

# Massachusetts Department of Transportation (MassDOT)

## Blue Line Extension to Lynn

### P3 Project Suitability Assessment Report

September 11, 2013



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## Proposed Project Description

- The Blue Line Extension project would extend the Blue Line subway service 4.5 miles above ground from the Wonderland stop in Revere (currently the northernmost terminus of the Blue Line) to the City of Lynn
- The estimated capital cost of the project ranges from \$737 million to \$1.048 billion, according to the Alternatives Analysis/DEIS prepared in 2011
- The project would require construction of new track either parallel to the Newbury / Rockport commuter rail or would make use of the abandoned narrow gauge right-of-way through Oak Isle and Point of Pines
- A third option includes development of a connector between the Wonderland and new Revere rail station to connect the blue line with the existing commuter rail line
- The extension would require construction of bridges and trestle systems over marshland and rivers, including the Saugus River which is a navigable waterway
- Other key project elements include development of a new Station in Lynn, rolling stock fleet acquisition, and development of a new storage and maintenance yard

### Alternative 3



### Alternative 4



Source: MassDOT

## Project Background and Status

This report is part of the high-level screening process used to assess the suitability of delivering a project under a Public-Private Partnership:

Project Background	
<b>Project Name:</b>	Blue Line Extension to Lynn Project
<b>Sponsoring Agency:</b>	Massachusetts Department of Transportation
<b>Preliminary Schedule</b>	<ul style="list-style-type: none"> <li>▪ Draft Environmental Impact Study (DEIS) initiation – December 2011</li> <li>▪ High level &amp; detailed level P3 assessment – Fall 2013 (anticipated)</li> </ul>

## Commonwealth Considerations

### Project-specific considerations:

- Provide a higher frequency public transportation service to the Lynn and North Shore communities
- Provide commuters in the North Shore and Lynn communities with more convenient access to the Boston metropolitan area and the Boston Logan International Airport
- Support economic development and job creation in Lynn

### Indicative drivers for P3 delivery :

- Accelerate project delivery and construction schedule
- Generate revenue that will be used to fund the project
- Transfer of certain risks

# Transportation Need and Benefit Statement

## Transportation Need and Benefit Statement

**To support economic development, job creation and to provide improved service for the North Shore and the City of Lynn communities**

### Description of surrounding area:

- The Blue Line currently terminates in Revere at the Wonderland station
- The Blue Line provides subsurface transit service in downtown Boston and above-ground service following the river crossing at the Maverick station
- The Blue Line is the smallest of MBTA's three heavy rail subway lines in terms of distance and ridership and is the newest, having been built within the last ten years
- An existing commuter rail service line provides 23-minute service from Lynn to Boston running between Revere and Lynn along the same route identified for proposed Blue Line Extension alternatives

### What is the existing transportation need?

- The Lynn community has an unemployment rate that is higher than the state average and one of the highest among the North Shore communities
- The current Newburyport / Rockford commuter rail line that serves the Lynn Community provides regular service during rush hour (approximately every 30 minutes), but does not provide any access to Logan International Airport and service reduces during non-rush hour periods to approximately one train every 1-2 hours

### How will the project address the existing transportation need?

- The project is expected to promote economic development in the City of Lynn and the surrounding region by increasing employment opportunities and enhancing the frequency of public transit service to Boston and direct access to Logan International Airport
- Under the various build alternatives for the Extension of the Blue Line to Lynn, transit would attract approximately 4,000 new transit trips per day in the year 2030 for Alternatives 3 and 4, reflecting trips that are diverted from automobile trips
- The extension is expected to have major land use and economic impacts, particularly in downtown, which is a revitalization area of the Commonwealth with potential for commercial and residential development
- Service quality would improve for those passengers currently utilizing MBTA bus or commuter rail service in the area, as travel times and transfers would be reduced and frequency of service would be higher on the extended Blue Line

