

Downtown Rail Extension (DTX) Project Delivery Alternatives Study

Analysis of PDA-DBFM Option: Progress Update

San Francisco Peninsula Rail Program

Executive Steering Committee

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Outline

- Background
- Risk Considerations
- OMR Scope Assessment
- Preliminary Financial Analysis
- Operator Technical Engagement
- Market Context
- Next Steps

Short List of Delivery Options under Consideration

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

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	PDB	PDB	PDBF	
Station Fit-out & Supporting Systems	CMGC	CMGC	CMGC	
Core Systems & Trackwork	CMGC			

- 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)

DTX PDA-DBFM: Description

PDA-DBFM refers to Design-Build-Finance-Maintain (DBFM) contract, developed through an initial Project Development Agreement (PDA) phase:

- Form of “public-private partnership” (P3), with early contractor involvement through PDA phase
- Long-term contract (~30-year operating term post-construction)
- Fully-aggregated contract, with exception of Enabling Works
- Ability to “off-ramp” to non-DBFM approach during PDA phase
- DBFM contract would not include rail operations, maintenance of rail systems & track, fare collection, or fare revenue risk
- DBFM contract would include certain other operations, maintenance, and rehabilitation (OMR) components for the operating term
- DBFM contractor (“Project Co”) compensated through combination of progress/milestone payment(s) during construction and annual Availability Payments (APs) during operating term, with APs reflecting transferred OMR costs, developer return/profit, and remaining capital repayment/financing

Considerations for 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

Considerations for Options 5 & 7

Option 5

- Ability to refine contract packaging based on further technical analysis and market engagement (scale and specialty scope)
- Potential approach to address Operator risks and requirements
- Relatively straightforward change to procurement approach relative to Option 6

Option 7

- Option to assist with bridging a construction-period financing gap
- Introduces some additional organizational complexity and development cost, along with further due diligence activities

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Tunnel				
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Core Systems & Trackwork	CMGC			

Risk as an input to delivery option selection

Risk should be allocated to the party best able to mitigate the risk, and who can best bear the risk if it materializes.

- Risk transfer and the approach to risk varies based on delivery model.
- Risk as a basis for comparing delivery models:
 - What allocation of projects risks offers value to the owner and is acceptable to the market?
 - What are the implications if a risk is realized?
 - What are the delivery model-specific risks and opportunities?
- Risk paradigms in procurement:
 - Transactional (DBB, DB, and traditional P3)
 - Collaborative (PDB, CMGC, PDA-P3)

DTX risk analysis process

- Risk and Contingency Management Plan in accordance with FTA guidelines
- Detailed project-wide risk register developed with input from a range of project stakeholders
- Qualitative risk assessment assessing pre- and post-mitigation risks
- Quarterly updates to the risk register
- Culminates in a quantitative risk analysis and a risk-based integrated cost and schedule model

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

Summary of Major DTX Risks

Certain major risks have different approaches under alternative Delivery Options:

Risk / Risk Area	Delivery Strategy Considerations
<p>Geotechnical and Tunneling Risk</p> <p>Right-of-Way Acquisition</p> <p>Utilities Relocation/Protection</p> <p>Adjacent Developments</p> <p>Third-Party Agreements</p>	<ul style="list-style-type: none"> ▪ Tunnel design to be completed by contractor to mitigate structural and construction risks ▪ Enabling works program includes ROW acquisition prior to major construction contract(s) ▪ Enabling works program includes utility works prior to major construction contract(s) ▪ Early contractor involvement to collaboratively develop design and mitigate risks ▪ Third-party agreements generally the responsibility of the delivery agency
<p>Third-Party Interfaces</p> <p>Related/Future Projects</p> <p>Systems Integration/Inter-Operability</p> <p>Funding Availability/Financing</p> <p>Market Interest</p> <p>Contract Interfaces</p> <p>Impact of Owner-Directed Changes</p> <p>Asset Maintenance / SOGR</p>	<ul style="list-style-type: none"> ▪ Some delivery options require more direct interfaces between contractor and third-parties ▪ Long-term contract generally less flexible to accommodate future changes post-construction ▪ General preference to retain systems design to coordinate operator requirements ▪ Differing delivery options have different cash-flow and financing requirements ▪ Feedback from previous and planned Industry Sounding exercises ▪ General preference for fewer contract packages, to reduce interface management by owner ▪ Early contractor involvement helps mitigate this risk for construction period ▪ Differing responsibilities for long-term asset maintenance/SOGR

Generally consistent approach to risk across short-listed Delivery Options

Varying risk implications, depending on Delivery Option

Analysis of PDA-DBFM: Study Activities

The Project Delivery Study Team is currently undertaking the following technical and engagement activities to further evaluate the PDA-DBFM option:

