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Green Line project could be priciest effort for MBTA

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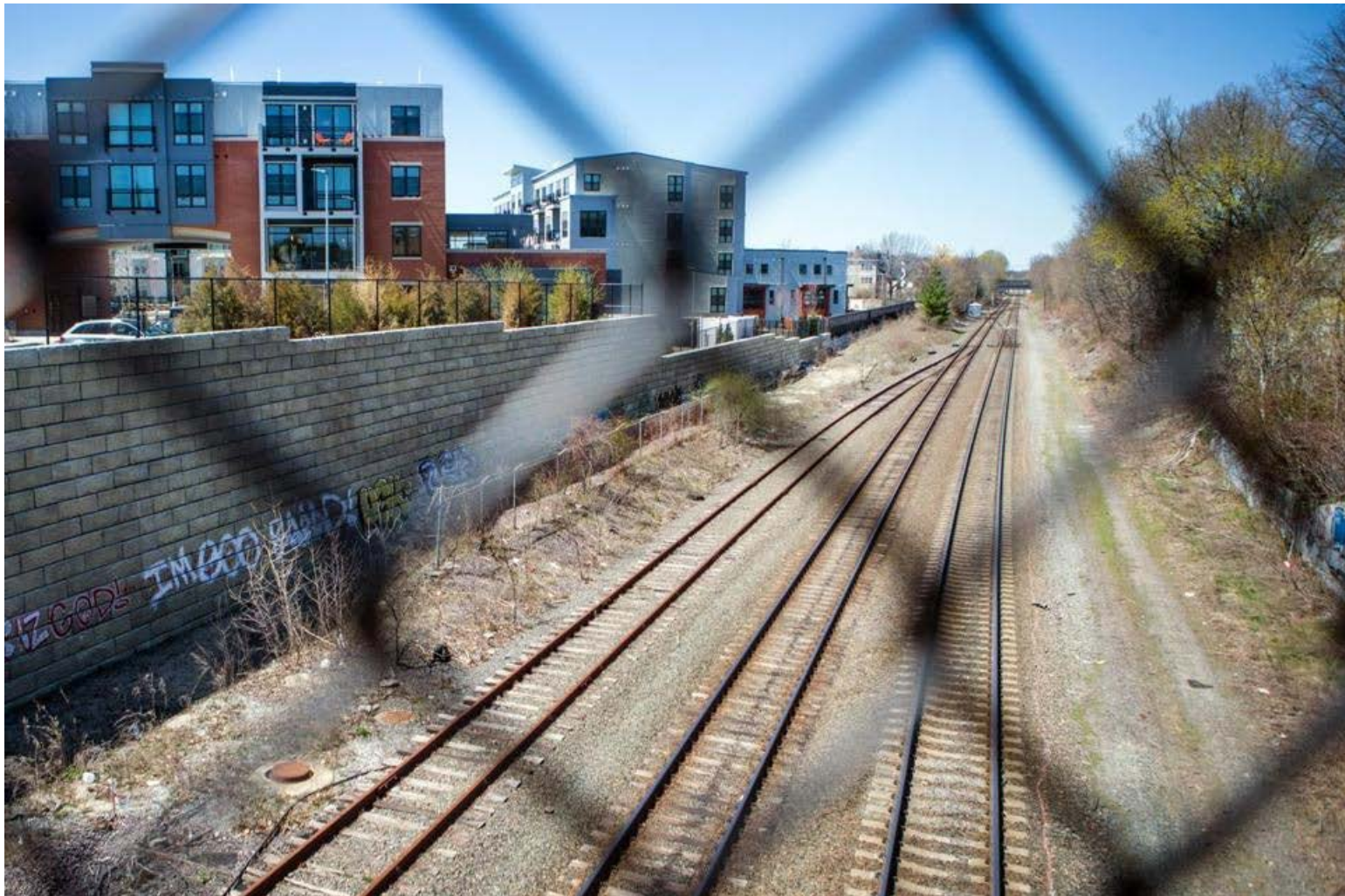
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ARAM BOGHOSIAN FOR THE BOSTON GLOBE

Train tracks along the proposed MBTA Green Line expansion area.

