

**STAFF REPORT FOR CALENDAR ITEM NO.: 14  
FOR THE MEETING OF: July 14, 2022**

**TRANSBAY JOINT POWERS AUTHORITY**

**BRIEF DESCRIPTION:**

Approve the Downtown Rail Extension (DTX) Project Delivery approach to include a Progressive Design-Build (PDB) for a single civil and tunnel contract and Construction Manager/General Contractor (CMGC) for the systems, trackwork, and station fit-out scope, with conditions for implementation, as recommended by the Executive Steering Committee (ESC) under the terms of the San Francisco Peninsula Rail Program Memorandum of Understanding with the Metropolitan Transportation Commission (MTC), the San Francisco County Transportation Authority (SFCTA), the Peninsula Corridor Joint Powers Board (Caltrain), the California High-Speed Rail Authority (CHSRA), and the City and County of San Francisco (Mayor's Office).

**EXPLANATION:**

Background

The TJPA, with the support and active engagement of its partners is actively developing Phase 2 of the Transbay Program, which includes design and construction of DTX. The San Francisco Peninsula Rail Program Memorandum of Understanding (MOU), effective June 5, 2020, described, in part, an organizational structure to support the efforts of the TJPA to develop the DTX project to ready for procurement status.

Among the elements of the MOU was the requirement to develop a project delivery and contracting strategy, including the analysis of project delivery alternatives. The MOU specified that this work was to be co-led by SFCTA and TJPA.

Project Delivery Alternative Study

The TJPA and SFCTA prepared a Project Delivery Alternatives Study (PDAS). Delivery options were refined through workshops with agencies party to the MOU. In particular, the Integrated Project Management Team (IPMT) was consulted and provided guidance at multiple interim points as the PDAS progressed. The Executive Steering Committee (ESC) was provided progress briefings and provided guidance at five of its meetings. The ESC Chair provided a presentation on the status of the PDAS at the TJPA Board's January 13, 2022, meeting.

The purpose of the PDAS is to recommend contract packaging and associated procurement and delivery models for the DTX, with these recommendations underpinned by a structured analysis process. Procurement and delivery alternatives considered through PDAS address the required management, design, construction, operations, and maintenance functions to successfully deliver the project. Analysis and evaluation priorities were informed by the DTX procurement objectives, project delivery risks, industry sounding feedback, and ESC and TJPA Board input.

Procurement Objectives

The procurement objectives formed the foundation of the screening and analysis throughout the Study. The procurement objectives for the DTX are:

- ◆ Market interest and competition: Attract sufficient market interest to promote competition amongst well-qualified contractors.
- ◆ Delivery Agency: Identify clear and achievable responsibilities for the delivery agency.
- ◆ Risk: Effectively manage, allocate, and minimize risk.
- ◆ Value: Deliver the project within the identified budget and support realization of value.
- ◆ Flexibility and adaptability: Manage and accommodate change during project development, construction, and operation.
- ◆ Schedule: Develop and deliver the project on the planned timeline.
- ◆ Procurement process: Implement a fair and deliberate procurement process while creating opportunity for small and disadvantaged businesses, and other TJPA inclusiveness-priority communities.

The TJPA Board was briefed and provided guidance regarding the study approach and procurement objectives at its January 2022 meeting.

Procurement Approaches

The PDAS considered several potential procurement approaches, with these approaches describing differing methods for structuring the contractual and working relationship between the public sector and the contractor(s). The procurement approaches can be broadly described as “Conventional”, “Integrated”, or “Collaborative”. Each approach has different characteristics of Risk Allocation, Delivery Agency and Operator control, cost and schedule certainty, and flexibility to accommodate change. The approaches and their characteristics are shown in Table 1.

