

Contracting and Project Delivery Options

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Presentation Outline

1. Trends, Cost Drivers & Owner Needs
2. Types of Delivery Methods
3. Delivery Methods for US Tunnel Projects
4. Design Bid Build Projects
5. Alternative Delivery Projects
6. Concluding Thoughts



Trends in Delivery of Tunnel Projects

Nature of Tunneling Contractors

Generally small, close-knit community
Good understanding of project risks and contract savvy
Frequently team on large projects

Current Atmosphere for Bidding in North America

International contractors bidding and winning increasing share of North America projects
Movement away from conventional delivery for very large projects
Relationship changing between owners and consulting engineers with alternative delivery

Contractor Expectations

Contract documents tailored to industry standards
Differing Site Conditions (DSC), Geotechnical Baseline Reports (GBR), Dispute Review Boards (DRB)

Comparison of Cost Drivers

General Construction Cost Drivers



Materials
Labor
Equipment
Design Quality
Business Climate / Market
Contract Method
Environment / Location
Indirects / Insurance
Inflation

Tunnel Cost Drivers

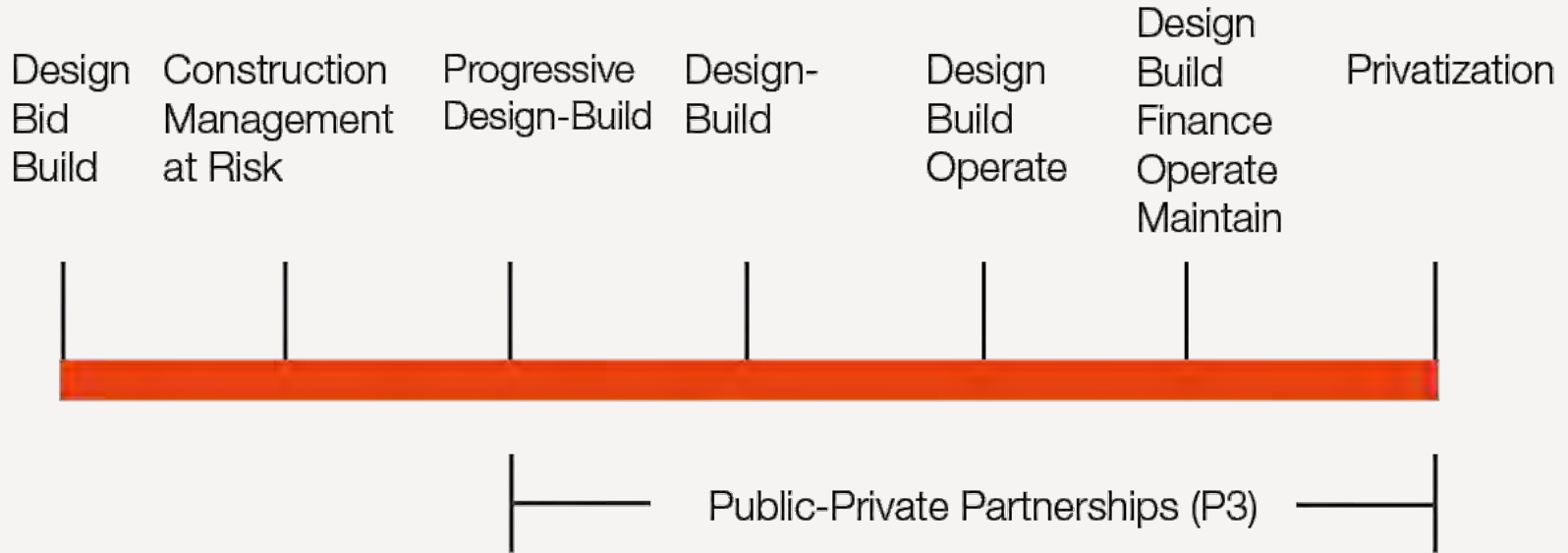


Differing Site Conditions
Design Development &
Unforeseen Design Changes
Linear Nature of the Work
Scope Changes & Transfer
Shaft Construction
Bonding & Limitations
Limited Contractor Pool
Specialized Labor
Ownership of Risk

