GREEN LINE EXTENSION PROJECT

massDOT
Massachusetts Department of Transportation

GLX

AUGUST 24
FMCB MEETING

Presentation Overview

1) Project Essentials
2) Funding the Green Line Extension Project
3) The Construction Manager/General Contractor Procurement Method
4) Higher than Expected Cost for the Next Contract
5) Options to Address the Funding Gap

GLX Project Essentials

The Green Line Extension

- The Green Line Extension will extend the existing MBTA Green Line by utilizing two distinct branches within the existing railroad right-of-way:
  1) A “mainline” branch which will operate along the MBTA Lowell Line, beginning at a relocated Lechmere Station in Cambridge and traveling to College Avenue in Medford;
  2) A branch line operating within the existing right-of- way for the MBTA Fitchburg Line to Union Square in Somerville.

- GLX serves as a historical transportation route - until the late 1800s/early 1900s, the Boston & Maine Railroad furnished limited commuter rail service on the Fitchburg and Lowell lines at eight stations in Somerville and three stations in Medford.
- The project has enormous local public support and has benefitted from strong interest and involvement in Cambridge, Somerville and Medford; local government officials, planners, community organizations, neighborhoods and hundreds of individuals have participated in the Project.

Project Elements

- The Green Line extension project includes
  - 4.5 miles of new Green Line track
  - Relocated Lechmere Station anchoring North Point development in Cambridge and six new stations anchoring new transit-oriented development in Somerville
  - Roadway and traffic improvements
  - Extension of the existing Somerville Community Path
  - 24 New Green Line vehicles and a new Green Line vehicle storage and maintenance facility that address systemwide State of Good Repair needs
- Constructing GLX involves
  - Relocation of four miles of Commuter Rail track
  - Widening or lengthening of eight bridges
  - Drainage and utilities in corridor and on bridges
  - Approximately 26,000 feet of retaining and noise walls
  - New catenary, signals, communication, and power

Why Build the Green Line Extension?

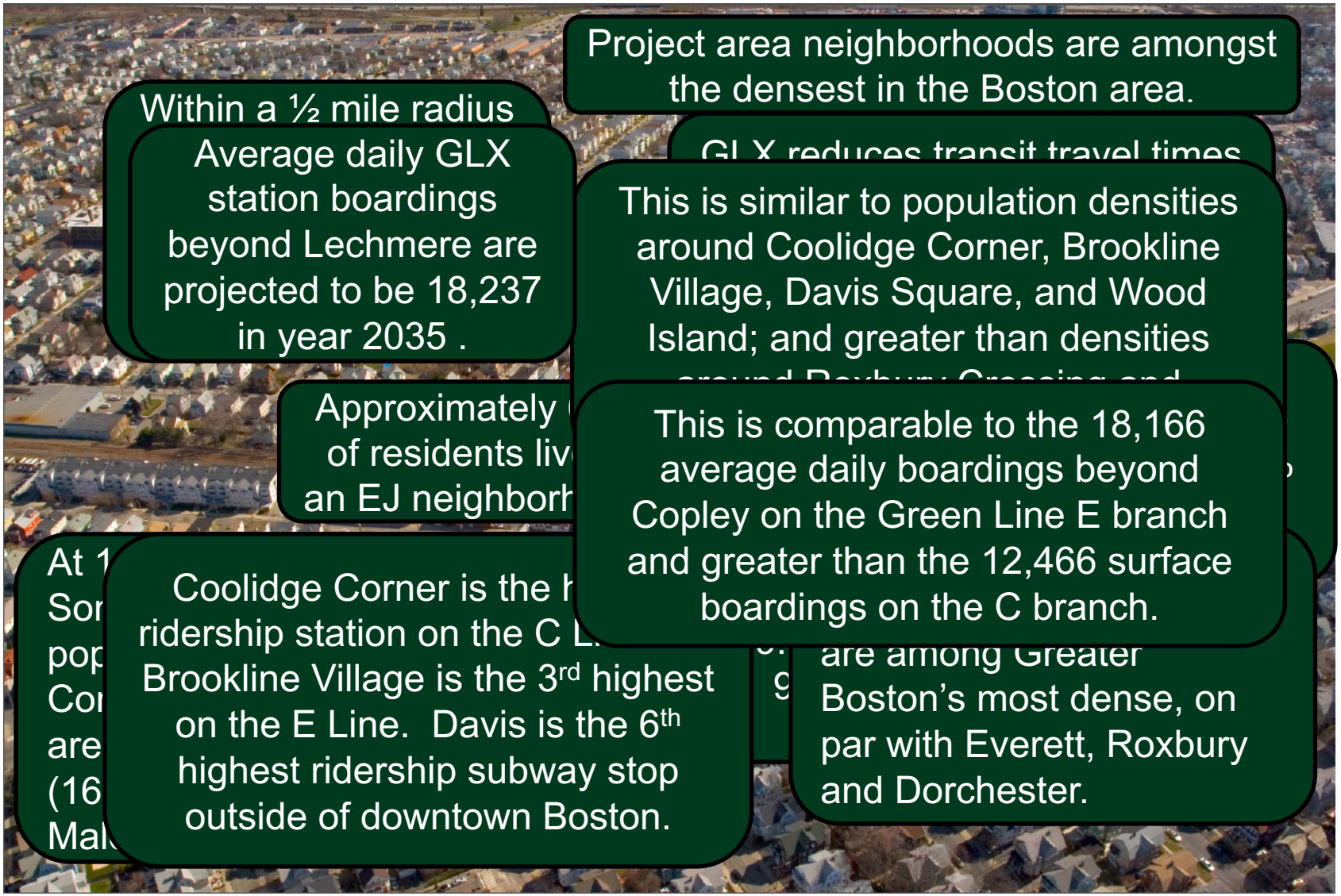
- Somerville is one of the most densely populated cities in the US, but unlike other areas of the region, it is underserved by fixed rail transit
- Currently, less than 20% of the residents are within walking distance of a rail station. GLX will change it to over 70%
- The roadway network in Somerville is heavily congested so bus transit is very slow since it is often stuck in traffic. The GLX will improve travel times by up to 75% since it avoids this traffic

