owners to the right collaborative method based on their entity's needs, risk tolerance, and desired timeline.

Regardless of method, each demonstrates that it is advantageous to include construction expertise earlier than Design-Bid-Build suggests. AV's "concept to commission" ethos fits well with collaborative delivery, offering construction and manufacturing expertise to benefit owners from the start of a PFAS removal project, rather than during the procurement and construction phases exclusively. As public works projects begin to navigate emerging contaminant regulations, population growth, and changing climates, working with experienced engineering and manufacturing teams from the beginning will be vital to completing treatment projects on time and within budget. 🚀

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