Alternative Project Delivery

Texas Water Development Board

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Project Overview

R. W. Beck, Inc. (R. W. Beck), in conjunction with Davidson & Troilo, P.A., was retained by the Texas Water Development Board (TWDB) to assess the applicability of alternative project delivery methods, including “Design-Build” (DB) and "Design-Build-Operate" (DBO) to water and wastewater projects in Texas.

The research project was conducted in two phases as follows:

- Phase I – Evaluation of Alternative Delivery Methods
  - Technical Assessment
  - Legal Review
- Phase II – Provide Training and Information Materials on Alternative Delivery Methods
  - Training for TWDB staff
  - Local Governmental Informational Materials

This final report is a compilation of the work completed in the two phases described above.

Description of Work

Phase I

Technical Assessment of the Alternative Delivery Models

A Background Issue Paper (Section 1 of this report) was developed to provide a description and analysis of alternative delivery methods used to implement water and wastewater projects.

This paper includes schematics outlining the relationships of the various parties involved in each alternative delivery method, applicability of these approaches to water and wastewater infrastructure projects, and how the use of these alternative delivery approaches relates to industry trends, such as privatization and competition.

Legal Review of Alternative Delivery Methods

R. W. Beck, assisted by the Texas Law Firm of Davidson & Troilo, reviewed the legal issues associated with alternative delivery approaches for water and wastewater projects in Texas. A review of applicable state legislation and local procurement practices was also included.

The legal review (Section 2 of this report) includes a characterization of the existing procurement requirements for Texas public works projects, identifies

statutory/regulatory impediments to using alternative delivery methods, and provides a comparison of potential liability/risks.

Phase II

Training for TWDB

R. W. Beck provided a one-day training workshop at the TWDB offices in Austin for the members of the 6 multi-disciplinary teams serving the Regional Water Planning areas. The workshop included:

- Overview of the Water Industry
- Description of Alternative Delivery Methods
- Comparison of Traditional vs. Alternative Delivery Methods
- Discussion of Implemented Alternative Delivery Projects
- Overview of Areas of Concern
- Small Group Discussions

Section 3 of this report includes copies of the Powerpoint presentations, as well as the supplemental materials, provided to participants at the TWDB training workshop.

Local Governmental Informational Materials

A checklist was developed identifying alternative project delivery issues. It is recommended that it be included as part of a set of informational materials for the various TWDB constituencies. The informational materials were developed to assist local governmental communities and Regional Water Planning Groups evaluate the applicability of alternative delivery methods to their water and wastewater projects. The Issues Checklist on Alternative Project Delivery can be found in Section 4 of this report. It contains a list of the benefits and concerns of both traditional and alternative delivery methods, as well as diagrams to illustrate the differences between the methods.

Summary

The information and analysis provided as part of this project will serve to assist the TWDB in the future as alternative project delivery methods become more readily used in Texas. Specifically, the detailed description for and analysis of DB and DBO serves to illustrate the applicability of these methods to water and wastewater projects.

BACKGROUND ISSUE PAPER ON ALTERNATIVE PROJECT DELIVERY FOR THE TEXAS WATER DEVELOPMENT BOARD

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Introduction

In the United States, the delivery of water and wastewater treatment facilities has historically been based on the concept of prescribing a single method for treatment. An engineer codifies the requirements for accomplishing the selected treatment method through a specific design. Then, the engineer produces drawings and specifications to comprehensively define the tanks, piping and equipment (i.e., the assets) selected to accomplish the treatment methodology and provide the ancillary facilities. The outcome of this process is a bid package upon which a contractor can base a bid price to construct the designed facility. The design engineer produces an estimate of the capital cost of the project. The construction contractors are generally viewed as providing a commodity service and are selected primarily based on their bid price.

Features of this traditional Design-Bid-Build (DBB) approach may result in some areas of concern: (1) the design engineer's services are generally procured without regard to the cost of the facility; (2) the selection of low bid construction contractor(s) heightens the risk of performance failure, and; (3) risks associated with the failure of a facility to perform in accordance with the owner's needs reside primarily with the owner.

Some more recent types of public/private partnerships have stirred significant interest in the water industry. Public/private partnerships have occurred in various forms, including:

- Design-Build (DB)
- Design-Build-Operate (DBO)
- Design-Build-Own-Operate (DBOO)
- Design-Build-Own-Operate and Transfer (DBOOT)

The most common form of public/private partnership used in the water industry is Design-Build-Operate (DBO). The DBO approach changes the traditional roles of project participants. For example, a water utility procures the services of key project participants differently using a DBO approach as opposed to traditional approaches. If a water utility elects to use a traditional project delivery approach, each of the external parties (design engineer, construction contractor and facility operator) are generally selected through separate selection processes. In the DBO approach, however, a single Request for Qualifications (RFQ) followed by a Request for Proposals (RFP) is used where a singular proposal is submitted by DBO teams to provide engineering, construction, and operating services.

The DBO approach allows for innovation on the part of proposers while providing an "apples-to-apples" comparison. In responding to an RFP, proposers must focus on the

overall performance of the project, as well as the detailed requirements of the project. Planning, design, engineering, construction and long-term operation of the facility are combined into a single package, single contract and single responsible entity. In the traditional approach, each component is viewed separately, resulting in multiple participants and different contractual arrangements. The DBO project delivery process may offer benefits of increased access to new and innovative technology, shortened project schedule, reduced owner risks, and construction and operational cost savings.

Two specific groups over the last five to ten years have leveraged this potential business opportunity: design engineers and the international water service companies. Several design engineering firms have strategically positioned themselves to foster, develop and capture a share of the growing Design–Build ("DB") market segment. The international water service companies have brought the Design-Build-Operate ("DBO") and Build-Own-Operate-Transfer ("BOOT") project delivery approaches to the US market. Over the last two decades, privatization in the water/wastewater industry has driven the industry to refocus on competition and performance.

Market Drivers

There exist four principal factors or "market drivers" that shape the direction of the water market. The four major market drivers are:

- aging facilities in need of major capital investments;
- implementation of stricter regulations;
- water industry globalization; and
- water industry privatization.

These market drivers are the impetus for many in the water industry to examine different approaches to service delivery to offer more value to the water utility's stakeholders.

Aging Facilities in Need of Major Capital Investments

Most water treatment systems are of an age that require significant capital renewals and replacements. Water and wastewater utilities are significantly more capital intensive than any other utility. Building new or expanded facilities or replacing outdated or inadequate facilities will require investments by utilities and rate increases to pay for the debt. Because the majority of the assets are in excess of twenty years old, the cost of construction for renewal or replacement of these assets will have increased many fold since originally constructed.

As many of these utilities received significant contributed assets when infrastructure was originally constructed, these utilities will be replacing these contributed assets with their own funds. Consequently, water rates of today are based on the recovery of only a fraction of the current replacement cost of the utilities' assets. This means that in the future, rates will have to undergo significant increases just to keep pace with current service and new capital requirements.

Implementation of Stricter Regulation

The Safe Drinking Water Act

The Disinfectant and Disinfectant By-Product Rule ("D/DBP") and the Enhanced Surface Water Treatment Rule ("ESWTR") have set new lower standards for Total Trihalomethane ("TTHMs"), Haleoacetic acids ("HAA5") and lower turbidity limits ("NTUs"). Additional filter monitoring requirements are likely and the necessity for monitoring and or meeting a Crytosporidium limit is also being considered. This is in part do to the Crytosporidium outbreak in the City of Milwaukee that gave their water system national media attention a few years ago.

Consumer Confidence Reports (CCRs)

The 1996 amendments to the SDWA required the EPA to mandate that water utilities provide their customers with "*Consumer Confidence*" Reports, which include monitoring results, violations, water source information, health implications of violations, and the identification of susceptible populations. In regulatory terms, this initiative is significant. Since the customer will know what is in their water and what problems their utility is experiencing, *the customer*, not the EPA, will drive the water utility expenditures.

Water Mergers and Acquisitions

The investor-owned segment of the water industry is also undergoing significant change. Mergers and acquisitions have been occurring with increasing frequency and in their dollar value. In November 1999 Thames Water Plc. acquired the Elizabethtown Water Company of New Jersey for slightly less than a billion dollars. Birmingham Utilities in Connecticut was put on the market. American Water Works has been on an aggressive acquisition campaign for the last several years. Their most recent acquisition in 1999 was San Jose Water in California. They had previously acquired Continental Water Company. Philadelphia Suburban Water Corporation acquired Consumers Utilities, Inc. Aquarion Water Company of Connecticut was acquired by Kelda, Plc affiliated company of Yorkshire Water, Plc. of England one of the ten privatized British water-sewerage utilities.

Enron in 1998 acquired Wessex Water Plc, another of the British water-sewerage utilities. They then spun off an IPO named Azurix that included their international water assets in South America and their North American water venture. In the mid 1990s, NIPSCO acquired Indianapolis Water Company, one of the largest water IOUs in the Midwest. Other electric utility entities that have significant water holdings include Minnesota Power and Light, Duke Energy and Southern Company. Many electric utilities are considering or implementing strategies to extend their service capabilities into the water market. The commonality of the regulated operating environment and leveraging shared competencies are some of the internal business drivers for these moves.

Water Industry Globalization

The provision of water has historically been a local enterprise. However, water is becoming big business for global industry participants. For example, two large French companies, Generale des Eaux now called Vivendi Water and Suez Lyonnaise des Eaux, each have revenues in excess of U.S. $ 30 billion a year. As recent as February 2000, Suez Lyonnaise des Eaux combined all its water activities within a single division, which reinforces its position as world leader in water-related services. By reorganizing, Lyonnaise mobilizes its skills and resources around a global strategic vision. Beyond its investments to meet anticipated growth in existing markets, the responsibility of the new division includes investing in new markets. The new organizational structure enables Lyonnaise to offer a worldwide service well adapted to the needs of industry, local public authorities, and private individuals. Lyonnaise's water division currently serves 100 million people throughout the world and provides its services to 60,000 industrial customers in 120 countries. Companies this size have tremendous advantages over small utilities due to economies of scale and available resources. These companies all have aggressive growth plans for their businesses in the U.S. Market.

Provided below is a table depicting some of these global industry participants.

TABLE 1-1
GLOBAL WATER FIRMS

Companies	Vivendi Formerly ("CGE")	Suez Lyonnaise des Eaux ("LDE")	United Utilities ("UU")	Severn Trent ("ST")
Total Revenues U.S. $	Approx. 37.1 B	Approx. 28.1 B	Approx. 3.4 B	Approx. 2.5 B
Water Revenues U.S. $	Est. 340 M	Est. 80 M	Est. 20 M	600 M
Principle Businesses	Water Services	Water Services	Water Services	Water Services
	Electric Production and Waste Management	Energy Services & Waste Management; Communication	Electric Distribution & Telecom	Waste Management
U.S. Affiliates:	Philadelphia Suburban	United Water Resources	U.S. Water	Severn Trent Environmental Services
	U.S. Filter Operations Services ("USFOS")	White River Environmental Partnership	Hydro Management	Severn Trent Systems
	Evirex, Wallace & Teirnan, General Filter, Memtec	Infilco-Degremont		Capital Controls Group Exceltec
International Activity:	Spain, Italy, UK, Portugal, Czech Republic, Hungary, Mexico, South America, Pacific Rim, France	Argentina, UK, Spain, Italy, South America, Pacific Rim, France	Malaysia, Australia, Philippines, Mexico, Turkey, East Europe, Canada, South America	Belgium, Portugal, Germany, Italy, Trinidad & Tobago

1999 Reported Revenues

Water Industry Privatization

There are a growing number of private sector firms poised to compete with the public sector. The privatization of water and wastewater services through public-private partnerships is an industry that has sustained a 20 to 30 percent growth rate over the last decade. The economic forecasts for this industry predict continued significant and robust growth. It is estimated that in the U.S. there are currently over eight hundred contracts between utilities and privatization contractors. The value of these contracts has been estimated at $500 million annually. However, in the context of an $80 billion dollar annual water and wastewater market, private companies involved in privatization efforts view the U.S. market as barely penetrated. As you can see from the table below these companies are becoming a significant presence in the marketplace.

Table 1-2
U.S. Privatization Firms

	Earth Tech	United Water Service Inc. ("OSI")	Vivendi Water U.S. Filter Operating Service ("USFOS")	Operations Management International ("OMI")	Severn Trent Environmental Services	U.S. Water ("USW")
Owners:	Tyco Inter-national	SLDE & United Water Resources	Vivendi	CH_2M Hill	Severn Trent Plc.	United Utilities & Bechtel
Form of Ownership:	Wholly Owned Subsidiary	Wholly Owned Subsidiary	Wholly Owned Subsidiary	Wholly Owned Subsidiary	Wholly Owned Subsidiary	JV-Partnership
Employees:	N/A	2,500 (US)	N/A	1,000	600	250
Facilities:	N/A	N/A	160	120	400	80
Project Finance:	Yes	Yes	Yes	No	Yes	Yes
Key Projects:	Franklin, OH Gardner, MA	Atlanta, GA Indianapolis, IN San Antonio, TX Jersey City, NJ Milwaukee, WI	Wilmington, DE Danbury, CT Woonsocket, RI Tampa Bay Water, FL Cranston, RI Newark, NJ	New Haven, CT	Lee County, FL Jackson, MI Pasadena, TX	Easton, PA No. Brunswick, NJ Springfeild, MA

These large private firms sell their products based on several features that distinguish them from other service providers. These features include:

- Multinational Corporate R & D
- Concession Fees
- Stabilized Rate Structure
- Access to Private Capital
- Off-balance Sheet financing
- Higher Competencies
- Performance Guarantees

These features translate into such benefits as:

- Cost Reduction
- Technologies
- Guarantees
- Management Expertise
- Capital

There is constant development of performance enhancement, financial and contractual products. The privatization contracts are for a myriad of different services and financial relationships that comprise the privatization product spectrum. The predominance of these contracts to date have been for Operations and Management ("O&M") services not involving private capital. O&M contracts present the lowest political and legal barriers to enter into privatized services. However, once a utility has been privatized, the general trend has been to continue operations and expand the business relationships.

Competition and Its Impacts

There is growing political support for privatization. This can be related to the fact that privatization has benefits to local government officials that may not be available through other forms of service delivery. In its 1997 survey, the Urban Water Council of the U.S. Conference of Mayors, confirmed that the political interest in Public/Private/Partnerships was expanding. Of 261 cities surveyed, 40 percent currently had some form of Public/Private/Partnership and 14 percent of the cities without any Public/Private/Partnerships were considering such an approach to delivering services.

The table below characterizes the extent services are presently provided through private sources and what is anticipated in the next decade.

Table 1-3
Urban Water Council Survey
PUBLIC/PRIVATE PARTNERSHIPS

Service Types	Existing	Future
Design & Construction	71%	36%
Meter Reading	33%	73%
Billing & Collection	31%	50%
Distribution System O&M	25%	32%
Treatment Facility O&M	19%	41%

The results of this survey strongly suggest that political decision makers increasingly perceive significant benefits using privatization for the delivery of water services. Therefore, methods of implementing public-private partnerships, such as DBO are likely to become more commonplace.

Conclusion

Predictions surrounding the water market generally suggest that alternative project delivery approaches like DB, DBO and BOOT projects will continue to increase. When implemented correctly, advantages of these alternative project delivery methods appear to directly benefit utility owners. The disagreement generally is over what market share will these alternative project delivery methods compose and the timing associated with this growth.

This dynamic environment has caused treatment agencies, legislatures, regulators, engineers, and labor to evaluate and question their basic roles and responsibilities. Alternative methods for project delivery frequently encounter procedural obstacles due to procurement laws, permitting regulations and funding requirements. It is reported that approximately twenty states currently permit DBO procurements. This whitepaper describes the various alternative project delivery methods and provides a comparative analysis of the benefits and drawbacks of alternative delivery and traditional project delivery.

Section 2

DESCRIPTION OF PROJECT DELIVERY METHODS

Introduction

Project delivery methods as currently practiced in the water and wastewater industry tend to fall into three groups:

- Traditional Design-Bid-Build ("**DBB**") and Design-Build ("**DB**");
- Engineer-At-Risk ("**EAR**") and Engineer-Procure-Construct ("**EPC**"); and,
- Design-Build-Operate ("**DBO**") and Build-Own-Operate-Transfer ("**BOOT**").

These groups are classified based upon the number of discrete contractual or informally defined relationships between the **Owner**, **Design Engineer**, **Construction Contractor** and the **Operator**. In the traditional **DBB** there are generally three contracts or relationships. In **DB** there are generally two contracts. **DBO** and **BOOT** generally involve a single contract. A glossary is included in the Appendix defining the terms in bold throughout this section.

Beyond these basic project characteristics there are few criteria that clearly define one project delivery approach versus another. Rather, there appears to be a spectrum of options available for all of the key contract terms and conditions. Consequently, the following discussion of defining features for project delivery methods has been based on trends we have observed in the use of alternative project delivery.

The table on the following page provides a schematic of the relationships of the project participants for **DBB**, **DB** and **DBO** and **BOOT**. Moving from left to right across the columns the **Owner** is, in general, relinquishing control over more aspects of the project in return for the potential of reduced cost and accelerated project delivery schedule, along with allocating more risk to the private vendor. The pros and cons of each type of project delivery alternative are identified. The conditions under which each type of project delivery is preferred is provided in the bottom row of the table.

The detailed discussion following the table includes for each method:

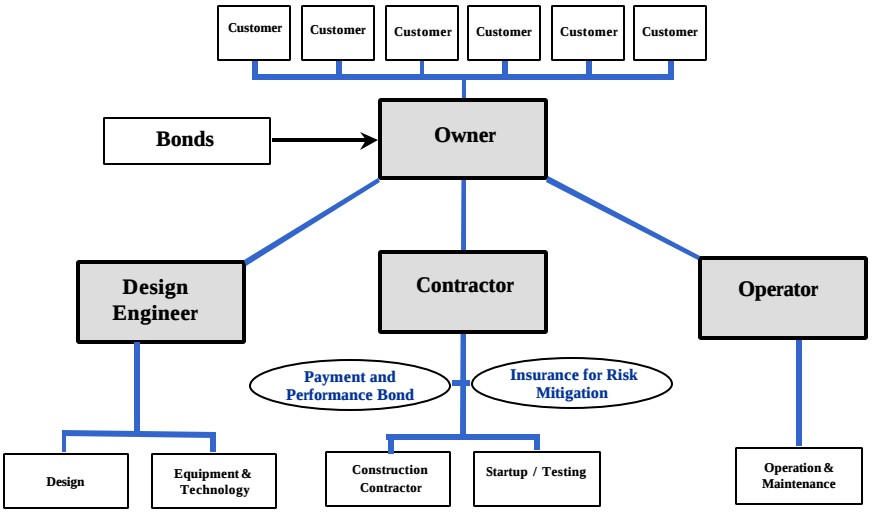
- General Description;
- Characterization of the Contractual Issues;
- Identification of Potential Benefits; and
- Areas of Concern.