Table 1: Description of the procurement approaches

Category	Procurement Approach	Category description	Applicability to DTX
<b>Conventional</b>	◆ Design-bid-build (DBB)	<ul style="list-style-type: none"> <li>◆ Delivery Agency control of design, construction, and interfaces.</li> <li>◆ Minimal contractor collaboration.</li> <li>◆ Disaggregated contracts / multiple interfaces.</li> <li>◆ Competitively tendered contract based on detailed design</li> </ul>	Applicable to Enabling Works; also evaluated for rail/systems and station fit-out
<b>Integrated</b>	◆ Design-build (DB)	<ul style="list-style-type: none"> <li>◆ Transfer of the design with the private finance during the construction period (DBF) or</li> </ul>	Anticipated limited applicability; evaluated for civil packages

Category	Procurement Approach	Category description	Applicability to DTX
	◆ Design-build-finance (DBF)	over operating period (DBFM).	Anticipated limited applicability; evaluated for civil packages
	◆ design-build finance-maintain (DBFM)	<ul style="list-style-type: none"> <li>◆ Appropriate and fair transfer of risk (including design risk).</li> <li>◆ Contractor input through procurement process.</li> <li>◆ Competitively tendered contract based on concept design and specifications.</li> <li>◆ Aggregated contracts / limited interfaces.</li> </ul>	DBFM potentially applicable when developed via a pre-development agreement (PDA) to attract market interest and develop a bankable project
<b>Collaborative</b>	◆ Progressive design-build (PDB)	◆ Variants of conventional and integrated options allowing for early collaboration with a construction contractor.	Under consideration for packages where design is closely tied to construction means and methods
	◆ Construction Manager / General Contractor (CMGC)	<ul style="list-style-type: none"> <li>◆ Early contractor involvement to mitigate risk.</li> <li>◆ Flexible contract packaging approach.</li> </ul>	Under consideration for packages where there is preference for the Owner to retain design
	◆ Pre-development agreement (PDA)	<ul style="list-style-type: none"> <li>◆ Options to retain or transfer design risk.</li> <li>◆ Negotiated contract based on risk transparency.</li> </ul>	Potential method for developing a DBFM, structured with off-ramp for non-financed option

### Contract Packaging

Contract packaging refers to the aggregation or disaggregation of construction activities into a discrete number of contracts to be procured and delivered. A contract packaging assessment was completed to define the bounds of possible solutions, prior to combining with the procurement approaches to develop delivery options for analysis. The contract packaging assessment considered contractors' capabilities with specialty scope (i.e., civil vs. systems, core systems vs. supporting systems, and general civil vs. tunnel). The key tradeoff with contract packaging is a balance between the scale of contract and the number of contract interfaces. The contract packaging assessment concluded:

- ◆ An early/enabling works package is required to effectively manage risk.
- ◆ The separation of tunnel/civil works from track/systems activities (including station fit-out) mitigates system integration and interoperability risks.
- ◆ A fully aggregated option has limitations but should be included in the delivery options assessment to consider long-term alternatively financed options such as DBFM.
- ◆ A highly disaggregated approach increases the Delivery Agency's interface management responsibilities.

- ◆ The level of disaggregation associated with design-bid-build would not meet the ‘Delivery Agency’ procurement objective.

### Long List of Delivery Options

The PDAS developed a long list of delivery options, shown in Table 1, to combine the procurement approaches with contract packaging approaches. The development of the long list of delivery options allowed strengths and limitations to be considered in the context of the project scope.

Table 1: Long list of delivery options

Scope	Delivery Option									
	1	2	3	4	5	6	7	8	9	10
Enabling	DBB	DBB	DBB	DBB	DBB	DBB	DBB	DBB	DBB	DBB
General Civil	DB	PDB	PDB	PDB	PDB	PDB	PDBF	PDB	PDBF	PDA-DBFM
Tunnel	PDB	CMGC	PDB	PDB						
Station Fit-out & Supporting Systems	CMGC	CMGC	CMGC	CMGC	CMGC	CMGC	CMGC			
Core Systems & Trackwork	DBB	CMGC	CMGC		CMGC					
	Design transferred			Design retained		Includes finance				

Options 1 through 4 were screened from further consideration due to the complex construction interfaces associated with two separate civil contracts. Option 1 was also removed from further consideration due to the low market interest in competitively priced lump sum DB contracts for complex, urban infrastructure projects. In addition to the two civil contracts, Option 2 was removed from further consideration as this option would not assign responsibility for tunnel/civil design to the contractor, which would be best placed to develop this design as it is linked to means and methods of construction. Options 8 and 9 were removed from further consideration due to the scale of the contracts (without long-term alternative finance) and the transfer of the system design to the contractor.