By Matt Rocheleau

GLOBE STAFF JANUARY 02, 2016

With a price tag that's ballooned to \$3 billion, the MBTA's planned Green Line extension is on pace to

be the most costly rail expansion per mile in the transit agency's recent history — and one of the most costly among similar projects around the nation.

The revelations in recent months about the rising estimate for the extension into Somerville and Medford have prompted state officials to consider scaling back the Green Line project or, in a less likely scenario, canceling it.

No major MBTA rail expansion dating back to at least the late 1970s has come close to the potential per-mile cost of the long-anticipated Green Line extension, according to a Globe analysis. The extension would expand the Green Line north through Somerville and into Medford.

Past projects that stretched the Red and Orange lines at each end were all at least 20 percent cheaper per mile, even after adjustment for construction cost inflation. And some of those undertakings involved more elaborate construction, including excavation of new tunnels.

A consultant hired by the T recently outlined several possible explanations for the high cost of the Green Line extension, including that the project would have to be built in a particularly dense urban environment that abuts commuter rail lines that would continue to operate during construction.

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State won't rule out cancellation

The state would need to spend about \$742.3 million and forgo nearly \$1 billion in federal money if the project is axed.

Troubles detailed in Green Line bid Extension may cost \$1 billion more

The consultant also said that the planned stations and maintenance facility are more elaborate than usual.

A relatively new contracting process the T is using may also be contributing to the high cost estimate. Instead of the T picking construction companies based primarily on which submits the cheapest offer, the new process has the T choose companies based largely on reputation, and prices are negotiated afterward.

The idea is to allow for faster project completion, because the construction company does not have to wait for the design of the entire project to be done before it can start work.

What's more, a T consultant found, the agency botched implementation of the new contracting method because its employees were understaffed to oversee it and missed signs that the project's costs would rise.

Concerns about high costs are common with any major publicly funded project, and MBTA officials cautioned that comparing projects that have been completed in different eras can be problematic.

The details of projects can also vary markedly — how many new stations, how much land and equipment are needed — and that can also distort comparisons.

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Still, T officials have acknowledged that the latest estimates for the Green Line extension are unusually high. The agency has canceled some contracts related to the project as it continues to evaluate the price.

“One of the reasons we put a halt on the project is we want to make sure we’re doing something that’s financially feasible and reasonable for us to advance,” said T general manager Frank DePaola.

Officials have said the extension would create significant economic growth — new businesses, housing, and jobs. It would serve about 45,000 riders daily and would reduce traffic congestion on nearby roadways, thus improving air quality.

Canceling the project altogether has not been ruled out, but it would be shocking.

The state would lose out on nearly \$1 billion in federal funding if it were to abandon the project.

The T also has a legal obligation to complete the work. The Conservation Law Foundation successfully sued the T to finish the project, which is meant to mitigate the environmental effects of building the Big Dig.

“If they canceled, they would still have the obligation to produce a substitute project that produces the same air quality benefits, and it would have to be in the same area, roughly,” said Rafael Mares, a vice president of the Boston environmental foundation.

Still, Mares said he is glad the T is exploring ways to reduce the cost estimate.

“There’s no doubt that the \$3 billion estimate is too high,” he said. “We want the T to get this done but at a reasonable cost. We certainly don’t want them to overpay.”

Historical costs

Based on a \$3 billion overall price tag, the 4.7-mile project would cost \$642 million per mile.

That would be significantly higher than the reported costs of four other major extension projects, a Globe analysis found:

“

‘We want the T to get this done but at a reasonable cost. We certainly don’t want them to overpay.’

The T's 3.2-mile northwest expansion of the Red Line, which was completed in 1985 and involved expensive new tunnels, cost about \$505 million per mile in today's dollars.