Owner's Needs on Major Capital Projects

- > Competitive Bidding Atmosphere
- > Delivered On-Time and On-Budget
- > Safety Culture
- > Understand Owner Policy and Procedures
- > Willingness to Partner and Resolve Issues
- > Provide People with Right Experience & Right Equipment
- > Be Proactive Before Problems Arise
- > Understands Public Outreach and How to Respond to Public

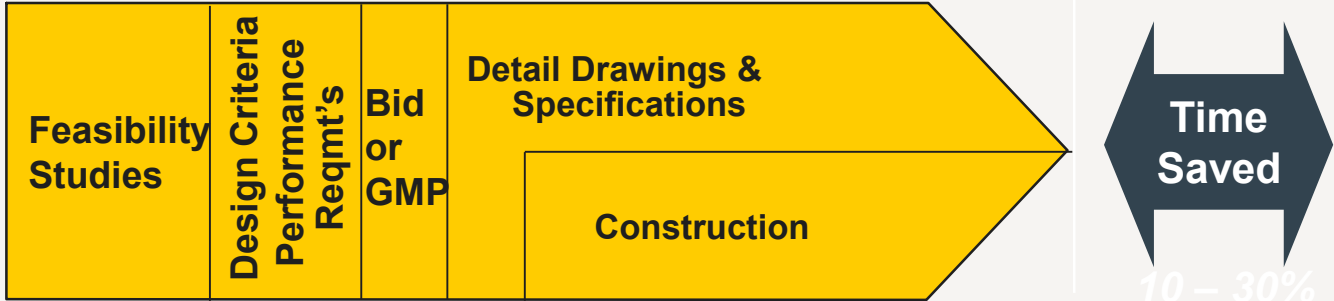
Major Types of Delivery Methods for Public Infrastructure Projects



