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Federal Highway Administration
Guidebook Contents

1. Introduction
2. Contract Structure
3. Financial Structure
4. Financial Models
5. Illustrative Financial Viability Assessment

This presentation will introduce Chapters 1-4.
Chapter 1: Introduction
Public-private partnerships (P3s)

Infrastructure Delivery Options

- Design, Bid, Build
- Design, Build
- Design, Build, Finance
- Design, Build, Operate and Maintain
- Design, Build, Finance, Operate, Maintain
- Privatization

PUBLIC SECTOR  PRIVATE SECTOR

Risk

Degree of ownership, development integration, risk transfer and extent of private financing
## Design-Bid-Build versus P3

<table>
<thead>
<tr>
<th>Design-Bid-Build</th>
<th>P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public sector takes on most risks (except construction)</td>
<td>Risks shared between public and private sectors</td>
</tr>
<tr>
<td>Public financing (mostly)</td>
<td>Private financing (mostly)</td>
</tr>
<tr>
<td>Lowest bidder</td>
<td>Best value for least net present cost</td>
</tr>
<tr>
<td>Operations and Maintenance (O&amp;M) and ongoing rehabilitation (if any) carried out by public agency (or under fee for prescribed services) once constructed</td>
<td>O&amp;M carried out by private sector; ongoing rehabilitation overseen by public sector stewardship of P3</td>
</tr>
</tbody>
</table>
P3 Delivery Models

PRIVATE FINANCE

INTEGRATED PROCUREMENT PACKAGE
Increased Private Responsibility

DBFOM Availability
DBFOM User Fees

SEGMENTED PROCUREMENT PACKAGE
Increased Public Responsibility

PUBLIC FINANCE

DBF
O&M Performance
DBB
DB
DBOM
Payment Mechanisms

- Toll Concession (Revenue Risk)
- Availability Payment
- Shadow Toll
Typical Toll Concession P3 Structure

- Bank/loans
- Special Purpose Vehicle (SPV)
- Facility
- Project Sponsors / Equity Providers

- Bonds, Loans
- Debt Service
- Toll Revenue
- Shared Revenue
- Subsidy
- Equity Investments
- Dividends
- Funds to build, maintain and operate
Typical Availability P3 Structure

- **Agency**
  - **Bank/lenders**
    - **Bonds, Loans**
    - **Debt Service**
    - **Milestone and Availability Payment**

- **Special Purpose Vehicle (SPV)**
  - **Equity Investments**
  - **Dividends**
  - **Funds to build, maintain, and operate**

- **Project Sponsors/Equity Providers**

- **Facility**
  - **Toll and Other Revenue**
Questions?

Submit a question using the chat box
Chapter 2: Contract Structure
Special Purpose Vehicle (SPV)

- Limits exposure in the case of bankruptcy
- Finances only project activities
- Repayment sources are project revenues
- Limits parent company exposure
P3 Contracts

▪ Codify risk sharing arrangements through development, procurement, and negotiation processes

▪ Include a set of back-to-back contracts
  • SPV transfers risk from public sector

▪ Provide the basis for financing

▪ Assign the right to collect project revenues
# Typical Risk Allocation

<table>
<thead>
<tr>
<th>Development Phase</th>
<th>Public Sector</th>
<th>SPV</th>
<th>Subcontractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning &amp; environmental process</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political will</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulatory</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permitting</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Procurement</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Financing</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Construction Phase</th>
<th>Public Sector</th>
<th>SPV</th>
<th>Subcontractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering &amp; construction</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Changes in market conditions</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operation Phase</th>
<th>Public Sector</th>
<th>SPV</th>
<th>Subcontractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Competing facilities</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operations and maintenance</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Appropriation</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Financial default risk to public agency</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refinancing</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulatory</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handback</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
SPV Arrangements

- Substitution Agreement
- Finance Agreement
- Concession Agreement
- Concessionaire (SPV)
- Concession Contractor
- Construction Contract
- Interface Agreement?
- Procuring Authority
- O&M Contract
- O&M Contractor
- Public Sponsors
- Equity etc.
- Holding Company
- Equity etc.
- Funders
Questions?

