

# **Green Line Extension (GLX) Project Recovery**

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*GLX Program Manager  
Boston, Massachusetts*



2018 Rail Conference

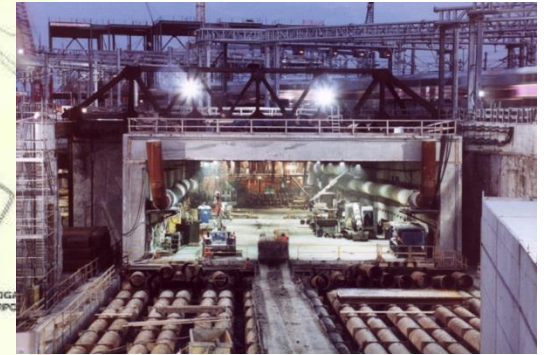
# Agenda

- GLX Project History
- Scope Summary
- Contracting Strategies
- Risk Management Strategies
- Procurement Outcomes
- Construction Update

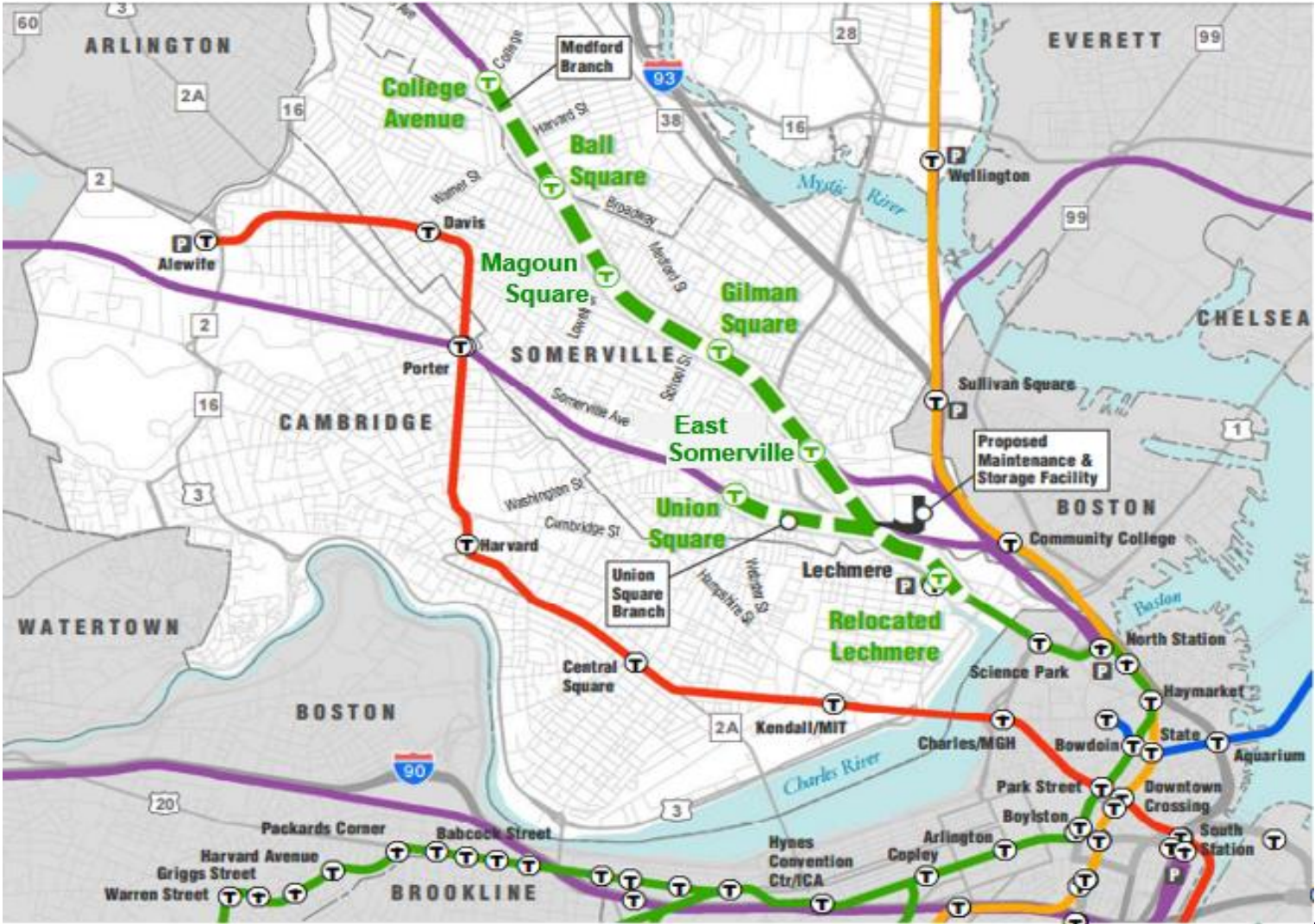
# Genesis of GLX Project

## Boston's "Big Dig"

**GLX**  
Green Line  
Extension



# GLX Project Area



# GLX Summary Fact Sheet

## **Seven light-rail GLX stations**

- Relocated Lechmere Station
- 5 on Medford Branch
- 1 on Union Square Branch

**Conforms with all environmental commitments and committed scope elements as established in the Full Funding Grant Agreement (FFGA)**