High-Level Screening Criteria – Commonwealth Considerations				
	Yes	No	TBD	Supporting Info
<b>Addresses Commonwealth's Considerations</b>	X			The project addresses considerations such as: <ul style="list-style-type: none"> <li>Providing the North Shore community with more direct access to the Boston metropolitan area and Logan International Airport</li> <li>Supporting economic development and job creation in the City of Lynn and the North Shore region</li> </ul>
	Yes	No	TBD	Supporting Info
<b>Satisfies Public Transportation Need</b>			X	<ul style="list-style-type: none"> <li>The project would provide improved service to the North Shore area with higher frequency public transportation alternatives</li> <li>The commuter rail system already serves this area with regular service (albeit not as frequent as potential transit service)</li> <li>The project benefits are focused on communities surrounding the City of Lynn</li> <li>The connector between Wonderland and Revere is the easiest and least expensive option, but wouldn't necessarily improve connectivity during off peak hours</li> </ul>
	Yes	No	TBD	Supporting Info
<b>Addresses Priorities Identified in State, Regional and / or Local Transportation Plan</b>		X		<ul style="list-style-type: none"> <li>The project has not been included in any transportation plans</li> <li>Support for this project is limited primarily to the City of Lynn as the project would not extend in other municipalities along the corridor limiting the potential user and stakeholder base</li> <li>The Blue Line is not under capacity constraint in the same way as many of the other Commonwealth transit and commuter lines</li> </ul>
	Yes	No	TBD	Supporting Info

## Assessment Criteria (Continued)

High-Level Screening Criteria - Opportunity for Acceleration, Innovation and Efficiencies				
	Yes	No	TBD	Supporting Info
<b>Opportunity for Private Sector Innovation</b>			X	<ul style="list-style-type: none"> <li>Opportunities for innovation may include cost efficiencies in construction, and maintenance through whole life costing</li> <li>Due to the small length of the extension compared to the overall size of the system, there may be limited opportunities of economies of scale and efficiencies in the operation and to a certain extent maintenance</li> <li>As an extension of an existing subway line, the Blue Line Extension would need to interface with the current subway system and meet existing system requirements</li> </ul>
<b>Ability to Transfer Risk</b>			X	<ul style="list-style-type: none"> <li>Risk transfer may include: financing, construction, maintenance and lifecycle risk</li> <li>The level of expected ridership, MBTA's fare box policy and overall capital expenditure may create challenges to revenue and ridership risk transfer. In addition market appetite will need to be tested</li> </ul>
<b>Accelerated Project Development</b>	X			<ul style="list-style-type: none"> <li>P3 delivery method could accelerate project development through the coordination of design and construction by a single concessionaire</li> <li>Private financing of capital investment could reduce the up-front funding needed by spreading out large costs over time</li> </ul>

## Assessment Criteria (Continued)

High-Level Screening Criteria – Funding/Financing				
	Yes	No	TBD	Supporting Info
<b>Ability to Raise Capital</b>	X			<ul style="list-style-type: none"> <li>Similar projects have been financed in the market using public funds (milestone payments and availability payments). In limited cases, transit projects were financed with some revenue risk transfer</li> <li>Financing will require reliable cash flows, which have not yet been identified.</li> <li>The ability to finance the project is subject to market conditions, public funding sources and risk allocation</li> </ul>
<b>Potential to Generate Revenue and Funding Requirement</b>			X	<ul style="list-style-type: none"> <li>There are no current identified funds for the project</li> <li>The project could generate fare revenue from new and increased ridership; however, fare revenues on transit projects typically only cover a portion of operating costs and none of the capital costs</li> <li>A MassDOT demand forecast projects positive, but limited ridership, which may not be sufficient to attract federal funding contributions</li> <li>Other sources of revenue may be explored, such as TOD/retail, advertising, state and local contributions, value capture, benefit assessment districts, and naming rights</li> </ul>
<b>Market Precedent</b>	X			<p>Market precedent of relatively similar P3 projects include:</p> <ul style="list-style-type: none"> <li>DBFOM: Madrid Metro Line 8 Extensión - T4 (Spain), Canada Line (Canada) and Edmonton Light Rail (Canada)</li> <li>DBF: Evergreen Line Rapid Transit Project (Vancouver, Canada)</li> <li>DB: Honolulu Guideway Phase I (Hawaii), Hiawatha Light Rail Transit (Minnesota), Crenshaw /LAX Transit Corridor (California), and Dallas Area Rapid Transit Orange Line Extension (I-3) (Texas)</li> </ul>