Traditional Design-Bid-Build ("DBB")

Description

The traditional architectural and engineering project delivery approach begins when an **Owner**, such as a state, a county, district or municipality, decides that a new asset is needed and secures funding. A project management group, such as municipal engineering staff, solicits the service of an engineer or architect to undertake the design. In Texas, the engineer is selected based upon qualifications and experience under the Professional Service Procurement Act. The engineer prepares for the **Owner** a complete design, which includes associated technical bid specifications. An attorney representing the municipality may prepare a construction contract to accompany the design. In some instances, an engineer may utilize a standard form of construction contract in lieu of an attorney preparing a contract for the project. The design, specifications and contract are distributed with request for bids for the construction. Applications for the construction permits are filed based upon the complete design. The **Design Engineer** reviews the construction bids received and the municipality awards the bid to the **Contractor** with the lowest responsive bid. The municipality generally must obtain all necessary authorizations prior to the start of construction. The project structure for a traditional **DBB** project is characterized in Figure 2-1.

Figure 2-1
Traditional DBB Project Structure



Ownership and funding of the project asset is generally public under this approach. Often, the **Owner** retains either the **Design Engineer** or a **Construction Manager** to ensure that the **Contractor** fulfills contract obligations. Upon completion of construction, the constructed asset is turned over to the **Owner** to operate.

Key Contractual Issues

The basis for fulfilling the **Construction Contractor's** contractual obligations are that construction has been completed and performed in accordance with the **Design Engineer's** specifications. Typically, any guarantees or warranties provided by the **Construction Contractor** are limited to whether facilities are constructed and equipment installed to industry standards. Generally, neither the **Design Engineer** nor the **Construction Contractor** is explicitly obligated to demonstrate that the completed facility will perform its intended purpose. The contracts are based primarily on delivery of an asset meeting the design specifications.

From design to completion, the typical **DBB** project delivery involves numerous parties and a minimum of three discrete contracts. The **Owner** retains most of the project risk. The **Design Engineer** typically is not selected on the basis of the delivered cost of the project. The design and construction process is neither interactive nor integrated. Each phase of the project is consecutive: design, bidding, permitting, construction and operation. Design deficiencies or unforeseen conditions are addressed via "change orders" between the **Owner** and the **Construction Contractor**.

Benefits

The key benefit of a traditional **DBB** approach is that it is the archetypal model for project delivery of municipal infrastructure. As the historical basis for most regulatory, legal, financial, insurance and political requirements for municipal project delivery, it has been accepted, tested and consequently is well understood by all stakeholders. The general familiarity and frequent repetition of the use of the **DBB** approach may minimize project "soft" costs.

The sequential project phasing, provides significant opportunities for public scrutiny of the project. Typically under this approach the project begins with a feasibility report and an estimate of probable project costs. At this point, a conceptual project definition and cost is available for review and approval. This is the first opportunity for public scrutiny of the project's cost-benefit features. In a **DBB** approach, the design is then completed and typically accompanied by an engineer's final project cost estimate. The final design and cost estimate can then be reviewed and approved as a whole by the public. Next, the construction bid and contract are distributed and bids are received and evaluated. The lowest responsible bidder is typically awarded the bid. At this point, the project is fully defined by the plans and specs and a presumptive final cost for the facility is available. This is a third opportunity for public review of the project. This sequential definition of the project provides multiple opportunities for the public's consideration of the project and extensive **Owner** input and project control.

Under this approach, the **Owner** generally retains the **Design Engineer** in the capacity of the **Resident Engineer** to administer the construction contract and review the **Construction Contractor's** compliance with the design requirements. The **Resident Engineer** is acting as the public entities' agent to review and witness the **Contractor's** work. This relationship is generally regarded as a check and balance approach to protect the **Owner**.

Areas of Concern

Potential drawbacks with the typical **DBB** approach as compared with other alternative delivery approaches are related to project schedule, project risk allocation, design and technology innovation, project performance, constructability and operability. Many of these areas of concern are directly linked to other **DBB** beneficial attributes. For example, a benefit of sequential project phasing is the increased ease of public review of the project. The drawback of sequential project phasing is that the project schedule is typically longer than other project delivery approaches.

Perhaps the fundamental element of the **DBB** project delivery approach is to attempt to keep the project cost as low as possible. The key objective is to obtain the lowest construction bid. Because of the historical perspective that transferring elements of project risk to an engineer and/or **Contractor** will increase project costs, a majority of the project risk using the **DBB** approach is retained by the **Owner**.

An example may help illustrate this point. Generally, in a **DBB,** the **Contractor's** bid price is to supply only that which is explicitly called for in the **Design Engineer**'s plans and specs. Because of this feature, the **DBB** project delivery method is prescriptive. If the plans and specs do not include a component necessary for the project's performance, the **Owner** is generally responsible for the added cost of the change to the project. All the involved parties for a variety of reasons could dispute this situation further adding to the cost and schedule of the project. However, using alternate project delivery methods can provide an opportunity to allocate some of this risk to the selected design-build team. If an alternative delivery project is performance-based, as opposed to design-based, then most of the risk associated with facility performance can be allocated to the **Design Engineer** and **Contractor**.

As reflected above in Figure 2-1, the **Owner** is responsible to accurately define the project, communicate it effectively to all of the parties, then direct, coordinate and execute the project delivery to meet all parties' needs. In this role, with usually three separate contracts with parties with frequently disparate interests, the task is inherently more prone to disputes.

In a **DBB** project delivery, where the **Design Engineer** is on a fee-for-service basis, there is limited incentive for a **Design Engineer** to risk undertaking innovative technologies. From a business perspective, **Design Engineer**s that can repeatedly use similar components of plans and specifications can be more efficient and perhaps more profitable. Thus, engineers are not generally rewarded financially for design innovation.

A project's life-cycle costs includes both the cost of the capital and the cost for the operation of the facilities. Most life cycle cost models for water and wastewater projects are significantly more sensitive to operating costs than capital costs. This means a dollar saved on operating cost has more value than a dollar saved in capital cost over the life of the project. Consequently, **DBB** projects in which the basis for cost evaluation is limited to the capital costs for the designed asset may not have adequately considered project features to reduce operating costs. A **DBB Design Engineer** has little incentive to promote design features that may increase capital cost, but reduce operating costs.

In many small to medium utilities, the operations staff may not have the competencies necessary for new project value engineering for reduced operating cost. However, to be competitive many of the contract operations firms have honed their skills in these areas and can apply them to project design. This can have a very significant effect on lowering the life-cycle cost of a project.

Design-Build ("DB")

Description

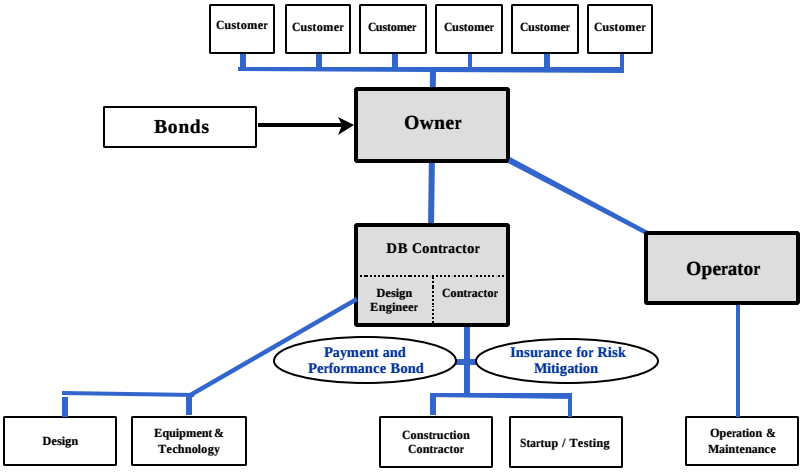
In a **DB** project approach, a **DB Contractor** is generally solicited by an **Owner**. Two specific approaches of **DB Contractor** selection are most prevalent. In the first, the **DB Contractor** selection is generally based upon experience and qualifications only. In the second approach, the **DB Contractor** is selected on a combination of qualifications and price. In the water industry, **DB** teams tend to be led by well-established firms who have chosen to pursue the **DB** contracting market segment.

In the first approach, a **DB Contractor** may include a construction firm, an engineering firm, or be a true Joint Venture containing both. The **Owner** will contract with only the DB Contractor. The firm within the **DB Contractor** team that performs the design engineering can be characterized as the **Design Consultant.** The **Design Consultant** then prepares design criteria, engineering drawings, diagrams and specifications that establish the **Owner's Project Criteria**. The **Project Criteria** is the information used to contractually define the project that the **Owner** desires. The **Owner's Project Criteria** are then used as the basis for the **DB Contractor** to develop a basis of payment**.** Frequently, the basis of payment is a lump sum fixed price or a maximum guaranteed price for construction of the desired facility.

The second approach involves the **Owner** preparing its own **Project Criteria** containing either performance specifications or a partial design with limited specifications. Frequently, an **Owner** will use an alternative project delivery **Procurement Advisor** or **Owner's Agent** to assist with the development of the solicitation approach and related documents (RFQs, RFPs, contracts), as well as to develop the **Owner's Project Criteria**. The **Project Criteria** documents are included in the **RFP** solicitation for the **DB Contractor**. The **DB Contractor** is then selected based upon an established set of qualifications criteria and a fixed price. An **Owner's** proposal evaluation committee typically evaluates the financial and technical merits of

the **DB** proposals. The typical project structure for a **DB** project is shown in Figure 2-2.

Figure 2-2
DB Project Structure



The **Design Consultant** of the **DB Contractor** prepares a design suitable for construction based on the **Owner's Project Criteria**.

Under a **DB** project delivery, there can be very different levels of interaction during the design process between the **Design Consultant** and the **Construction Contractor**. In some instances, the **Design Consultant** may substantively complete the design with limited input from the **Construction Contractor**. This tends to occur in **DB** projects without lump sum fixed price or guaranteed maximum price contracts. In other instances, the **Construction Contractor** may work in an integrated and iterative manner with the **Design Consultant** to develop a project that maximizes constructability, expedites schedule, and minimizes capital cost. This tends to occur in **DB** projects with a fixed price contract and allocation of the schedule risk to the **DB Contractor**. Owners should consider the **DB Contractor's** specific approach carefully as they will obtain the greatest value from an interactive approach of both the **Construction Contractor** and the **Design Consultant**.

In **DB** Contracting, generally, there is a trade off of **Owner** control over design details and project schedule for project cost and/or schedule benefits. Generally, the **Design Consultant** has significant discretion under a **DB** contract regarding the design details. An **Owner** should carefully consider the project's design review and public involvement process. The **DB Contractor** also generally has significant discretion over the project schedule as long as key milestones are met.

Key Contractual Issues

A **DB** contract is primarily based on delivering an asset that was defined by the **Owner's Project Criteria** for a lump sum fixed price or guaranteed maximum price. A **DB** contract generally provides that design activities and certain construction activities can be performed concurrently. Consequently, a **DB** contract is structured to consider the schedule and project cost implications of all permits that will be required to commence construction. The requirements and obligations of the **Owner** and the **DB Contractor** concerning the development, review, submission, and approval of project permits are usually explicitly addressed as part of a **DB** contract.

The **Owner** may utilize an **Owner's Representative** or **Construction Manager** to ensure that the **DB Contractor** constructs the project consistent with the requirements of the **DB** contract. The **Design Consultant** of the **DB Contractor** is the **Designer** of record for the project. Upon completion of construction and the meeting of commercial operational requirements, final payment is authorized to the **DB Contractor** by the **Owner**. The facility is turned over to the **Owner** and commences operation with the **Owner's** operator.

Benefits

There are a set of benefits that may result from the close cooperation and teaming of the **Design Consultant** and the **Construction Contractor** as part of a **DB** contract. The single-point accountability reduces the potential for disputes between the **Design Engineer** and the **Construction Contractor**. A concurrent cooperative effort between the **DB** team's **Design Consultant** and the **Construction Contractor** can benefit the project by shortening the project's schedule and/or reducing the capital costs. Examples of this may occur when the **Construction Contractor** works with the **Design Consultant** to identify lower cost construction alternatives than what the **Design Consultant** selected. The shared **DB** team's incentive to produce a project that meets the **Owner's** requirements while being cost competitive, often leads to design innovations. Even without significant changes to the project's installed material and equipment, the concurrent implementation of the design and permitting activities with the pre-construction work (i.e., site preparation, temporary utilities, access road construction) can shorten the project's overall schedule. A shortened project schedule may result in lower project cost.

In **DB** project delivery, the contracted price to design and build the project is established at an earlier point in the project than with a traditional **DBB** approach. In a **DBB**, the design is completed and the project permitted before the construction bid is generally available.

Areas of Concern

The primary area of concern for **DB**, and other alternative delivery approaches, is that current laws regulating public sector design and construction were promulgated without consideration of **DB** or **DBO**-type approaches. Consequently, the legal basis for the use of these methods of project delivery is frequently unclear, limited or even precluded. Specifically, selecting **Design Engineers** and **Construction Contractors** jointly based on costs and qualifications is perceived as both controversial and

unorthodox. Furthermore, given that there is a variety of risk allocation possibilities for **Owners** and **DB Contractors**, not all the related legal and insurance issues have been formally tested.

Another concern with concurrent design and construction is that generally most state regulations require the design to be completed as a prerequisite to obtaining the project permits. With the **Construction Contractor** a party to the contract from project outset, construction costs and contracted fixed price are time sensitive. For alternative delivery projects to be successful, they require cooperation of all the parties associated with the time and effort necessary to obtain project permits. A **DB Contractor's** general conditions costs, project overhead and project management labor can be substantial. Project delays due to the **Owner** not being able to obtain permits required for construction, could result in project cost overruns. The **Owner** should carefully consider the permitting requirements and the probability of third party challenges to permit applications when considering selection of a project delivery approach and in allocating permit risk in a **DB** contract.

There are a few other concerns associated with concurrent design and construction activities under the **DB** approach. Because the **Design Consultant** is contractually related to the **Construction Contractor,** it may be the perception that the **Design Consultant's** independence is compromised and the quality of the project is sacrificed to deliver reduced project costs. One consequence of this could be that the **Design Consultant** compromises the quality of the project to deliver a lower installed project cost. Moreover, the risk of any pre-ordering or pre-purchasing must be weighed against public review and approval requirements of the project.

Another concern to **Owners** is that with a **DB** project delivery approach, the public may not have adequate information concerning project details before the project begins construction. The points of entry in the project for public input are significantly different and must be carefully considered and managed by the **Owner** if a **DB** project delivery approach is utilized.

Lastly, in **DB** project solicitations where the request for proposals requires a significant design engineering effort, there is some concern that the cost to prepare such detailed proposals may preclude smaller, yet qualified, firms from competing for the project.

Engineer-At-Risk ("EAR")

Description

EAR is a variation of **DB** that focuses on shifting a more significant amount of the project development, design, and capital cost risks to the **DB Contractor**. Structurally, the **EAR** contract looks schematically the same as a **DB** shown previously in Figure 2-2. An **EAR Contractor** is selected based upon a combination of qualifications, submitted price, and willingness to accept project permitting risks. The **Owner** typically has defined **Project Criteria** and a significantly developed design (65% complete design) before soliciting for an **EAR Contractor**. These

Project Criteria documents are generally included in the **RFP** solicitation for the **EAR Contractor**. Often, the commercial terms of the solicitation relative to price, schedule assurances, and guarantees are a component of the overall basis for the **EAR Contractor's** selection.

Another term for **EAR** that is sometimes used for project management is "**Construction Manager** (**CM**) at Risk". In a situation wherein the **Owner** has developed a detailed design and received construction permits, a construction management firm, as opposed to a design-engineering firm, takes the lead contracting role. In the **CM** at Risk approach, liquidated damages are applied to schedule and bid cost performance of a project.

Under an **EAR** approach, the **Design Consultant** develops a design suitable for construction based on the **Owner's Project Criteria**. The **Construction Contractor** will work in an integrated and iterative manner with the **Design Consultant** to develop a project that maximizes constructability and minimizes capital costs. The **Design Consultant** has significant discretion regarding the design details. Often sequential design development and construction are used to facilitate aggressive scheduling.

Key Contractual Issues

Similar to a **DB** project, the **EAR** contract tends to be primarily based on delivering an asset that has been defined by the **Owner's Project Criteria** for a guaranteed price. However, the contracts under **EAR** tend to include provisions that allocate more project capital and schedule risk to other parties. The areas of risk that the **Owner** may allocate are typically associated with design completion, obtaining permits, construction schedule, and delivering the facilities at bid cost.

The contract issues that were identified in the prior section dealing with **DB** generally apply also to **EAR**.

Benefits

EAR projects tend to be prescriptive with defined **Project Criteria** and a significantly developed design. They also tend to allocate more project risk to the vendor team than in a typical **DB**. Consequently, **EAR** offers the benefits of a **DB**, plus any benefit associated with transferring additional risk to the **Contractor**.

Areas of Concern

The areas of concern for **EAR** type contracts are generally the same or similar to those for **DB** identified in the prior section. In addition, the **Owner** should allocate costs to the **Construction Contractor** commensurate with the **Construction Contractor's** ability to manage the risk. Shifting risk to the **Construction Contractor** may increase project costs significantly and/or result in the use of a **Construction Contractor** unable to adequately address claims associated with project default.

Engineer-Procure-Construct ("EPC")

Description

An **EPC** approach is similar to the **DB** project delivery. The principal project participants of an EPC Contractor are a **Design Consultant** and an **EPC Contractor**. Structurally, the **EPC** approach looks schematically the same as the **DB** previously depicted in Figure 2-2. The distinguishing features of **EPC** contracting are as follows:

- the projects tend to be over $50 million in value;
- the projects usually involve significant procurement of a technology, equipment or assets;
- the price is typically a guaranteed maximum price;
- the contract is typically performance, not specification-based; and
- EPC Contractors generally subcontract for a majority of the construction work.

Typically, an **EPC Contractor** will retain a **Design Consultant** and a **Construction Contractor** as subcontractors. The EPC **Design Consultant** will often prepare the design in multiple bid packages. The **EPC Contractor** will typically bid out most elements of the work competitively to qualified subcontractors and/or specialty **Contractors** for unique construction work.

Some **EPC** contracts are structured so the **Owner** agrees to pay the **EPC Contractor** a design fee for the services of the **Design Consultant** and a **Construction Management** fee. Under this type of **EPC** approach, the Owner is given access to the material and equipment costs, subcontractor bids and have some input as to equipment selection. This is known as an Open Book **EPC** approach. The **EPC Contractor** may also receive a fee for the procurement services and general conditions costs.