- **OMR Scope:** analysis of options for operations, maintenance, and rehabilitation (OMR) scope elements considered for incorporation into the DBFM agreement
- **Initial Financial Analysis:** preliminary assessment of DBFM financial structure, including high-level comparison to PDB/CMGC approach
- **Partner Engagement Process:** series of technical review sessions with Caltrain and CHSRA staff underway, focused on implementation requirements and organizational structure; additional engagement with funding partners planned
- **Market Context:** comparison to in-progress and completed projects of relevant type/scale

OMR Scope Considerations

Potential Operations, Maintenance, and Rehabilitation (OMR) scope elements considered in the following categories:

- **Operations:** facility and transit operations (transit operations excluded from DTX analysis)
- **Management:** management and coordination of service delivery; performance management and reporting; health and safety; etc.
- **“Hard” Maintenance:** reactive and planned maintenance of core infrastructure asset components
- **“Soft” Maintenance:** delivery of services such as janitorial and security (typically more challenging to transfer)
- **Rehabilitation/Lifecycle:** replacing and renewing infrastructure to ensure state-of-good-repair and satisfy “hand-back” requirements
- **Energy/Utilities:** responsibility for purchasing and maintaining access to electricity

Key considerations for transfer of OMR responsibility:

- **Interfaces** (e.g., core operations, third parties)
- **Ability to price** scope and risk
- **Flexibility** and likelihood of change
- Ability to define and measure **requirements**
- Opportunity for private sector **innovation** and balancing of investment over lifecycle
- Relationship to scale of availability payment and performance/**payment mechanism**

Scale of OMR Scope

Multiple indicative scenarios for scope allocation developed, reflecting market & project context:

Scenario		#1	#2	#3	#4
		DTX Hard FM and Lifecycle	DTX and Transit Center Hard FM; DTX Lifecycle	DTX Hard FM, Soft FM and Lifecycle	DTX and Transit Center Hard FM and Soft FM; DTX Lifecycle
DTX	Hard FM	\$ 2.7m	\$ 2.7m	\$ 2.7m	\$ 2.7m
	Soft FM			\$ 4.1m	\$ 4.1m
	Lifecycle	\$ 3.8m	\$ 3.8m	\$ 3.8m	\$ 3.8m
Transit Center	Hard FM		\$ 3.4m		\$ 3.4m
	Soft FM				\$ 8.9m
TOTAL		\$ 6.5m	\$ 10m	\$ 11m	\$23m

Source: Mott MacDonald analysis – estimate based on the OMR cost estimate developed in 2016 to develop order of magnitude costs for a series of OMR scenarios. Transbay Transit Center Program, Operations and Maintenance Report, January 2016, Prepared by ISES Corporation. Costs are 2015\$ escalated to 2022\$ based on assumed 3% escalation.

OMR Scope – Summary of Analysis to Date

- There is a range of potential scope allocations possible for DTX, with differing implications for value, risk, and interfaces
- OMR scope transfer provides for “hand-back” of asset at end of operating term, subject to hand-back requirements for asset condition/SOGR
- Activities that directly interface with transit operations (retained by operators) are anticipated to be more challenging to transfer to DBFM
- An OMR scope allocation consistent with typical industry practice for a transit P3 would be relatively small relative to scale of DTX capital investment

Preliminary Financial Analysis: Approach & Assumptions

Preliminary financial assessment of PDA-DBFM (Option 10), on basis of currently available information, including comparison to PDB/CMGC (Option 6)

High-level comparative assessment of PDB/CMGC (Option 6) versus PDA-DBFM (Option 10)

- Order of magnitude assessment of the incremental costs for PDA-DBFM
- Considered OMR scope for a P3 developer under two scenarios described above (Scenarios 4 & 2)
- Qualitative considerations on the applicability of the PDA-DBFM approach
- Not a value for money analysis

Limitations

- The costs are not risk adjusted for each of the two options
- Construction (2016) and O&M (2015) costs have not been updated, but have been escalated
- Analysis relies on many simplifying assumptions regarding the developer's financing and the structure of the P3 milestone and availability payments
- Other assumptions based on precedent/reference projects

Note: A Risk Adjusted project cost estimate will be completed in 2022, per the adopted project schedule.

