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One of the largest infrastructure projects in the commonwealth and the Massachusetts Bay Transportation Authority’s (MBTA’s) first expansion project in 25 years, the Green Line light rail service project in Boston is set to greatly improve sustainable public transit service in some of the region’s most densely populated municipalities.

**PROJECT SCOPE**

The project, known as the Green Line Extension (GLX), will include seven new stations — Lechmere, Union Square, Washington Street, Gilman Square, Lowell Street, Ball Square and College Avenue — which are all due to open by 2019; 4.5 miles of light rail track; the relocation of Lechmere station; the reconstruction of bridges along the corridor; and the development of two new buildings, including a vehicle maintenance facility. In total, the project will add approximately 215,000 square feet of new facilities.

Due to the immense impact, the GLX project scope demanded sustainability objectives be established early on, are managed in an organized and meaningful way, and remained transparent so they can be communicated to all project stakeholders — especially the surrounding communities directly affected by the GLX and hold high expectations for the project. As the GLX runs through many neighborhoods, at times in extremely close proximity to homes, it has been critical to implement practices addressing sustainability in every aspect of the project’s design and construction.

“The MBTA has a duty to responsibly design, construct, operate, and manage all aspects of the project to ensure continued community support and deliver a project that not only provides long-term operational benefits to the MBTA, but also showcases the need for sustainable transit and infrastructure projects,” says Mary Ainsley, senior director, design and construction, for MBTA.

“The GLX project provides a vital service to the communities that will help connect and strengthen them,” says Andrew Brennan, director, energy and environment, of the MBTA, who is leading the sustainability charge for the GLX. “Sustainability is one of the key principles of this entire project and is embedded at every decision point.”

The project will be delivered by con-

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*BY AMY GARROD, LEED AP BD+C*
M E T R O

Project teams, including probability workshops with the client and has participated in sustainable teams and reductions, and reduce impact on the environment — it is important sustainability is given equal weight in the decision making process by being a consideration made alongside cost, schedule and impacts to the community."

The GLX’s integrated process is enabled by the melting pot of technical disciplines working together to promote innovation, ease of communication and integrated thinking to bring this project to life.

SUSTAINABILITY FRAMEWORK

The GLX project centered its sustainability framework around the Massachusetts Department of Transportation’s (MassDOT’s) GreenDOT program, which mandates sustainability goals for all MassDOT divisions, including rail and transit, which owns the GLX project. Launched in June 2010, GreenDOT aims to achieve three primary goals:

- Reduce greenhouse gas emissions.
- Promote the healthy transportation options of walking, bicycling and taking public transit.
- Support smart growth development.

By covering seven key sustainability themes — air; energy; land; materials; planning, policy and design; waste and water — the use of GreenDOT enables the project team to structure work in a way that leads to integrating sustainability without being too prescriptive or stifling innovation.

“GreenDOT’s variety in sustainability forces the project team to address issues at all levels of the project and organization while providing a structured way in which to track and report performance,” says Brennan.

As another aspect of the GLX’s sustainability framework, the project adopted a dedicated Division 1 Sustainability Specification as a primary mechanism for ensuring sustainability measures are integrated. This ensures MBTA policies are implemented for sustainable landscaping practices, construction vehicles and equipment as well as construction and demolition waste.

“The GLX project gives the MBTA the opportunity to formalize many ongoing practices that can then be implemented on all MBTA projects going forward,” says Ainsley.

Meeting the GreenDOT indicators also means implementing many U.S. Green Building Council Leadership for Energy and Environmental Design (LEED) sustainability measures, such as green and blue roofs that will be installed as part of the overall stormwater management strategy and construction and demolition waste management goals that require at least 65% of waste to be recycled or salvaged, as well as GreenDOT-specific measures such as the implementation of complete streets concepts; development of a climate change and adaptation strategy; and implementation of internal sustainability practices for the project team’s office environment. Further, the team looked to pursue LEED in other cost-effective, best-value ways that benefited the project and

construction manager/general contractor White Skanska Kiewit, a joint venture team that has participated in sustainability workshops with the client and project teams, including AECOM, HNTB, HDR and Gilbane, to ensure all players are aware of the sustainability drivers for the project. These drivers emphasize the importance of not cutting sustainability measures from the job and to provide the opportunity for developing and implementing sustainable solutions wherever possible.