EPC contracting has its origin in the private sector where the needed asset's performance and project schedule benefits are considered a higher priority than the lowest installed capital cost. The **EPC** contract concludes with an acceptance test of the desired asset to demonstrate that the facility that was adequately designed and built will meet the performance standards identified in the **EPC** contract. Stand-alone **EPC** contracts are unusual in the water industry because of their smaller project size as compared to other industries. Recent **EPC**-type contracts in the water industry have typically only occurred as a subordinate contract where the project team was led by a financial developer. In this case, the financial developer, not the **Owner,** secures and enters into the **EPC** contract for the project.

Key Contractual Issues

Performance-based contracts require a significant effort by the **Owner** at the project inception to develop performance, testing and **Project Criteria** that will adequately define the desired facilities. The project definition needed for a successful **EPC** contract is not typical for municipal water projects. Issues regarding applicable industry standards, aesthetic standards for textures and finishes, and product

performance (i.e. finished product water or treated effluent standards) require considerable research, evaluation, and negotiations.

Benefits

In **EPC** contracting, as opposed to **DBB or DB,** the **EPC Contractor** is not necessarily bound to a specific **Design Engineer** or a **Construction Contractor**. Consequently, the **EPC Contractor** can act as an **Owner's Agent,** negotiating terms and conditions and seeking competitive costs from subcontractors and equipment vendors for specific elements of the project work. When a project involves a technology that is a specialty of a given **EPC Contractor**, the **Owner** can gain the benefit of the value-added services from that **EPC Contractor**.

Areas of Concern

In **EPC** project delivery, the vendor is providing some degree of design and construction services similar to **DB.** Consequently, the areas of concern regarding **DB** and **EAR** project delivery methods previously identified also apply.

Performance-based EPC contracts provide the least opportunity for the **Owner** to exercise control over design details and to facilitate general public project input. The contract emphasis is on constructing a facility that meets the **Owner's** schedule and defined performance requirements under a given price structure. The **Owner** may have limited input into details beyond those typically associated with a 50-60% design unless they were previously defined in the **Owner's Project Criteria**.

Design-Build-Operate ("DBO")

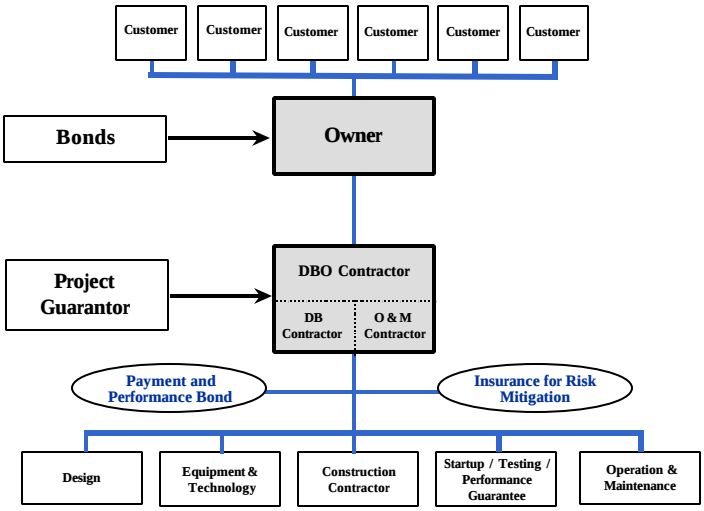
Description

A Design-Build-Operate or **DBO** approach typically involves the **Owner** retaining a **Procurement Advisor** to provide procurement support services. The **Procurement Advisor** may provide limited design engineering services or the **Owner** may hire a **Design Engineer** to develop the **Project Criteria.** The **Procurement Advisor** role is to aid the **Owner** in the preparation of the Request for Qualifications ('**RFQ**") and the Request for Proposals ("**RFP**") to secure a DBO vendor team. Due to the complexity of a contract that includes project development, construction and operations phases, the **Owner** typically retains an attorney for the development of the **DBO** service agreement. The **Owner's** project management staff, **Procurement Advisor**, **Design Engineer** and the contract attorney typically constitute the **Owner's** project team.

The **RFP's Project Criteria** may be solely performance-based or have some prescriptive design requirements. The objective of the **RFP** is to secure a contract with one party, usually the lead of the **DBO Contracto**r team, who will have overall responsibility for the development, design, construction, start-up, acceptance testing, and long-term operation of the project. The **DBO** contract is primarily based on delivering an asset with a given design/construction and operational performance.

Generally, one of the participants in the **DBO** vendor team is the **Project Guarantor** who pledges to financially back the **Performance Guarantees** of the **DBO** vendor team for the project duration. The **Performance Guarantee** is a financial contract between the Owner and the **Project Guarantor** to assure that the project will perform as intended by the **Owner**. The project structure for a **DBO**-type project is shown in Figure 2-3 below.

Figure 2-3
DBO Project Structure



The **DBO Contractors** are generally selected based upon a combination of **Design Consultant**, **Construction Contractor**, **Operator** and **Project Guarantor** qualifications; their technical proposal; and proposed capital and operating price. Each proposal will include the **DBO Contractor's** design approach, operating approach, and fixed capital price and operating fee. A proposal evaluation committee of the **Owner** is typically used to evaluate the economic, financial, technical, and legal aspects of the **DBO** proposals.

Generally, the **Owner** will utilize an **Owner's Agent** and/or **Owner's Representative** to ensure that the **DBO Contractor** develops, designs and constructs the project consistent with the requirements of the service agreement. The **Design Consultant** of the **DBO Contractor** is the design engineer of record for the project. Upon completion of construction, an acceptance test is performed to demonstrate the facility can operate within the service agreement performance criteria. Once the facility has met the acceptance conditions, the facility commences commercial operation and is operated by the **DBO Contractor**'s **Operator**. The terms of service and the service fees for the operation of the facility are competitively established and guaranteed in the **DBO** proposal and the service agreement. Typically, the design, construction, installation and **Performance Guarantees**/warranties are established to a maximum

dollar amount that is a percentage of the project's capital value related to project risk. The operating guarantees and warranties are set at a maximum dollar amount that is some multiple of the service fee.

Typically, the **RFP** characterizes the **Owner's** desired risk position. The objective is to allocate project risk to the party best able to manage risk. Commercial and performance risks tend to be shifted to the **DBO Contractor** through future capital risk. Risks for future regulatory change, uncontrollable circumstances and change in law tend to remain with the **Owner**.

Key Contractual Issues

State and local enabling statutes that address the public procurement of engineering and/or a contractor's services frequently do not address operational issues as a factor in selection. The specific limitations of the procurement enabling statues tend to dictate the means for procuring and selection of a **DBO Contractor**.

DBO project delivery is a contractual blending of a **DB** and a contract **Operator** into one vendor team. The one other responsibility in a **DBO** contract is that of the **Project Guarantor**, a financial "backer" of project. The **Project Guarantor** is typically one of the project participants or parent company of a participant. The **Project Guarantor** agrees to financially back the project participants at some prescribed dollar amount. The **Project Guarantor** component of the agreement should be carefully considered so as to assure its usefulness in the event of default by the **DBO Contractor**.

The **DBO Contractor** project phases include a design and development period, a construction period, and an operating period. To have reasonably comparative fixed and/or guaranteed prices from multiple vendor teams requires substantially complete contractual terms and conditions for all three phases of the project. This often necessitates the inclusion of an extensive draft contract in the **RFP**.

An accurate and complete characterization of the **Owner's Project Criteria** in the **RFP** is paramount to a successful project in terms of desired quality, cost and schedule for the project. The **Owner's Project Criteria** define all of the requirements that the **DBO Contractor** has to fulfill in the design, permitting, construction and operation of the facilities. The **DBO Contractor** will have substantial control over the definition of details of the project beyond those identified in the **Owner's Project Criteria.** The design review process should be carefully considered by the **Owner.** Clarity of the **Owner's** intent and needs, adequate definition of any required interrelationships with existing infrastructure and the applicable quality standards for the project, should be adequately defined by the **Owner's** project team early in the project.

The contract with the **DBO Contractor** should, to the greatest extent possible, protect the **Owner** from costs related to delays during the design and development period. Projects frequently experience unanticipated schedule delays related to permitting activities. Whereas a **DBO** contract has potential involvement of a **Guarantor**, **Design Consultant**, **Construction Contractor** and subcontractors, the contract language should specifically address what delay costs will be charged during the

various contract phases. These delay charges can be included in the competitive fixed fee for the services of the **DBO Contractor.**

Benefits

A **DBO** project delivery has all the advantages of a **DB** type project delivery identified in the prior section including:

- Single point of contractual accountability for design, construction and operation;
- Cooperative teaming effort of the **Design Consultant** and the **Construction Contractor** can reduce project capital costs and shorten schedule;
- A collaborative design and construction effort competitively procured can foster innovation;
- Concurrent design, permitting and construction activities can shorten project schedule; and
- The certainty of the project cost is determined at an earlier point in the project.

The addition of the **Operator** to a project delivery team has the potential to create a new dynamic in the design process. For example, if the project selection criteria for the **DBO Contractor** includes life-cycle project costs, then the facility's annual operating expense can be a more significant factor in **DBO Contractor** selection than the consideration of only the installed project capital cost. With a significant competitive incentive to minimize project operating expenses, contract **Operators** have the opportunity to value engineer designs to optimize the facility's operability. This may involve technologies that have a higher installed capital cost but will result in significantly lower operating costs. Therefore, the overall life-cycle project costs are reduced as compared to traditional approaches.

Some **DBO** contracts include shifting the long-term capital operating risk to the **DBO Contractor**s. The long term capital operating risk is associated with the future cost to maintain a facility. Other terms used by utilities to describe these expenses include extraordinary maintenance, non-routine maintenance and major capital maintenance. When the **Operator** is obligated to provide cost guarantees for this long term operating capital risk, they have an incentive to assure optimal equipment quality to minimize maintenance expense for the term of the contract and renewals. This may have significant cost benefit for the public.

An additional benefit is that the rates for the utility can be reduced to a formula for the term of the contract because of the fixed cost-basis for operations. Many communities have found it beneficial for economic growth and development to be able to predict their utility rates long term with the added certainty of a guaranteed contract.

Areas of Concern

Public **Owners** must understand that to reap the benefits of guaranteed fixed construction and fixed operating costs, they will commensurately have to relinquish, control over project construction details, schedule, and operation. Appropriate due diligence with respect to the competency and performance of the vendor team in similar circumstances is critical to project success.

The **Owner** may have very limited experience with long term **DBO** contracting and thus have difficulty adequately defining the contractual relationship with the **DBO** vendor team. A contract that includes, at a minimum, the provisions for project development, design, permitting, start-up, acceptance testing, operations, regulatory compliance, monitoring and reporting and future plant modifications, is undoubtedly complex. A multiphase project contract can be difficult to prepare, understand and administer. This is the reason that **Owner Agent**, **Procurement Advisor, Owner Representatives** and specialized outside legal counsel are typically used on DBO projects.

The requirements for significant financial strength of the **Project Guarantor** and the high cost of developing a **DBO** proposal are frequently cited as deterrents to smaller, less sophisticated contractors participating in the **DBO** process. These two features tend to necessitate that at least one of the project participants is a major corporation with significant financial assets. This is often interpreted as meaning that **DBO** project delivery approach limits competition to major companies in the water and wastewater field. However, the procurement process can be structured to require a portion of the work to be performed by local, minority or disadvantaged **Contractor**s.

A significant **DBO** contract issue is the **Owner's** administrative oversight during the operations period and the applicable standards of care for maintenance during the operating period of the contract. In a long-term, fixed price contract for the O & M of a facility, the **Owner** must be able to hold the **DBO Contractor** to enforceable standards for equipment maintenance. Otherwise, the **DBO Contractor** has an incentive to increase their profits by shortchanging equipment maintenance. **DBO** contracts should have clearly defined and measurable standards for acceptable equipment maintenance, periodic inspections and an **Owner's** remedy for inadequate maintenance by the **DBO Contractor's Operations**.

Build-Own-Operate-Transfer ("BOOT")

Description

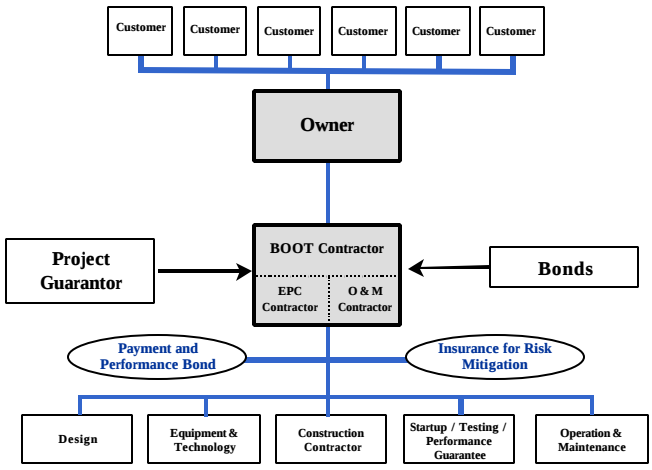
BOOT projects have had very little commercial application in the United States. **BOOT** projects can be characterized as an "absolute" performance-based contract in that they are structured as buying a commodity of given quality at a fixed price. The characteristics of a **BOOT** project include the vendor providing the design, permitting, financing, construction, commissioning and long-term operation of the constructed utility asset. Consequently, the vendor uses commercial private financing and owns the asset. The security for the **BOOT Contractor** to secure financing is a purchase contract for the asset from the **Owner**. **BOOT Contractor**s are generally pre-qualified, but the final **Contractor** selection is based fundamentally on providing a commodity at a given price or tariff. An example of a tariff for a water contract would be a contract based on providing a minimum quantity of quality water for a fixed dollar value. This type of project delivery is common throughout many developing nations of the world where cost of service is critical and design and operational expertise of the **Owners** in these areas can be very limited.

Solicitations for **BOOT Contractor**s are similar to a **DBO Contractor**. The **RFP**s for **BOOT**S are typically performance-based. The vendor teams are typically pre-qualified based on qualifications and experience, including the team's ability to secure financing for facility design and construction. The **Vendors** prepare and submit extensive proposals that generally include a concept design, operating plan and a guaranteed tariff in a form specified by the **Owner** to either deliver water or treat wastewater. A "Take or Pay" form of contract between the **Owner** and the private vendor generally secures financing. The private vendor owns the facility until such time as debt is repaid to the investors. Then, the asset is transferred to the **Owner** at the end of the contract term for either its market value or some diminimous value prescribed in the contract.

The **Owner's** role and responsibility in a **BOOT** project may be simpler than in a **DBO**, because the private investors have an interest in assuring that the project begins commercial operation and generates revenue to repay the debt. **Owners** will typically utilize an independent engineer to see that the **BOOT** vendor develops, designs and constructs the project consistent with the requirements of the service agreement. The **Designer** in the **BOOT Contractor's** consortium is the **Designer** of record for the project. Upon completion of construction, an acceptance test is performed to demonstrate that the facility can operate within the service agreement performance criteria. Once the facility has met the acceptance test conditions, the facility commences commercial operation and is operated by the **BOOT** vendor's **Operator**. The terms of service and the tariff paid for the operation of the facility are competitively established and guaranteed in the **BOOT** service agreement.

The **BOOT** vendor is allocated nearly all the project risks, except the commercial risk related to the customer's ability to pay the tariff, change in law or Force Majeure. The project structure for a **BOOT** contract is shown in Figure 2-4.

Figure 2-4
BOOT Project Structure



Key Contractual Issues

A **BOOT** project is structurally similar to a **DBO** project. The major differences is that the **BOOT** vendor will finance the project based on the strength of a "Take-or-Pay"-type water purchase or wastewater treatment agreement. The key contract issues for a **BOOT** project are then similar to those for a **DBO** project. The **Project Criteria** that define the **Owner's** objectives and desired outcomes for the project must accurately reflect the **Owner's** needs. The complexity of the termination conditions in a **BOOT** project also require careful consideration. A subordinate agreement with an **EPC Contractor** is usually developed and is consistent with the service agreement. A key area for disputes can be the inadequate characterization of the quality or quantity of raw water, in the case of a water treatment plant, or effluent wastewater in the case of a wastewater treatment plant.

Benefits

The key benefits of a **BOOT** project delivery are that the commercial and technology risks of a project can be fully allocated to the **BOOT** vendor. From the perspective of the **Owner**, the **BOOT** project is "off balance sheet financing". Thus, the project is neither an encumbrance upon, nor directly dependent on the credit limits of the **Owner**. This factor can be significant when the **Owner** needs to preserve public credit or has debt limitations.

One area where **BOOT** projects have been recently used in the United States is with seawater desalination plants. The risk associated with the design and project implementation associated with a developing technology is daunting to most public **Owners**. In the **BOOT** approach, with the **Owner** primarily responsible only to buy water exceeding stated quality standards for a fixed unit cost, the **Owner** can be significantly insulated from the project's technology risk.

Areas of concern

The areas of concern applicable to **DBO** generally apply to **BOOT**. These include the following:

- Reduced **Owner** control over project details;
- Use of a complex multiphase contract;
- Cost of proposal preparation may limit competition; and
- Operations and maintenance oversight standards are required to protect and maximize asset life.

In addition, there may be some incrementally higher cost to provide the service due to the higher cost of private capital. Proponents of this form of project development suggest that these incrementally higher costs are offset by risk transfer, project cost reductions and technology **Performance Guarantees**.

Table 2-1 compares the traditional **DBB** to the most commonly used alternative delivery approaches of **DB** and **DBO**.

SUMMARY TABLE 2-1
COMPARISON OF TRADITIONAL VS. ALTERNATIVE PROJECT DELIVERY APPROACHES

Criteria	Traditional DBB	DB Approach	DBO Approach
Primary Contract Arrangements	Separate contracts or relationships with **Design Engineer**, **Construction Contractor** and the Operating agency.	Separate contracts with **DB Contractor** and Operating agency.	One contract for **DB** service and long- term operation of facility.
Design Engineer Selection	Engineer selected on basis of capability and experience, not cost. Engineer is responsible for design and cost estimate only.	Engineer selected on basis of capability, experience and cost. Joint venture of Engineer and **DB Contractor** are responsible for facility's capital cost.	Engineer is not independently selected. **DBO Contractor** may be qualified in part because of Engineer's capability and experience. **DBO Contractor** selected on merits of **Designer**'s proposed design, facility capital and operating costs.
Design Process	**Design Engineer**, in consultation with **Owner**, prepares one final design. **Owner** retains most performance risk for design. Design is developed independent of constructability review. Value engineering is an option at **Owner's** expense.	Design conducted in phases with many constructability reviews by **Contractor** as joint venture partner. Value engineering skills are a competitive advantage to a **DB Design Engineer.**	Proposers, through competitive process, prepare several conceptual designs for **Owner** to choose preference. Proposer's commitment to fixed operating cost creates a competitive incentive for low O & M designs. Provides **Guarantor** for design.
Permitting	**Owner** responsible to obtain all permits prior to construction.	**Owner** responsible to obtain all permits prior to construction. May transfer some permit development responsibilities to **DB Contractor**.	Procurement defines sharing of permitting responsibility between **Owner** and **DBO Contractor**.
Contractor Proposals	**Owner** selects "lowest cost, responsive bid" constructor to build the designed asset, and retains risk for design implementation. **Owner** retains risk of appropriate construction and coordinated project	**Owner** may pre-qualify **Contractor**s during selection of **DB Contractor**. Cost of facility is significant basis for selection. Risks for construction and coordinated project implementation shared or can be	Proposers internally select the **DB** team to oversee construction and final implementation of its own design and assume the risk for coordinated project implementation.