Submit a question using the chat box
Chapter 3: Financial Structure
P3 Project Finance

- Use of project revenues is restricted
- Structure insulates the public authority and private investors from project bankruptcy
- Can be structured off of the public and private balance sheet
  - Availability Payments a special consideration
Typical Cash Flow Waterfall

- Project Revenues
- Revenue Fund
- O&M Fund
- Rehabilitation & Reconstruction Fund
- Senior Debt Service (Reserve) Fund
- Subordinate Debt Service (Reserve) Fund
- O&M Reserve Fund
- Equity Distributions
P3 Senior Debt

- Relatively conservative (risk-averse) type of financing
- High in repayment hierarchy (cash flow waterfall)
- Relatively high Debt Service Coverage Ratio (DSCR)

\[
\text{DSCR} = \frac{\text{CADS}}{\text{DS}}
\]

Where DSCR = Cash Available for Debt Service (CADS) divided by debt service (principal + interest)
Tax-exempt Debt ("Muni Bonds")

- Issued by state and local governments to finance infrastructure projects in the US
- Carries a lower financing rate than taxable debt
- Approximately $\frac{1}{3}$ of all tax-exempt debt is issued as General Obligation (GO) bonds backed by the “full faith and credit” of the issuer
- The other $\frac{2}{3}$ of tax-exempt debt is issued as “revenue bonds” backed by designated sources of revenue which have some features in common with project finance
Private Activity Bonds (PAB)

- Most tax-exempt bonds are reserved for public uses and have a 5% eligibility cap for private uses.
- A special type of tax-exempt bond, Private Activity Bonds (PAB) can be used for private infrastructure.
- The 2005 SAFETEA-LU transportation legislation authorizes $15 billion in PABs for surface transportation projects.
  - As of November 10, 2016, approximately $11.2 billion of this pool had been allocated and $6.5 billion issued.
## Midtown Tunnel PABs

<table>
<thead>
<tr>
<th>Series</th>
<th>Maturity</th>
<th>Principal (US$)</th>
<th>Coupon</th>
<th>Yield*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1/1/2022</td>
<td>670,000</td>
<td>4.25%</td>
<td>4.45%</td>
</tr>
<tr>
<td>B</td>
<td>1/1/2023</td>
<td>685,000</td>
<td>4.50%</td>
<td>4.60%</td>
</tr>
<tr>
<td>C</td>
<td>7/1/2023</td>
<td>1,775,000</td>
<td>5.00%</td>
<td>4.60%</td>
</tr>
<tr>
<td>D</td>
<td>1/1/2024</td>
<td>1,760,000</td>
<td>5.00%</td>
<td>4.75%</td>
</tr>
<tr>
<td>E</td>
<td>7/1/2024</td>
<td>2,900,000</td>
<td>5.00%</td>
<td>4.75%</td>
</tr>
<tr>
<td>F</td>
<td>1/1/2025</td>
<td>3,080,000</td>
<td>4.75%</td>
<td>4.90%</td>
</tr>
<tr>
<td>G</td>
<td>7/1/2025</td>
<td>4,875,000</td>
<td>5.00%</td>
<td>4.90%</td>
</tr>
<tr>
<td>H</td>
<td>1/1/2026</td>
<td>5,290,000</td>
<td>5.00%</td>
<td>4.95%</td>
</tr>
<tr>
<td>I</td>
<td>7/1/2026</td>
<td>6,700,000</td>
<td>5.00%</td>
<td>4.95%</td>
</tr>
<tr>
<td>J</td>
<td>1/1/2027</td>
<td>6,150,000</td>
<td>5.00%</td>
<td>5.00%</td>
</tr>
<tr>
<td>K</td>
<td>7/1/2027</td>
<td>8,480,000</td>
<td>5.00%</td>
<td>5.00%</td>
</tr>
<tr>
<td>L</td>
<td>1/1/2032</td>
<td>91,795,000</td>
<td>5.25%</td>
<td>5.25%</td>
</tr>
<tr>
<td>M</td>
<td>1/1/2037</td>
<td>209,185,000</td>
<td>6.00%</td>
<td>5.32%</td>
</tr>
<tr>
<td>N</td>
<td>1/1/2042</td>
<td>320,405,000</td>
<td>5.50%</td>
<td>5.50%</td>
</tr>
</tbody>
</table>

*The rate is the rate offered to bond buyers. When bonds are sold, they often do not sell at face value but at either a premium or a discount. The yield indicates the actual return offered to bondholders based on the actual price paid. Source: Midtown Tunnel Official Statement available from MSRB EMMA database, CUSIP 928104LK2.
Pros and Cons of Bank Financing