## Assessment Criteria (Continued)

High-Level Screening Criteria - Readiness				
	Yes	No	TBD	Supporting Info
<b>Readiness</b>		X		<ul style="list-style-type: none"> <li>From an environmental standpoint, project readiness is limited. It is expected that the MEPA and NEPA processes will run concurrently, however, while the DEIS has been discussed with the Army Corps of Engineers, it has yet to be formally submitted or approved</li> <li>For certain proposed alignment alternatives, MassDOT is in possession of the ROW required, however, additional land acquisition may be required depending on the preferred alternative ultimately selected</li> </ul>
<b>Consistent with Federal Requirements</b>			X	<ul style="list-style-type: none"> <li>Both FTA and Army Corps of Engineers approvals are required</li> </ul>
<b>Can Be Structured as a P3</b>	X			<ul style="list-style-type: none"> <li>Market precedent indicates that the project may be structured as a P3</li> <li>Different delivery methods can be used for the delivery of the project, including DB and DBF, which would allow the Commonwealth to benefit from accelerated project completion without transferring O&amp;M responsibilities</li> <li>DBFM could be an option for the project if the complexities related to interface issues with the existing system can be addressed and if significant opportunities exist for private sector involvement during the operating and maintenance phase</li> </ul>

# Potential Delivery Structures

Potential Delivery Model	Features
<b>Option 1: DBFM - Availability Payment</b>	<p><b>Risk transfer:</b> A developer will be responsible for the delivery of the project under a fixed-price, date-certain design-build contract and will be responsible for maintenance during the contract life (up to about 35 year contract term). Ridership/revenue risk, operations risk, fare policy and collection are retained by Commonwealth</p> <p><b>Payment mechanism:</b> The Commonwealth makes an annual payment to developer which is subject to performance deductions. The Commonwealth may fund payments through state funds and fare revenue</p> <p><b>Private investment:</b> Typically, under this delivery model, projects are funded with a combination of debt and equity at a ratio between 85/15 – 90/10%</p>
<b>Option 2: DBF</b>	<p><b>Risk transfer:</b> A developer will be responsible for the delivery of the project under a fixed-price, date-certain design-build contract and will be responsible for raising financing for the project. The Commonwealth will provide O&amp;M and retain ridership and revenue risk, fare policy and fare collection</p> <p><b>Payment mechanism:</b> Commonwealth collects the fare revenue and makes milestone, construction completion or annual payments to developer (not subject to availability or performance) for the repayment of the capital investment. The Commonwealth may fund payments through state funds and fare revenue</p> <p><b>Private investment:</b> Typically, under this delivery model, projects are funded with 100% debt (e.g. bank debt or tax-exempt debt utilizing a 63-20 structure)</p>
<b>Option 3: DB</b>	<p><b>Risk transfer:</b> A developer will be responsible for the design, construction and delivery of the project under a fixed-price, date-certain design-build contract. The Commonwealth will retain all other major risks</p> <p><b>Payment mechanism:</b> Commonwealth pays for design and construction during construction on a regular basis (e.g. monthly) so the contractor is not required to finance construction</p> <p><b>Private investment:</b> There is no private investment under this delivery model, but there is risk transfer (design/construction). MassDOT will not be able to accelerate delivery of the project, unless it raises debt or identifies other funding sources to pay for the improvements</p>

\*Please note that these are illustrative examples. Other options or variations on these themes may exist.

# Key Findings Summary

High Level P3 Suitability Assessment	
<b>Addresses Considerations</b>	<b>TBD.</b> This project supports economic development and job creation, improving service to the City of Lynn and North Shore communities by providing higher frequency public transportation, and by providing easier access to the Boston metropolitan area and Logan International Airport. However, the project is not included in the Commonwealth’s transportation plan and may have a more limited public benefit than other potential projects
<b>Opportunity for Acceleration, Innovation and Efficiencies</b>	<b>Yes.</b> This project has the potential for private sector acceleration by transferring design and construction risk to the private sector and create incentives for whole-life costing
<b>Funding/Financing:</b>	<b>TBD.</b> Although there is opportunity to raise capital, the total funding for the project is still under evaluation as it is not clear how much public funding will be available
<b>Readiness:</b>	<b>No.</b> While the DEIS has been discussed with the Army Corps of Engineers, it has yet to be formally submitted or approved. Further, the project does not appear to be as much of a priority to the MBTA as compared to other large-scale projects
<b>Can the project be structured as a P3?</b>	<b>Yes</b>
<b>Move to the next phase for further analysis?</b>	<b>[TBD by the Commission]</b>