SUMMARY TABLE 2-1
COMPARISON OF TRADITIONAL VS. ALTERNATIVE PROJECT DELIVERY APPROACHES

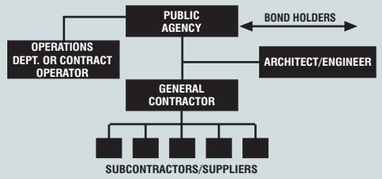
Criteria	Traditional DBB	DB Approach	DBO Approach
	implementation.	allocated to **DB** Team.	Provides **Guarantor** for construction.
Project Schedule	Sequentially procure **Design Engineer**, complete design, procure **Contractor** and construction of asset which typically requires longest delivery schedule.	Opportunity for integrated design with construction cost development and fast track construction facilitate shortened project delivery schedules.	Opportunity for integrated design with construction cost development and fast track construction facilitate shortened project delivery schedules.
Construction Oversight	**Owner** retains **Design Engineer** to review **Contractor** equipment submittals, observe construction and to attest that construction conforms to design requirements. **Owner** retains responsibility for design ambiguities or inadequacies.	**Owner** has option to retain independent engineer to observe construction and contract compliance. Risk for design ambiguities or inadequacies allocated to **DB Contractor**.	**Owner** has option to retain independent engineer to observe construction and contract compliance. **DBO Contractor** has overall responsibility to provide all **Design Engineer** and construction oversight during construction. Provides Guarantee for Performance.
Plant Commissioning	**Owner** accepts plant upon construction completion from construction firm and initiates effective operation with newly hired staff. **Owner** retains all operational performance risk.	**Owner** accepts plant upon construction completion from construction firm and initiates effective operation with newly hired staff. **Owner** retains all operational performance risk.	**Owner** accepts tested and operating facility, with trained staff, and a detailed operations and maintenance plan. Provides **Guarantor** for operational performance over the term of the Service Agreement.
Start-up of Operations	**Owner** trains staff and manages treatment processes, including emergencies. **Owner** retains all risk for operating costs of facility	**Owner** trains staff and manages treatment processes, including emergencies. **Owner** retains all risk for operating costs of facility	**DBO Contractor** qualified in part on skill and capability of **Operator**. **Owner** contracts with private sector experts for fixed fee structure to operate plant and respond to emergencies.

SUMMARY TABLE 2-1
COMPARISON OF TRADITIONAL VS. ALTERNATIVE PROJECT DELIVERY APPROACHES

Criteria	Traditional DBB	DB Approach	DBO Approach
Facility Modifications	**Owner** enhances/modernizes plant as needed when adequate funds are available.	**Owner** enhances/modernizes plant as needed when adequate funds are available.	Proposers, identify plant enhancement based on profitability under **Owner** approved processes.
Long Term Capital Maintenance Risk	**Owner** establishes maintenance plan and annually adopts budget, addressing need for proposed enhancements.	**Owner** establishes maintenance plan and annually adopts budget, addressing need for proposed enhancements.	**Owner** contracts for fixed maintenance costs for 15 to 25 years, without need for annual review. **DBO Operator** must maintain plant per contracted performance specifications.

PUBLIC/PRIVATE PARTNERSHIPS

TRADITIONAL
Design-Bid-Build



- Owner selects engineer who helps define project, develop bid documents, evaluate bids
- Construction awarded to lowest responsive bidder
- Construction monitored by engineer or construction manager
- Operations by owner or contract operator

PROS

- Well understood by all involved parties
- Potential for high degree of control and involvement by owner
- Independent oversight of construction contractor

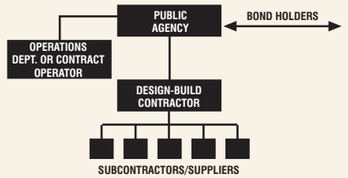
CONS

- Segments design, construction, and operation and reduces collaboration
- Linear process increases schedule duration
- Prone to disputes and creates opportunities for risk avoidance by the designer and construction contractor
- Low-bid contractor selection reduces creativity and increases risks of performance problems
- Risks are mostly borne by the owner
- May not allow for economies of scale in operations
- For new technologies, operability may not be the primary design concern

WORKS BEST WHEN...

- Operation of facility is minimal or well understood by owner
- Project requires a high degree of public oversight
- Owner wants to be extensively involved in the design
- Schedule is not a priority

D/B
Design-Build



- Owner hires design-build team. Operation by owner or contract operator
- Variations:
  - (1)RFQ-shortlist-RFP or (2)RFP plus qualifications
  - Define existing conditions and desired outcomes, then request 30% design and bid price
  - +/- 30% design then bid for final design and construction

PROS

- Collaboration between designer and contractor
- Allows parallel work processes and reduces duration
- Reduces design costs
- Reduces potential for disputes between designer and construction contractor
- Single point of accountability
- Can promote design innovation
- Provides more certainty about costs at an earlier stage
- Allows owner to assign certain risks to D/B team

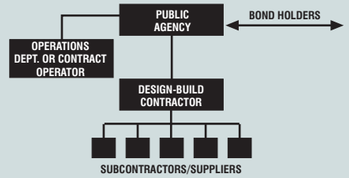
CONS

- Owner may not be as familiar with DB process or contract terms
- Reduces owner control and oversight. Owner's rejection of the design, if not based clearly on rights in the contract, can entail large change orders and delay claims
- Design and "as-built" drawings not as detailed
- Eliminates "independent oversight" role of the designer
- Does not inherently include incentives for operability and construction quality as does a DBO or BOOT approach
- Higher cost to compete

WORKS BEST WHEN...

- Time is critical BUT existing conditions and desired outcomes are well defined
- Project uses conventional, well-understood technology
- Owner willing to relinquish control over design details
- Operational or aesthetic issues are easily defined
- Early contractor input will likely save time or money

EAR
Engineer-at-Risk



- Variation on DB concept
- Owner hires DB team based on qualifications and fixed price
- Operation by owner or contract operator
- Often employs fast-track construction
- Design services competitively procured

PROS

- Same as DB and;
- Provides project focus on delivered cost
- Provides for transfer of schedule risk

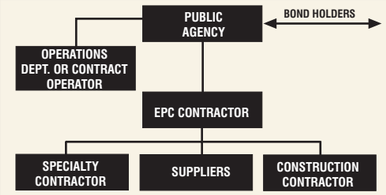
CONS

- Same as DB and;
- Requires early definition of project
- Owner needs to be vigilant on quality

WORKS BEST WHEN...

- Same as DB and;
- Price is critical success factor

EPC
Engineer-Procure-Construct



- Selection of a single firm to do predesign, design, and be the general contractor. Facility must meet performance tests. Compensation is typically fixed.
- Subcontractors selected to do most construction by EPC contractor, primarily on cost. EPC contractor procures equipment
- Utilizes private financing

PROS

- Provides some of the schedule benefits of D/B BUT bid packages must be assembled by EPC contractor to bid subcontracts
- Collaboration between design and construction
- Construction expertise brought in during design
- EPC contractor can act as owner's advocate
- Allows smaller firms to compete for EPC contract
- Single point of accountability
- Liquidated damages for failure to meet performance guarantees

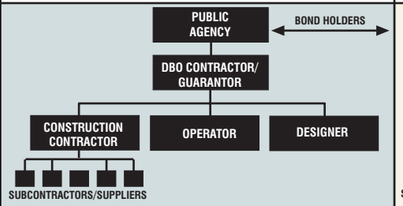
CONS

- More design effort than for design build
- Owner may not be familiar with EPC contracting
- Cost of private capital
- Financial strength of EPC contractor backs guarantees

WORKS BEST WHEN...

- Owner wants minimal involvement during design and construction
- Equipment procurement is a significant part of the work
- Capital intensive project

DBO
Design-Build-Operate



- Involves a single umbrella contractor for overall design, construction, and long-term operation
- Because of high costs to compete, selection is typically a two-step process: (1) short-list based on qualifications and (2) selection based on RFP criteria
- Owner has wide discretion in how perscriptive or performance-based the process is, but must define existing conditions, inputs (ie. raw water quality and flows), and expected outcomes

PROS

- Allows designer, construction contractor, and operator to work together collaboratively
- Parallel processes reduce duration
- Operator input on new technologies and design saves money
- DBO contractor has a built-in incentive to assure quality since they will be the long-term operator
- Single point of accountability
- Allows owner to assign certain risks to DBO contractor
- Economies of scale for operations
- Collaboration, long-term contract, and appropriate risk allocation can substantially cut costs
- Defines long term expenses for rate setting

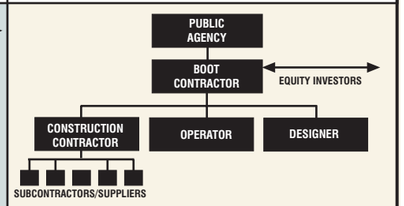
CONS

- Reduces owner involvement
- Owner may not be familiar with DBO contracting
- High cost to compete may limit competition
- Depending on contract terms, may give operator incentives to over-charge for ongoing renewals and replacements or to neglect maintenance near the end of the contract term
- Operations contract may limit long-term flexibility
- Requires multi-phase contract

WORKS BEST WHEN...

- Owner's staff does not have experience operating the type of facility
- Input conditions to the facility can be well defined and the number of external influences affecting plant operations are limited
- Owner is comfortable with less direct control during design, construction, and operation

BOOT
Build-Own-Operate-Transfer



- Similar to DBO except private financing and ownership
- Ownership may be transferred to public agency at end of contract term. Contract sets method for valuing facility at that time

PROS

- Same as DBO and;
- Can be used where project expenditures would exceed public borrowing capacity
- Beneficial where preserving public credit for other projects is important (ie. no debt on balance sheet)
- Can isolate owner from project risk

CONS

- Same as DBO
- BUT lack of public financing increases the cost of money

WORKS BEST WHEN...

- Public financing cannot be obtained
- Transfer of technology risk is important

Objectives

Utility operating agencies generally tend to be wholly responsible for rendering a service, such as water treatment and distribution or wastewater collection and treatment, to their customers. A utility may select an alternative project delivery method to allocate greater project risk to the contractor, gain a price or schedule advantage, or have greater assurance that the project meets their needs.

There are characteristic objectives for a successful alternative project delivery procurement process for the general implementation, design, construction, and operations phases.

Specific project objectives can be divided into several phases.

Procurement objectives include:

- Assure a fair, open market solicitation process,
- Protect the owner's interests, and
- Allocate risk for project implementation to those parties (private and public) best suited to protect the public interest.

Design and construction objectives should assure:

- Optimization of present and future treatment processes,
- Efficient environmental permitting and mitigation,
- Aggressive scheduling,
- Lowest construction costs without overruns, and
- Maximize design/build coordination at minimal risk to owner.

For DBOs and BOOTS:

Plant operation and maintenance objectives should include:

- Reliable efficient treatment services to the public,
- Continuous compliance with all applicable regulations and operating requirements,
- Effective response to both standard and unusual operating situations,
- The lowest possible operational costs,
- Prudent management and protection of public resources, and
- Maximize asset life.

One of the critical areas of concern from a public policy perspective is addressed by the procurement objective to assure a fair, open market solicitation process. The costs of developing proposals for alternative procurement methods that involve the development of multiple concept designs by each vendor can be very expensive. The aggregate contract value for the design, construction and 15 to 20 years of operations can be hundreds of millions of dollars. The selection of some combination of engineer- contractor-operator, not principally based on lowest cost presents the opportunity for abuse of discretion. The procurement process should safeguard against these possibilities through specific limitations on vendor contact with elected officials and sponsoring agency staff during the procurement. In addition, the process needs to provide for clearly articulated and transparent evaluation criteria. A procurement process that addresses these issues can be effective at achieving the owner' s objectives.

Benefits

There are three interrelated elements of any project that an owner has the responsibility to control: cost, schedule and quality. For an owner to pursue an alternative project delivery method, there typically has to be a benefit in at least one of these areas. If one considers that "performance", defined as either on-budget construction or meeting an owner's operating needs efficiently, then it may be more clear where DB and DBO/BOOT type project delivery offers an advantage. Potential benefits come from different features of each of the alternative project delivery methods, which provide opportunity to derive efficiencies beyond a traditional project delivery approach. The efficiencies from the designer /contractor relationship in a DB contract and the designer/operator relationship in a DBO contract are identified below. In addition, listed below are some commercial factors that continue to afford owner benefits in selecting DB and DBO/BOOT project delivery.

Design/Build efficiencies (perhaps in the 10 to 20% range of the project capital cost) are possible when:

- Design services may be competitively procured;
- The close working relationship of the designer and contractor can lead to the incorporation of more economical design and the application of cost saving construction techniques;
- The owner's burden to mediate disputes between the designer and constructor is eliminated, with the design/builder required to resolve design issues as they surface during construction. Thus, the owner gains the ability to fix project costs earlier in the procurement process than in other project approaches; and
- With construction and purchase of equipment undertaken prior to final design completion, "fast track" procurement can be accomplished.

Design/Operate efficiencies (perhaps in the 30-40% per year range) are possible because of the following:

- Highly automated facilities may reduce staffing costs;
- Firms with high levels of plant operational experience may design and accept final facilities to meet their experience requirements;
- Bulk purchasing of supplies and materials is feasible; and
- Operational firms with large research/development budgets can introduce new technology and provide "Best Practice" management skills, thereby driving down their long-term operating costs.

Competitive market savings may be possible because of the following:

- Keen international market interest exists in bringing the DBO/BOOT approach to the American water industry;
- Qualified competitors who want to establish a long-term market niche could trade near-term profits for longer-term operation goals; and
- Vertically integrated developer/equipment/operations vendors can provide cost guarantees.

An example of a comparison of the traditional project delivery approach and a DB or DBO project approach is graphically illustrated below with two sample project schedules. The example is for the construction of a new water treatment plant. In the example, the significant schedule difference is reflected in the single procurement of the designer and contractor, which enables the construction to start before the final design is complete.

Figure 3-1
Traditional Contracting Approach
For Water Treatment Facility
Sample Schedule

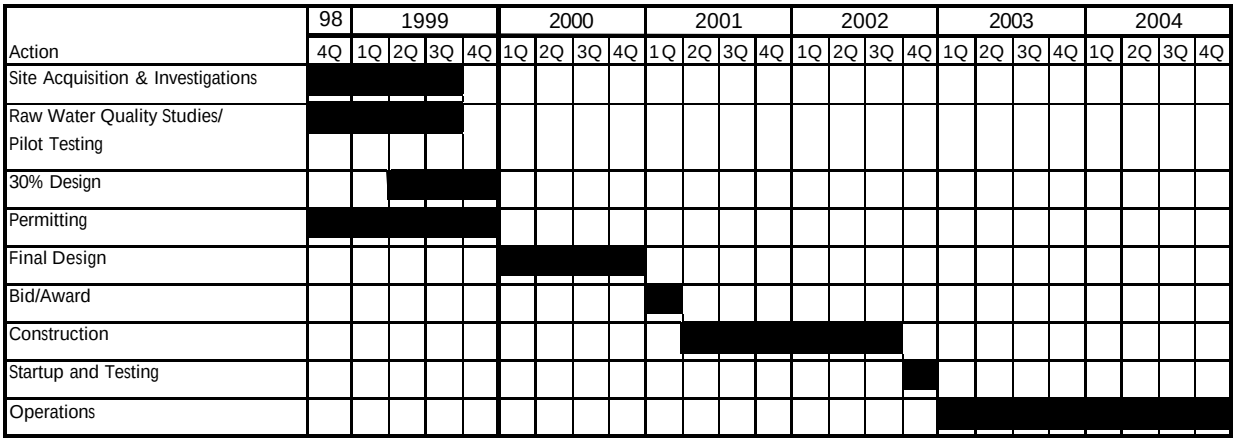
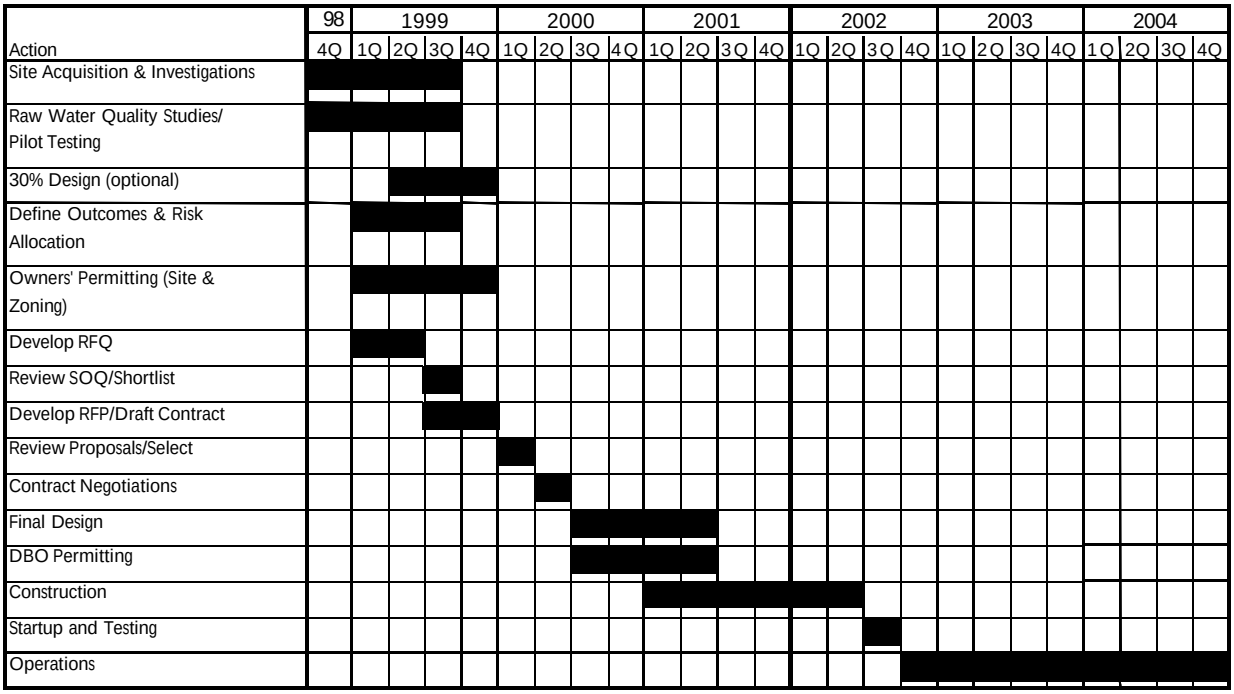


Figure 3-2
DB or DBO Approach
For Water Treatment Facility
Sample Schedule



As shown above, the estimated time savings from a DB approach for the treatment plant would likely be on the order of three months.