Why Build the Green Line Extension?

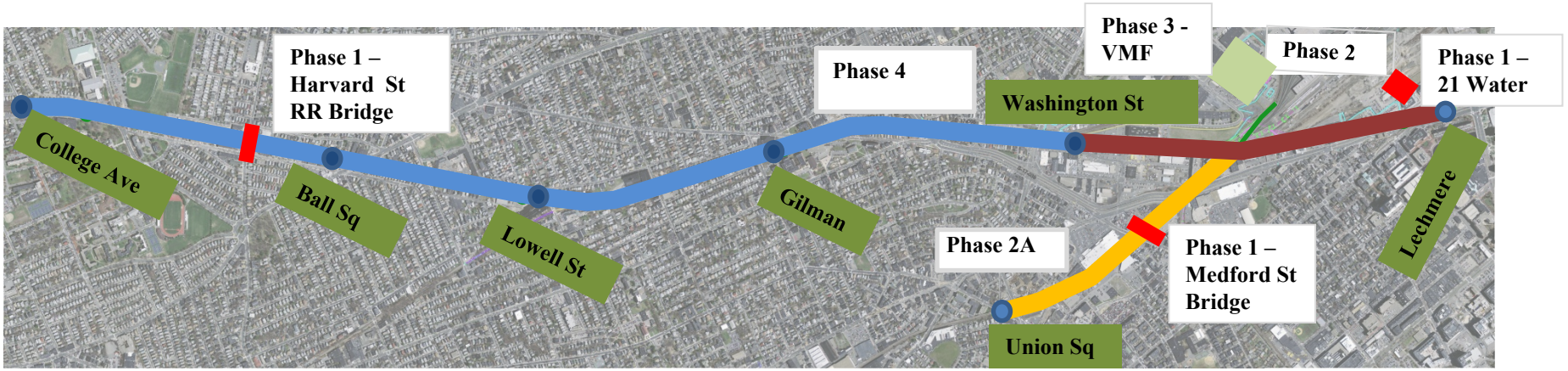
• Green Line service greatly enhances the opportunity for real economic development. Developers have shown a far greater interest in developing near stations such as Union Square – far more so than developing around a bus station.

•The GLX project is a commitment under the US Clean Air Act State Implementation Plan. Failure to build GLX would could result in the USDOT withholding federal transportation funding.

