San Francisco Peninsula Rail Program Executive Steering Committee

Item 6 – Presentation on the Downtown Rail Extension Project Delivery Alternatives Study: Risk Comparison of Shortlist Options

April 22, 2022

Caltrain

SEAL OF THE CITY AND COUNTY OF SAN FRANCISCO

CALIFORNIA High-Speed Rail Authority

METROPOLITAN TRANSPORTATION COMMISSION

TJPA TRANSBAY JOINT POWERS AUTHORITY

San Francisco County Transportation Authority

Agenda

- Feedback from ESC and TJPA Board
- Feedback from IPMT
- DTX risk process
- Delivery Strategy risk analysis approach
- Summary of Delivery Strategy qualitative risk analysis

Feedback from ESC and TJPA Board

- Summarize risk work completed to date for Project Delivery Alternatives Study
- Undertake qualitative risk-based assessment of the short-listed options
- Focus on the differences between the options
- Seek input from other MOU agencies to complement Operator input
- Consider how the options deliver on TJPA values (e.g., small, disadvantaged, veteran and local business participation)

Feedback from IPMT

IPMT April 12, 2022, discussion:

- A key difference between DTX and other successful transit P3 projects is that there is not sufficient operating-period scope (“OMR”) to generate enough value to offset the additional cost of a P3.
- Clarify that "Agency Capacity" refers to front-end procurement specialized skill sets and requirements
- Consider biggest project risks, irrespective of delivery method

The majority opinion from the IPMT:

- No additional focus on Option 10 in the Project Delivery Alternatives Study, subject to work-to-date being finalized and documented in the Study Final Report.
- Additional work will be conducted on Options 5, 6, and 7 to inform the Project Delivery recommendation for presentation to the ESC in June and Board action in July.

DTX Risk Analysis Process

- Detailed project-wide risk register developed with input from a range of project stakeholders
- Qualitative assessment, considering impact of risks before and after mitigation
- Quarterly updates to the risk register
- Culminates in a quantitative risk analysis and a risk-based integrated cost and schedule model
- Risk and Contingency Management Plan in accordance with FTA guidelines (December 2022)

Risks captured in the risk register are grouped by FTA Standard Cost Categories

10 – Guideway

20 – Stations, Stops, Terminals

40 – Sitework and Special Conditions

50 – Systems

60 – Right-of-Way (ROW), Land, Existing Improvements

80 – Professional Services

100 – Funding / Finance Charges

Risk Register

- Risk Report consistent with FTA Guidance
- IPMT Qualitative Risk Workshops held:
  - September 2020
  - October 2020
  - February 2021
  - May 2021
  - October 2021
  - February 2022
- Quarterly reviews/updates conducted
- 42 Risk items identified

Key DTX Risks

- Tunnel design/construction and site conditions
- Changes to combined sewer line relocation approach
- Proximity and type of adjacent development foundations
- Delays/design changes resulting from agency reviews / changes to requirements
- Loading parameters above train box extension and throat
- Preservation of historic building facades
- Delay in acquisition of funding will extend schedule
- Space programming changes
- Underestimation of the testing and commissioning phase extends the completion date
- Delay in real estate acquisition extends schedule
- Management of contract interfaces