### Short list of Delivery Options

In December 2021, after presentation and discussion, the ESC recommended narrowing the study to focus on Options 5-7, and 10, summarized in Table 3 below. All options include forms of early contractor involvement for all packages except the enabling program. All options have an initial enabling/advance works program informed by project risks and market engagement.

Table 3: Short list of delivery options

Scope	Option				
	5	6	7	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				
Conventionally Financed			Alternatively Financed		

**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** pre-development agreement

Descriptions of the short-listed options are as follows:

Option 6: A conventionally financed option, with a Progressive Design Build (PDB) contract for the tunnel and other heavy civil components, and a CMGC contract for the systems, track, and station fit-out components. By aligning the contract packages to the specialty nature of the scope (i.e., tunnel/civil versus systems, track, and station fit out), the contract packaging responds to market feedback, with the intent to promote market interest. A separate systems, track, and station fit-out package supports a focus on the integration work that is critical to achieving the revenue service date and can otherwise lose focus if consolidated with a large civil package. The contract packaging accommodates different approaches to design for each package (i.e., the Delivery Agency retains the design for the enabling works and the systems, track, and station fit out, but transfers it for the civil and tunnel scope). A single civil package, combining the general civil and tunnel scope, responds to construction access limitations. Option 5 is a variation of Option 6, with the CMGC contract for systems, trackwork, and station fit out divided into two distinct CMGC contracts, to reflect greater alignment of contract packaging and specialty scope.

Option 7: An alternatively financed option and a variation of Option 6. Option 7 consists of a progressive-design-build-finance (PDBF) contract for the tunnel and other heavy civil components and a CMGC contract for the systems, track, and station fit-out components. The structure of the PDBF is such that the private sector consortium secures short-term construction financing from third-party lenders and/or using its own equity; a lump sum payment (either all or part of the contract value) is made at substantial completion (or after a limited-term post-construction warranty period) to cover design, construction, and construction financing costs. Withholding payment until later in construction (i.e., at substantial completion) incentivizes on-time performance. Additional financing costs due to construction delay are borne by the private sector. This Option could help to address a short-term cash flow challenge experienced by the Delivery Agency during the construction period.

Option 10: An alternatively financed option with a long-term design-build-finance-maintain (DBFM) contract. The project would be developed via an initial pre-development agreement (PDA) phase, with the ability to “off-ramp” to a non-alternatively financed approach delivery during the PDA phase. A DBFM arrangement involves a private sector consortium taking responsibility for design, construction, financing, maintenance, and rehabilitation; requirements and scope are driven by pre-defined performance requirements over the length of the contract term, including an approximately 30-year operating term. The Delivery Agency retains ownership of the asset, and payment for design, construction, and financing is made through a combination of progress payments, a substantial completion payment, and availability payments through the operating term. Repayment over the operating term, tied to performance, is intended to promote construction quality and whole-life decision making. The DBFM for DTX scope does not include transit operations, which will be retained by the Operators.

After further evaluation of the flexibility, scale, cost, and schedule characteristics of Option 10, it was removed from further consideration. Because DTX is an extension of an existing system, and due to the Operators’ desire to retain transit operations and maintenance responsibilities, an Operations and Maintenance contract of sufficient size and scope could not be developed to provide value to offset the additional financing and schedule costs of a DBFM contract.