## Considerations and Challenges

- Impact of project from/to adjacent competing commuter rail facility and bus service
- System integration and interface issues with the existing the Blue Line service
- Relationship between ridership benefits and project costs
- No identified public funding
- Stakeholder outreach needed to help determine level of support
- Both FTA and Army Corps of Engineers approvals are required
- No preferred alternative selected. Evaluation of less costly alternative (i.e. connector between Revere and Wonderland stations) may be required
- Consideration of fare policy for extension (e.g. potential for surcharge?)
- System integration and interfacing with the commuter rail system and private operator

## Potential Next Steps

- Perform Benefit/Cost analysis for alternatives
- Commission a revenue and ridership study
- Update preliminary capital and O&M cost estimates
- Perform high-level financial analysis for each proposed alternative
- Identification of potential federal, state, and local funding and financing alternatives
- Analyze project affordability and impact to MassDOT and/or MBTA finances

## List of References

### Specific information in this report came from the following sources:

MassDOT, North Shore Transit Improvements Alternatives Analysis/Draft Environmental Impact Statement, December 2011

Interview with Charles Planck, Senior Director – Strategic Initiatives and Performance, on August 7, 2013

# Appendix: Market precedents

# Madrid Metro Line 8 Extensión - T4

Characteristic	Project Detail
Project Type	Greenfield
Sector	Transportation – Subway / Light rail
Description	<ul style="list-style-type: none"> <li>▪ The project extended Line 8 of the Madrid metro to the mixed RENFE/Underground station integrated in the new T4 terminal building at Madrid-Barajas Airport. The extension linked the new terminal with Barajas Pueblo. The project only includes the execution of the superstructure of the Metro line in the interior of the terminal station</li> <li>▪ The total length of the stretch is 2.572 km, which is entirely within the municipal area of Madrid. Three construction methods were used in the civil engineering work: execution with a tunneling machine, execution with screens and open-cut execution between screens</li> </ul>
Public sponsor	Comunidad de Madrid
Private sector partner	Global Vía Infraestructuras, S.A (FCC/Caja Madrid)
Status	Financial Close – December 2006
Term	20 years
Project size	€ 45 million
Delivery model	DBFOM
Payment mechanism	Revenue / demand risk



# Madrid Metro Line 8 Extensión - T4

Procurement Schedule	
April – 2006	Preferred Bidder Selected
December – 2006	Financial Close
April – 2006	Construction Commencement
May – 2007	Operations Commencement

## Madrid Metro Line 8 Extensión Project Map



Source: Centre for Innovation in Transport, Barcelona

## Lessons Learned

### P3 suitability

- Expedited construction delivery at approximately one year giving the Madrid Metro the title of second largest metro network in Europe

### Risk Transfer

- The fare for a single ticket was agreed upon in advance of the construction of the transit line minimizing revenue risk

### Technical Challenges

- Three construction methods were incorporated in the transit extension, including execution with a tunneling machine, execution with screens and open-cut execution between screens

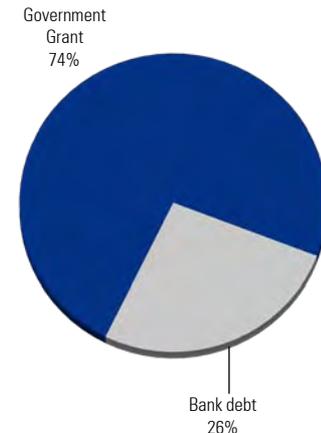
# Canada Line (Canada)

Characteristic	Project Detail
Project Type	Greenfield
Sector	Transportation – Light rail
Description	The Canada Line (previously known as the Richmond-Airport-Vancouver [RAV] Line) project is a 19 km rail rapid transit line linking downtown Vancouver, Vancouver Airport, and the City of Richmond in the Province of British Columbia. After Vancouver won the rights to host the 2010 Winter Olympics in 2003, the Province sought to advance a rapid transit link in the Richmond-Vancouver corridor and the Province provided a funding commitment for the project contingent on P3 procurement.
Public sponsor	Greater Vancouver Transportation Authority
Advisor	KPMG
Private sector partner	InTransitBC
Status	Financial Close – July 2005
Term	35 years
Project size	\$1.8 billion
Delivery model	DBFOM
Payment mechanism	Availability payment based on availability of trains (70%), quality of service delivered (20%), and achievement of ridership forecasts (10%).