FTA Risk Categories and Ranking

Categories

- Requirements
- Design
- Market
- Construction

Ranking

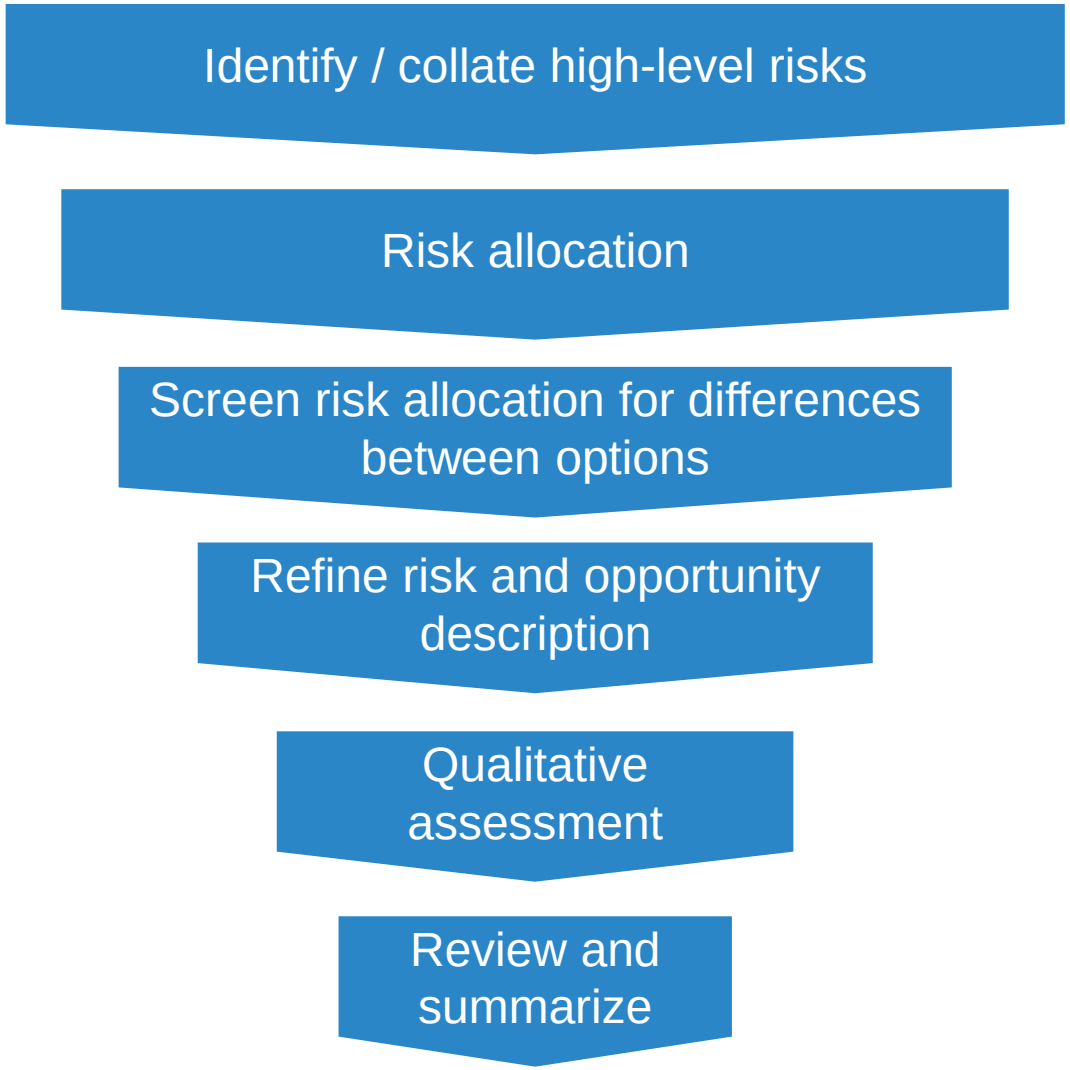
Probability	Low (1)	Med (2)	High (3)	Very High (4)	Significant (5)
	<10%	10> <50%	>50%	76%> <90%	>90%
Severity					
Cost	<$250k	$250k> <$1m	$1m> <$3m	$3m> <$10m	>$10m
Schedule	<1 Month	1> <3 Months	3> <6 Months	6> <12 Months	>12 Months
Ranking	<=3	3.1-9.49		>=9.5	

DTX Risk Analysis Process – 2022 Activities

- Quantitative Risk Assessment scheduled August 2022 using updated cost estimate
- Risk Mitigation Workshop scheduled August 2022
  - Contingency-priced risk based on occurrence probability and severity
  - Monte Carlo simulations applied to guide schedule risk and contingency accordingly
- Quantitative Risk Analysis Report scheduled October 2022
- Risk and Contingency Management Plan in accordance with FTA guidelines scheduled for completion December 2022