GLX Community Ridership Facts



Project Phasing



- Phase 1 – Harvard Street Rail Bridge; Medford Street Rail Bridge; & 21 Water Street Demolition
- Phase 2 – Lechmere to Washington Street
- Phase 2A – Union Square Branch
- Phase 3 – Vehicle Maintenance Facility
- Phase 4 – Washington Street to College Avenue

Funding the GLX Project

Funding the GLX Project: Overview

- A Full Funding Grant Agreement was signed January 5, 2015 with the Federal Transit Administration
- The FTA will provide $996 million in Capital Investment Grant program (New Starts) funds for design, property acquisition, vehicle procurement, and construction of GLX
- This represents half the then-current project capital cost of $1.992 billion ($2.3 billion with finance charges)
- The Commonwealth is responsible for the remaining costs of the project (e.g. all cost overruns above the $1.992 billion project cost are the state's responsibility)
- The state portion of the project cost is to be paid through issuance of Special Obligation Transit Bonds (the same source being used to pay for purchase of Red and Orange Line cars for the MBTA)

How the Funds Flow and Are Approved

- Project costs are split between the Commonwealth of Massachusetts and the Federal Transit Administration
  - The federal contribution is capped at $996 million
- The state contribution comes from Special Obligation Transit Bonds, authorized by legislation and requiring approval from the Executive Office of Administration & Finance (ANF) for issuance
- Funding flows as follows:
  - Bond proceeds are made available to MassDOT
  - MassDOT has a funding agreement in place with the MBTA to transfer the bond proceeds
  - MBTA FMCB approves contracts of $15 million or more

Full Funding Grant Agreement - January 2015

SUMMARY OF GLX PROJECT COSTS BY STANDARD COST CATEGORY	
Track and Viaduct Structures	$199,057,000
Stations	$194,643,000
Maintenance Facility and Support Buildings	$128,648,000
Sitework & Special Conditions	$321,429,000
Systems (catenary, signals, power, etc)	$224,758,000
Construction subtotal	**$1,068,535,000**
Land Acquisition and ROW	$112,594,000
Vehicles	$165,734,000
Professional Services	$392,708,000
Project Subtotal	**$1,739,571,000**
Unallocated Contingency (11%)	$252,672,000
TOTAL PROJECT COST	**$1,992,243,000**

Notes:

- All costs are shown in Year of Expenditure dollars, using base year 2014
- Each category includes contingency in addition to the unallocated contingency
- Total contingency for the project (allocated + unallocated) is 30.72% of the base costs

The Construction Manager/ General Contractor Procurement Method

What is CM/GC Procurement?

- Phases 2 through 4 of the project use a contract delivery method called Construction Manager/General Contractor (CM/GC). In this procurement method
  - A CM/GC contractor is procured through a qualifications- and price-based selection process
  - A design team is procured under a separate contract
  - The MBTA, CM/GC and design team work together to develop designs which the CM/GC prices at a Guaranteed Maximum Price (GMP)
- The use of CM/GC on the GLX Project was approved as a pilot program by legislation signed on June 19, 2012
- The MBTA Board of Directors approved use of this approach on July 11, 2012

What is CM/GC Procurement?

- Another key piece of the CM/GC methodology is the Independent Cost Estimator (ICE). The ICE provides cost estimating services on individual GLX construction packages, which are used for comparison with the bids received from the CM/GC team on those packages
- Advantages of the CM/GC model are that it overlaps design and construction, thereby shortening overall program delivery time and providing a single point of responsibility
- A disadvantage of the CM/GC model is that it may create an incentive for the CM/GC to increase costs to protect itself from costs above the Guaranteed Maximum Price

GLX Procurement Timeline

- White Skanska Kiewit Joint Venture (WSK) was chosen as the CM/GC in 2013
- Stanton Constructability Services was hired by the MBTA as the ICE in October 2013
- The work associated with Phases 2-4 was broken down into a series of guaranteed maximum price (GMP) contracts with the CM/GC and the first three GMP contracts were awarded to WSK in the fall of 2014
- In May the MBTA received a bid from WSK for GMP 4, a contract which covers the remaining work on Phase 2 of the GLX project