### Funding Details: \$1.8 billion

- \$490 million bank debt
- \$1.4 billion government grant

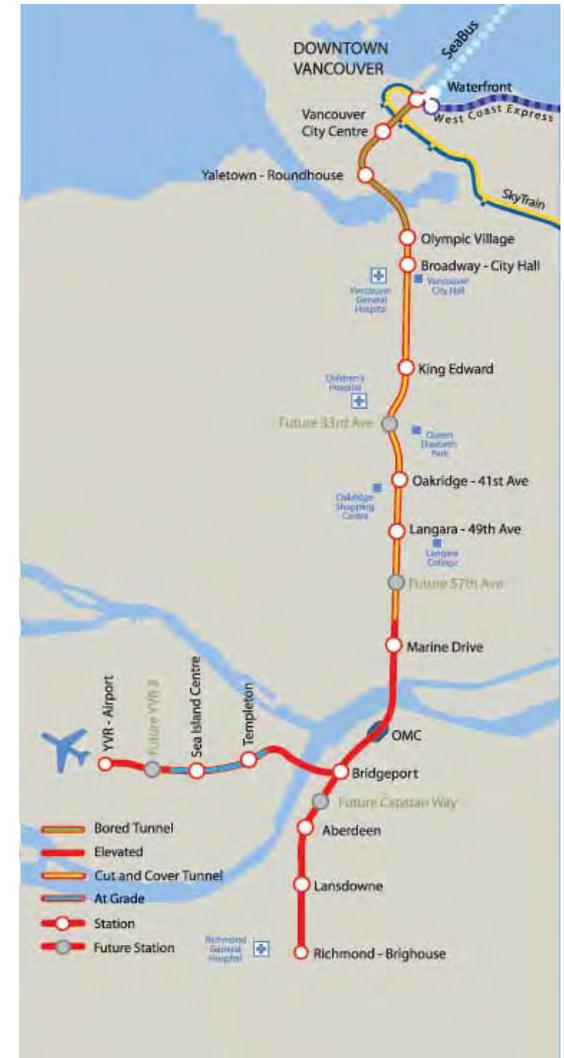


**DRAFT – FOR DISCUSSION PURPOSES ONLY**

# Canada Line (Canada)

Procurement Schedule	
August – 2003	RFP Issued
January – 2004	RFP Responses Received
July – 2004	BAFO's Issued
September – 2004	BAFO's Responses Received
November – 2004	Preferred Bidder Selected
Mar – 2005	Commercial Close
July – 2005	Financial Close

Canada Line Project Map



Source: thetransportpolitic.com

Lessons Learned		
<p><b>P3 suitability</b></p> <ul style="list-style-type: none"> <li>The project demonstrated Value for Money to the public through higher generation of ridership due to the innovative designs brought forth by the private sector</li> </ul>	<p><b>Risk transfer</b></p> <ul style="list-style-type: none"> <li>Perform a revenue and risk study to understand if their benefits of transferring revenue risk to the private sector</li> </ul>	<p><b>Funding/financing</b></p> <ul style="list-style-type: none"> <li>The project that supports an improved environment and fosters economic growth is eligible for funding through the P3 Canada Fund</li> </ul>

# Edmonton Southeast Light Rail Transit Project (Canada)

Characteristic	Project Detail
Project Type	Greenfield
Sector	Transportation – Light rail
Description	<p>The City of Edmonton’s Light Rail System project includes the construction of the southeast leg of the Southeast to West light rail transit line, running 13.2 km from Mill Woods to downtown Edmonton. The project also includes the construction of a signature bridge spanning the North Saskatchewan River.</p> <p>The project has an initial daily projection of 28,000 passengers, increasing to 49,000 by 2044.</p>
Public sponsor	City of Edmonton
Advisor	KPMG
Private sector partner	Yet to be determined
Status	Pre-launch
Term	30 years
Project size	\$1.8 billion
Delivery model	DBFOM
Payment mechanism	Yet to be determined



### Funding Details: \$2 billion

- \$408 million P3 Canada Fund
- \$817 million City of Edmonton
- \$817 million Federal Government / Private Developer