Delivery Strategy Risk Approach

- Risks related to the delivery strategy
- Screening and shortlisting of delivery options informed by:
  - Scope and risks informed the contract packaging (interfaces, schedule, access)
  - Precedent projects / case studies
  - Comparative analysis against procurement objectives
  - Market engagement
- Further analysis consolidating project-wide delivery risk information:
  - Project risk register
  - Engagement with Partners
  - Financial analysis



Short List of Delivery Options under Consideration

Short List of DTX Delivery Options

Scope	Option 5	Option 6	Option 7	Option 10
Enabling	DBB	DBB	DBB	DBB
General Civil	PDB	PDB	PDBF	PDA-DBFM
Tunnel				
Station Fit-out & Supporting Systems	CMGC	CMGC	CMGC	
Core Systems & Trackwork	CMGC			

ESC provided direction in December 2021 to narrow potential delivery approaches to a Short List of 4 options

DBB (design-bid-build)

DB (design-build)

PDB (progressive design-build)

CMGC (construction manager/general contractor)

DBF (design-build-finance)

DBFM (design-build-finance-maintain)

PDA (project development agreement)

Option 10: DTX PDA-DBFM

- PDA-DBFM refers to Design-Build-Finance-Maintain (DBFM) contract, developed through an initial Project Development Agreement (PDA) phase
- Considerations for Potential Application of DTX PDA-DBFM:
  - Defers portion of construction-period costs through progress payment(s) and private financing over operating term
  - Provides for asset “hand-back” in state of good repair at end of operating term
  - Developer capital at-risk incents project completion and performance/availability during operating term
  - Opportunity for developer to balance capital, maintenance, and rehabilitation investments over lifecycle
  - Brings additional oversight and due diligence associated with private financing
  - Collaborative and integrated approach to de-risk project delivery during the PDA phase