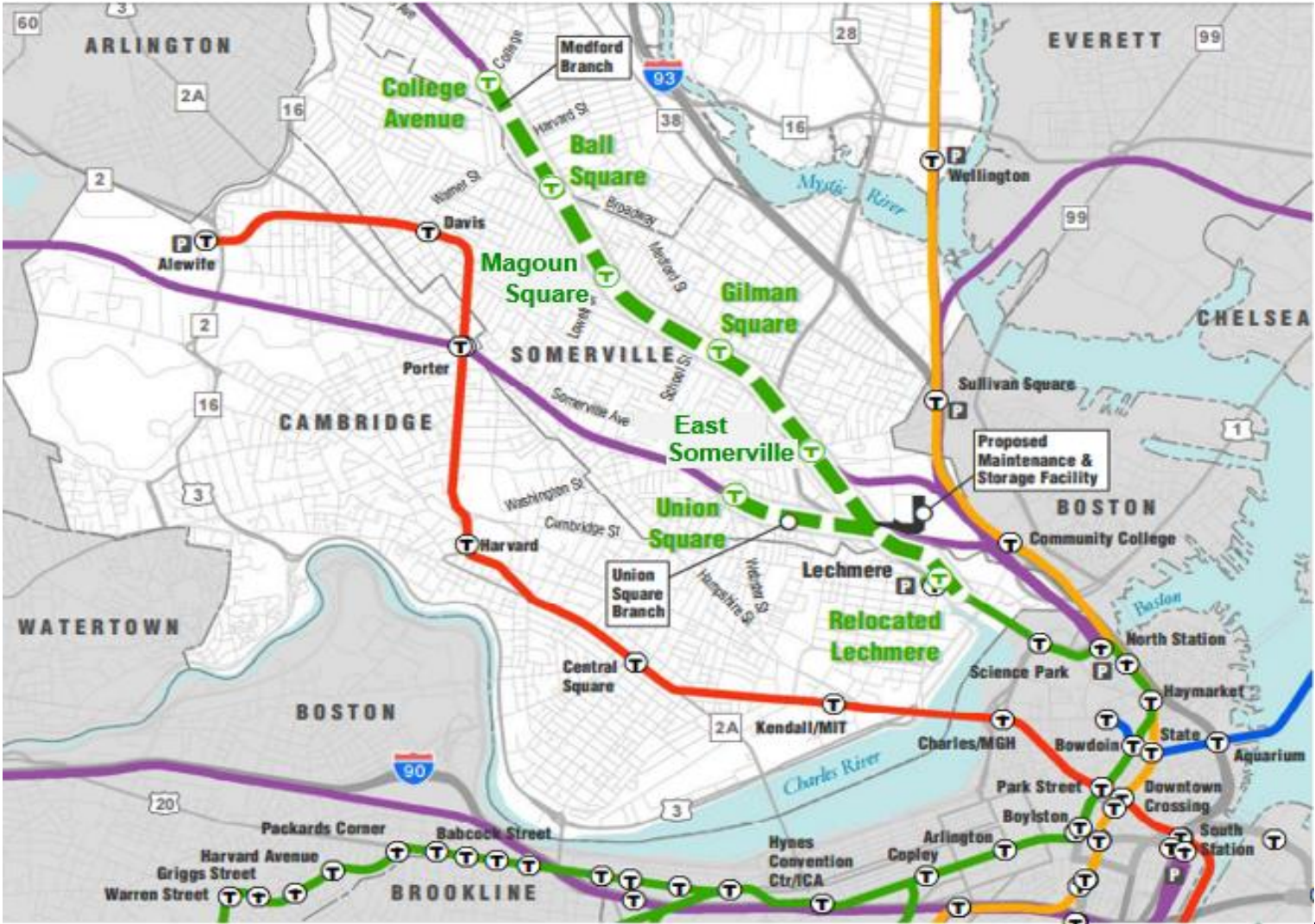
**Includes a multiuse community path**

**Procurement of 24 Green Line light rail vehicles**

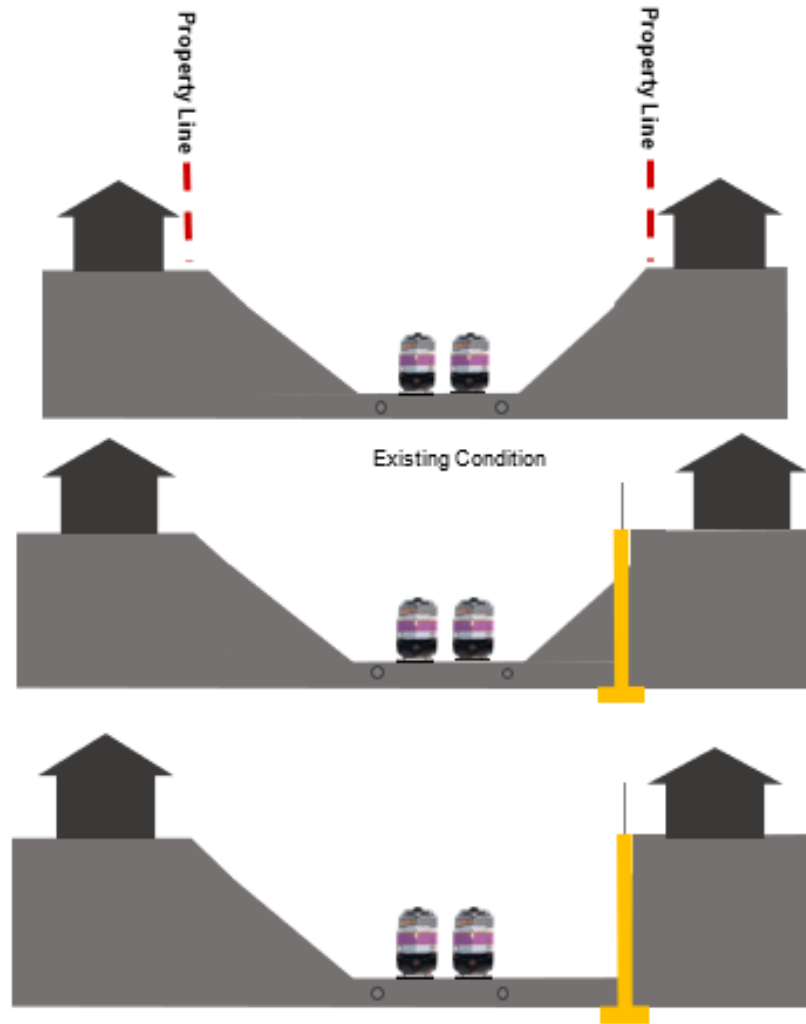