Areas of Concern

To present a balanced approach to alternative project delivery, it is important to identify some of the potential problems with this approach. Most of the areas of concern arise due to the limited experience with these project delivery approaches, existing procurement laws developed without consideration of these approaches, and the lack of legal precedents surrounding the risk sharing and task sharing. Provided below in Table 3-1 is a summary of potential areas of concern.

TABLE 3-1
POTENTIAL AREAS OF CONCERN
TRADITIONAL VERSUS DB/DBO APPROACH ON PUBLIC PROJECTS

CRITERIA	TRADITIONAL APPROACH	DB/DBO APPROACH
Abuses of Discretion	Subjective selection of designer is subject to criticism. Presumption of objective result because competitive process selects Contractor.	Vendor selection not based on "lowest responsible bidder or most qualified designer" has potential for Owner abuses of discretion, fraud, and favoritism.
Proposals	Engineer responsible for design and cost estimate only. Response by Contractor to fully designed final plans and specifications allows objective price proposal development.	Substantial costs can be associated with producing DB or DBO/BOOT proposals due to the requirement for conceptual designs. This can limit competition to larger established participants. Owners often only identify basic needs for project Owner and may not adequately establish standards for aesthetics and asset life.
Review of Proposals	Engineers selected on subjective basis of capability and experience, not cost. Contractor selected objectively on responsiveness to bid request and responsibility to perform work.	Public Owners may not have in-house personnel with expertise in preparing and administering design-build requests for proposals and contracts May be difficult to compare proposals. Owner must evaluate both technical merits of design and quality related to construction price.
Legal Precedent	Long history analyzing and allocating responsibilities between designer, versus Contractor, versus Owner.	Very little case law regarding DB/DBO process and liability currently exists, so there is uncertainty about how courts and arbitrators will resolve new issues associated with the system.[1]
Oversight During Construction	Owner or its separate consultant can evaluate quality and workmanship of construction by Contractor.	Quality standards of performance for contractor are not always clearly defined. Quality of construction should not be sacrificed for cost or schedule.
Contractual Arrangements	Separate contracts with Contractor and Engineer allow Owner to define roles and responsibilities of each.	Joint venture team may not have long history together. Allocation of responsibility between Contractor and Designer is developed independently of Owner and assignment of responsibility may be unclear to Owner.
Competition	Larger universe of individual service providers (designers/	Fewer DB entities exist because of uniqueness of relationships and liability,

TABLE 3-1
POTENTIAL AREAS OF CONCERN
TRADITIONAL VERSUS DB/DBO APPROACH ON PUBLIC PROJECTS

CRITERIA	TRADITIONAL APPROACH	DB/DBO APPROACH
	Contractors/Operators) should allow for more competition.	making smaller pool for Owner to choose from. Smaller pool could make for less competition. Advantage to Owner could be pairing of experienced designer and Contractor and ability to eliminate bad teams during selective procurement process.
Legal Barriers	Texas state public entities procurement law provides a well-recognized, historically based framework for the traditional approach.	Texas state law requires submission of complete water plans prior to regulatory approval. According to Texas state public entities procurement law, public entities must use the traditional design-bid-build process to obtain water/wastewater infrastructure.[2]

[1] Please see "Legal Review of Alternative Delivery Methods", March 2001.
[2] More detailed discussion included in "Legal Review of Alternative Delivery Methods," March 2001.

Responsibilities

Even under the alternative delivery approach, some responsibilities and risks can not be transferred to a third party.

Generally, the Owner is responsible to maintain project ownership and responsibility for the following:

- Overall project management;
- Establish conditions for environmental permitting and mitigation;
- Public health protection and regulatory responsibilities;
- Define water quality objectives;
- Permit ownership (except BOOT); and
- Project financing (except BOOT).

Thus, when undertaking an alternative delivery approach the above responsibilities must be acknowledge and effectively addressed to ensure project success.

Section 4

EXAMPLES OF RECENT OR ONGOING ALTERNATIVE DELIVERY PROJECTS

Several examples of recent and ongoing DBO projects are summarized below to reflect the application of alternative project delivery.

Bexar Metropolitan Water District, Texas

Bexar Metropolitan Water District, Texas ("BexarMet"), based in the San Antonio metropolitan area, provides water directly to over 250,000 people in Bexar, Medina, Comal and Atascosa counties. The majority of the water is provided to retail customers and a very small portion is provided on a wholesale basis. A seven-member board that is elected by the residents of this service area governs BexarMet.

Background

To develop new water supplies in order to reduce dependence on the Edwards Aquifer, BexarMet initiated the construction of new surface water intake and treatment facilities. Because private companies are not subject to the same engineering and construction requirements prescribed in Texas State law, BexarMet chose to create a non-profit industrial development corporation. Using the private corporation structure, BexarMet was able to use a DBO approach for project delivery while also benefiting from tax-exempt bonding.

For the BexarMet DBO, the DBO contractor agreed to accept the risk that the constructed facility would meet the criteria of the TNRCC. United Water, lead for the selected DBO team, regularly met with TNRCC to review compliance of the facility with the appropriate regulations. Permitting was granted for operation.

Facility: 10 MGD surface water intake and transmission facility, 9-MGD ultra-filtration membrane plant.

Developer: United Water

Subcontractor: Montgomery Watson - Design Engineer
Local contractors - construction

Project Summary

- The nonprofit private entity consists of a subgroup of the governing board members of BexarMet.

- The company, BexarMet Development Corporation (BMDC), floated tax exempt bonds using the assets of BexarMet and leases back to BexarMet the facilities created by the private corporation.

The financial arrangement was developed as follows:

- BexarMet bills its customers and receives payment;
- BexarMet pays BMDC a fee for the lease and operation of the facilities;
- BMDC pays the DBO contractor for operation and construction; and
- BMDC pays the bondholders.

Benefits

- As a direct benefit of the DBO procurement method, the facility was completed and placed in service less than 16 months from the commencement of the contract.
- The operation was reported to be effective and resulted in a successful project for both BexarMet and United Water, the DBO contractor.

Present Status

The facility remains in operation.

Houston, Texas

The City of Houston ("City") provides water on a retail basis to residents within the City's jurisdictional boundaries. The City currently operates its water utilities through the City Department of Public Works.

Background

To develop new water supplies and to reduce dependence on groundwater sources, the City is in the process of developing a 60-MGD surface water treatment plant and transmission system. The water plant, which will draw water from Lake Houston, was a response to the need for surface water supplies in northeast Houston. The City also envisions selling water from the new plant to municipal utility districts in northeast Harris County. The City intends to procure the design, construction and operation of these facilities through the use of DBO project delivery.

On August 23, 2000 the City Council of Houston created the Houston Area Water Authority to shepherd the development of a northeast water plant. The Authority allows the City to use DBO for project delivery and permit the City to act as a private company while retaining the financial advantages of a public entity.

The City Council retains approval authority over several major steps in the development of the water plant. The board of the local government corporation will be

appointed by the City. Under the approved articles of incorporation, the City Council must approve the issuance of any debt for the project, any design, construction or operating contracts, and the establishment of water rates.

Facility

The facility can be described as follows:

60 MGD surface water transmission and treatment facilities.

The definition of specific facilities has been left for the DBO entities to propose inclusive of:

- Treatment process;
- Physical facilities; and
- Organization, including regionalization, etc.

Benefits

City officials contend such a plan could save millions of dollars over traditional development methods.

Present Status

As of December 2000, the City had solicited for DBO proposals but had not yet selected a vendor team. The City's proposal required a concept design and qualifications of responding firms but did not initially request budgets. In addition, the proposers were asked to suggest means of financing the project. Eight proposals have been submitted to the City. It was reported that the City will short list respondents and then request price proposals for selection of the DBO contractor as the next step in the process.

Cranston, Rhode Island

Background

In the early 1990's, the City of Cranston was in poor financial health and was facing a State Department of Environmental Management Consent Order to up-grade its aged wastewater collection system and treatment plant. The wastewater utility was operated as a municipal enterprise fund. The revenues from user rates were intended to fully support the sewer enterprise fund. The improvements mandated by the Consent Order for the upgrade where evaluated by the City's consultant engineer and determined to present significant economic hardship to the City. The City pursued other alternative means to comply with the Consent Order.

In 1996 the City selected the proposal of Poseidon Resource Corporation of Stamford, CO to design, build, operate and finance the necessary improvements to the City's wastewater system. The term of the contract was 25 years. The City would also

receive an up-front concession fee of $48,000,000. The security for the financing was a lease for the treatment system. This form of project delivery approach is known as a Build Operate Transfer.

Facility: 23 MGD WWTP, 11 pump stations, collection system

Developer: Poseidon Resource Corp., d/b/a Triton Ocean State L.L.C.

Subcontractors: Professional Services Group ("PSG") - Operator
Metcalf & Eddy ("M&E")/Hart Engineering-Design/Builder

Project Summary

- City leases system to Triton Ocean State L.L.C.
- Triton secures project financing on lease payments.
- Triton pays Cranston a $48 million concession fee and agrees to construct capital improvements necessary to guarantee performance of facilities.
- PSG and M&E are subcontractors for O&M and Design-Build components of project.
- Parent Company of Air & Water Technologies is guarantor.

Benefits

- Risk mitigation
- Performance guarantees
- Rate stabilization
- Improved bond rating
- Off-balance sheet financing
- Defeased $26 million in Municipal GO debt
- $11 million of capital system improvements
- Established $6 million general fund surplus

Savings Anticipated: **$ 76 million**

Present Status

As of 2000, Triton Ocean State was in the third year of the concession contract with the City. The initial $11,000,000 of Planned System Improvements (PSIs) were constructed and are operating. A second set of facility modifications, known as the Advance Wastewater Treatment modifications (AWT), also completed and were in the process of being tested and accepted.

The City received an improved bond rating as a result of the elimination of the municipal debt and the creation of a surplus. The PSIs have significantly improved the performance of the collection and treatment system. The operator has made additional

capital investments in the plant that have a value of more than $2,000,000. These investments optimize facility performance, reduce operating costs, and reduce odor emissions. Other capital improvements made by the operator were performed to improve the operability or performance of the original PSIs.

Significant staff turnover at the City of Cranston has diluted the City's first hand involvement in the Service Agreement.

North Brunswick, New Jersey

Background

The City of North Brunswick is a middle class community of approximately 32,000 residents. In the late 1980's and early 1990's, North Brunswick was experiencing challenges related to growth. The financial pressure for new and expanded municipal infrastructure coupled with a prevailing anti-tax increase sentiment caused the municipality to pursue alternatives to conventional project delivery.

The City solicited proposals from vendors for a concession type contract for the operation of the City's wastewater collection system and the water utility. US Water L.L.C. was selected by the City to enter into a 20-year full service contract. The services included utility billing and management of revenues. A contract was signed February 1996 and the financial closing occurred in June 1996.

Facility: 10 MGD WTP, two storage tanks/pump stations, water distribution and wastewater collection system.

Developer: U.S. Water L.L.C.

Subsidiaries: North Brunswick Water L.L.C.

Project Summary

- Township leases water collection treatment & distribution system to North Brunswick Water, L.L.C.
- U.S. Water secures loan on lease payments.
- U.S. Water pays North Brunswick Township a $6 million up-front concession fee with annual royalty payments of $ 23.9 million over the life of the concession.
- U.S. Water agrees to make capital improvements necessary to assure the installation of ARM water meters.
- Parent Company guarantee(s) project.

Benefits

- Risk mitigation
- Performance guarantees

- Rate stabilization
- Off-balance sheet financing
- Defeased $25 million in Municipal GO debt
- $1 million of Metering System improvements

Savings Anticipated: **$ 9.9 million**

Present Status

U.S. Water L.L.C. d/b/a North Brunswick Water L.L.C. began operating the City's utilities in March 1996. Billing problems experienced during the transition initially caused some concern in early 1997. U.S. Water completed the installation of a new Automatic Meter Reading system. The contract has performed financially as anticipated.

Currently, there is a pending County initiative by the Middlesex County Improvement Authority (MCIA) to solicit one private vendor for utility contract operations services for several municipalities. The City of North Brunswick is one of the participating municipalities in the MCIA solicitation. The City will have the option of terminating its contract with U.S. Water and repaying the balance of the loans and fees and participating in the MCIA contract or continuing with North Brunswick Water in the near future.

City of Seattle, Seattle Public Utilities ("SPU"), Washington

Background

In the early 1990's, SPU was facing the prospect of having to build water filtration plants for its reservoir supplies. SPU had begun design of a 120 mgd plant that would produce one third of SPU's water supply using a conventional project delivery process. However, SPU's new senior management was concerned about reducing cost and maximizing the value of water quality. SPU determined that DBO project delivery could potentially result in significant capital, operating and maintenance savings.

No major water industry precedent for DBO project delivery for a major water treatment plant existed at the State of Washington. SPU and the City managers decided that if the DBO alternative project delivery method could produce 15% savings or more as compared to a conventional project delivery process, then the risk of a DBO would be worth pursuing.

Facility: 120 MGD Tolt Water Treatment Facilities

Developer: CDM & Phillips Utilities Management Corp ("CDM-Phillips")

Project Summary

- CDM-Phillips designs, builds and operates a filtration/ozonation plant for $101 million.
- SPU retains ownership and liability for future capital requirements.
- City of Seattle provides the financing for the project.
- Company guarantees on project.

Benefits

- Risk mitigation
- Performance guarantees
- Rate stabilization
- Exceeded 15% savings off of benchmarked construction costs
- Exceeded regulatory requirement

Savings Anticipated: **$70 million**

Present Status

After a national solicitation, the Tolt River DBO project was awarded to the Team of Philips Management, (now Azurix), Camp, Dresser & McKee and Dillingham Construction. The Contract was signed in March 1997 and construction started in May 1998. The plant is now in operation

Tampa Bay Water, Florida

Background

Tampa Bay Water ("TBW") is the wholesale supplier of water to its member governments, which provide drinking water to more than 1.8 million people in three Florida counties. TBW's mission is to provide its member governments with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically sound manner.

Tampa Bay Water entered into the "Northern Tampa Bay New Water Supply and Ground Water Withdrawal Reduction Agreement" (Partnership Agreement) with the Southwest Florida Water Management District (SWFWMD). SWFWMD is the regulatory agency in Florida that regulates groundwater use and drinking water permits. Pursuant to the Partnership Agreement, Tampa Bay Water developed the Tampa Bay Water Master Plan (Water Master Plan) that identifies needed projects to provide new sources of potable drinking water totaling an annual average of at least 85 million mgd.

Pursuant to stringent timing requirements, the Partnership Agreement calls for the phased reduction of pumping from eleven existing wellfields serving the Tampa Bay region as new water sources are developed. The Agreements specifically require TBW to reduce its average daily withdrawals from the eleven wellfields.

The Water Master Plan projects currently being developed or under construction include the following:

- 66 mgd surface water treatment plant;
- 25 mgd seawater desalination plant;
- 9 mgd groundwater treatment plant;
- 15 billion gallon offstream reservoir; and
- 47 miles of large diameter pipe.

These projects include 174 environmental/construction permits and acquisition of land rights on 266 parcels of land. The budget for the construction of these projects exceeds $609.

TBW's objective in executing the Water Master Plan was obtaining the highest water quality at the lowest possible cost for its members. It evaluated the entire capital improvement program for opportunities to reduce costs through alternative project delivery methods. Based on the evaluation, TBW selected DBO project delivery for the surface water plant as having the most benefit to the Authority.

On April 10, 2000, the TBW board of directors approved the $135 million agreement, which is one of the largest water treatment DBO contracts in the United States and an essential component of the plan to meet the region's need for new water supplies. The contract includes approximately $79 million in capital costs and $56 million in operation and maintenance fees over the initial 15-year term and a five year option period. The new water treatment plant will treat water at a rate of 53.8 cents per gallon, significantly lower than earlier project cost estimates.

Facility: 66 MGD surface water treatment plant

Developer: U.S. Filter, CDM & Clark Construction ("USFOS/CDM")

Project Summary

- USFOS/CDM will design, build and operate a filtration/ozonation plant for $80 million.
- TBW retains ownership and liability for future capital requirements.
- TBW provides financing for the project.
- Company guarantees on project.

Benefits

- Risk mitigation
- Performance guarantees

- Rate stabilization
- Exceeded 10% savings on construction costs
- Exceeded 20% savings on life-cycle costs
- Exceeded regulatory water quality requirement

Savings Anticipated: **$85 million**

Present Status

In May 2000, a third party sued to protest the construction permit for the project. The construction permit issuance was delayed for approximately five months. During this interval in the project, TBW choose to increase the plant size to 66 mgd. The expanded plant construction permit was issued in January 2001. A Notice to Proceed was issued by TBW on January 24, 2001. The plant is scheduled to be completed and in service by the original proposed date of October 2002.

Appendix A

GLOSSARY

- B -

BOOT: Build-Own-Operate-Transfer. A project delivery approach wherein a BOOT Contractor finances, designs, builds and operates a facility for a project sponsor for some defined timeframe. The project financing is typically secured by a "Take or Pay"-type contract. At the end of the contract term, the facility can be transferred to the sponsor under stipulated financial terms or the contract renewed with the BOOT Contractor.

- C -

Construction Contractor: A firm that contracts to furnish labor, materials, equipment and associated services to perform construction work as specified for a specified price.

Construction Manager: A firm with the expertise and resources to provide the construction phase engineering services, bid solicitations, construction monitoring and contract administration, scheduling and other construction oversight services to an **Owner** or to a member of Contractor team.

Construction Resident Inspection: Onsite official examination or review of the work completed or in progress to determine its compliance with contract requirements.

- D -

DB: Design-**B**uild project delivery method.

DBB: Traditional **D**esign-**B**id-**B**uild project delivery method.

DB Contractor: A contractor (led by either construction or engineering firm) that provides both design and construction services under a single responsibility contract to an **Owner**.

DBO: Design-**B**uild-**O**perate project delivery method.

DBO Contractor: A **Contractor** (led by either construction, engineering or contract operations firm) that provides design, construction and operation services under a single responsibility contract to an **Owner**.

Design Engineer or Design Consultant: A firm or business who provides Design Engineering services.