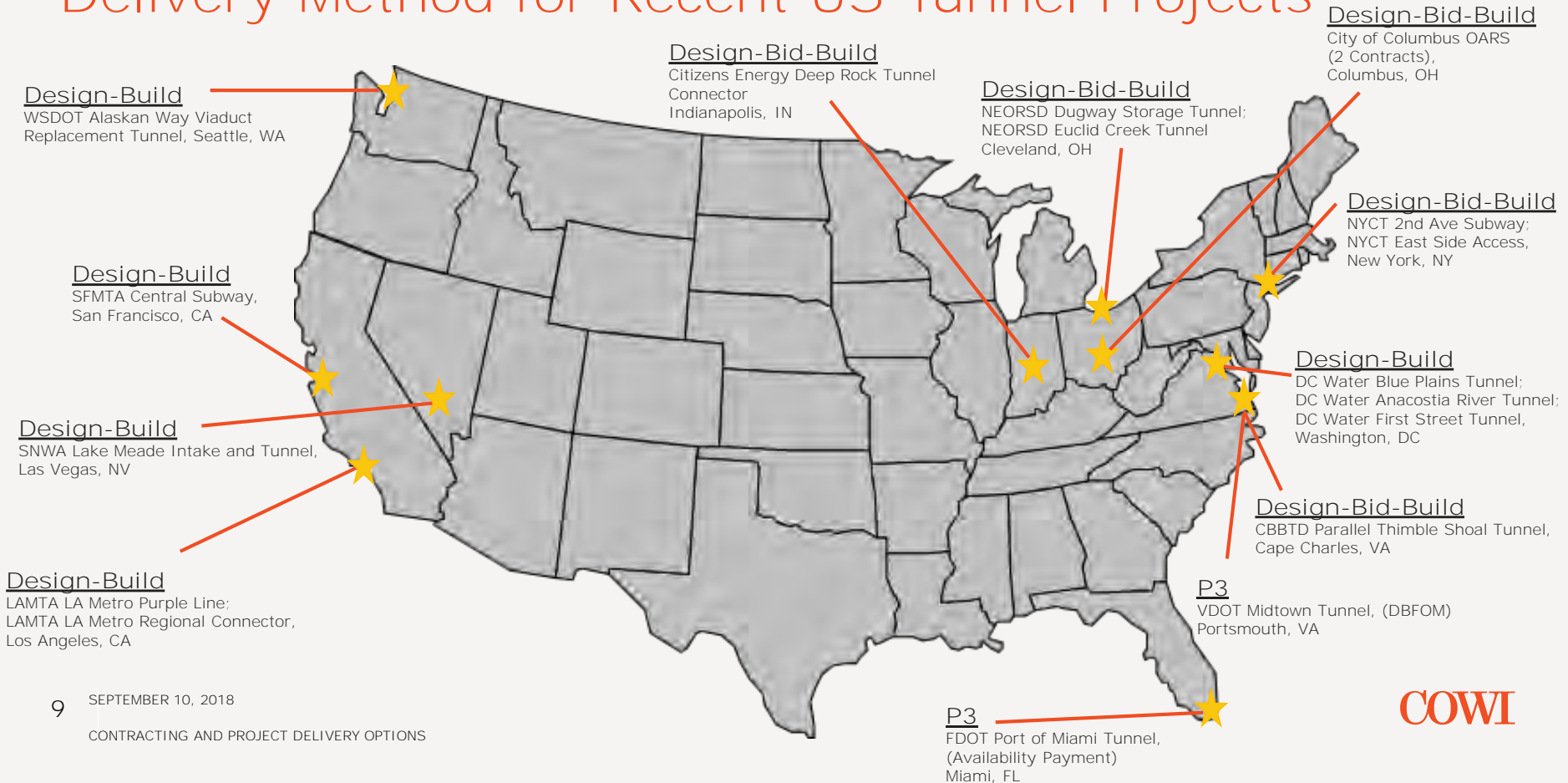
Overview Major Delivery Methods

- > **Design-Bid-Build:** sequential linear process – design, procurement and construction
- > **CM At Risk (CMAR):** constructor selected based on qualifications shortly after the designer selection. Provides pre-construction services. At 50-60% design development, price & schedule proposal provided.
- > **Progressive Design-Build:** involves the design-build team during the earliest stages of the **owner's project** development. Promotes collaboration between owner, designer and contractor.
- > **Design-Build Lump Sum:** risk and responsibility for providing both design and construction with one entity under one contract with the Owner.
- > **Design-Build-Operate:** form of project financing, wherein a private entity receives a concession from the public sector to finance, design, construct, own, and operate a facility.
- > **DBFOM / P3 / Concession:** contractual arrangement between a public agency and the private sector. Skills and assets of each sector shared in delivering facility for the use of the general public.

Collaborative Project Delivery Integrates Design, Long Lead Item Procurement and Construction Activities



Delivery Method for Recent US Tunnel Projects



Design-Bid-Build

- > Previously, DBB preferred method delivery
- > Still popular with many water/wastewater agencies



NYC Transit /
East Side Access:
11 mi., 22 ft. diam.
transit tunnel -
\$10.8B



NYC Transit /
Second Ave.
Subway: 2 miles,
22 diam. transit
tunnel - \$4.5B



Northeast OH
Regional Sewer
District / Euclid
Creek Tunnel:
3.4 mi., 24 ft. diam.
ww tunnel - \$199M



Indianapolis, IN /
Deep Rock Tunnel
Connector, Phase 1:
8 miles, 20 ft. diam.
ww tunnel - \$179M