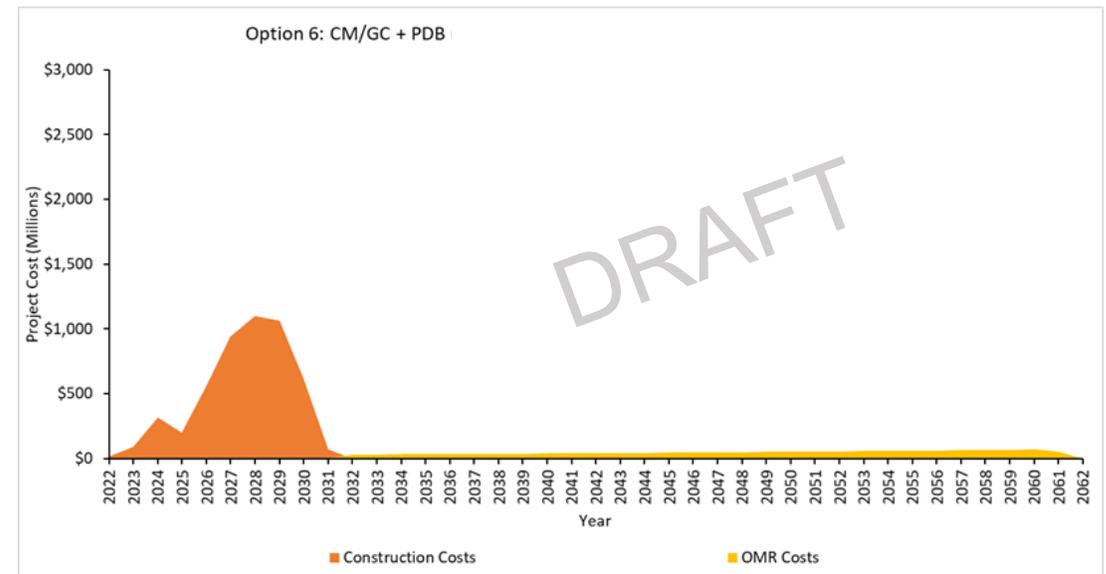
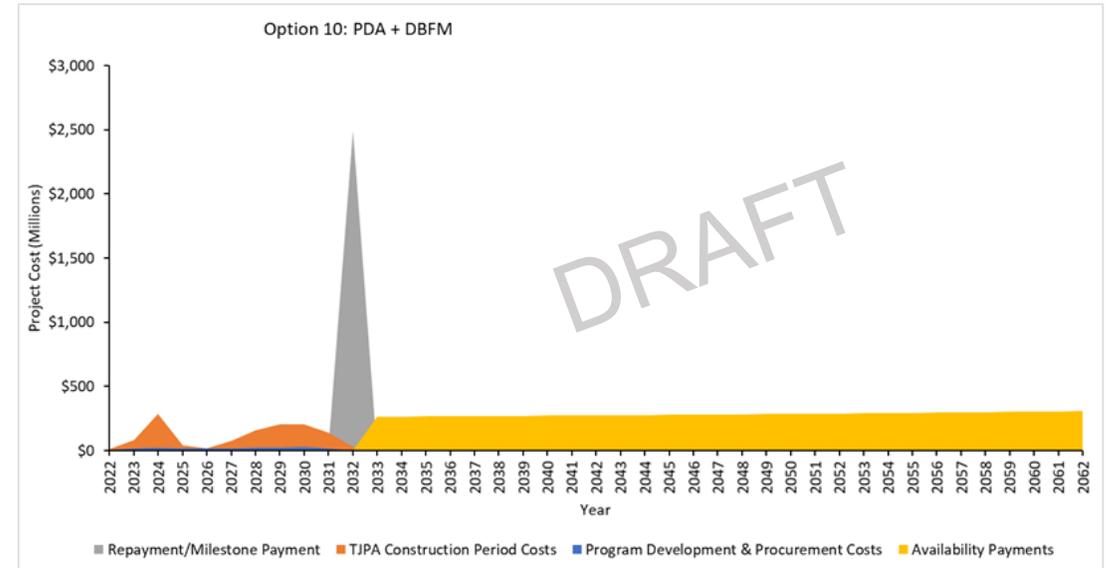
Preliminary Financial Analysis: Comparison of Options

Cost considerations for PDA-DBFM (Option 10)

- Additional delivery agency costs (e.g., legal, financial advisory and technical advisory costs associated with Option 10)
- P3 developer costs (e.g., developer costs, and P3 advisor costs – financial, legal and technical costs)
- Incremental Caltrain and CHSRA resourcing costs for interface during PDA phase
- Additional escalation due to longer development period
- Milestone/progress payment structure defers some public sector funding requirements

Discounted cashflow difference of ~\$0.3 billion to ~\$2.3 billion in favor of PDB/CMGC (Option 6)

- Considered a spectrum of potential discount rates from 3% to 7%, assuming cost of capital of ~4.5%
- Costs for both options are not risk adjusted.