- E -

EAR: Engineer-**A**t-**R**isk.

EPC: Engineer-**P**rocure-**C**onstruct project delivery method.

- L -

Life Cycle Project Costs: The estimated total project capital and operational costs associated with a project throughout the useful life of the project.

- O -

Operator: A firm or business organization that operates a project facility or facilities.

Owner: An individual or entity that owns a real property and/or a facility.

Owner's Agent: A consulting firm that is retained by an **Owner** to prepare or assist with the preparation of procurement documents (RFQs, RFPs, **Project Criteria,** contracts) in order to implement an alternative project delivery.

Owner's Representative: A firm with the expertise and resources to provide the construction phase engineering services, construction monitoring and contract administration, and other construction oversight services of project on behalf of the **Owner**.

- P -

Performance Guarantee: An assurance of the quality or the length of use to be expected from a product or facility offered for sale often with a promise of reimbursement.

Procurement Advisor: A consulting firm that provides guidance and assistance to an **Owner** for selection, development and execution of a procurement for a facility via an alternative project delivery method. The Procurement Advisor can act solely in an advisory role or as the **Owner's Agent**.

Project Criteria: The basis of design, design criteria, engineering drawings, diagrams, performance specifications and other information that are used to define the **Owner's** project requirements.

Project Guarantor: A firm that is a **DBO Contractor** project participant or an affiliated company that pledges a financial performance guarantee for a project. The **Project Guarantor** accepts responsibility for fulfilling the obligations of the entire project.

- R -

Resident Engineer: An individual permanently assigned at a job site for the purpose of representing the **Owner's** interests during the construction phase, including providing an official examination or review of the work completed.

RFP: Request for Proposal.

RFQ: Request for Qualifications.

LEGAL REVIEW OF ALTERNATIVE DELIVERY METHODS

OVERVIEW

This workpaper provides a review of the legal issues associated with DBO delivery approaches for water and wastewater projects in Texas. Davidson & Troilo, a Texas Law Firm, provided the primary legal research and analysis associated with this document.

The workpaper is divided into the following sections:

- Public Entities Authorized to Procure Water/Wastewater Infrastructure
- Laws Affecting Public Procurement Processes
- Procurement by Specific Entities
- Regulatory Approval
- Organizational Flexibility
- School Districts (allowed by statute to use design/build)
- Barriers
- Projects (examples of water infrastructure projects using alternative delivery)
- Conclusion

Overall, the workpaper provides a discussion of the framework for public procurement of water/wastewater projects, potential barriers to the use of alternative delivery, and examples of projects where alternative delivery is being used. Based upon the research provided below, the following are critical issues:

- substantial legal barriers exist for traditional public entities to use alternative delivery approaches to procure water/wastewater infrastructure projects, including state procurement requirements and the requirement for submission of completed design prior to permit approval;
- select non-public entities created by public entities may not be subject to state procurement laws and have flexibility as related to use of alternative delivery approaches;
- types of non-public agencies that have utilized alternative delivery approaches include non-profit water supply corporations, municipal development districts; and local government corporations; and
- Texas school districts since 1995 have been legislatively delegated the authority to use alternative delivery methods for procurement of infrastructure projects.

I. Public Entities Authorized to Procure Water/Wastewater Infrastructure

The following types of public entities are authorized by state law to procure water/wastewater infrastructure:

1. The State of Texas, acting by and through one or more of its agencies. For example the Texas Water Development Board is authorized to develop and acquire water and wastewater infrastructure.[i]
2. Municipalities.
3. Districts created under the authority of Article 16, Section 59 of the Texas Constitution.
4. "Affected" counties as defined by the Texas Water Code, Section 16.341.

II. Laws Affecting Public Procurement Processes

Each type of the above-listed entities are subject to the state constitution, the laws relating to the selection of professional services, and applicable sections of the Texas Administrative Code.

State Constitution

A public entity must comply with applicable procurement laws in order for payments under a contract to be lawful. The Texas Constitution specifically prohibits the state, either on its own or through its political subdivisions, from granting extra compensation after service has been rendered, or a contract has been entered into or performed.[ii] This limitation prevents the state and its public entities from payment of a claim under a contract unless the contract is authorized under the law and service has or will be rendered for the benefit of the state or the public entity.[iii] Any unlawfully entered contract would be void from its inception and ineligible for compensation to the performing party.

However, the state constitution does not identify any specific procurement process except for the procurement of stationery, printing, and fuel.[iv] One author states that the section requiring bidding for fuel and stationery was added to the Constitution in reaction to the prior policy of granting government contracts for fuel and printing at exorbitant prices as special favors to friends or relatives of those wielding government powers.[v]

Professional Services

1. Licensed Engineer Required by Texas Engineering Practice Act.

The Texas Engineering Practice Act prohibits the state and its public entities from engaging "in the construction of any public works project involving professional engineering, where public health, public welfare or public safety is involved, unless

the engineering plans and specifications and estimates have been prepared by, and the engineering construction is to be executed under the direct supervision of a licensed professional engineer."[vi] This prohibition does not apply to a public works projects that either (i) involves structural, electrical, or mechanical engineering but the contemplated expenditure for the completed project does not exceed $8,000 or (ii) does not involve structural, electrical, or mechanical engineering but the contemplated expenditure for the completed project does not exceed $20,000.[vii]

The Texas Attorney General has opined the Texas Engineering Practice Act does not, by its terms, require the preparation of architectural or engineering plans and specifications for a construction project prior to competitive bidding.[viii] However, the Attorney General also stated that such a requirement is "implicit" in the competitive bidding statutes.[ix] As discussed below, laws relating specifically to water/ wastewater infrastructure require the submission of final plans and specifications to state agencies prior to starting construction.

2. Selection of Engineer Must Comply with Professional Services Procurement Act.

The state and its public entities must also select a licensed professional engineer, and other types of professional services, in accordance with the Professional Services Procurement Act.[x] The Act prohibits the selection of an engineer on the basis of competitive bids.[xi] The Act also specifies the process that must be used to select the engineer.[xii]

The prohibition against selecting professionals on the basis of competitive bids was the principal reason for an opinion by the Attorney General that a county could not use a design/build methodology for construction of public buildings.[xiii] The opinion states "A commissioners court lacks the authority to make a contract for the construction of public works under the 'design/build' concept when the resulting contract is awarded pursuant to competitive bidding and includes architectural or engineering services as a component of the contract."[xiv]

In a subsequent opinion, the Attorney General also concluded that a state law specifically authorizing a county to contract with a private vendor to provide for the financing, design, and construction of detention facilities, created a specific exemption from the prohibition of selecting architects on the basis of competitive bids.[xv]

The Attorney General recently concluded that the two-phase process required for schools to select a design/build contractor specified in the Texas Education Code Section 44.036 complies with the Professional Services Procurement Act.[xvi] The Attorney General describes the two-phase process as first reviewing each offeror's experience and qualifications and selecting a "short list" of offeror's to provide additional information, including costs, and secondly, choosing from the short listed contractors offerors, the proposal that offers the best value for the district. The Attorney General further stated that the law requires the selected firm's "engineers or architects to complete the design and, prior to or concurrently with beginning construction, to submit all design elements 'for review and determination of scope compliance by the district's engineer or architect.'"[xvii]

Texas Antiquities Act.[xviii]

The Texas Antiquities Act may be perceived as affecting procurement processes. "Before breaking ground on a project location on state or local public land, the person primarily responsible for the project... shall notify the [Texas Historical Committee]."[xix] The committee would then determine whether a historically significant archeological site is likely to be present; the action needed to protect the site, and if an archeological survey is necessary.[xx] Neither the Antiquities Act nor the rules of the Historical Committee explicitly require the submission of final plans and specifications in order to obtain the required determination.

The Texas Water Development and the Texas Antiquities Commission are parties to a memorandum of understanding (MOU) authorizing the TWDB to conduct environmental surveys.[xxi] The MOU authorizes the TWDB to "conduct surveys for all types of archeological sites on lands belonging to or controlled by any county, city or other political subdivision of the State of Texas which may be impacted by proposed development projects that are funded in whole or in part by TWDB."[xxii] The MOU does not require that final plans and specifications be submitted prior to obtaining the survey, but the survey requires pedestrian surveys and subsurface probing, so the general location of the project facilities need to be finalized. TWDB rules do not require the submission of final plans, but TWDB guidance documents or instructions may require final plans.

Regulatory impediments arising from federal grant requirements may exist. For example, prior to federal action, such as issuing a permit or providing financial assistance, a review may be required under the National Environmental Policy Act. Analysis of this issue is beyond the scope of this workpaper.

III. Procurement by Specific Entities

State laws regulating the construction or purchase of water/wastewater infrastructure differs between the various public entities, but generally is based on the competitive bid process.[xxiii] Unlike the law specifically authorizing schools to use the design/build procurement process and other alternative procurement methods, there is no statute specifically authorizing public entities to use alternative procurement methods for water/wastewater infrastructure projects. The choice of procurement methods for water/wastewater projects by public entities is limited by the provisions of the Professional Services Procurement Act and the requirement for complete designs as a condition for required regulatory approval.[xxiv]

State

The General Services Commission (the "GSC") acquires all goods and services for all state agencies.[xxv] State law further requires the procurement will be accomplished through competitive bidding, unless otherwise provided by law, and that the state will purchase goods that provide the best value for the state.[xxvi] The competitive purchasing methods available to the GSA include the contract purchase procedure,

which is generally the competitive bidding based upon plans and specifications; or the "open market" purchase procedure; or "competitive sealed proposals method."

Municipalities

1. Charter

In Texas, there are two types of municipalities; those established under the general law and those that are established by "home-rule" charter. Under the Texas Constitution, cities with at least 5,000 citizens may become a "home-rule" city by adopting a city charter.[xxvii] A city's charter may specify the manner in which contracts for public works must be advertised and awarded. For example, the charter for the City of Brownsville, Texas, requires that all contracts in excess of $1,000 be let on sealed competitive bids after ten days advertising in a newspaper, but the charter does allow the governing body of the city to allow the proposals to be submitted for doing the work.

> *"upon alternative or different plans and methods, or for different materials or upon proposals and specifications of different bids and may select and adopt such bids and let the work to or purchase the supplies in question from the bidder whose bid is in the opinion of the [governing body] most advantageous to the City."*[xxviii]

2. State Law

State law requires cities to advertise and award any contract that requires the expenditure of more than $15,000 in the manner specified by chapter 252 of the Local Government Code, unless the process conflicts with a city charter requirement, in which event the city charter controls unless the city governing body elects to have chapter 252 supercede the city charter.[xxix] Chapter 252 requires a city to award the contract using the sealed competitive bid or sealed competitive proposal process.[xxx] Certain exemptions from the process are allowed, such as procurement of professional services, but the exemptions do not include alternative procurement methods such as design/build.[xxxi] Chapter 252 requires that the notice of the contract be advertised and specifies the process for awarding the contract and other related matters.

Water Districts

There are many different types of public entities established under the authority of article 16, section 59 of the Texas Constitution. Some are created by a special act of the Legislature and some are created by state agencies or commissioners courts under the general law. The names of such entities vary, such as the Guadalupe-Blanco River Authority, Laguna Madre Water District, or East Medina County Special Utility District. However, for purposes of this memorandum, these entities will be generally referred to as "water districts".

The procurement process for water districts may be specified in the act creating the water district or in the chapter of the Water Code under which the water district was established. In order to establish a general standard among water districts, the Legislature adopted chapter 49 of the Water Code, which applies "to the extent that

the provisions of this chapter do not directly conflict with a provision any other chapter of this code or any Act creating or affecting a special law district. In the event of such conflict, the specific provisions of such other chapter or Act shall control."[xxxii] Chapter 49 does not apply to groundwater conservation districts established under chapter 36 of the Water Code and allowed to purchase, sell, transport, and distribute surface or groundwater."[xxxiii]

Under chapter 49, water districts must award construction contracts using the competitive sealed bid basis.[xxxiv] The law appears to require that the district provide the final set of plans and drawings at the time of advertisement because the law states: "The bidding documents, plans, specifications, and other data needed to bid on the project must be available at the time of the first advertisement and the advertisement shall state the location at which these documents may be reviewed". [xxxv]

Counties

The County Purchasing Act, codified as subchapter C, Chapter 262 of the Local Government Code applies to public improvement contracts that require an expenditure of more than $25,000.[xxxvi] The law requires the award of the contract based upon competitive sealed bids or competitive sealed proposals and requires that the notice describe the item or the location where the specifications can be obtained.[xxxvii] If the county is obtaining the funds for the project from certificates of obligations, the procurement process described in subchapter C, Chapter 271 of the Local Government Code applies.[xxxviii] Chapter 271 also requires the competitive bidding process if the contract amount exceeds $15,000.[xxxix]

IV. Regulatory Approval of Plans for Water/Wastewater Infrastructure

The following summarizes the regulatory approval to procure water/wastewater infrastructure projects. Under existing state law, the plans and specifications from all water and most wastewater projects must be completed and submitted for approval prior to the beginning of construction.

Water

State law prohibits a person from beginning the construction of a public drinking water system unless the executive director of the TNRCC approves a business plan for the system as well as the plans and specifications for the system.[xl] The exemptions to this requirement include exemptions only for certain entities from filing the required business plan, not the required plans and specifications.[xli] The law specifically states that "The prospective owner or operator of the proposed system shall provide to the commission *completed plans and specifications for review and approval* in accordance with commission rules.*"(emphasis added)*[xlii] The TNRCC has adopted rules relating to the review and approval of water system plans.[xliii] By memorandum of understanding between the TNRCC and TWDB, the TWDB can review plans and specifications of proposed systems that are to be funded by the TWDB.[xliv]

Wastewater

State law also requires the TNRCC to review and approve plans and specifications for wastewater infrastructure.[xlv] The plans must be submitted before beginning construction of a wastewater treatment facility or a material alteration of a treatment facility.[xlvi] Selected entities are not required to submit plans, such as municipalities with their own engineering staffs or entities that are required by law to submit their plans to a local municipality for approval. TNRCC rules relating to approval of wastewater infrastructure plans are codified at 30 Texas Administrative Code Sections 317.1-15.

Bonds

State law also requires TNRCC approval of a water district's proposal to issue bonds to purchase or construct water/wastewater infrastructure.[xlvii] TNRCC rules implementing this requirement are codified at 30 Texas Administrative Code Sections 293.41-59. The process includes a review and approval of the completed water/wastewater infrastructure plans and specifications.[xlviii]

V. Organizational Flexibility and Impact on Procurement Process

State law provides public entities some flexibility to use different agencies to accomplish their purposes and the types of agencies used could affect the procurement processes that are available. Although the law under which the entity is established may not require the design-bid-build procurement process, other applicable state laws may impose the procurement process required by the entity creating the non-public entity.

The following agencies organized or established by public entities can acquire water/wastewater infrastructure projects:

1. Non-profit water supply corporations.
    a. Cities and districts may contract with these non-profit corporations for the purpose of acquiring water/wastewater infrastructure.[xlix]
    b. Corporations created under chapter 67 of the Water Code and prior laws. Some, but not all, laws relating to public entities apply to these corporations.
    c. State procurement laws do not apply, but corporation's by-laws may specify procurement process.
2. Industrial Development Corporation.
    a. The Development Corporation Act[l] authorizes cities and counties to create or establish several different types of non-profit corporations.
    b. Depending upon circumstances specified by law, industrial development corporations may acquire or construct "projects" which is a term defined to include water/wastewater infrastructure projects.[li]

   c. Procurement statutes requiring competitive bids not applicable.[lii]

3. Public Facility Corporation.
   a. Non-profit corporation created by city, county or water district under chapter 303 of the Local Government Code.
   b. Procurement laws for public entities do not apply.[liii]
4. Public Utility Agency.
   a. Agency created by two or more public entities under chapter 422 of the Local Government Code.
   b. Procurement laws for public entities apply.
5. Municipal Management Districts.
   a. Public entity created under chapter 375 of the Local Government Code.
   b. Procurement laws for public entities do apply.[liv]
6. Municipal Development District.
   a. Public entity created under chapter 377 of the Local Government Code.
   b. Procurement laws for public entities do not apply.[lv]
7. Defense Base Development Authorities.
   a. Public entity created under chapter 378 of the Local Government Code.
   b. Procurement laws for public entities do not apply.[lvi]
8. County Development Districts.
   a. Public entity created under chapter 383 of the Local Government Corporation.
   b. Procurement laws for public entities do apply.[lvii]
9. Local Government Corporations.
   a. Established by two or more cities under subchapter D, chapter 431 of the Transportation Code to aid and act on their behalf.
   b. Local Government Corporations may contract with municipalities to provide services which in turn would give them power to acquire water/wastewater infrastructure.
   c. Not required to use competitive bidding process.[lviii]

VI. School Districts

School districts have been allowed to use design/build and other alternative procurement methods since 1995. According to one author, "some districts embraced the new rules and responsibly procured construction. Some districts embraced, then abused, the new processes, using them to award brother-in-law deals, but the author did not cite to specific examples.[lix]

In 1997, the law was revised by S.B. 583 and is codified, as revised, as Section 44.036 of the Education Code.[lx] S.B. 583 was supposedly, at least in part, a compromise and consensus bill involving the Associated General Contractors, the Consulting Engineers Council, the Texas Society of Architects, and the State Board of Registration of Professional Engineers.[lxi]

The Associated General Contractors, Texas Building Branch, caused to be prepared and distributed a *Construction Procurement Handbook for Texas School Districts and Institutions of Higher Education.* The Handbook describes in detail the several procurement methodologies allowed schools, a description of each methodology, and how to implement and satisfy each requirement.

VII. Barriers

The barriers described below are listed in order of significance, beginning with the most significant barrier and progressing to the least significant barriers.

Constitution

If the required procurement process is not followed, the contractor may jeopardize the right to receive payment under the Texas Constitution. Further a contractor is presumed to know the law and contracts at his or her risk with a public entity. Thus, the first barrier is "contractor beware." Any change to the required procurement process would need to provide a level of comfort to the contractors.

Professional Services

As previously stated in this memorandum, the revised law authorizing school districts to use alternative procurement methods passes muster under the Professional Services Procurement Act only because a bifurcated process to select the design/build contractor is used.

Plan Approval

As described previously in this memorandum, state law requires the submission of complete water system plans. Western system plans must also be submitted. To the extent that alternative wastewater procurement methods use less than complete plans to achieve cost savings, these requirements would be a barrier.

Procurement Process

As described previously in this workpaper, public entities must use the design-bid-build process to obtain water/wastewater infrastructure. Also as previously stated, state law has allowed alternative procurement methods on a case-by-case basis for detention facilities with public schools.