Categorization of Delivery Strategy Risks

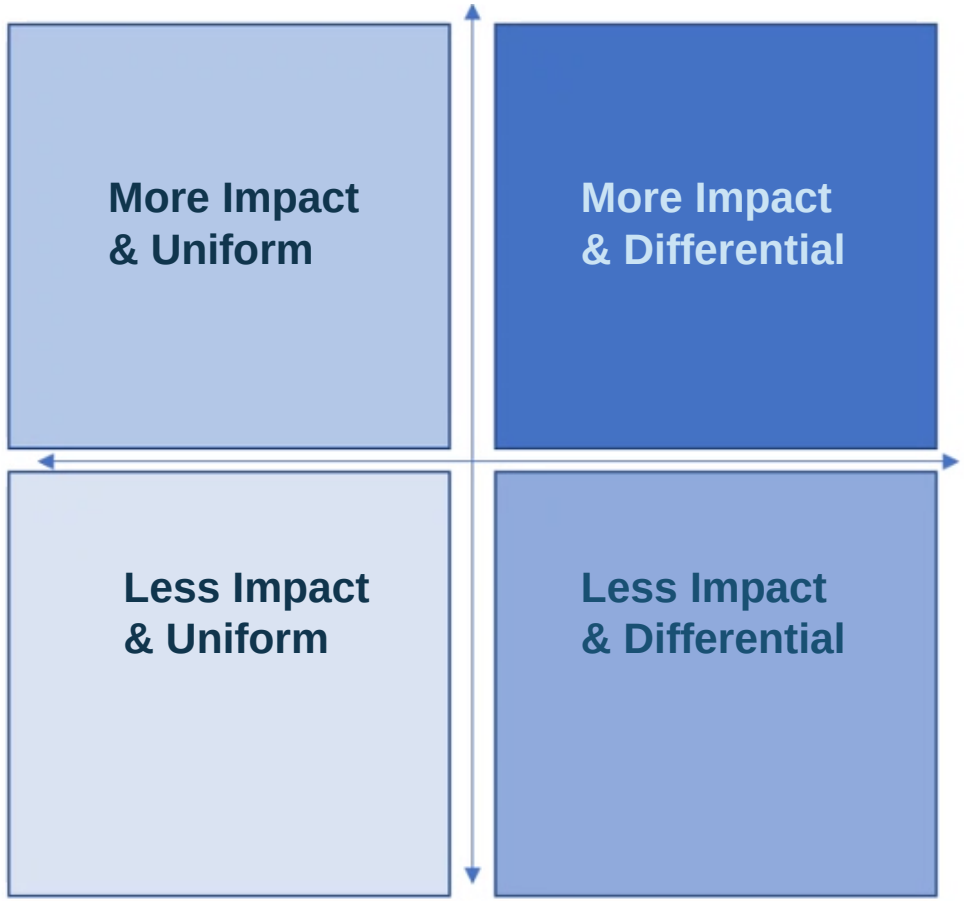
Identified relevant risks by phase

- Financial and organization
- Procurement process
- Design
- Construction
- Operating Period

Grouped based on:

- Impact (less vs more)
- Delivery option comparison (uniform vs differential)

Primary focus on risks that differentiate between the delivery options



Funding and Financing

Risk that timing of available funding does not meet project cashflow needs

Risk Drivers	Option 6	Option 7	Option 10
Multiple funding streams and forecasts	○	○	○
Project schedule and enabling works	●	○	○
Preconstruction services phase	●	○	○
Risk Mitigation		Private financing – construction period	Private financing – construction period and operating period

Legend: ○ Risk Driver is Present ● Risk Driver is Present and Comparatively More Significant

Resourcing

Risk that there is insufficient project delivery organization capacity/capability to successfully manage all phases of delivery

Risk Drivers	Option 6	Option 7	Option 10
OMR scope development			○
Inclusion of private finance		○	●
Unique form of contract	○	○	●
Contract interface management	○	●	
Institutional experience	●	●	●
Development of organizational capacity	○	○	○
Risk Mitigation	• Pre-construction services phase • Build project management capacity		• Develop in-house agency resources • Secure specialty consultant support • Additional time to develop final contract

Legend: ○ Risk Driver is Present ● Risk Driver is Present and Comparatively More Significant

Procurement Schedule

Risk that the process to development of procurement documents and secure approvals takes longer than scheduled

Risk Drivers	Option 6	Option 7	Option 10
Complexity of contract(s)		○	●
Inclusion of private finance		○	●
Form of contract and precedent examples	○	○	●
Review and approval process	○	○	●
Interface management	○	○	
Level of multi-agency involvement	○	○	●
Risk Mitigation	• Civil/tunnel package separate from systems/fit-out package • Reduced contractual complexity • Availability of and ability to use precedent project documents		• Allow for additional time in the schedule • Precedent projects

Legend: ○ Risk Driver is Present ● Risk Driver is Present and Comparatively More Significant

Contract Negotiations

Risk Drivers	Option 6	Option 7	Option 10
Demonstrated value/fair contract value	○	○	○
Diverging perspectives on risk, schedule and cost	○	○	○
Contract packaging	○	○	○
Contractor ceases involvement	○	○	○
Technical complexity	○	○	○
Risk Mitigation	• Reduced contract complexity • Sufficient time to negotiate • Experienced negotiators and independent cost estimator • Commercial elements at RFP stage • Off-ramps		• Sufficient time to negotiate • Experienced negotiators and independent cost estimator • Commercial elements at RFP stage • Offramps

Legend: ○ Risk Driver is Present ● Risk Driver is Present and Comparatively More Significant

Market Interest

Risk that a lack of market interest limits competition amongst qualified contractors and/or reduces the quality of submissions