#### **FINDINGS:**

After review and consideration of the PDAS, the IPMT recommended to the ESC a delivery approach to include a Progressive Design-Build (PDB) for a single civil and tunnel contract and Construction Manager/General Contractor (CMGC) for the systems, trackwork, and station fit-out scope, with the conditions listed below for implementation. At its June meeting, the ESC discussed these findings and approved forwarding IPMT’s recommendations to the TJPA Board for consideration and approval:

1. Undertake a program of “enabling works” (Enabling Program), including but not limited to utility relocations, demolition, and site preparation, with the Enabling Program delivered through a design-bid-build (DBB) approach.
2. Utilize a collaborative procurement approach with early contractor involvement (PDB/CMGC) for the primary DTX contracts to attract market interest and flexibility in defining requirements and integrating/coordinating contract packages. Under both PDB and CMGC, selection of contractors reflects a competitive selection, weighted toward qualifications and experience, with commercial elements, and with pre-construction periods leading to negotiated prices, allocation of risk, and final contract terms.
3. Deliver the tunnel and civil scope through a single contract, due to construction and access interfaces between the tunnel and other civil components of the Project, using the PDB model, such that responsibility for the tunnel and civil design is transferred to the PDB contractor, as the design is closely linked to means and methods of construction and is a mitigation of construction risk.
4. Deliver the core systems, supporting systems, trackwork, and station fit-out scope through one or two contracts using the CMGC model, such that the Delivery Agency retains the responsibility for the design of rail and other systems, track, and station fit-out, in order to accommodate and integrate the requirements of the two Operators.

5. Deliver the operations, maintenance, and rehabilitation scope separate from (but coordinated with) infrastructure design and construction, in order to allow for flexibility to respond to changes during the operating period.
6. Prepare the preliminary design and capital cost estimate under the assumptions of two separate CMGC contracts, in order to maintain flexibility to either one or two such contracts.
7. Determine the number of CMGC contracts (Option 5 or 6) based on the preliminary design, market engagement and market capacity, quantitative risk assessment, and consideration of the Operator's role during design and construction.
8. Determine the applicability of construction period alternative financing (Option 7) based on the funding plan and financial plan, quantitative risk assessment, and market engagement.
9. Prepare a Strategic Implementation Roadmap for project delivery, to describe the approach and requirements for successfully implementing the recommended delivery method.
10. Coordinate the development of the quantitative risk assessment, preliminary design, capital cost estimate, funding and financial plans, and governance study to support preparation of the Implementation Roadmap and decision-making among Options 5, 6, and 7.

The final PDAS will include an implementation roadmap to be developed in coordination with the activities described above.

**RECOMMENDATION:**

Approve the DTX Project Delivery approach to include a Progressive Design-Build (PDB) for a single civil and tunnel contract and Construction Manager/General Contractor (CMGC) for the systems, trackwork, and station fit-out scope, with conditions for implementation as described herein, as recommended by the ESC under the terms of the MOU.

**ATTACHMENTS:**

1. Resolution

**TRANSBAY JOINT POWERS AUTHORITY  
BOARD OF DIRECTORS**

**Resolution No. \_\_\_\_\_**

WHEREAS, The Transbay Joint Powers Authority (TJPA) is a joint powers agency organized and existing under the laws of the State of California; and

WHEREAS, Pursuant to state law and the Joint Powers Agreement creating the TJPA, dated April 4, 2001, the TJPA has primary jurisdiction over and will implement all aspects of the Transbay Program, including the portion of the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project commonly referred to as Phase 2/Downtown Rail Extension (DTX); and

WHEREAS, The TJPA is actively engaged in developing the DTX; and

WHEREAS, On April 9, 2020, the TJPA Board of Directors authorized the TJPA Board Chair to execute the San Francisco Peninsula Rail Program Memorandum of Understanding (MOU) with the Metropolitan Transportation Commission, the San Francisco County Transportation Authority, the Peninsula Corridor Joint Powers Board (Caltrain), the California High-Speed Rail Authority, and the City and County of San Francisco (Mayor's Office); and