Conclusions

The primary approach for overcoming these identified barriers is legislation specifically authorizing alternative delivery. Bills have been filed in the 2001 Texas Legislative Session to authorize municipalities to use the design/build approach if certain conditions are satisfied, such as the probable cost of the project exceeding $50 million, select transportation projects, or public buildings.[lxii] These pending bills do not address, or cure, the regulatory impediments requiring the submittal of final plans and specifications in order to obtain regulatory agency approval of the project prior to the start of construction.

VIII. Projects

Schertz/Seguin Local Government Corporation

This is a joint water supply project by the Cities of Schertz and Seguin to develop a groundwater supply using the Carrizo/Wilcox Aquifer, treating the groundwater, and delivering the treated water to Schertz and Seguin by pipeline. The Attorney General has issued an opinion that local government corporations are not required by law to use the traditional design/bid/build approach.[lxiii] This ruling allowed the Corporation to negotiate the purchase of water treatment ancillary equipment using an alternative delivery approach.

City of Eagle Pass

The City of Eagle Pass proposes to enter into contract to purchase treated water supplied to a point of delivery. The vendor would acquire water rights, permits, rights of way and all the facilities required to produce, treat, and supply the water. City would pay for the service under a "take or pay" contract.

This project is not progressing because the projected cost of treating the water is projected to increase the cost of the water beyond prior estimates. Because the City would be relying upon a private entity to deliver a significant portion of the City's water supply, the contract between the City and the design/build/own/operate contractor needed to be very detailed and anticipated design and operations changes increased the expected cost of the project to an unacceptable level.

Brownsville PUB

Brownsville PUB recently acquired an undivided ownership interest in an electric generation facility. The majority of the interests in the plant is owned by a private corporation. At the time of the acquisition, the facility had been designed and was under construction. Competitive bids were not taken for construction. Upon purchasing its interest, Brownsville PUB began paying its share of the prior and current construction costs.

San Antonio Water System

By contract effective February 15, 2000, the San Antonio Water System agreed to purchase a specified amount of non-Edwards Aquifer groundwater. Under the contract, the seller is responsible for constructing and equipping the eight wells required to produce the water.

Bexar Metropolitan Water District

Bexar Metropolitan Water District used an economic development agency to acquire a treated surface water supply. Bexar Metropolitan owns the land and the water rights, but leased the land to a private entity to design, construct, own, and operate a surface water treatment plant. At the end of the twenty-year contract, Bexar Metropolitan has the option of acquiring the facility. In order to obtain approval of the bonds issued to finance the transaction, Bexar Metropolitan's enabling act was amended to allow this type of privatization activity. The facility became operational within 16 months of commencement of the DBO contract.

Conclusion

Barriers to use of alternative delivery approaches include the following:

- state public entities' procurement law;
- permitting requirements concerning facility design; and
- prohibition against competitive bids for professional services.

Before contractors can develop water/wastewater infrastructure projects in Texas for public entities using the design/build method or other alternative procurement methods, the state law would need to be amended. Alternative procurement methods would need to be allowed, such as the law specifically allowing the construction of schools using the design/build method. The statute would need to bifurcate the procurement process to avoid violating the state law prohibiting the award of contracts for professional services based upon bids. Engineering services are considered professional services under state law.

State law requires regulatory approval of the design of water/wastewater infrastructure and further requires that the design be complete upon submission for approval. To the extent that alternative procurement methods use incomplete design before the start of construction, state laws requiring complete design would need to be amended.

The opinions expressed in this memorandum are subject certain limitations.[lxiv]

[i] Tex. Const. Art. 3, § 49-d.

[ii] Tex. Const. Art. 3, § 44, 53

> Sec. 44. The Legislature shall provide by law for the compensation of all officers, servants, agents and public contractors, not provided for in this Constitution, but shall not grant extra compensation to any officer, agent, servant, or public contractors, after such public service shall have been performed or contract entered into, for the performance of the same; nor grant, by appropriation or otherwise, any amount of money out of the Treasury of the State, to any individual, on a claim, real or pretended, when the same shall not have been provided for by pre-existing law; nor employ any one in the name of the State, unless authorized by pre-existing law.
>
> Sec. 53. The Legislature shall have no power to grant, or to authorize any county or municipal authority to grant, any extra compensation, fee or allowance to a public officer, agent, servant or contractor, after service has been rendered, or a contract has been entered into, and performed in whole or in part; nor pay, nor authorize the payment of, any claim created against any county or municipality of the State, under any agreement or contract, made without authority of law.

[iii] Tex. Const. Art. III § 52 interp. commentary (Vernon 2000).

[iv] Tex. Const., Art. 16, § 21.

[v] Tex. Const. Art. XVI § 21 interp. commentary (Vernon 2000).

[vi] Texas Engineering Practice Act, Tex. Rev. Civ. Stat. Ann. Art. 3271a § 19(a)(West 2000).

[vii] *id*. at § 19(b).

[viii] Op. Tex. Att'y Gen. No. JM-1189 (1990).

[ix] *id*.

[x] Tex. Gov't Code Ann. § 2254.001-2254.109 (West 2000).

[xi] *id*. at § 2254.003.

[xii] *id*. at § 2254.004.

[xiii] Op. Tex. Att'y Gen. No. JM-1189 (1990).

[xiv] *id*.

[xv] Op. Tex. Att'y. Gen. No. LO-117 (1996).

[xvi] Op. Tex. Att'y. Gen. No. JC-0037 (1999).

[xvii] *Id*. at page 3-4.

[xviii] Codified as Tex. Natural Resources Code, §§ 191.001-191.174.

[xix] Tex. Nat. Res. Code, § 191.0525 (Vernon Supp. 2000).

[xx] Id.

[xxi] 31 Tex. Admin Code §354.1.

[xxii] 31 Tex. Admin. Code § 354.1(b).

[xxiii] Joe Canterbury Jr., Texas Construction Law Manual (2nd Ed.) Shepard's/McGraw Hill 1992, § 3.02-3.04.

[xxiv] Kenneth M. Roberts and Nancy C. Smith, *Design-Build Contracts Under State and Local Procurement Laws*, 25 Pub. Cont. L.J. 645, 690-692 (1996).

[xxv] Tex. Gov't Code Ann. § 2155.061 (West 2000).

[xxvi] *id*. at § 2155.063. 2155.074.

[xxvii] Tex. Const. Art. V, § 11.

[xxviii] Brownsville, Tex. City Charter, Art. IV, § 29.

[xxix] Tex. Local Gov't Code Ann. § 252.002 (West 2000).

[xxx] *id*. at § 252.0021.

[xxxi] *id*. at § 252.022.

[xxxii] Texas Water Code Ann. § 49.002 (West 2000).

[xxxiii] *id*. at § 49.002(b) and § 36.104.

[xxxiv] *Id*. at § 49.273.

Section 49.273 states:

> (a) The board shall contract for construction and repair and renovation of district facilities and for the purchase of equipment, materials, machinery, and all things that constitute or will

constitute the plant, works, facilities, or improvements of the district in accordance with this section. The bidding documents, plans, specifications, and other data needed to bid on the project must be available at the time of the first advertisement and the advertisement shall state the location at which these documents may be reviewed.

(b) A contract may cover all the work to be provided for the district or the various elements of the work may be segregated for the purpose of receiving bids and awarding contracts. A contract may provide that the work will be completed in stages over a period of years.

(c) A contract may provide for the payment of a total sum that is the completed cost of the work or may be based on bids to cover cost of units of the various elements entering into the work as estimated and approximately specified by the district's engineers, or a contract may be let and awarded in any other form or composite of forms and to any responsible person or persons that, in the board's judgment, will be most advantageous to the district and result in the best and most economical completion of the district's proposed plants, improvements, facilities, works, equipment, and appliances.

(d) For contracts for $25,000 or more, the board shall advertise the letting of the contract, including the general conditions, time, and place of opening of sealed bids. The notice shall be published in one or more newspapers circulated in each county in which part of the district is located. If one newspaper meets both of these requirements, publication in such newspaper is sufficient. If there are more than four counties in the district, notice may be published in any newspaper with general circulation in the district. The notice shall be published once a week for three consecutive weeks before the date that the bids are opened, and the first publication shall be not later than the 21st day before the date of the opening of the sealed bids.

(e) For contracts for $15,000 or more but less than $25,000, the board shall solicit written competitive bids on uniform written specifications from at least three bidders.

(f) For contracts of less than $15,000, the board is not required to advertise or seek competitive bids.

(g) The board may not subdivide work to avoid the advertising requirements specified in this section.

(h) The board may not accept bids that include substituted items unless the substituted items were included in the original bid proposal and all bidders had the opportunity to bid on the substituted items or unless notice is given to all bidders at a mandatory pre-bid conference.

(i) Change orders to contracts may be issued only as a result of unanticipated conditions encountered during construction, repair, or renovation or changes in regulatory criteria or to facilitate project coordination with other political entities.

(j) The board is not required to advertise or seek competitive bids for the repair of district facilities by the district's operator if the cost of the repair is less than or equal to the advertising requirements of this section.

[xxxv] Texas Water Code Ann. § 49.273(a) (West 2000).
[xxxvi] Tex. Loc. Gov't Code, § 262.023 (West 2000).
[xxxvii] *Id*. at § 262.025.
[xxxviii] *Id*. at § 262.023(b).
[xxxix] *Id*. at §.271.024.
[xl] Tex. Health & Safety Code § 341.035 (West 2000).
[xli] *Id*. at § 341.035(d).
[xlii] *Id*. at § 341.035(c).
[xliii] 30 Tex. Adm. Code §§ 290.38-47 (1999) (TNRCC rules regarding construction of public water systems).
[xliv] Letter of Agreement between the TNRCC and the TWDB dated September 21, 1992.
[xlv] Tex. Water Code Ann. § 26.034(a) (West 2000).
Section 26.034 states:

(a) The commission may, on a case-by-case basis, review and approve plans and specifications for treatment facilities, sewer systems, and disposal systems that transport, treat, or dispose of primarily domestic wastes.

(b) Before beginning construction, every person who proposes to construct or materially alter the efficiency of any treatment works to which this section applies shall submit completed plans and specifications to the commission.

(c) The commission by rule shall adopt standards to determine which plans and specifications the commission will review for approval. If the commission excludes certain plans and specifications from review and approval, the commission shall require that a registered professional engineer submit the plans to the commission and make a finding that the plans and specifications are in substantial compliance with commission standards and that any deviation from those standards is based on the best professional judgment of the registered professional engineer.

(d) Except as provided by Subsection (e), the commission may not require plans and specifications for a sewer system that transports primarily domestic waste to be submitted to the commission from:

(1) a municipality if:

(a) the municipality has its own internal engineering review staff;

(b) the plans and specifications subject to review are prepared by private engineering consultants; and

(c) the review is conducted by a registered professional engineer who is an employee of or consultant to the municipality separate from the private engineering consultant charged with the design of the plans and specifications under review; or

(2) an entity that is required by local ordinance to submit the plans and specifications for review and approval to a municipality.

(e) If the commission finds that a municipality's review and approval process does not provide for substantial compliance with commission standards, the commission shall require all plans and specifications reviewed by the municipality under Subsection (d) to be submitted to the commission for review and approval.

[xlvi] *Id*. at § 26.034(b).

[xlvii] *Id*. at § 49.181 states:

(a) A district may not issue bonds unless the commission determines that the project to be financed by the bonds is feasible and issues an order approving the issuance of the bonds. This section does not apply to refunding bonds or bonds issued to and approved by the Farmers Home Administration, the United States Department of Agriculture, or the Texas Water Development Board.

(b) A district may submit to the commission a written application for investigation of feasibility. An engineer's report describing the project, including the data, profiles, maps, plans, and specifications prepared in connection with the report, must be submitted with the application.

(c) The executive director shall examine the application and the report and shall inspect the project area. The district shall, on request, supply the executive director with additional data and information necessary for an investigation of the application, the engineer's report, and the project.

(d) The executive director shall prepare a written report on the project and include suggestions, if any, for changes or improvements in the project. The executive director shall retain a copy of the report and send a copy of the report to both the commission and the district.

(e) The commission shall consider the application, the engineer's report, the executive director's report, and any other evidence allowed by commission rule to be considered in determining the feasibility of the project.

(f) The commission shall determine whether the project to be financed by the bonds is feasible and issue an order either approving or disapproving, as appropriate, the issuance of the

bonds. The commission shall retain a copy of the order and send a copy of the order to the district.

(g) Notwithstanding any provision of this code to the contrary, the commission may approve the issuance of bonds of a district without the submission of plans and specifications of the improvements to be financed with the bonds. The commission may condition the approval on any terms or conditions considered appropriate by the commission.

(h) This section does not apply to a district if:

(1) the district's boundaries include one entire county;

(2) the district was created by a special Act of the legislature and:

(a) the district is located entirely within one county;

(b) entirely within one or more home-rule municipalities;

(c) the total taxable value of the real property and improvements to the real property zoned by one or more home-rule municipalities for residential purposes and located within the district does not exceed 25 percent of the total taxable value of all taxable property in the district, as shown by the most recent certified appraisal tax roll prepared by the appraisal district for the county; and

(d) the district was not required by law to obtain commission approval of its bonds before the effective date of this section;

(3) the district is a special water authority; or

(4) the district is governed by a board of directors appointed in whole or in part by the governor, a state agency, or the governing body or chief elected official of a municipality or county and does not provide, or propose to provide, water, sewer, drainage, reclamation, or flood control services to residential retail or commercial customers as its principal function.

[xlviii] 30 Tex. Admin. Code § 293.43 (1999) (TNRCC approval of issuance of bonds)

[xlix] *id*. at § 402.014, 402.018 and Tex. Water Code § 49.213 and 49.219 (West 2000).

[l] Tex. Rev. Civ. Stat. Ann. Art. 5190.6 (Vernon 2000).

[li] *id*. at § 2(11).

[lii] *id*. at § 23(a).

[liii] Tex. Loc. Gov't Code Ann §§ 303.001-303.124 (West 2000).

[liv] *Id*. at §§ 375.221-223.

[lv] *Id*. at §§ 375.221-223.

[lvi] *Id*. at §§ 378.001-378.012.

[lvii] *Id*. at § 383.111.

[lviii] Tex. Trans. Code Ann. § 431.102 (Vernon 1999).

[lix] Steven Nelson, Procurement of Educational Facilities in Texas, An Overview of Senate Bill 583, presented to the 11th Annual Construction Law Conference, San Antonio, Texas, February 19, 1998.

[lx] Tex. Edu. Code Ann. § 44.036 (Vernon 1999).

[lxi] Nelson *supra* note 54.

[lxii] S.B. 155, S.B. 227, and S.B. 510.

[lxiii] Op. Tex. Att'y Gen. No. JC-0206 (2000).

[lxiv] This memorandum reflects our current opinion on the legal and factual issues addressed and is based on current applicable legal authorities. Future court decisions, legislation, and other relevant developments, however, can change the law. Before applying this opinion in the future, therefore, it is essential to determine whether the law has changed in any respect that would necessitate a revision of the opinion expressed. We have not been requested to keep you informed as to such future developments and are under no obligation to do so.

This opinion is supplied solely for your information and use in connection with the transaction or matter described above and should not be quoted or otherwise referred to in any financial statement or any other documents, in whole or in part, or furnished to any other person or agency, other than the Texas Water Development Board, without our prior written consent.

The opinions in this letter are limited to the matters expressly stated. No opinion is implied and none should be inferred, beyond the opinions expressly stated.

Our opinion concerning probable outcomes should not be construed as a guarantee or unqualified prediction of the result. Litigation is an inherently risky undertaking, and for that reason, it is always possible that the outcome will differ from our expectation.

Neil Callahan - National Director for Alternative Project Delivery
Robert Craggs - Senior Director and Project Manager

ALTERNATIVE PROJECT DELIVERY METHODS WORKSHOP

TEXAS WATER DEVELOPMENT BOARD

JUNE 27, 2001

Agenda

I.	**Introductions and Workshop Logistics**	**10:00 a.m. - 10:10 a.m.**
II.	**Overview of Water Industry**	**10:10 a.m. - 10:30 a.m.**
III.	**Description of Alternative Delivery Methods**	**10:30 a.m. - 11:30 a.m.**
IV.	**Break and Small Group Discussion**	**11:30 a.m. - 12:15 p.m.**
V.	**Comparison of Traditional vs. Alternative Delivery Methods**	**12:15 p.m. - 12:45 p.m.**
VI.	**Lunch**	**12:45 p.m. - 1:30 p.m.**
VII.	**Discussion of Implemented Alternative Delivery Projects**	**1:30 p.m. - 2:20 p.m.**
VIII.	**Overview of Areas of Concern**	**2:20 p.m. - 2:50 p.m.**
IX.	**Summary**	**2:50 p.m. - 3:00 p.m.**

Small Group Break-Out Session

Questions for Discussion

1. What are the primary differences in the procurement processes when comparing the traditional Design-Bid-Build (DBB) approach to the Design-Build-Operate (DBO) approach?

2. How are the risks associated with design and operational performance allocated in DBB as compared to Design-Build (DB) and DBO?

3. What are the benefits of using a DBO approach to project delivery?

4. How does the Engineer-At-Risk (EAR) approach differ from the traditional DBB?

5. Which alternative delivery method is most applicable to your project work?

Comparison Of Traditional Vs. Alternative Project Delivery Approaches

Criteria	Traditional DBB	DB Approach	DBO Approach
Primary Contract Arrangements	▪ Separate contracts or relationships with **Design Engineer**, **Construction Contractor** and the Operating agency.	▪ Separate contracts with **DB Contractor** and Operating agency.	▪ One contract for **DB** service and long-term operation of facility.
Design Engineer Selection	▪ Engineer selected on basis of capability and experience, not cost. Engineer is responsible for design and cost estimate only.	▪ Engineer selected on basis of capability, experience and cost. Joint venture of Engineer and **DB Contractor** are responsible for facility's capital cost.	▪ Engineer is not independently selected. **DBO Contractor** may be qualified in part because of Engineer's capability and experience. **DBO Contractor** selected on merits of **Designer**'s proposed design, facility capital and operating costs.
Design Process	▪ **Design Engineer**, in consultation with **Owner**, prepares one final design. **Owner** retains most performance risk for design. ▪ Design is developed independent of constructability review. Value engineering is an option at **Owner's** expense.	▪ Design conducted in phases with many constructability reviews by **Contractor** as joint venture partner. ▪ Value engineering skills are a competitive advantage to a **DB Design Engineer.**	▪ Proposers, through competitive process, prepare several conceptual designs for **Owner** to choose preference. ▪ Proposer's commitment to fixed operating cost creates a competitive incentive for low O & M designs. Provides **Guarantor** for design.
Permitting	▪ **Owner** responsible to obtain all permits prior to construction.	▪ **Owner** responsible to obtain all permits prior to construction. May transfer some permit development responsibilities to **DB Contractor**.	▪ Procurement defines sharing of permitting responsibility between **Owner** and **DBO Contractor**.