Why owners continue to use Design-Bid-Build

More ability to influence / control the design

Greater understanding of costs prior to bid

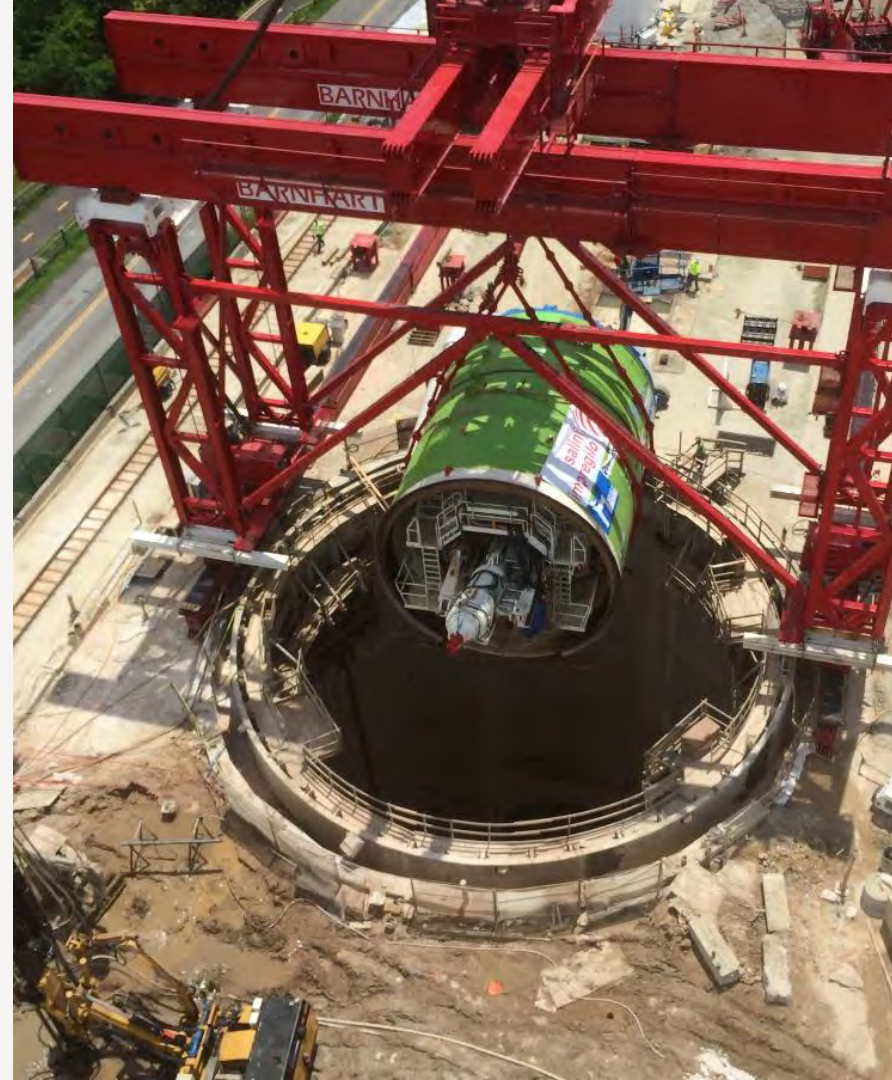
Larger ability to transfer risk to contractor based on completed designs