**Vehicle Maintenance Facility (VMF)**

**Program Budget - \$2.3Bn**

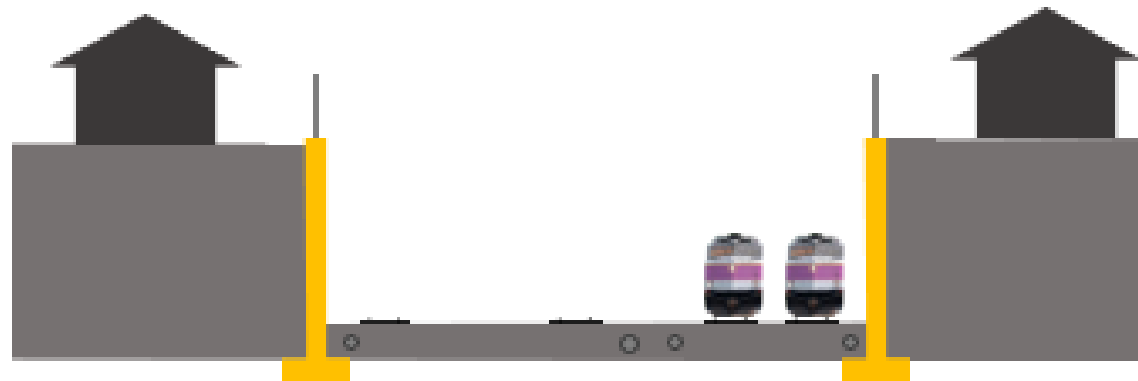
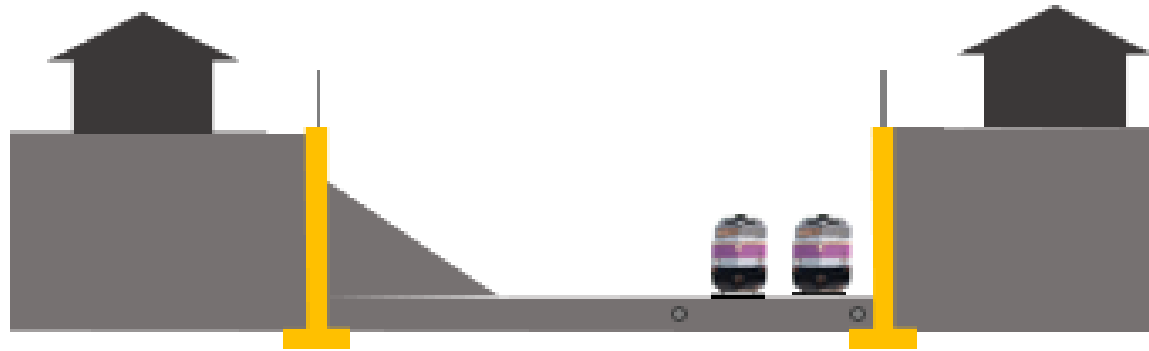
# GLX Project Area