Source: Sperry Capital, Project Delivery Alternatives Study Financial Analysis Memorandum – DRAFT

Note: financial analysis inputs are approximate and preliminary in nature

Preliminary Financial Analysis: Reference Project Comparison

Comparison to other P3 projects completed or in-progress:

	LAX APM	Maryland Purple Line	Denver Eagle Project	DTX Scenario 4*	DTX Scenario 2*
Total P3 Project Costs (\$)	\$2.7B	\$2.4B	\$1.6B	\$4.5B	\$4.5B
Construction Period Payments as a % of Total P3 Project Costs	38%	41%	70%	55%	55%
Average Annual Revenue as a % of Total P3 Project Costs	5%	6%	9%	6%	6%
Average Annual OMR Costs as a % of Average Annual Revenue	27%	52%	63%	18%	9%
<ul style="list-style-type: none"> Information utilized in the table is from the official statements for associated private activity bond transactions, prior to construction/construction completion for precedent projects. Scenario 4 assumes \$22.9 million (2022\$) in annual OMR costs as the maximum scope transfer. Scenario 2 assumes a lower scope transfer of \$9.9 million (2022\$) in annual OMR costs. Note: In both DTX scenarios, average annual revenue in the table above represents the average annual availability payment, numbers are preliminary. The table presents a rough generalized comparison. Categories may not be precisely consistent across projects. All values in the table above are approximations. 					

Preliminary Financial Analysis: Summary of Analysis to Date

- Preliminary financial analysis does not yet reflect quantitative risk analysis and delivery option-specific risk allocation
- Preliminary analysis indicates OMR scope could account for ~10-20% of annual Availability Payment amount
 - Scale of likely OMR scope would not generally be consistent with P3 risk transfer objects
- DBFM structure would require relatively large annual Availability Payment, with a committed funding source over 30-year operational term

Operator Technical Engagement and Input

Series of technical workshops convened with Caltrain & CHSRA, with key input regarding requirements and risks of the DBFM approach:

Ability to accommodate future changes

- Future growth in service levels will reduce available maintenance windows
- Future infrastructure projects – e.g., Railyards, PAX, Link21
- Future corridor-level systems changes (e.g. train control)

Integration with existing operations

- Interface with operations contractor, including flagger availability / prioritization
- Ability to define and manage maintenance responsibilities

Inter-operability and control over design & systems procurement

- System-wide approach to obsolescence / rehabilitation lifecycles
- Lifecycle configuration management challenges (e.g. heavily-integrated fire/life safety systems)

Implications of service disruptions

- System-wide impacts due to DTX service disruption
- Approach to recourse in the event of disruptions

Performance and reliability of vertical transportation

- Coordination with existing infrastructure and contracts
- Challenges with misalignment between supplier and maintainer

Operator Engagement – Summary of Discussions to Date

- DBFM would transfer certain systems design and management responsibilities to private sector, which are otherwise preferred to be retained by the owner/operators
- Organizational structure for DBFM would require highly-structured delineation of responsibilities and relationships between delivery agency, operators, and P3 entities for each project phase (design/development, construction, operations)
- P3 agreements are relatively inflexible and changes are typically costly, creating challenge in the context of future related projects and future Caltrain/HSR system infrastructure changes
- Key challenges and risks identified for the DBFM option are also present in some fashion for the PDB-CMGC option

Market/Peer Context

North American transit P3 track record is mixed; delivery agencies have struggled with on-time/on-budget completion of both P3 and non-P3 delivery methods.

<p>Emergence of collaborative contracting models</p> <ul style="list-style-type: none">• Northgate Link Extension, Sound Transit (DBB, CMGC)• Lynwood Link, Sound Transit (CMGC x3)• BART Silicon Valley Phase II Extension – BSVII (DB, PDB)• Sepulveda Transit Corridor, LA Metro (PDA-DBFOM)• Scarborough Subway Extension, Toronto (DBF, PDB)• East San Fernando Valley LRT, LA Metro (PDB)	<p>Relatively limited number of completed or underway P3 transit projects in the U.S.</p> <ul style="list-style-type: none">• Eagle P3, Denver• Automated People Mover (APM), LAX• Purple Line, Maryland• Sepulveda Transit Corridor, LA	<p>Project delays on some recent/current transit P3s in North America</p> <ul style="list-style-type: none">• Confederation Line, Ottawa• Eglinton Cross Town LRT, Toronto• Valley Line Southeast LRT, Edmonton• Purple Line, Maryland
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Next Steps

- Further development and analysis of the short-listed options
- Develop Project Delivery recommendation, including procurement method and contract packaging
 - Prepare Strategic Implementation Roadmap to provide blueprint for project procurement

Thank you

