



Board Report

File #: 2024-0799, File Type: Project

Agenda Number: 35.

OPERATIONS, SAFETY, AND CUSTOMER EXPERIENCE COMMITTEE OCTOBER 24, 2024

SUBJECT: RAIL CROSSING GATE OPTIMIZATION DEMONSTRATION PROJECT

ACTION: APPROVE RECOMMENDATION

RECOMMENDATION

AUTHORIZE the Chief Executive Officer to:

- A. AMEND the Fiscal Year (FY) 2025 budget to add \$2,000,000 for the Rail Crossing Gate Optimization Demonstration Project, federally funded by the Strengthening Mobility and Revolutionizing Transportation (SMART) Grant Award; and
- B. EXECUTE agreements and any contracts within the grant amount for the Rail Crossing Gate Optimization Demonstration Project.

ISSUE

In March 2024, the United States Department of Transportation (USDOT) awarded Metro a \$2 million grant to test a wireless crossing gate activation system. Metro executed the grant agreement with USDOT in July 2024 but needs to allocate funds for FY25 for this project. Metro received notice of the award after the budget drafting process had concluded. Approval of these recommendations will allow staff to begin work on the Rail Crossing Gate Optimization Demonstration Project, which will test whether wireless technology can activate at-grade crossing gates on Metro's light rail system.

BACKGROUND

The Strengthening Mobility and Revolutionizing Transportation (SMART) Program provides grants to public sector agencies to conduct demonstration projects that advance smart technologies and systems that improve transportation efficiency and safety. The Bipartisan Infrastructure Law established this discretionary grant program with a \$100 million appropriation annually for FY 2022-2026.

The SMART Program has two stages of funding. Stage One, which Metro received, is open to any eligible entity for the purpose of conducting a demonstration project. The maximum award for Stage One is \$2 million for a project period of 18 months. Stage One grantees can apply to expand their projects through Stage Two grants, which award a maximum of \$15 million for 36 months. Stage Two

grants are intended to fund the implementation of plans or prototypes previously tested during Stage One.

DISCUSSION

Current Crossing Gate Activation System

Crossings on Metro's light rail lines are currently equipped with hardwired track loop circuits that trigger the opening and closing of crossing gates at a fixed point of activation (i.e., when light rail vehicles enter and exit the circuit). The point at which the light rail vehicle enters or exits the track loop circuit, which triggers when the gates open and close, is based on a calculation that assumes the light rail vehicle is traveling at its posted speed for the given area. However, when the light rail vehicle is stopped or traveling slower than its posted speed, crossing gates remain closed for longer than necessary.

A review of data over a six-month period in 2019 concluded that of more than two million gate events, nearly 3,000 instances of downtimes greater than five minutes occurred across Metro's light rail system. Prolonged crossing gate downtimes result in delays that can increase localized congestion and the potential for risky behavior among drivers and pedestrians waiting to cross the train tracks. These delays affect thousands of residents who travel through grade crossings every day, including passengers onboard Metro buses.

Wireless crossing gate systems, such as the one being tested for this project, have been proven to optimize crossing gate activation times on commuter rail, but they have not yet been implemented on a light rail system. The Rail Crossing Gate Optimization Demonstration Project will provide Metro and other transit agencies with a greater understanding of how such a system could improve crossing gate efficiencies.

About the Rail Crossing Gate Optimization Demonstration Project

Metro will use the SMART grant award to test whether a wireless crossing system can trigger the opening and closing of the crossing gate systems safely and reliably at five crossings along the A and E lines. The technology, which Metro would test in a shadow mode with no impact to current operations, would communicate between the crossing activation system and onboard vehicle systems to record the point of gate crossing activation, allowing Metro to compare with activation times using the conventional loop circuit. Rather than a fixed point of activation, as is the current default, this technology would allow for a more dynamic warning system sensitive to the train's speed, position, and direction.

Staff will review log files that record crossing time warning results to determine the viability of this technology. If viable, this wireless technology can bring many benefits to communities that surround Metro's light rail system. These benefits extend beyond drivers and include transit riders, pedestrians, cyclists, and people with disabilities. Optimized gate downtimes can reduce delays, resulting in faster travel times as these groups travel within and around their communities. Due to more efficient traffic circulation, residents adjacent to railroad crossings can benefit from anticipated reductions in greenhouse gas emissions. These positive impacts will compound if this wireless technology is widely implemented, benefitting many Equity Focus Communities (EFCs) that intersect with Metro's

light rail system.

Beyond optimizing gate downtimes, this wireless gate activation system could streamline communication with traffic signals and provide more accurate arrival times, ensuring that trains arrive at intersections within a specified window. This functionality could increase the efficiency and reliability of the light rail system, reduce travel times for passengers, and increase the overall throughput of the transit system.