# Conceptual Project Sequencing

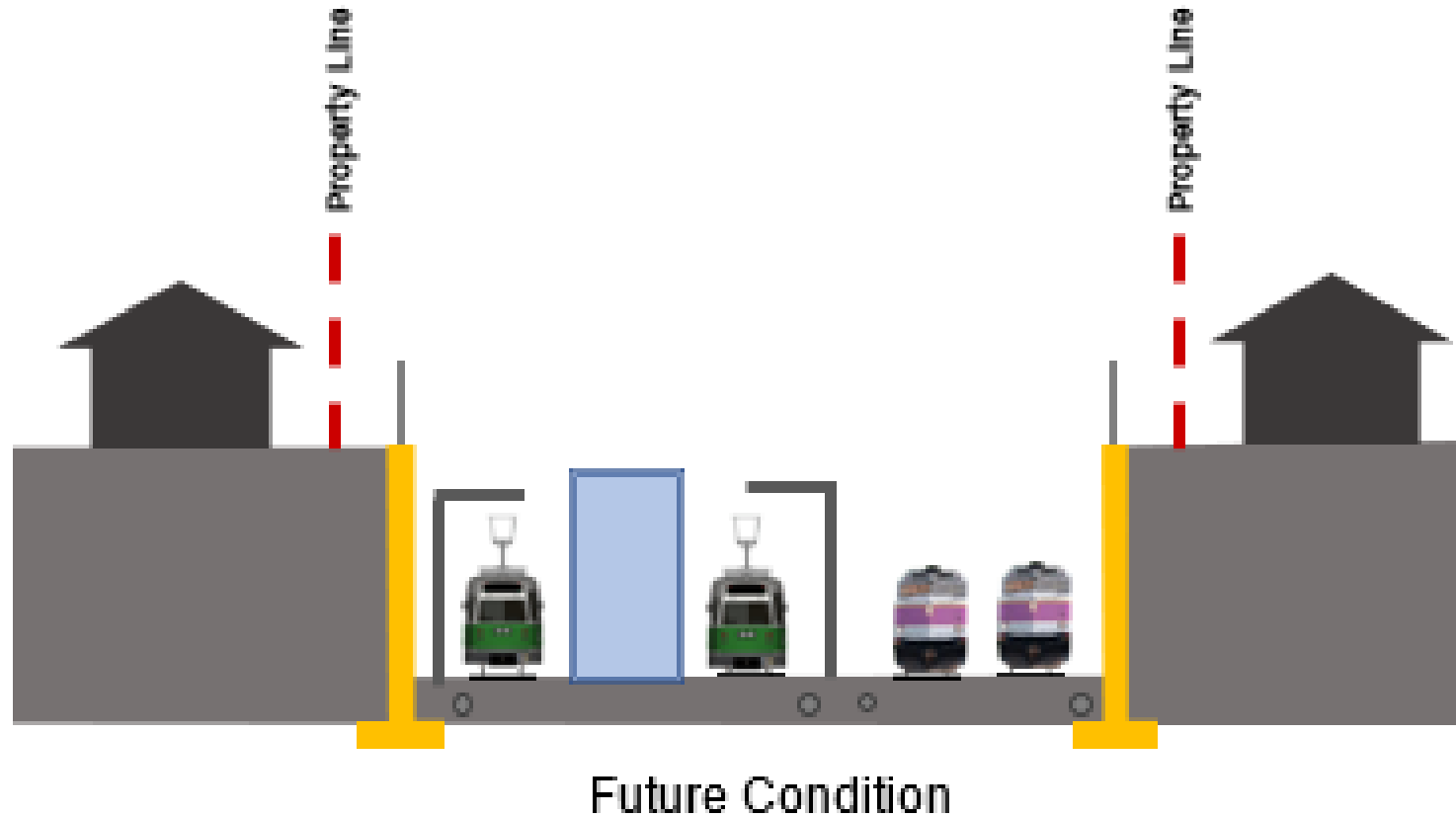


# Conceptual Project Sequencing





# Conceptual Project Sequencing

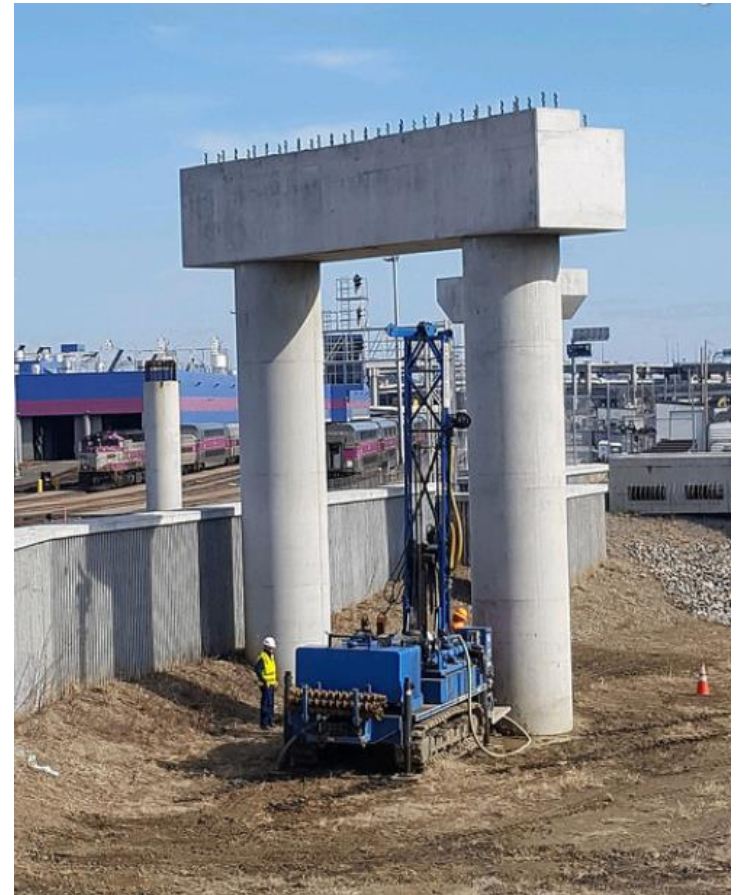


# Project Goals & Benefits

- Improves local and regional air quality
- Commonwealth Commitment to Cambridge, Somerville, and Medford
- 20% of Somerville population is within walking distance of rail transit today, and 80% is anticipated to be so with GLX
- Economic benefits, including the improvement of the commercial tax base

# Project History

- “Episode 1” was CM/GC delivery method; 7 total packages
- 4 packages approved; could not agree on Guaranteed Maximum Price beyond that