WHEREAS, The MOU described, in part, an organizational structure to support the efforts of the TJPA to develop the DTX project to ready for procurement status, including the formation of an Executive Steering Committee (ESC) to make recommendations to the TJPA Board; and

WHEREAS, The MOU contemplates that the ESC would, among other things, recommend to the TJPA Board for approval a project delivery and contracting strategy, including the analysis of project deliver options; and

WHEREAS, On June 17, 2022, the ESC recommended for TJPA Board approval the DTX Project Delivery approach to include a Progress Design-Build (PDB) for a single civil and tunnel contract and Construction Manager/General Contractor (CMGC) for the systems, trackwork, and station fit-out scope, with conditions for implementation, as recommended by the Integrated Program Management Team; now, therefore, be it

RESOLVED, That the TJPA Board of Directors approves the DTX Project Delivery approach to include a PDB for a single civil and tunnel contract and CMGC for the systems, trackwork, and station fit-out scope, with conditions for implementation, as recommended by the ESC and as described in the accompanying Board Report presented herewith.

I hereby certify that the foregoing resolution was adopted by the Transbay Joint Powers Authority Board of Directors at its meeting of July 14, 2022.

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Secretary, Transbay Joint Powers Authority



# Downtown Rail Extension Project Delivery Approach

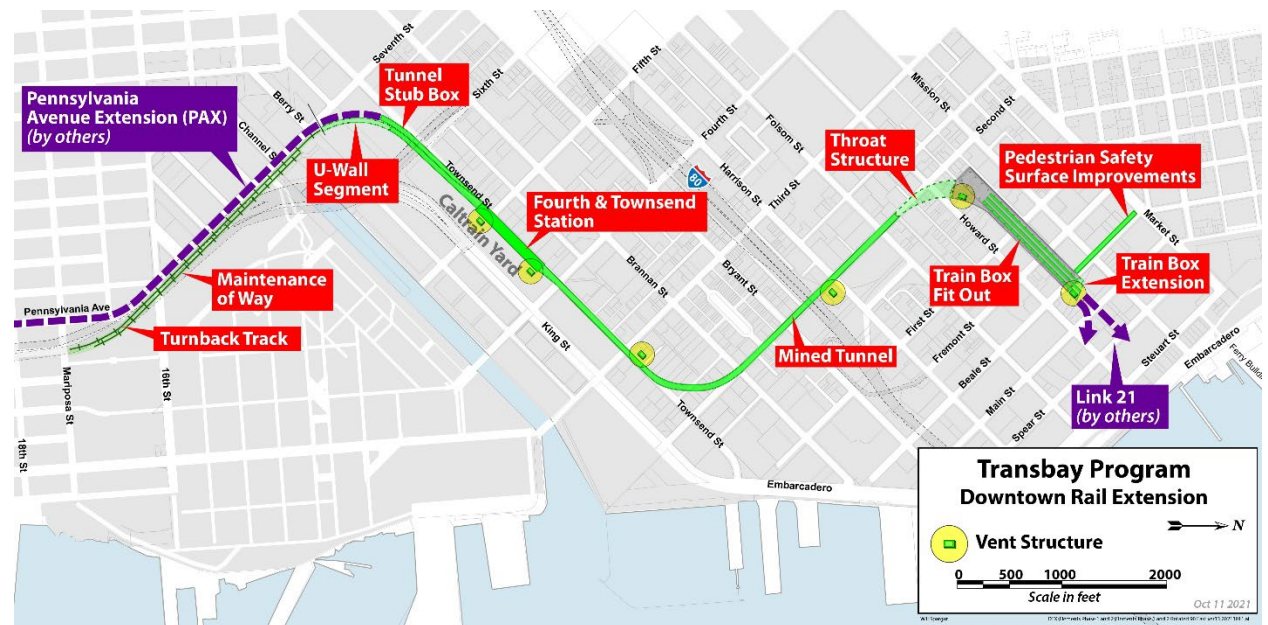
TJPA Board  
July 14, 2022



# DTX Project Elements

2.4 miles of total construction principally within Townsend and Second Streets

- 1.5 miles of tunnel
- New underground station at Fourth and Townsend Streets and trainbox extension at Salesforce Transit Center
- Ventilation and emergency egress structures
- Fit out of Salesforce Transit Center trainbox and Fourth and Townsend station
- Trackwork (surface and tunnel)
- Systems