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly draws</td>
<td>Maximum tenors of 7-9 years have been more common</td>
</tr>
<tr>
<td>Easier to negotiate modifications</td>
<td>(up to 20 for availability payment deals)</td>
</tr>
<tr>
<td>More flexible repayment sculpting to match project revenues</td>
<td>vs. up to 40-year tenors for bond financing</td>
</tr>
<tr>
<td>Potential expertise of lenders in similar projects</td>
<td>Not tax-exempt</td>
</tr>
<tr>
<td>Monitoring and project oversight</td>
<td></td>
</tr>
</tbody>
</table>

Maximum tenors of 7-9 years have been more common (up to 20 for availability payment deals) vs. up to 40-year tenors for bond financing.
Subordinate Debt

- Generally requires lower DSCRs and higher interest rates than senior debt
- Accepts a lower level of priority in the cash flow waterfall
- May be provided by specialized funds or by project shareholders

Transportation Infrastructure Finance and Innovation Act (TIFIA) also provides a form of subordinate debt
TIFIA Financing

- **Types of financial assistance:**
  - **Secured (direct) loan**—Maximum term of 35 years
  - **Loan guarantee**—Guarantees repayments to non-Federal lender
  - **Standby line of credit**—Contingent loan available

- Involved in almost all major US highway P3s (other than asset monetizations)

- Generally up to 33 percent of eligible cost financed

- Provides capital, supplemental and subordinate, to projects

- Flexible repayment terms and interest rates
TIFIA has been involved in almost all major US greenfield P3s and approximately a third of the projects in the TIFIA portfolio are P3s.

<table>
<thead>
<tr>
<th>Project</th>
<th>Amount</th>
<th>Rate (%)</th>
<th>Term (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-95 HOT Lanes</td>
<td>$300.0</td>
<td>2.76</td>
<td>35.0</td>
</tr>
<tr>
<td>Presidio Parkway Tranche A</td>
<td>$90.0</td>
<td>0.46</td>
<td>3.5</td>
</tr>
<tr>
<td>Presidio Parkway Tranche B</td>
<td>$60.0</td>
<td>2.71</td>
<td>28.0</td>
</tr>
<tr>
<td>Midtown Tunnel</td>
<td>$422.0</td>
<td>3.17</td>
<td>44.0</td>
</tr>
<tr>
<td>LBJ-635 Corridor</td>
<td>$850.0</td>
<td>4.22</td>
<td>40.5</td>
</tr>
<tr>
<td>North Tarrant Express</td>
<td>$650.0</td>
<td>4.51</td>
<td>35.0</td>
</tr>
<tr>
<td>Port of Miami Tunnel</td>
<td>$341.0</td>
<td>4.31</td>
<td>35.0</td>
</tr>
<tr>
<td>I-595</td>
<td>$603.0</td>
<td>3.63</td>
<td>35.0</td>
</tr>
<tr>
<td>SH-130 Segment V-VI</td>
<td>$430.0</td>
<td>4.45</td>
<td>35.0</td>
</tr>
<tr>
<td>I-495 HOT Lanes</td>
<td>$589.0</td>
<td>4.40</td>
<td>40.0</td>
</tr>
</tbody>
</table>
Questions?

Submit a question using the chat box
Role of Equity in P3

- Equity investors:
  - Appear at the bottom of the cash flow waterfall in first-loss position
  - Try to insulate from losses by seeking to transfer risks to subcontractors
  - Accept highest level of risk and require a higher return on investments

No investor guarantee on returns and no investment recourse
## Types of Equity Investors

<table>
<thead>
<tr>
<th>Investor</th>
<th>Strategy/Objective</th>
<th>Project Transaction Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subcontractors engaging in Design Build and Operations &amp; Maintenance</td>
<td>Broadening participation and potential financial returns over the project term</td>
<td>Midtown Tunnel: Skanska is a 50% equity investor in the SPV and member of the DB contractor team</td>
</tr>
<tr>
<td>Financial institutions</td>
<td>Provide development capital and typically exit once the project is up and running or even before</td>
<td>Denver Fastracks Eagle P3: Macquarie sold its stake after the project reached financial close.</td>
</tr>
<tr>
<td>Pension funds and insurance companies</td>
<td>Seek long-term return; they prefer a larger share of the concession’s cash flows</td>
<td>Florida I-595: TIAA-CREF acquired a 50% stake when the project neared substantial completion</td>
</tr>
</tbody>
</table>
## Equity Investors in US Transportation P3s