The actual cost was adjusted to today's dollars using a Boston-specific historical construction cost index created by the Engineering News-Record, a national construction industry magazine.

Building the existing 4.7-mile southern portion of the Orange Line was "the largest public works project in Massachusetts history" at the time it was completed in 1987, the Globe reported. In today's dollars, it cost \$422 million per mile.

The 5.4-mile Haymarket-North Orange Line extension project, completed in 1977, cost a "staggering" \$180 million, a Globe reporter wrote at the time. In today's construction dollars, that's \$159 million per mile.

The 3.4-mile extension of the Red Line to add its two southernmost stations on the Braintree branch was finished in 1983 and cost about \$83 million per mile in today's dollars.

Bradley H. Clarke, a transit historian and president of the Boston Street Railway Association, said that he researched several decades' worth of reports from both the MBTA and its predecessor, the Metropolitan Transit Authority, and also found that the estimated per mile costs of the Green Line extension are far above what was spent per mile on past expansion projects.

"It appears that the Green Line extension is grossly overpriced," he said. "It's disproportionately high."

He also said the next most expensive expansion project per mile — the Red Line extension to Alewife — was far more complicated to build, because it involved boring through deep rocks to build tunnels, relocating underground utilities, building temporary stations during construction, and rebuilding a tunnel for buses.

How the Green Line extension's cost estimate compares historically

Other major expansion projects on the MBTA have cost significantly less per mile.

| Project | Cost per mile (in 2015 dollars) | Year completed | Total cost (in 2015 dollars) | Total cost (at time) | Length (in miles) | Stations | Location |
|----------------------------|---------------------------------|----------------|------------------------------|----------------------|-------------------|----------|------------|
| Green Line north extension | \$642m | possibly | \$3.018b | \$3.018b | 4.7 | 7 | North from |

| | | by 2020 | | | | | relocated Lechmere; work began in 2013 |
|---|--------|---------|---------|--------|-----|---|---|
| Red Line northwest extension | \$505m | 1985 | \$1.6b | \$574m | 3.2 | 4 | Between Harvard and Alewife |
| Orange Line south extension, replacing elevated railway | \$422m | 1987 | \$1.98b | \$743m | 4.7 | 9 | Between Tufts Medical Center and Forest Hills |
| Orange Line north extension | \$159m | 1977 | \$856m | \$180m | 5.4 | 6 | Between Haymarket and Oak Grove |
| Red Line south extension | \$83m | 1983 | \$282m | \$90m | 3.4 | 2 | Between Quincy Center and Braintree |