# ESC Recommendation (December 2021)

In December 2021 ESC recommended to narrow the potential delivery approaches to a short list of four options:

- Options 5 & 6: PDB/CMGC** – Progressive Design-Build for tunnel & civil works; Construction Manager/General Contractor for systems, trackwork, and station fit-out
- Option 7: PDBF/CMGC** – Inclusion of short-term construction period finance within the civil/tunnel contract
- Option 10: PDA-DBFM** – Integrated Design-Build-Finance-Maintain contract developed through an initial Project Development Agreement phase

Scope	Option			
	5	6	7	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			

**DBB** design-bid-build  
**PDB** progressive-design-build  
**CMGC** construction manager / general contractor  
**PDBF** progressive-design-build-finance  
**DBFM** design-build-finance-maintain  
**PDA** project development agreement

■ Detailed design by the private sector  
■ Owner controlled detailed design  
■ Alternatively financed

# Recommended Option

**Progressive Design-Build (PDB) for a single civil and tunnel contract.**



**Construction Manager / General Contractor (CMGC) for the systems, trackwork, and station fit-out scope.**

The Delivery Agency retains:

- responsibility for contract interface management between the PDB and CMGC contracts
- control of the detailed design for the systems, trackwork, and station fit-out contract
- flexibility to deliver the systems, track and station fit-out scope as one or two contract packages

Decision on systems, trackwork, and station fit-out contract packaging will be informed by the quantitative risk assessment, updated construction schedule, and upcoming market engagement.

Scope	5	6
Enabling	DBB	DBB
General Civil	PDB	PDB
Tunnel	PDB	PDB
Station Fit-out & Supporting Systems	CMGC	CMGC
Core Systems & Trackwork	CMGC	CMGC

 Detailed design by the private sector  
 Owner controlled detailed design

**DBB** design-bid-build  
**PDB** progressive-design-build  
**CMGC** construction manager/general contractor

# Recommended Option: Rationale

- Single PDB civil contract, due to construction and access interfaces between the tunnel and other civil works
- CMGC approach for systems, trackwork, and station fit-out to retain public sector responsibility for design of these packages
- DTX is an extension of an existing system, with integration and interoperability risks best managed by the public sector
- Inclusion of pre-construction services phases for the primary PDB/CMGC contracts, to progressively develop cost, scope, and schedule, and mitigate risks
- Flexibility to determine CMGC contract packaging, based on design, risk, and market engagement
- Flexibility to accommodate changes during the operating period
- Option to incorporate short-term, construction period alternative finance (Option 7)

Scope	5	6
Enabling	DBB	DBB
General Civil	PDB	PDB
Tunnel	PDB	PDB
Station Fit-out & Supporting Systems	CMGC	CMGC
Core Systems & Trackwork	CMGC	CMGC

■ Detailed design by the private sector  
■ Owner controlled detailed design  
**DBB** design-bid-build  
**PDB** progressive-design-build  
**CMGC** construction manager/general contractor

# Consideration of Construction-Period Alternative Finance (Option 7)

- Alternatively-financed variation of the PDB/CMGC option
- Progressive-Design-Build-Finance (PDBF) contract for the tunnel and other heavy civil components; CMGC for the systems, trackwork, and station fit-out scope
- PDBF based on the Canadian Design-Build-Finance (DBF) model:
  - Design and construction awarded under a single contract
  - Private sector consortium secures short-term construction period financing
  - Lump sum payment (either all or part of the contract value) is made at substantial completion (or after a warranty period), to cover design, construction, and financing costs

## Rationale

- Use of substantial completion payment incentivizes on-time performance by contractor
- Opportunity to bridge a gap in capital funding availability (may not be most cost-effective form of finance)

Decision on Option 7 will be guided by the Funding Plan and Financial Plan, with consideration of the quantitative risk assessment, design, and market engagement.