- Late 2015 – State of Massachusetts/MBTA halted the project
- May 2016 – MBTA Board approved Redesign & Reprocurement
- November 2016 – Design Build procurement process began
- December 20, 2017 – “GLX Constructors” received Notice to Proceed



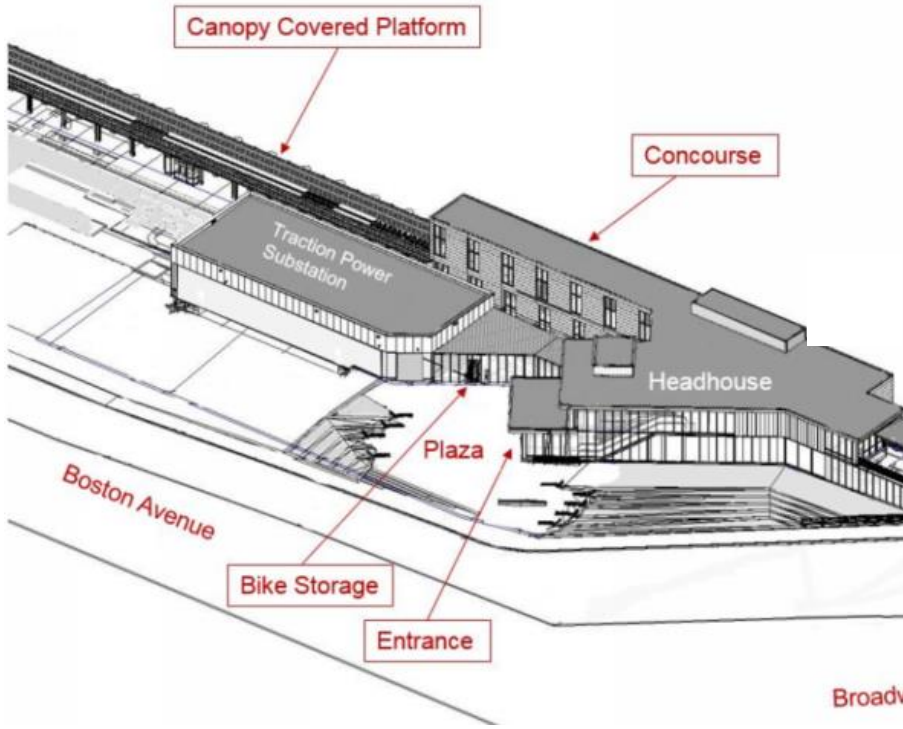
# Redesign / Reprocurment - Key Principles

- 1) Significantly reduce the projected cost
  - Design scope (“brutal cuts”)
  - Procurement model
- 2) Do not violate the requirements of the FFGA
  - Scope, Schedule, Budget
- 3) Reduce and manage construction risks, complexities, and uncertainties
- 4) Responsibly maximize affordable scope