Comparison Of Traditional Vs. Alternative Project Delivery Approaches

Criteria	Traditional DBB	DB Approach	DBO Approach
Contractor Proposals	▪ **Owner** selects "lowest cost, responsive bid" constructor to build the designed asset, and retains risk for design implementation. ▪ **Owner** retains risk of appropriate construction and coordinated project implementation.	▪ **Owner** may pre-qualify **Contractor**s during selection of **DB Contractor**. Cost of facility is significant basis for selection. ▪ Risks for construction and coordinated project implementation shared or can be allocated to **DB** Team.	▪ Proposers internally select the **DB** team to oversee construction and final implementation of its own design and assume the risk for coordinated project implementation. ▪ Provides **Guarantor** for construction.
Project Schedule	▪ Sequentially procure **Design Engineer**, complete design, procure **Contractor** and construction of asset which typically requires longest delivery schedule.	▪ Opportunity for integrated design with construction cost development and fast track construction facilitate shortened project delivery schedules.	▪ Opportunity for integrated design with construction cost development and fast track construction facilitate shortened project delivery schedules.
Construction Oversight	▪ **Owner** retains **Design Engineer** to review **Contractor** equipment submittals, observe construction and to attest that construction conforms to design requirements. ▪ **Owner** retains responsibility for design ambiguities or inadequacies.	▪ **Owner** has option to retain independent engineer to observe construction and contract compliance. ▪ Risk for design ambiguities or inadequacies allocated to **DB Contractor**.	▪ **Owner** has option to retain independent engineer to observe construction and contract compliance. ▪ **DBO Contractor** has overall responsibility to provide all **Design Engineer** and construction oversight during construction. ▪ Provides Guarantee for Performance.
Plant Commissioning	**Owner** accepts plant upon construction completion from construction firm and initiates effective operation with newly hired	▪ **Owner** accepts plant upon construction completion from construction firm and initiates effective operation with newly	▪ **Owner** accepts tested and operating facility, with trained staff, and a detailed operations and maintenance plan.

Comparison Of Traditional Vs. Alternative Project Delivery Approaches

Criteria	Traditional DBB	DB Approach	DBO Approach
	staff. **Owner** retains all operational performance risk.	hired staff. **Owner** retains all operational performance risk.	▪ Provides **Guarantor** for operational performance over the term of the Service Agreement.
Start-up of Operations	▪ **Owner** trains staff and manages treatment processes, including emergencies. ▪ **Owner** retains all risk for operating costs of facility	▪ **Owner** trains staff and manages treatment processes, including emergencies. ▪ **Owner** retains all risk for operating costs of facility	▪ **DBO Contractor** qualified in part on skill and capability of **Operator**. ▪ **Owner** contracts with private sector experts for fixed fee structure to operate plant and respond to emergencies.
Facility Modifications	▪ **Owner** enhances/modernizes plant as needed when adequate funds are available.	▪ **Owner** enhances/modernizes plant as needed when adequate funds are available.	▪ Proposers, identify plant enhancement based on profitability under **Owner** approved processes.
Long Term Capital Maintenance Risk	▪ **Owner** establishes maintenance plan and annually adopts budget, addressing need for proposed enhancements.	▪ **Owner** establishes maintenance plan and annually adopts budget, addressing need for proposed enhancements.	▪ **Owner** contracts for fixed maintenance costs for 15 to 25 years, without need for annual review. ▪ **DBO Operator** must maintain plant per contracted performance specifications.

Potential Areas Of Concern

Traditional Versus DB/DBO Approach On Public Projects

Criteria	Traditional Approach	DB/DBO Approach
Abuses of Discretion	▪ Subjective selection of designer is subject to criticism. ▪ Presumption of objective result because competitive process selects Contractor.	▪ Vendor selection not based on "lowest responsible bidder or most qualified designer" has potential for Owner abuses of discretion, fraud, and favoritism.
Proposals	▪ Engineer responsible for design and cost estimate only. ▪ Response by Contractor to fully designed final plans and specifications allows objective price proposal development.	▪ Substantial costs can be associated with producing DB or DBO/BOOT proposals due to the requirement for conceptual designs. This can limit competition to larger established participants. ▪ Owners often only identify basic needs for project Owner and may not adequately establish standards for aesthetics and asset life.
Review of Proposals	▪ Engineers selected on subjective basis of capability and experience, not cost. ▪ Contractor selected objectively on responsiveness to bid request and responsibility to perform work.	▪ Public Owners may not have in-house personnel with expertise in preparing and administering design-build requests for proposals and contracts. ▪ May be difficult to compare proposals. ▪ Owner must evaluate both technical merits of design and quality, related to construction price.
Legal Precedent	▪ Long history analyzing and allocating responsibilities between designer, versus Contractor, versus Owner.	▪ Very little case law regarding DB/DBO process and liability currently exists, so there is uncertainty about how courts and arbitrators will resolve new issues associated with the system.
Oversight During Construction	▪ Owner or its separate consultant can evaluate quality and workmanship of construction by Contractor.	▪ Quality standards of performance for contractor are not always clearly defined. ▪ Quality of construction should not be sacrificed for cost or schedule.

Potential Areas Of Concern

Traditional Versus DB/DBO Approach On Public Projects

Criteria	Traditional Approach	DB/DBO Approach
Contractual Arrangements	▪ Separate contracts with Contractor and Engineer allow Owner to define roles and responsibilities of each.	▪ Joint venture team may not have long history together. ▪ Allocation of responsibility between Contractor and Designer is developed independently of Owner and assignment of responsibility may be unclear to Owner.
Competition	▪ Larger universe of individual service providers (Designers/ Contractors/Operators) should allow for more competition.	▪ Fewer DB entities exist because of uniqueness of relationships and liability, making smaller pool for Owner to choose from. Smaller pool could make for less competition. ▪ Advantage to Owner could be pairing of experienced designer and Contractor and ability to eliminate bad teams during selective procurement process.
Legal Barriers	▪ Texas state public entities procurement law provides a well-recognized, historically based framework for the traditional approach.	▪ Texas state law requires submission of complete water plans prior to regulatory approval. ▪ According to Texas state public entities procurement law, public entities must use the traditional design-bid-build process to obtain water/wastewater infrastructure.

Alternative Project Delivery Methods Workshop

Texas Water Development Board

Participant Evaluation

Staff Title/Position: _____

Technical Role: Engineer, Attorney, Geologist, Planner, Manager, Other:

Please identify which components of the workshop were most useful?

Please identify which components of the workshop were least useful?

How would you rate the presenters as to their knowledge of the material and approach?

Very Good Good Fair Poor

What additional materials would be useful to you on this subject matter?

Other comments:

Introduction

The delivery of water and wastewater treatment facilities has historically been based on the concept of Design-Bid-Build (DBB). As the water market changes (i.e., stricter regulations; water industry globalization and privatization; and aging facilities needing major capital investments), increased interest in public/private partnerships within the industry has resulted in the use of alternative project delivery methods. Provided below is a list of the benefits and concerns of the traditional DBB approach and two alternative delivery methods that are increasingly being used to deliver services: Design-Build (DB) and Design-Build-Operate (DBO). In addition, we have provided a description, including diagrams, to illustrate the differences between the traditional and alternative delivery methods.

"What You Should Know"

Design-Bid-Build (DBB)

Benefits:

- This method has been accepted, tested and is well understood by stakeholders;
- Sequential project phasing provides significant opportunities for public review/consideration; and
- The owner usually relies on the engineer to review the contractor's compliance with the design requirements. This check and balance approach helps to protect the owner's interest.

Areas of Concern:

- Sequential project phasing typically results in a longer project schedule than other alternative project delivery approaches;
- The design engineer has few incentives to promote innovative technologies; and
- Risks associated with the failure of a facility to perform in accordance with the owner's needs reside primarily with the owner.

Design-Build (DB)

Benefits:

- Single point of accountability for design and construction;

- A collaborative design and construction effort can foster innovation;
- Concurrent design, permitting and construction activities can reduce capital costs and shorten project schedule; and
- The certainty of the project cost is determined at an earlier point in the project than with a DBB approach.

Areas of Concern:

- The legal basis for this method is frequently unclear, limited or even precluded;
- State regulations may require the design to be completed as a prerequisite to obtaining project permits;
- Perception that the design consultant's independence is compromised and the quality of the project is sacrificed;
- The public may not be provided with comprehensive project details before the project begins construction;
- The cost to prepare a detailed proposal may preclude smaller, yet qualified, firms from competing for the project; and
- Significant effort and expertise is required in preparing Requests for Qualifications/Requests for Proposals (RFQ/RFPs), and especially in preparing and negotiating contracts.

Design-Build-Operate (DBO)

Benefits:

A DBO project delivery has all the advantages of a DB-type project, as identified previously, plus:

- Significant cost benefit for the public may occur because the operator has an incentive to maintain optimal equipment quality to minimize maintenance expense for the term of the contract.
- There is an incentive to minimize project operating expenses, thus the facility may use value engineer design, lowering overall contract costs.

Areas of Concern:

- Public owners have to relinquish some control over project construction details, schedule, and operation;
- A multiphase project contract can be difficult to prepare, understand and administer;
- The high cost of developing a DBO proposal may be a deterrent to smaller, less sophisticated contractors participating in the DBO process. However, the procurement process can be structured to require a portion of the work to be performed by local, minority or disadvantaged contractors;

- Public input opportunities are limited, as with a DB project; and
- Significant effort and expertise is required in preparing RFQ/RFPs, and especially in preparing and negotiating contracts.

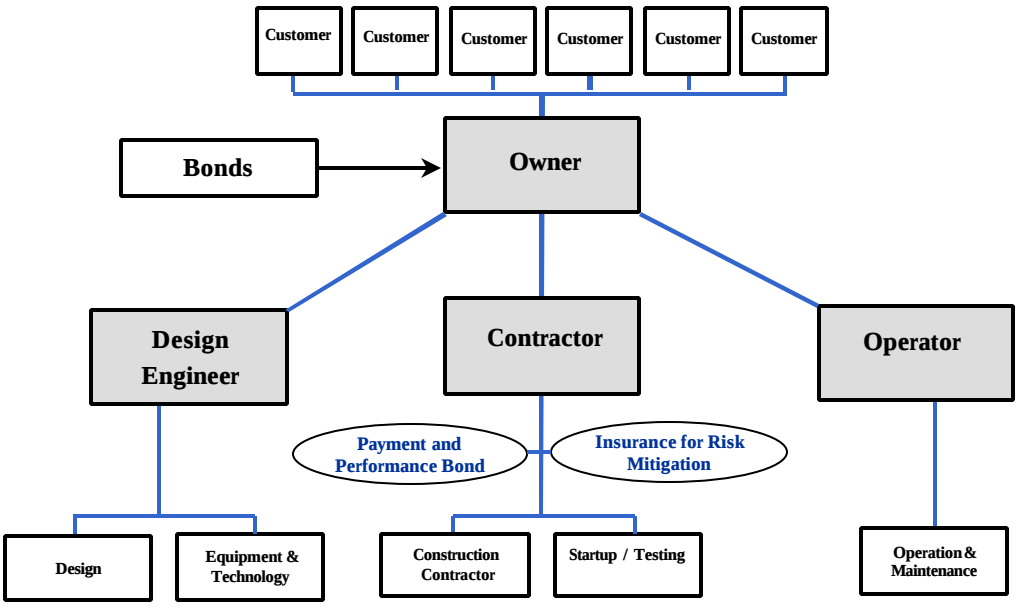
Descriptions of Delivery Methods

Design-Bid-Build (DBB)

This traditional architectural and engineering project delivery approach begins when an owner, such as a state, a county, district or municipality, decides that a new asset is needed. An engineer is hired to design the facility and provide technical bid specifications; the owner publishes a request for bids (RFB) for the construction; bids are received; and the municipality awards the bid to the contractor with the lowest responsive bid. If the owner does not intend to operate the facility, a request for proposals (RFP) for the operations of the facility may be distributed as well. Under this approach, the municipality generally must obtain all necessary authorizations prior to the start of construction.

The project structure and the relationships of the various parties involved in a traditional DBB project are characterized below.

Traditional DBB Project Structure



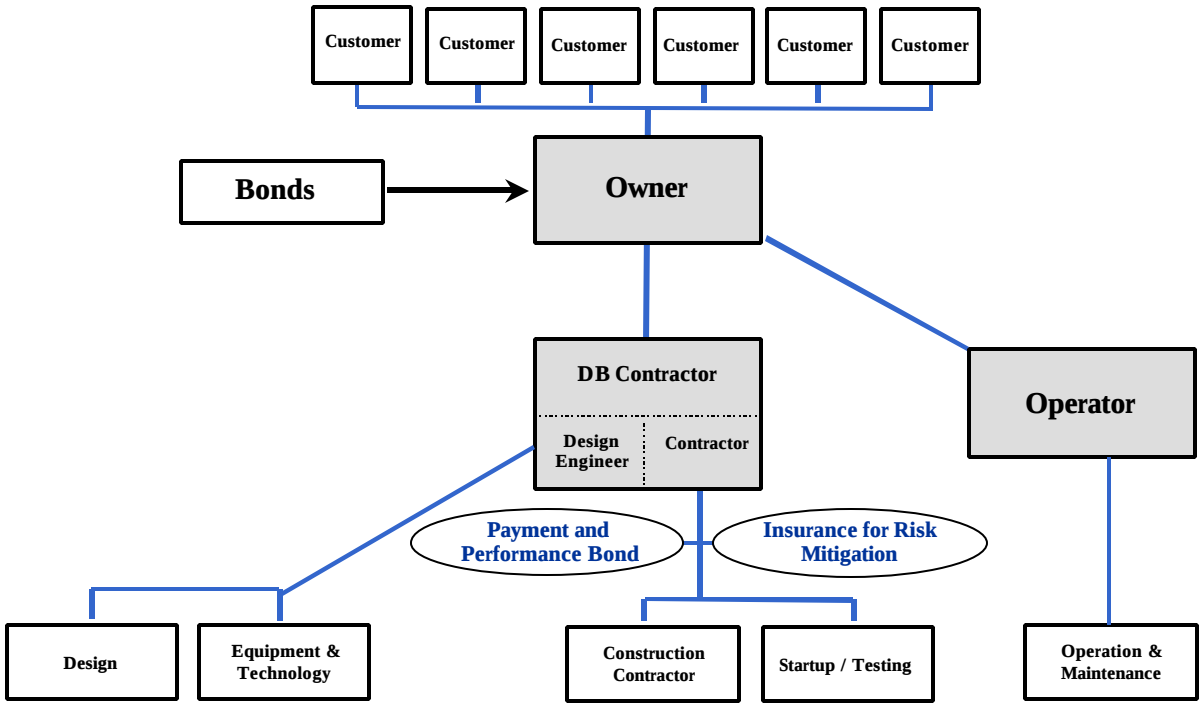
Design-Build (DB)

In a Design-Build project approach, a DB contractor is generally solicited by an owner. A DB contractor may include a construction firm, an engineering firm, or be a true joint venture containing both. In the water industry, DB contractor teams tend to be led by well-established firms who have chosen to pursue the DB market.

The DB contractor is usually selected through a formal selection process. The owner may select a contractor based on experience and qualifications only, or on qualifications and price. The selected vendor team will have overall responsibility for the development, design, and construction of the facility. As a result, the construction of the facility is usually initiated before the design is complete. A separate contract for operation of the facility is generally procured by the owner.

The typical project structure and the relationships of the various parties involved in a DB project are shown below.

DB Project Structure



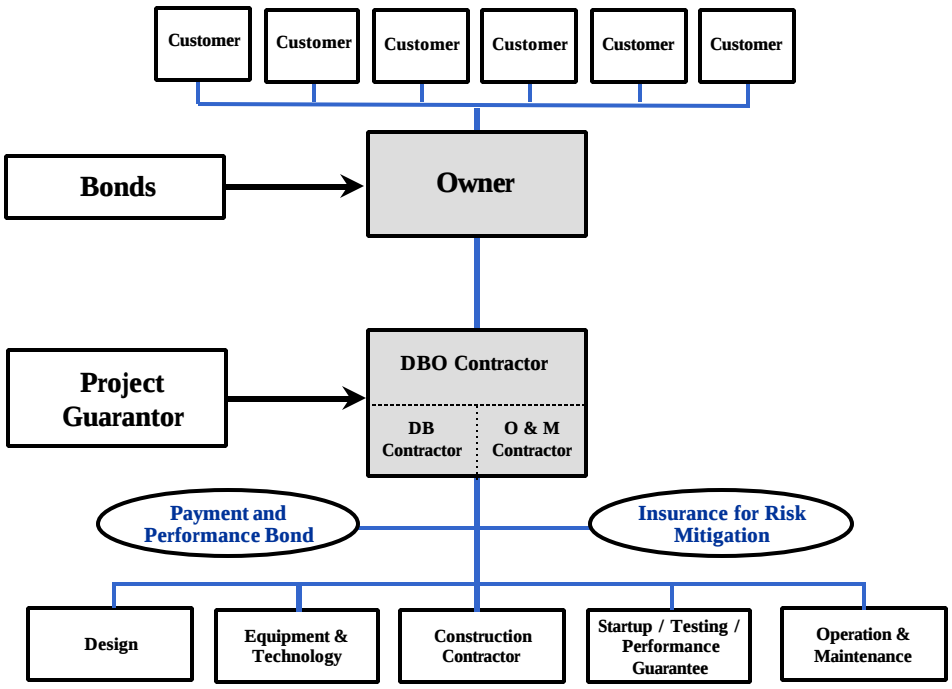
Design-Build-Operate (DBO)

A Design-Build-Operate or DBO approach involves securing a contract with one vendor team who will have the overall responsibility for the development, design, construction, start-up, acceptance testing, and long-term operation of the facility. This differs from the DB approach in that operation of the facility is provided through the vendor team also providing design and construction services. The DBO vendor team is usually selected through a formal RFQ/RFP process where the owner retains a procurement advisor and attorney to assist with the process, including development of project criteria and a draft service agreement.

Generally, one of the participants in the DBO vendor team is the project guarantor who pledges to financially back the performance guarantees of the team for the project duration. This ensures that the project will perform as intended by the owner.

The typical project structure and the relationships of the various parties involved in a DBO project are shown below.

DBO Project Structure



Summary

In the water industry, the Design-Bid-Build project delivery approach is familiar to most municipalities and has been historically accepted as the approach for delivering new infrastructure. Increasingly, many in the water industry are examining different approaches to service delivery to offer more value to the water utility's stakeholders.

Design-Build and Design-Build-Operate approaches may reduce project costs while shortening project schedules, but may not be applicable to all projects. The extent of the benefits may vary and the areas of concern can be mitigated.

For additional information, visit the Texas Water Development Board web site at www.twdb.state.tx.us.