Current Program Contract Packages

Contract	CM/CG IGMP	Status	Description	WSK Contract Value	FFGA Budget	Variance
E22CN02	#1	Awarded	Procurement of long lead items including traction power substations signal equipment and special track work superstructure steel for the new Washington Street railroad bridge and the build-out of construction field offices at 200 Inner Belt.	$32,235,006	$22,528,833	$9,706,173
E22CN03	#2	Awarded	Phase 2/2A and Phase 4 temporary Utility bridges adjacent to existing bridges at Medford Street, Broadway and School Street, and utility relocation work at various locations.	$18,042,718	$12,452,060	$5,590,658
E22CN04	#3	Awarded	Millers River drainage improvements and the relocation of the Fitchburg Mainline (FML) Commuter Rail track, viaduct shafts and foundations in the FML track area.	$116,635,126	$62,667.946	$53,967180
E22CN06	#4A	Awarded	Procurement, fabrication and delivery of the long lead viaduct structural steel, girders and tubs.	$39,600,110	$44,688,166	($5,088,056)
E22CN05	#4	Bid in Process	Balance of Work – Phase 2/2A, including Washington Street Bridge, new Lechmere Station, Union Sq. Station, traction power substation, viaducts and Commuter Rail work in the vicinity of Tufts University.	To be determined	$387,588,371	TBD
E22CN07	#5	In Design	Balance of Work – Phase 4, including construction of four stations; structural systems and roadway improvements for bridge crossings; construction of the Community Path, retaining walls and noise walls; track, signals, OCS, power and communications including signal bungalows and removal of the temporary utility bridges constructed under IGMP-2.	To be determined	$391,816,547	TBD
E22CN08	#6	In Design	Phase 3 Vehicle Maintenance Facility (VMF) and Yard early work including site remediation; demolition of two industrial buildings and removal and salvage of existing buildings and contents.	To be determined	$143,252,063	TBD
E22CN09	#7	In Design	Phase 3 Balance of Work VMF and Yard including construction of VMF and all associated yard track, construction of Transportation Building and associated parking deck; track, signal, OCS, power and communication within the site and Testing and Start-up	To be determined		
			Total CM/GC Contracts Awarded to Date =	$206,512,960	$1,068,543,192	

Higher than Expected Costs for the Next Contract

Higher Than Expected Cost

The Project Budget used for the Full Funding Grant Agreement (based on 60% design) assumed that GMP4 would cost $487 million but the bid from WSK is substantially higher (May 21, 2015 bid submission).

	FFGA (60% Design)	Engineer (100% Design)	WSK	Variance
Direct	$324,450,166	$393,857,192	$581,678,348	$187,821,156
InDirect	$47,718,393	$73,583,443	$271,157,355	$197,573,912
Fee	$15,419,812	$19,866,227	$36,245,518	$16,379,291
Subtotal	**$387,588,371**			
Contingency	$99,718,491			
Total	**$487,306,862**	**$487,306,862**	**$889,081,221**	**$401,774,359**

Possible reasons for higher than expected bids for GMP 4 include:

1. **FFGA Budget Based on Standard Costs in the Transit Industry 2010-2013**
   - CM/GC contractor based its estimate on anticipated future costs and conditions
   - Higher subcontractor and material quotes - hot regional construction market compared to earlier recessionary pricing
2. **FFGA Budget Was Based on 60% Design, While New Numbers are Based on 100% Design**
   - Additional costs (environmental, material, utility removals) as plans went from 60% to 100% design
   - Substantial increase in concrete reinforcing steel due to updated geotechnical information
   - Utility exploration program uncovered increased utility conflicts and necessary relocations
   - Additional soil characterization lead to increased quantities of offsite disposal
3. **CM/GC Priced the Contract to Protect Itself from Risk**
   - CM/GC 'padding' costs with high ratio of management to craft staff, due in part to avoid costs above guaranteed maximum price
   - Contractor's conservative support of excavation systems & slower productivity rates to reduce risk
4. **Other Considerations**
   - Original estimate could have been too low
   - Conflict between commuter rail and construction schedules, as well as lack of railroad flaggers
   - Increased length of work schedule

The Bottom Line: Total Project Costs Will Substantially Exceed $1.992 billion

- MBTA is negotiating with CM/GC to lower price so final cost of GMP #4 remains uncertain but will be substantially higher than budgeted
  - Value engineering will be used, with a target of identifying approximately $100 million in cost savings
- Cost of remaining GMP packages, particularly GMP 5, must be re-evaluated in light of higher than expected cost of GMP 4
- MassDOT, MBTA and ANF have been working to develop a revised cost range for the full project cost; *without including any cost mitigation efforts, the most likely range for the full project cost would rise from the $1.992 billion assumed in the Full Funding Grant Agreement to between $2.7 and $3.0 billion*