More familiar with T's & C's

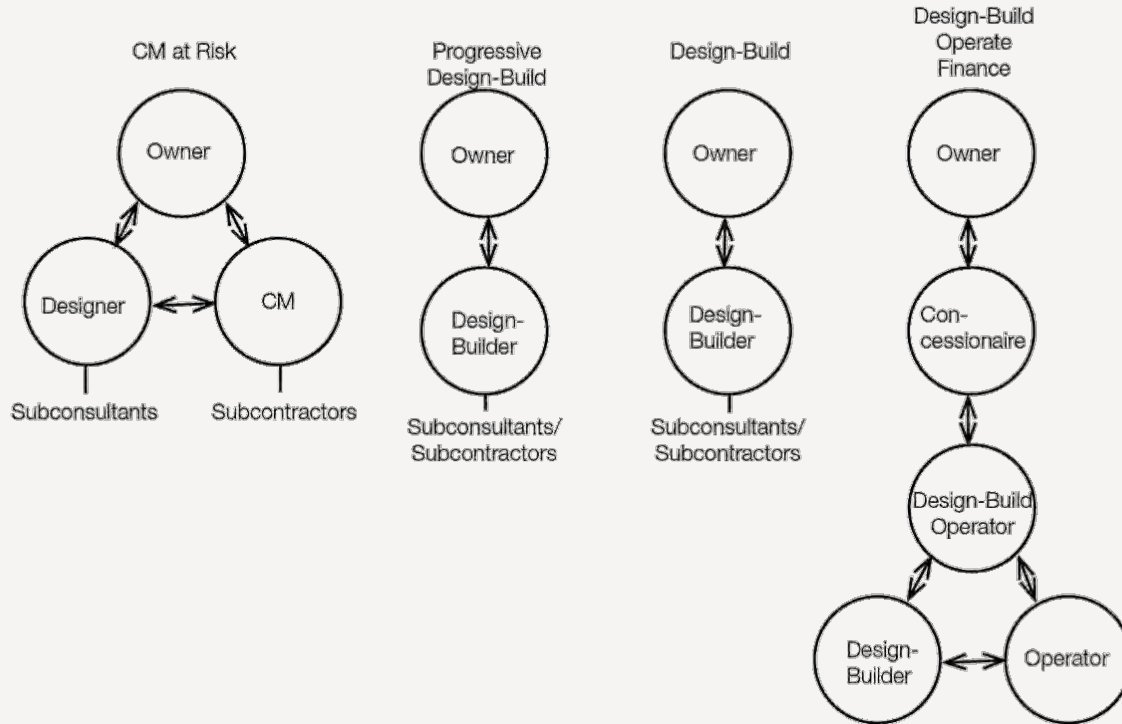
Desire to specify / use new technology

Why owners specify Alternative Delivery

- Single entity responsible for design, construction, technology integration and project delivery
- Shorter schedule and less schedule risk
- Efficient administration
- Fewer potential disputes and change orders



Alternative Delivery Project Structures



CM at Risk

- > Constructor selected based on qualification shortly after designer selection
- > At 50% stage of development, CMAR provides price and schedule based on Owner defined scope

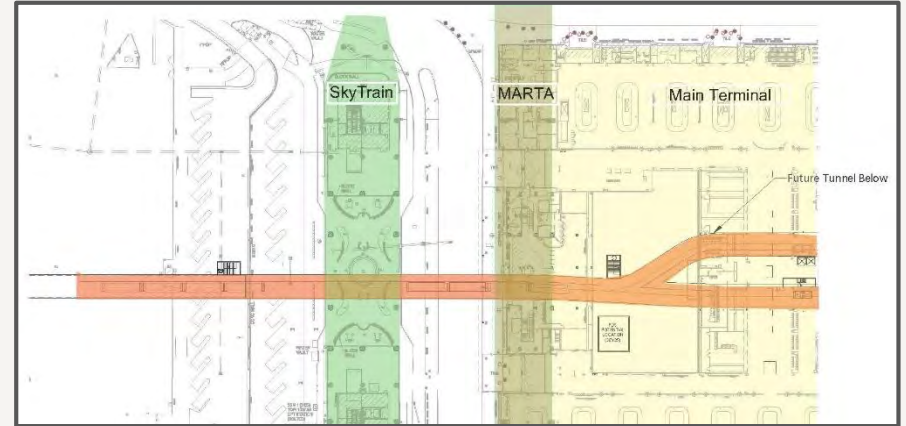
City of Atlanta / Water Supply-Quarry –
Chattahoochee Tunnel: 24,000 ft. long, 13 ft.
diam. tunnel - \$330M



Progressive Design-Build

- Owner involves DB team during early stages of development
- DB team provides a lump sum price to owner at 50% design or when sufficient design for providing a lump sum price

City of Atlanta / Plane Train Extension at Hartsfield Airport – 700 ft. extension from existing baggage claim to area past SKYTrain station – Estimated cost \$100M



Design-Build Lump Sum

- > Risk and responsibility for design and construction with one entity



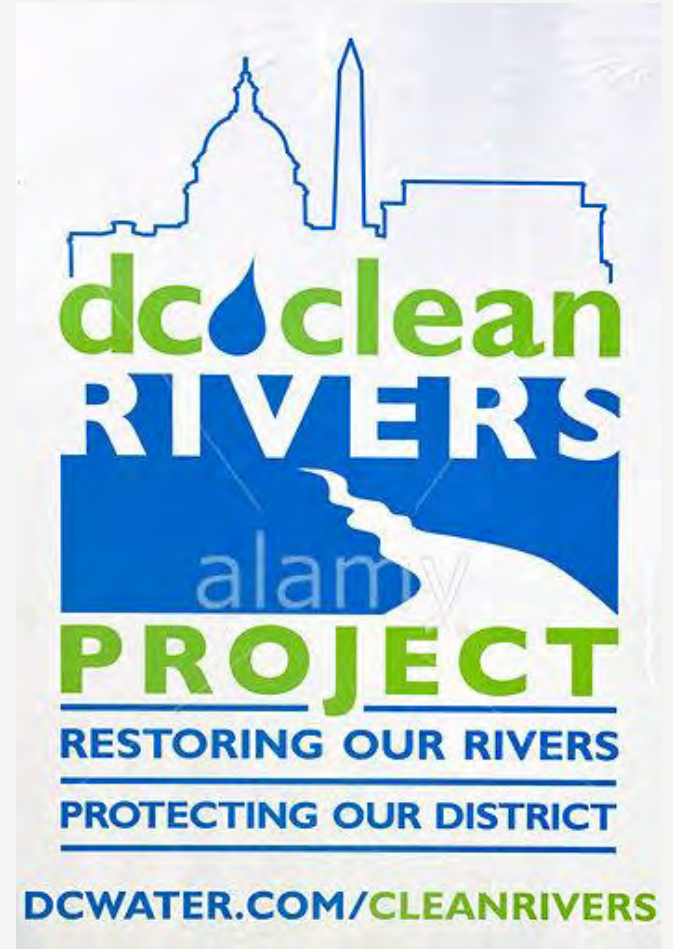
DC Water / Clean Rivers Program:
15 miles of 23 ft. diam. sewers - \$2.6B