Risk Drivers	Option 6	Option 7	Option 10
Scale of construction contract	○	○	●
Commercial structure of contract	○	●	●
Scale/composition of OMR scope			●
Committed funding for payment model	○	●	●
Contract packaging	○	○	●
Contractor and subcontractor selection			●
Risk Mitigation	• Continued market sounding • Early contract involvement • Appropriate risk allocation • Align with market precedents • Manage/moderate contract size • Align contract packages with specialty scope		

Legend: ○ Risk Driver is Present ● Risk Driver is Present and Comparatively More Significant

Changing Requirements

Risk of design changes, either before or after construction contract award, due to poorly articulated or evolving design requirements

Risk Drivers	Option 6	Option 7	Option 10
Time to certainty	○	○	○
Responsibility for detailed design			●
Current known uncertainties	●	●	●
Current operating arrangements			●
Risk Mitigation	• Early contractor involvement • Delivery Agency control of detailed design (track and systems) • Coordination with existing/future O&M agreements • Risk based engineering prior to preconstruction phase		• Early contractor involvement and PDA phase • Risk based engineering prior to preconstruction phase

Legend: ○ Risk Driver is Present ● Risk Driver is Present and Comparatively More Significant

Contract Interfaces

Risk that contract interfaces are poorly defined and/or managed

Risk Drivers	Option 6	Option 7	Option 10
Number of contracts	●	●	○
Civil construction delays track and systems construction	●	●	
Delivery Agency capacity and capability	●	●	
Risk Mitigation	• Early contractor involvement • Concurrent pre-construction services phases • Additional project and construction management support		• Fewer contracts • Early contractor involvement

Legend: ○ Risk Driver is Present ● Risk Driver is Present and Comparatively More Significant

Construction Schedule

Risk Drivers	Option 6	Option 7	Option 10
Limited consequence of delay vs cost to mitigate delay	●	○	
Contract clauses for delay are challenging to enforce	●	○	
Risk Mitigation	• Realistic construction schedule development • Shared incentive models	• Realistic construction schedule development • Private finance liquidated damages • Shared incentive models	• Private finance (liquidated damages) • Realistic construction schedule development

Legend: ○ Risk Driver is Present ● Risk Driver is Present and Comparatively More Significant

Future Changes

Risk of future changes to DTX infrastructure or operations

Risk Drivers	Option 6	Option 7	Option 10
Related/interfacing major projects or developments	○	○	●
Scope and functionality of asset	○	○	●
Changes to operations	○	○	●
Interfacing service contracts	○	○	●
Contract term			●
Project Co obligations to Lenders			●
Risk Mitigation	• Shorter term contracts • Change clauses and mechanisms		• Scope of OMR contract • Change clauses and mechanisms • Relief from performance requirements (last resort)

Legend: ○ Risk Driver is Present ● Risk Driver is Present and Comparatively More Significant

OMR Performance

Risk that poor quality OMR service delivery impacts system performance and/or fare box recovery

Risk Drivers	Option 6	Option 7	Option 10
Existing operating arrangements	○	○	●
Reduced Delivery Agency control			●
Payment mechanism			●
Delivery Agency obligations	○	○	●
Risk Mitigation	• Proactive contract administration • Contract packaging	• Proactive contract administration • Contract packaging	• Proactive contract administration • Sufficient scale of OMR services • Calibrated payment mechanism • Step-in thresholds that allow Delivery Agency intervention

Legend: ○ Risk Driver is Present ● Risk Driver is Present and Comparatively More Significant

Risk Summary – Preliminary Draft

	Option 6	Option 7	Option 10
Funding and Financial		↓	↓
Resourcing	↓	↓	↑
Procurement Schedule			↑
Contract Negotiations	↑	↑	↑
Market Interest	↓	↓	↑
Changing Requirements	↓	↓	↑
Contract Interfaces	↑	↑	↓
Construction Schedule		↓	↓
Future Changes			↑
OMR Performance			↑

Legend

↑ Delivery model increases the risk (likelihood and/or consequence)

↓ Delivery model decreases the risk (likelihood and/or consequence)

Delivery model does not impact the risk

Thank you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