SOURCE: Globe analysis, review of archives

National projects

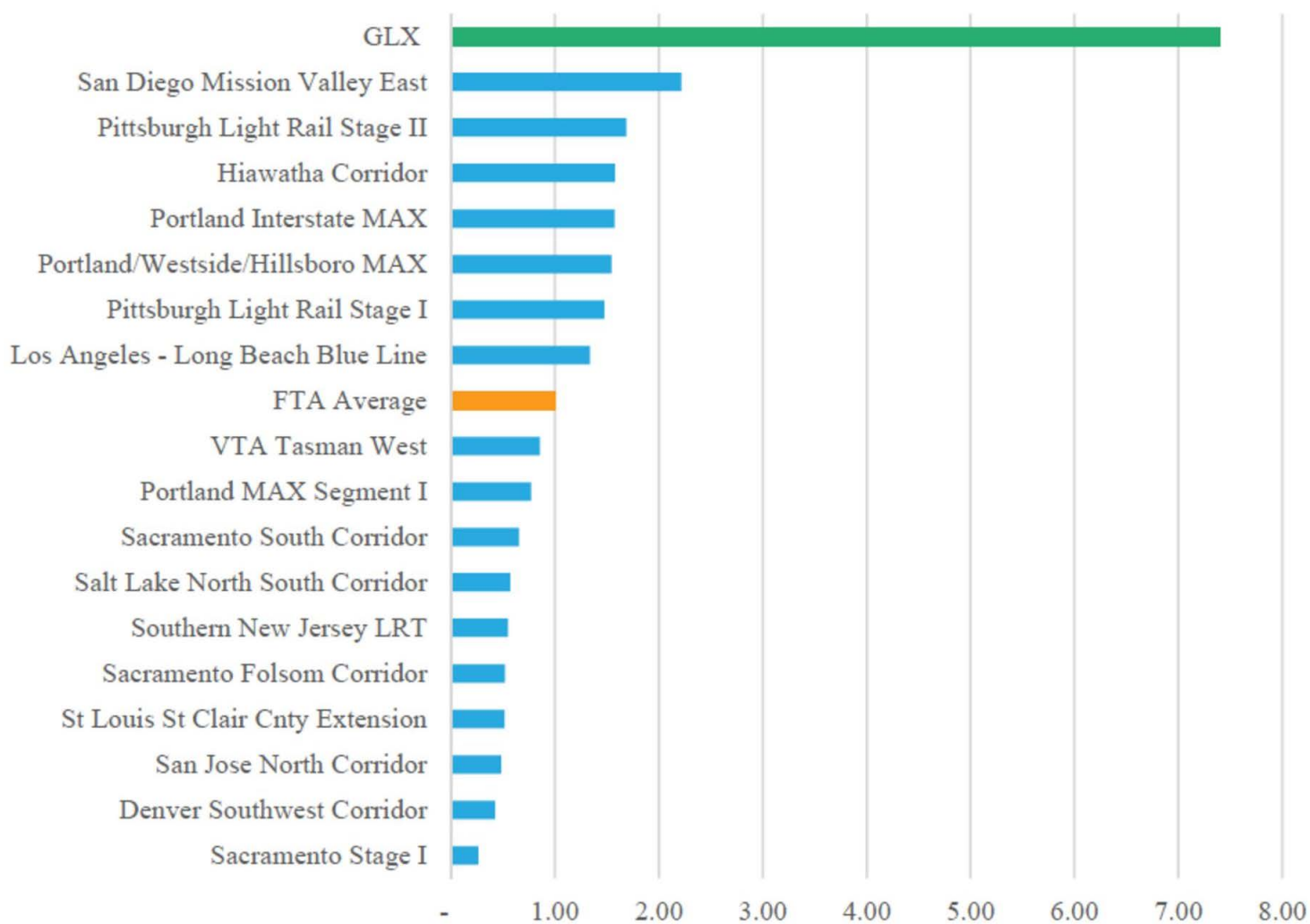
The Green Line extension's price tag is also high when compared with other similar projects around the nation, according to a recent analysis by the Arup Group, a consulting firm the T recently retained to help find ways to reduce the project's cost.

The firm looked through a database of federally funded projects and identified 17 comparable light rail projects completed between 1987 and 2005, according to T officials.

The cost figures for each project were adjusted to account for changes in construction expenses over time, as well as regional cost differences, and then compared with the Green Line extension project, T officials said.

The firm found that the T's pending project was by far the most expensive per mile, with capital costs more than seven times higher than the average of the other 17 projects, according to a copy of a [presentation](#) made to the T earlier this month.

Comparative Cost / Mile SCC 10-50 with FTA Avg = 1.0



MBTA / ARUP GROUP

The above graphic from a recent consultant presentation to the MBTA compares the cost of the Green Line extension project to other similar projects around the country.

Using a different analysis, the Globe reported last September that the Green Line extension ranks as the third highest when compared with six other light rail projects financed through a federal grant similar to the Green Line extension.

The most expensive, in that analysis, were projects in San Francisco and Los Angeles, similarly dense urban centers with relatively high construction costs.

The Green Line extension is more expensive than projects in Honolulu, Portland, Ore., and Charlotte, N.C.

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