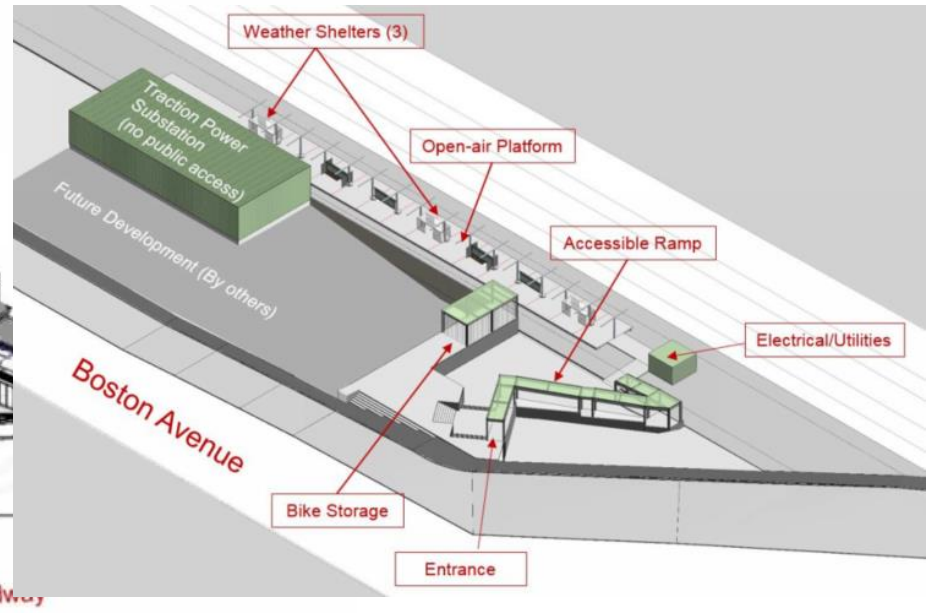
# **Key Cost Drivers**

## **Design**

# Redesign Concepts – Stations

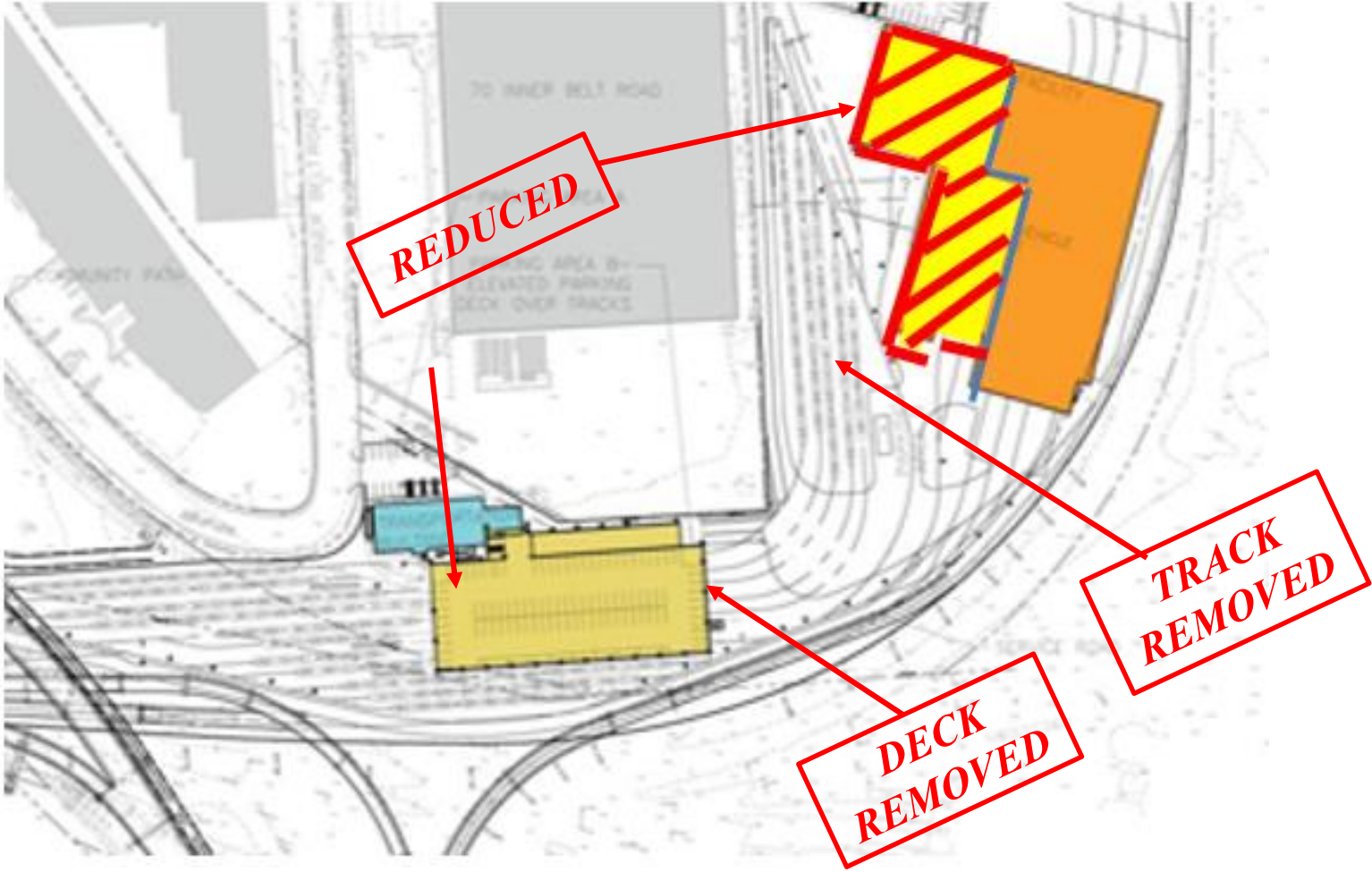


PREVIOUS



REDESIGN

# Redesign Concepts - Vehicle Maintenance Facility



# Redesign Concepts – Bridges



Bridge	Previous Design	Redesign
<b>Medford Street</b>	Full Replacement	Modify Existing Bridge
<b>School Street</b>	Full Replacement	Modify Existing Bridge
<b>Lowell Street</b>	Full Replacement	Modify Existing Bridge
<b>Broadway</b>	Full replacement of 3-lane bridge, sidewalk, and 2 bike lanes. Partial closure during construction	Full replacement of 2 lane bridge, sidewalk, and 2 bike lanes. Full closure during construction
<b>College Ave</b>	Widen bridge structure to accommodate right-hand turning lane	Maintain existing bridge structure to accommodate right-hand turn lane by removing sidewalk. Add new pedestrian bridge