“The GLX project is a great example of how, in today’s environment, sustainability must no longer be perceived as a separate service, rather it must be a requirement for every solution presented to a client,” said AECOM’s Caroline Downing, GLX design deputy project manager. “Especially when looking at transit projects — which are already an inherently sustainable mode of transportation as they are effective, reduce carbon emissions and energy requirements, and reduce impact on the environment.”

Dedicated Pedal and Park enclosed bicycle storage units (rendering shown) will offer a secure spot for cyclists to lock their bikes, which can be accessed using a Bike Charliecard.
As part of the project the Commonwealth of Massachusetts is committed to designing a community path that runs alongside the GLX corridor (rendering shown).

Additionally, the GLX project is in the early stages of considering the use of the Institute of Sustainable Infrastructure’s Envision rating system. Only two years old, this system is made for projects like the GLX and could be a beneficial system if the MBTA pursues formal certification.

PUBLIC ENGAGEMENT

For a team that is working within constrained spaces, quite literally in people’s back yards, on tight deadlines and under close scrutiny by future users, one of the key success stories of the project is the public engagement program that has allowed for open dialogue between the MBTA, the project team, and surrounding communities to understand key concerns and share solutions.

Public meetings have been, and continue to be, held often, utilizing venues that are easily accessible by public transit to encourage public participation.

“The GLX project is truly the communities’ project,” says Ainsley. “As such, we want to do everything we can to ensure people are given the opportunity to participate and have their voices heard.”

The design team is committed to solving residents’ concerns. Desires such as the communities’ preference for stations to blend in with the surrounding neighborhood in which it is located have been heard and addressed through such meetings, leading to the decision for each station to be unique. Other public opinions, such as potential noise concerns, were met with a series of public meetings to address the specific claim, in this case meetings to address noise walls. All meeting notes and project information are published on the GLX project website, as an example of the project team’s commitment to full transparency.

ACCESSIBILITY

Accessibility is a key focus of the GLX project, since more than 90% of customers will arrive at a station by bicycle, walking or public transit. Accessi-
bility concerns have, therefore, been ingrained into the early stages of the process to reinforce the importance of public input.

Indeed, the notion of what this project gives back to the community, rather than just simply providing a mode of transport, has been an important consideration by the client and the project team. Ultimately, the GLX project aims to provide greater mobility to its users by connecting them with local and regional transit systems to enhance access across the region. This means greater access to jobs, economic growth and sustainable development around the stations.

Further, by reducing the reliance on car use, the MBTA estimates that the GLX project will help reduce regional daily vehicle miles traveled by 25,728 miles, in turn leading to improved air quality and reductions in congestion and contributing to Boston’s greenhouse gas reduction target of 25% by 2020 and 80% by 2050.

As part of the GLX project the Commonwealth of Massachusetts is committed to designing a community path that runs alongside the corridor. Portions of this 1.9-mile path will be integrated as emergency egress, a utility corridor, and accessibility to the stations.

“Our team’s innovative thinking has developed some well-coordinated and well-thought-out solutions that have solved numerous problems or concerns and certainly offer what we believe to be a more sustainable solution,” says AECOM’s Greg Yates, GLX design project manager.

Cyclists play a prominent role in the design of the GLX project, with more than 1,100 bicycle spaces located throughout the seven stations. Dedicated Pedal and Park enclosed bicycle storage units will offer a secure spot for cyclists to lock their bikes, which can be accessed using a Bike Charliecard. Additional bicycle parking will also be provided on the station’s plazas, making cycling to the train a very attractive option.

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