<table>
<thead>
<tr>
<th>Project/Investor</th>
<th>Amount ($millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>East End Crossing</strong></td>
<td></td>
</tr>
<tr>
<td>Walsh Investors</td>
<td>$26.00</td>
</tr>
<tr>
<td>VINCI Concessions SAS</td>
<td>$26.00</td>
</tr>
<tr>
<td>Bilfinger Berger</td>
<td>$26.00</td>
</tr>
<tr>
<td><strong>I-95 HOT Lanes</strong></td>
<td></td>
</tr>
<tr>
<td>Fluor</td>
<td>$24.20</td>
</tr>
<tr>
<td>DRIVe USA</td>
<td>$217.80</td>
</tr>
<tr>
<td><strong>Presidio Parkway</strong></td>
<td></td>
</tr>
<tr>
<td>Hochtief</td>
<td>$23.00</td>
</tr>
<tr>
<td>Meridiam</td>
<td>$23.00</td>
</tr>
<tr>
<td><strong>Midtown Tunnel</strong></td>
<td></td>
</tr>
<tr>
<td>Skanska</td>
<td>$99.45</td>
</tr>
<tr>
<td>Macquarie</td>
<td>$121.55</td>
</tr>
<tr>
<td><strong>LBJ-635 Corridor</strong></td>
<td></td>
</tr>
<tr>
<td>Cintra</td>
<td>$364.00</td>
</tr>
<tr>
<td>Meridiam</td>
<td>$266.00</td>
</tr>
<tr>
<td>Dallas Police / Fire Pension Fund</td>
<td>$70.00</td>
</tr>
<tr>
<td><strong>North Tarrant Express</strong></td>
<td></td>
</tr>
<tr>
<td>Cintra</td>
<td>$241.50</td>
</tr>
<tr>
<td>Meridiam</td>
<td>$141.90</td>
</tr>
<tr>
<td>Dallas Police / Fire Pension Fund</td>
<td>$42.60</td>
</tr>
<tr>
<td><strong>Port of Miami Tunnel</strong></td>
<td></td>
</tr>
<tr>
<td>Bouygues</td>
<td>$8.00</td>
</tr>
<tr>
<td>Meridiam</td>
<td>$72.30</td>
</tr>
<tr>
<td><strong>I-595</strong></td>
<td></td>
</tr>
<tr>
<td>ACS Iridium</td>
<td>$207.70</td>
</tr>
<tr>
<td><strong>SH-130 Segment 5-6</strong></td>
<td></td>
</tr>
<tr>
<td>Cintra</td>
<td>$136.40</td>
</tr>
<tr>
<td>Zachry</td>
<td>$73.40</td>
</tr>
<tr>
<td><strong>I-495 HOT Lanes</strong></td>
<td></td>
</tr>
<tr>
<td>Flour</td>
<td>$35.00</td>
</tr>
<tr>
<td>Transurban</td>
<td>$315.00</td>
</tr>
</tbody>
</table>
### Equity Returns for Different Project Phases

- Required equity return decrease as the risks affecting returns reduce over time through key phases.
- Differentials exist even though investors pass most risks onto subcontractors.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Risk-free Rate</th>
<th>Project Risk</th>
<th>Phase Risk</th>
<th>Equity Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>6%</td>
<td>2-4%</td>
<td>4%</td>
<td>12-14%</td>
</tr>
<tr>
<td>Ramp up</td>
<td>6%</td>
<td>2-4%</td>
<td>2%</td>
<td>10-12%</td>
</tr>
<tr>
<td>Long-term operation</td>
<td>6%</td>
<td>2-4%</td>
<td>-</td>
<td>8-10%</td>
</tr>
</tbody>
</table>

US Secondary Equity Market

- US secondary market for equity stakes in P3 projects is just beginning to develop

- Transaction examples:
  - I-595
  - Dulles Greenway
  - CA SR-125 South Bay Expressway
Equity Share on US Transportation Projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Equity Share as % of Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-95 HOT Lanes</td>
<td>32</td>
</tr>
<tr>
<td>LBJ-635 Corridor</td>
<td>25</td>
</tr>
<tr>
<td>North Tarrant Express</td>
<td>21</td>
</tr>
<tr>
<td>I-495 HOT Lanes</td>
<td>18</td>
</tr>
<tr>
<td>Midtown Tunnel V-VI</td>
<td>11</td>
</tr>
<tr>
<td>SH-130 Segment V-VI</td>
<td>16</td>
</tr>
<tr>
<td>I-595</td>
<td>11</td>
</tr>
<tr>
<td>Presidio Parkway</td>
<td>12</td>
</tr>
<tr>
<td>Port of Miami Tunnel</td>
<td>7</td>
</tr>
<tr>
<td>East End Crossing</td>
<td>10</td>
</tr>
</tbody>
</table>