Chesapeake Bay Bridge Tunnel District
/ Parallel Thimble Shoal Tunnel:
5,700 ft. long, 42 ft. diam - \$756M

DC Clean Rivers Projects

- > Federal Consent decree to relieve discharge of waste into Potomac and Anacostia Rivers
- > 15 miles of 23 foot diameter storage tunnels and 53 combined sewer outfalls, shafts and other near surface structures
- > \$2.6 billion construction budget
- > Project to be completed by 2025



DC Clean Rivers Projects

Project Delivery Strategy

- Alternative Early Contractor Involvement (ECI) including Design-Build (DB), Construction Manager at Risk (CMAR), Cost Reimbursement Fixed Fee (CRFF), Public Private Partnership (PPP)
 - **Allows for contractor “buys-in” to the design solution to obtain the best quality and value with single-source accountability**
 - Shorter project schedule than DBB with more reliability and predictability
 - Collaborative atmosphere that promotes equitable risk sharing and management
 - Alternative options are not well proven especially in wastewater tunnel projects
 - Owner relinquishes some control over value, quality, function and other objectives

DC Clean Rivers Projects

Selected Contract Packaging and Project Delivery Systems:

- › DB process used for all deep tunnel project components (BPT, ART, NBT & NBBT)
- › DBB process used for all near-surface project components
- › A total of 16 contracts:
 - › 4 deep tunnel contracts
 - › 7 surface diversion structure contracts
 - › 2 overflow structure contracts
 - › 2 pumping station contracts
 - › 1 demolition/site preparation contract



P3 Projects

- Contractual arrangement between public agency and private sector
- Shared delivery of a service or facility for use by general public
- Private entity receives a concession from the public sector to finance, design, construct, own and operate a facility



Recent P3 Tunnel Projects



Virginia Dept. of Transportation / Elizabeth River Crossing (parallel Midtown Tunnel):
Two-Lane 3,700 ft. immersed tube tunnel - \$2.1B. 58-year public partnership with VDOT



Florida Dept. of Transportation / Port of Miami Tunnel:
Twin 4,200 ft. long, 39 ft. diam tunnels - \$1B. Availability payments to concessionaire for a 30-year period until 2044.

Port of Miami Tunnel, Miami, FL



Deal with FDOT

- > Financial close: October 15, 2009
- > 55-months for construction
- > Project cost: \$1.062 Billion (Bank Debt, TIFIA Loans, Concessionaire)
- > Description: 30-year Design, Build, Finance, Operation & Maintenance (DBO/FM) Concession
- > Operate until October 15, 2044
- > DB Contractor/Designer: Bouygues/Jacobs
- > Owner's Rep: WSP (PB)



Bidding Strategies for Increasing Competitiveness

- > Progressive design build
- > Modified fixed fee plus cost reimbursable
- > Fee at risk approaches
- > Risk mitigation techniques with shared contingency
- > Best value formulas
- > Advance purchase of TBM
- > Pre-qualification approaches
- > Contract packaging
- > CMGC (construction manager general contractor)
- > CM at risk

Concluding Thoughts



Owners using full range of delivery options for tunnel projects

With APD, risks of delivery shifting to designers and contractors. Costs of these risks being added to bid prices

Use of APD significantly increased for tunnel projects in past 10 years especially for transportation projects.

Conventional delivery still heavily used for water and wastewater tunnels

Designers and contractors adapting their approaches to new delivery options

THANK YOU!