If this testing phase is successful, staff will apply for a Stage Two grant to expand testing, allow the technology to activate the crossing gates, and collect pre- and post-implementation data to measure the anticipated benefits.

DETERMINATION OF SAFETY IMPACT

Approval of staff recommendations presented in this Board Report will have no immediate negative safety impacts to Metro employees or customers due to the testing occurring in shadow mode.

FINANCIAL IMPACT

The Rail Crossing Gate Optimization Demonstration Project is fully funded by the USDOT SMART Grant Program. The \$2 million grant was awarded specifically for this project.

Since this is a multi-year project, the cost center manager and the Chief Innovation Officer will be accountable for budgeting the cost in future years, based on the executed grant agreement.

Impact to Budget

The FY25 budget will need to be amended in an amount not-to-exceed \$2 million for this project. Funds will be transferred to cost center 2031 (Office of Strategic Innovation) under project number 405701 (P3, UPs, Pilots & Other).

EQUITY PLATFORM

Metro will conduct testing for this project at five at-grade crossings along Metro's A and E lines. Three of the five crossings are in EFCs: Mountain Avenue (Duarte), Degnan Boulevard (Central Los Angeles), and Spring Street (Long Beach). Because this demonstration project will occur in shadow mode (i.e., crossing gates will be activated using the existing setup), there are no negative equity impacts on riders.

If Metro receives a Stage Two grant, staff will work extensively with Community Relations and community based organizations to create and execute an Outreach Plan that ensures surrounding communities understand the project details and can provide feedback.

IMPLEMENTATION OF STRATEGIC PLAN GOALS

The Rail Crossing Gate Optimization Demonstration Project supports the following Strategic Plan

goals:

- Goal 2: Deliver outstanding trip experiences for all users of the transportation system
- Goal 3: Enhance communities and lives through mobility and access to opportunity

If successful, the tested technology can reduce localized congestion, reduce idling vehicles, and lower greenhouse gas emissions. As mentioned above, this wireless technology can contribute to Metro's pursuit of light rail vehicle signal preemption, which would reduce trip times for transit users.

ALTERNATIVES CONSIDERED

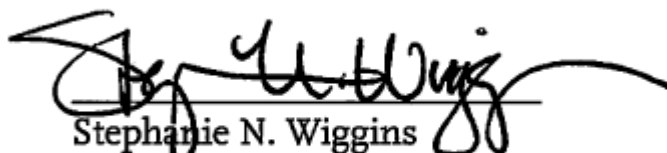
The Board could elect not to approve the staff recommendation. However, this is not recommended as the federal grant has been awarded to Metro, thereby removing the need to use local funds for the demonstration project. Metro would also be excluded from applying for Stage Two of this grant, which has a maximum award amount of \$15 million. If testing in Stage One is successful, Metro would apply for Stage Two funds to conduct additional testing prior to systemwide implementation.

NEXT STEPS

Upon Board approval, staff will begin the project and follow the project milestones and deliverables set forth by USDOT, which include regular progress reports, an Evaluation Plan, a Data Management Plan, and an Implementation Report.

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Chief Executive Officer

Item 35

Rail Crossing Gate Optimization Demonstration Project

October 2024

NO VEHICLES
ON TRACK
Vehiculos
no permitidos
sobre vías



Metro

About this Demonstration Project

USDOT Strengthening Mobility and Revolutionizing Transportation (SMART) Grant Program

- Award amount: \$2 million
- Project period: 18 months (Jul '24-Jan '26)
- Test wireless crossing gate activation system in shadow mode at five locations along A and E lines
- Metro eligible to apply for Stage Two implementation grant (up to \$15 million)

About this Demonstration Project

Challenge with Current Crossing Gate Activation System

- Hardwired circuits trigger crossing gates at fixed point of activation
- Crossing gates can remain closed for longer than necessary due to current configuration
- In 2019, there were nearly 3,000 instances of gate downtimes greater than five minutes on light rail system

About this Demonstration Project

Potential Benefits:

- Optimize crossing gate downtimes
- Reduce delays for all travelers
- Greenhouse gas emissions reductions
- Streamline communication with traffic signals, increasing efficiency and reliability of light rail system (in the long-term)

Staff Recommendation

AUTHORIZE Chief Executive Officer to:

- A. PROGRAM \$2,000,000 of the Strengthening Mobility and Revolutionizing Transportation (SMART) Grant Program award for the Rail Crossing Gate Optimization Demonstration Project, and
- B. EXECUTE agreements and any contracts within the Board Approved project cost for the Rail Crossing Gate Optimization Demonstration Project.