Potential GLX Project Costs ($ millions)*

GMP	Description	FFGA budget with allocated contingency	Low Range	High Range
Phase 1	Advanced demo (awarded, completed)	3	3	3
1	Long Lead Time items procurement (awarded)	23	29	29
2	Utility Relocation Work (awarded)	12	17	17
3	Relocation of Fitchburg Main Line (awarded)	63	115	115
4A	Viaduct steel and installation pricing (awarded)	45	40	40
4	Extension service from Lechmere to Washington St. & Union Square - In Bid Process	388	700	850
5	Extension service from Washington Street to College Ave - Price in 2 years	392	700	850
6&7	Construction of VMSF and demo/remediation of existing structure	143	170	190
	Non-Construction Costs & Contingencies	924	924	924
Total		**$1,992**	**$2,698**	**$3,018**
	Total Increase over FFGA	*$0*	*$706*	*$1,026*

* Without accounting for potential changes by MBTA to mitigate higher bid price

Options to Address the Funding Gap

Options: Overview

- MBTA will use negotiation with the CM/GC and value engineering to reduce project costs, in addition to all options presented in the following slides
- Before seeking additional state funding, MassDOT and the MBTA must consider:
  - Whether to proceed with the GLX project
  - All available options to reduce costs (beyond value engineering and CM/GC negotiations)
  - All available options to identify additional funding from sources other than state-issued bonds

Option 1 - Reduce Project Scope to Reduce Project Cost

- Downsize, delay or eliminate vehicle maintenance and storage facility – Up to $149 million in savings
- Downsize/streamline or delay stations (to be more like stations elsewhere on the Green Line) – Up to $40 million in savings
- Downsize, delay or eliminate Community Path Extension – Up to $28 million in savings

Pros

- Bring project costs closer to FFGA budget
- Focus Commonwealth funding on core project elements

Cons

- Could reopen FFGA process due to changed scope
- Would reduce project benefits and disappoint project stakeholders

Option 2 - Find Additional Sources of Funds (Other Than State Bonds)

- Reallocate $158 million in federal funds programmed by Boston Region MPO for future Route 16 extension to core GLX project
  - Requires MPO action and approval
  - Would delay but not cancel the Route 16 project
- Work with municipal partners (Cambridge, Somerville, and Medford) to
  - Implement value sharing mechanisms (for example, Transit Impact Fees or Tax Increment Financing for stations
  - Identify additional municipal, private or philanthropic funding for the Community Path Extension

Option 2 - Find Additional Sources of Funds (Other Than State Bonds), Continued

- Seek institutional and private contributions (for example from Tufts University or Union Square master developer)
- Seek any additional federal funding in cooperation with the Congressional delegation

Pros

- Relieve financial burden on the Commonwealth
- Use 'value sharing' to allocate some of the costs to project benefactors

Cons

- Would require municipal, institutional, and developer willingness to participate in the costs of GLX
- If MPO reprograms federal funding, would postpone future Route 16 extension
- Success of value sharing arrangements is unknown

Option 3 - Change Procurement Method

– Halt Construction Manager/General Contractor process and rebid project – in smaller contract packages – using a more traditional procurement method

Pros

- Could reduce project costs by attracting more competitive bidders

Cons

- Would cause at least a year of project delay
- Financial benefits are unknown and bids could come in higher
- Could require reopening of the FFGA process

Option 4 - Mothball or Cancel the Project

Pros

- Avoids financial exposure of increasing project costs
- Allows Commonwealth to reallocate unused portion of state share of project costs ($338 million already spent) to MBTA State of Good Repair

Cons

- Forgoes substantial anticipated transportation, economic, and land use benefits from the project
- Forfeits $996 million in federal New Starts funding
- Hundreds of millions of dollars in state funding for sunk costs/project shutdown will have been spent for little benefit
- Creates litigation risk or requires changes to the State Implementation Plan under the Clean Air Act

Option 5 - All Ideas Welcome

- MassDOT and the MBTA want public input on how to align project revenues and costs given substantially higher cost estimates
- An extended public comment period will be provided at September 9th MassDOT Board/FMCB meeting
- Public comments and ideas are welcomed through September 9th via email to:
  - planning@dot.state.ma.us
  - info@glxinfo.com

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