# Reprocurement Considerations

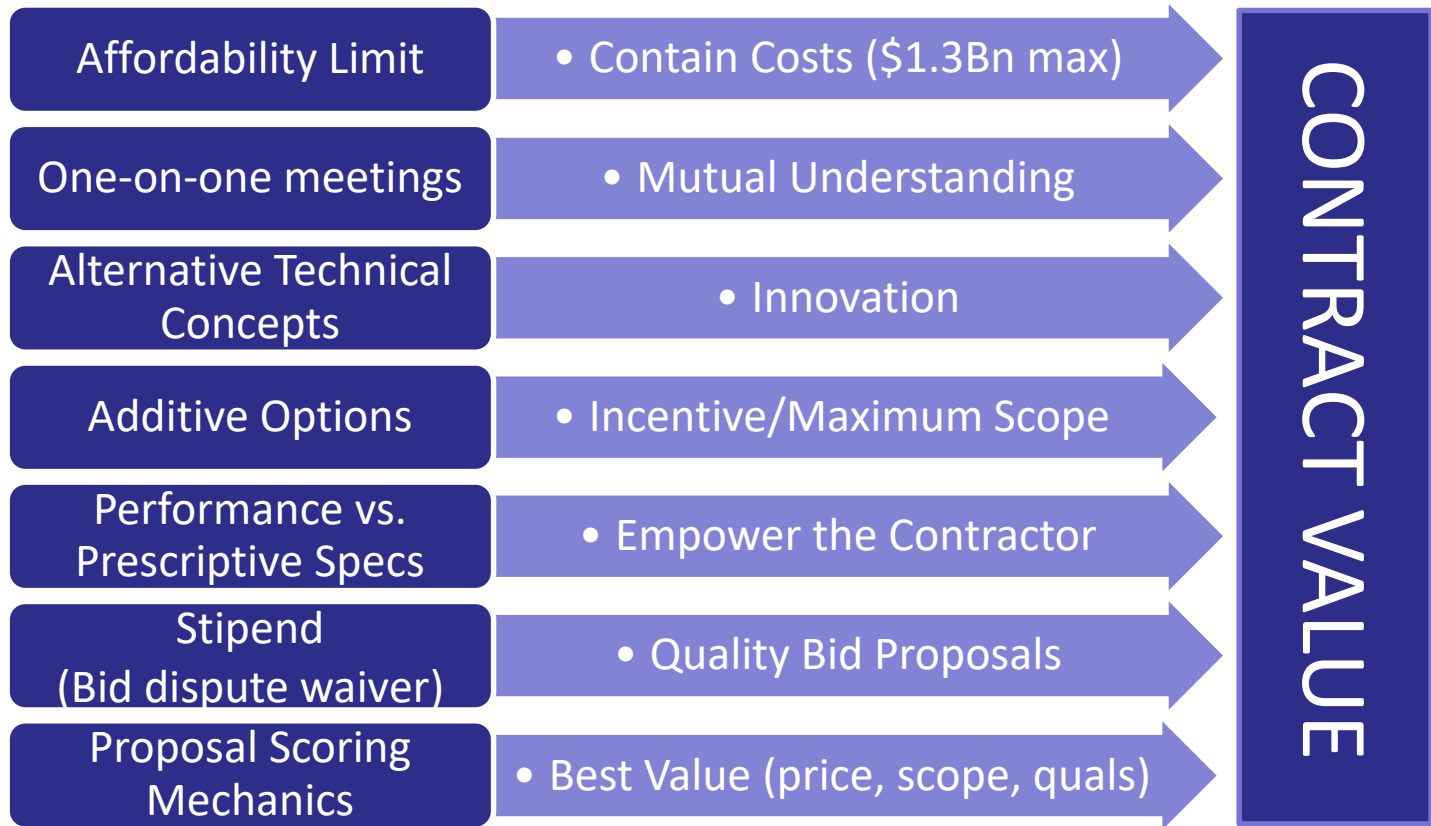
# Procurement Guiding Principles

- ✓ Allow for Risk-Sharing dialogue
- ✓ Maintain Costs within established affordability limit
- ✓ Procure maximum scope without jeopardizing project budget
- ✓ Fully leverage competitive bidding environment
- ✓ Encourage innovation
- ✓ Guarantee “Best Value”

**Selected Procurement Model =====>**

**DESIGN-BUILD**

# Procurement Process/Innovation



# Design-Build Selection Process

## Evaluation Formula for “Best Value” determination:

$$\text{Overall Value Rating} = \frac{\text{Proposal Price}}{\text{Quality Score}}$$

- Proposal Price includes the GLX Lump Sum, Allowances, and Additive Options Price
- Quality Score is the Technical Proposal Score + AO points

Affordability Limit: \$1.319 billion

Successful Proposer has the lowest price per quality score, or lowest “Overall Value Rating”

# Risk Management Strategies

- Extensive Geotechnical Investigation Plan –
  - Borings at all major foundations
  - ‘Test Pits, Test Pits, and more Test Pits’
- Dispute Resolution Process & Partnering Process
- Start Testing and Commissioning Planning in Design Phase
- Strong **Contract Notice** provisions (to help the owner deal with changes)
  - 24-hour notice for Differing Site Conditions
  - 5-day notice for Potential Change Order

# Contract Packaging and Management

## *Challenges*

- Managing internal interfaces
  1. Positive Train Control
  2. Competing Operational Priorities (Flagging Support)
  3. PMIS on enterprise level
  4. Commuter Rail Operator – Outsourced
- Making a massive redesign “stick”
- Keeping up with a large DB Contractor staff/speed
- Stakeholder Relations (DB education)

# Contract Packaging and Management

## *Successes*

- Avoided program shut-down
- Improving organization capacity (6 FTE's to 83 FTE's in 16 months)
- Strengthen long term agency expertise
- Supportive engagement from FTA
- Rapid deployment of PMIS (e-Builder)
- Rapid procurement of staff augmentation (PM/CM)
- Co-location of program team
- Early Works



# Key Lessons Learned

- **Optimize risk-sharing/innovation during pre-proposal stage** (“Pre-Proposal Negotiation”)