Payment mechanism:
- **Revenue Risk**
- **Availability**
Upfront Government Contributions on US P3 Projects
Operations Phase Contributions

- Govt. contributions to operations have not been a feature of US P3 projects
- Possible to mix availability payment and user fee (toll) revenue streams
- The recently awarded I-77 P3 in North Carolina is expected to feature a mix of operational payments and toll revenues
Credit Enhancements

- Credit enhancements help to reduce project risk
- Main tradeoff: price vs. liquidity
- Cash reserves are the most liquid
- Insurance costs the least (<1% of project costs)
- Surety coverage is required
## Credit Enhancements

<table>
<thead>
<tr>
<th>Source of Funds</th>
<th>Terms and Conditions</th>
<th>Value</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash reserves</td>
<td>Funded at financial close</td>
<td>Project specific</td>
<td>Immediate (*)</td>
</tr>
<tr>
<td>Cash reserves</td>
<td>Funded from project cash flows</td>
<td>Project dependent</td>
<td>Immediate once constituted</td>
</tr>
</tbody>
</table>
| Letters & Lines of credit | On call from a financial institution  
Supports project cash flows during construction to avoid impact on schedule. | About 5-10% of contract value | Immediate (irrevocable and unconditional) |
| Parental guarantee      | Guarantee of performance by ultimate parent of the Construction or the Operations & Maintenance contractor | Based on probable loss | Immediate subject to credit worthiness |
| Performance bond        | Surety bond provides core performance support in case of contractor failure          | 100% of contract value | Conditional and subject to process               |
| Insurance               | Provided by third party to subcontractors and SPV                                    | Priced on coverage, insured | Conditional and subject to process               |

Notes (*) Lenders will only consent to use of the reserves for their designated purpose. In other words the debt service reserve is not available for maintenance purposes.
Questions?

Submit a question using the chat box
Chapter 4: Financial Modeling
Use of Financial Modeling

Project Development
• Determine financial viability
• Assess P3 Value for Money

Bid Preparation
• RFP designed to ensure project can be successfully tendered
• Bidders test potential financial structures
• Bid evaluation by public agency
Use of Financial Modeling

Commercial & Financial Close
- Due diligence by Lenders
- Term negotiations

Concession Period
- Monitoring project performance
- Price compensation payments
- Calculate any refinancing gains
- Revenue sharing
- Handback
Modules

- Risk Assessment
- Financial Viability Assessment
- Value for Money Analysis
- Project Delivery Benefit-Cost Analysis
Tool and References

- P3-VALUE 2.0 Excel Spreadsheet
- User Guide
- Primers & Guidebooks
Questions?

Submit a question using the chat box
FHWA P3 Training

**INTRODUCTORY**

Introduction to P3s
- Overview
- Project Development
- Procurement
- Risk Assessment
- Value for Money
- Project Financing

Successful P3 Practices and Model Contracts
- Successful Practices Over Project Life Cycle
- Model Toll Concession Contracts
- Model Availability Payment Contracts

**ADVANCED ANALYSIS**

P3 Project Financing
- P3 Structuring
- Finance Viability
- Financial Models

Risk Assessments
- Risk Identification
- Risk Analysis and Valuation
- Risk Allocation

Value for Money
- Public Sector Comparator (PSC)
- P3 Option
- Evaluation

P3 Benefit-Cost Evaluation
- Estimating P3 Efficiency Impacts
- Estimating Public Benefits
Upcoming P3 Webinars

- **February 9**  Use of Performance Measures in P3s
- **February 16**  P3 Projects in the U.S.

**To register for the webinars, please visit:**


**FACT SHEETS**
- Ten concise single-sheet discussions of key P3 concepts for a non-technical audience

**PRIMERS**
- P3 Concessions for Highway Projects
- Risk Assessment
- Value for Money
- Financial Structuring and Assessment
- Establishing a P3 Program

**GUIDES**
- How FHWA Reviews P3s
- Model Toll Concession Contracts
- Model Availability Payment Contracts
- P3 Project Financing
- Risk Assessment
- Value for Money
- Benefit–Cost Analysis

**DISCUSSION PAPERS**
- Revenue Risk Sharing
- Performance Requirements for Design and Construction in P3s

**ANALYTICAL TOOLS**
- P3-SCREEN
- P3-VALUE

**INFORMATIONAL REPORTS**
- Successful Practices for P3s
- Highway P3 Projects in the U.S
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