Scope	7
Enabling	DBB
General Civil	PDBF
Tunnel	
Station Fit-out & Supporting Systems	CMGC
Core Systems & Trackwork	

DBB design-bid-build  
 PDBF progressive-design-build-finance  
 CMGC construction manager/general contractor

■ Owner controlled detailed design  
 ■ Alternatively financed. Detailed design by the private sector

# Evaluation of the PDA-DBFM Option (Option 10)


- Alternatively-financed, long term (~30 year) Design-Build-Finance-Maintain (DBFM) contract, preceded by an initial Project Development Agreement (PDA) phase
- DBFM contract scope includes design, construction, financing, and certain operations, maintenance, rehabilitation (OMR) scope elements
- DBFM arrangement defers some construction-period costs, stipulates asset “hand-back” condition, provides for integration of operating period scope with design/construction approach, and brings additional oversight/diligence

## Rationale for Study’s Evaluation of Option 10

- DTX is an extension of an existing system, making long-term operating period requirements more challenging to plan for and manage
- Extent of DBFM OMR would be modest relative to capital cost
- DBFM benefits of maintaining an asset in a state-of-good-repair would be limited to the scope transferred to the private sector
- Complexity of PDA-DBFM requires a longer pre-construction services phase to develop and negotiate the DBFM Project Agreement

<b>Scope</b>	<b>10</b>
<b>Enabling</b>	DBB
<b>General Civil</b>	PDA-DBFM
<b>Tunnel</b>	
<b>Station Fit-out &amp; Supporting Systems</b>	
<b>Core Systems &amp; Trackwork</b>	

DBFM design-build-finance-maintain  
PDA project development agreement

 Alternatively financed. Detailed design by the private sector

# Recommendation (1 of 2)

Advance the findings and recommendations of the Downtown Rail Extension Project Delivery Alternatives Study to the TJPA Board of Directors for approval, including the recommendations that the DTX project team:

1. Implement an Enabling Program, in order to de-risk the delivery of the primary contracts to follow;
2. Utilize a progressive form of project procurement for the primary contracts, to provide for the early and collaborative involvement of the project contractors in project final design;
3. Deliver the tunnel and civil scope through a single Progressive-Design-Build (PDB) contract;
4. Deliver the core systems, supporting systems, trackwork, and station fit-out scope through one or two contracts using the Construction Manager / General Contractor (CMGC) model;
5. Deliver the operations, maintenance, and rehabilitation scope through arrangements separate from (but coordinated with) infrastructure design and construction;



# Recommendation (2 of 2)

6. Prepare the preliminary design and capital cost estimate under the assumption of two separate CMGC contracts, in order to maintain flexibility to either one or two such contracts;
7. Determine the number of CMGC contracts by October 2022, with such decision informed by the preliminary design, quantitative risk assessment, and market engagement;
8. Further consider the potential incorporation of private finance into the tunnel/civil contract during the construction period, with consideration of this Progressive-Design-Build-Finance (PDBF) option informed by the preliminary design, funding and financial plans, quantitative risk assessment, and market engagement, with decision-making by February 2023;
9. Prepare a Strategic Implementation Roadmap for Project Delivery, to describe the approach and requirements for successfully implementing the recommended delivery method; and
10. Coordinate the development of the quantitative risk assessment, preliminary design, capital cost estimate, funding and financial plans, and governance study to support preparation of the Implementation Roadmap and decision-making among Options 5, 6, and 7.

Questions?