- **Autonomous Program Organization**
- **Supportive Sponsoring Group (Board)**
- **Try to minimize the # of Contracts**
- **Collaborative / Web Based - Program Management Information System (PMIS)**
- **Early works** (utility relocation, commuter signal relocation)

# Procurement Outcomes

- 3 Teams short-listed
- 2 of 3 Certified Affordability Limit compliant price offerings
- Final price offerings within 5% of each other
- Additive Option offerings included in both proposing teams' proposal scoring mechanics (“Best Value”)
- Contract awarded for \$1.082Bn
- NTP Advanced 2 months early to benefit from 2018 construction season

# Procurement Outcomes

Massachusetts Bay Transportation Authority



*Major Participants*

**FLUOR**



**HERZOG**

**Balfour Beatty**

Key Subcontractor (Lead Designer)



# Construction Underway



# Discussion

# Design Build Selection Outcome

- Overall Value Rating Outcome

Proposer Name	Proposal Price	Quality Score	Overall Value Rating
GLX Constructors		1213.7	
Green Line Partners		1277.2	

$$\text{Overall Value Rating} = \frac{\text{Proposal Price}}{\text{Quality Score}}$$

# Design Build Selection Outcome

- Overall Value Rating Outcome

Proposer Name	Proposal Price	Quality Score	Overall Value Rating
GLX Constructors	\$954,618,600	1213.7	
Green Line Partners	\$1,052,600,000	1277.2	

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# Design Build Selection Outcome

- Overall Value Rating Outcome

Proposer Name	Proposal Price	Quality Score	Overall Value Rating
GLX Constructors	\$954,618,600	1213.7	786,535.882
Green Line Partners	\$1,052,600,000	1277.2	824,146.571



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# Design Build Selection Outcome

- Overall Value Rating Outcome

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GLX Constructors	\$954,618,600	1213.7	786,535.882
Green Line Partners	\$1,052,600,000	1277.2	824,146.571



- Contract Price Determination

Proposer Name	Proposal Price	Owner Contingency	Contract Price
GLX Constructors	\$954,618,600	\$127,500,000	\$1,082,118,600
Green Line Partners	\$1,052,600,000	\$127,500,000	\$1,180,100,000

