

CORRIDOR CROSSINGS STRATEGY

SAFETY ENHANCEMENT AND
ELIMINATION PROGRAMS REPORT

June 2026 Draft



ACKNOWLEDGMENTS

The Corridor Crossings Strategy and development of the programs was made possible through the collaboration and dedication of:

- Peninsula Corridor Joint Powers Board
- San Francisco County Transportation Authority
- San Francisco Municipal Transportation Agency
- San Mateo County Transportation Authority
- Santa Clara Valley Transportation Authority
- Metropolitan Transportation Commission
- Elected officials and staff from the 20 jurisdictions that Caltrain serves especially members of the Local Policy Maker Group and City/County Staff Coordination Group



TABLE OF CONTENTS

Corridor Crossings Strategy	3
<i>Guiding Principles</i>	3
<i>Background</i>	4
<i>Program Structure</i>	5
• <i>Safety Enhancement Program</i>	5
• <i>Elimination Program</i>	5
<i>Success Story: Broadway Burlingame Crossing</i>	6
<i>Implementation and Oversight</i>	7
<i>Caltrain’s Role</i>	7
<i>Corridor Crossings Sequence List</i>	8
• <i>Scoring Safety Enhancements Projects</i>	8
• <i>Scoring Elimination Projects</i>	8
• <i>Closure Projects</i>	8
<i>Safety Enhancement Program Group Description and Activities</i>	10
<i>Elimination Program Group Description and Activities</i>	11
<i>Moving Forward</i>	12

For more information and technical background on the Corridor Crossings Strategy Programs, and methodologies see the report appendices on the CCS website:

www.caltrain.com/projects/ccs

CORRIDOR CROSSINGS STRATEGY

The Corridor Crossings Strategy (CCS) establishes a framework for sequencing and delivering at-grade crossing safety enhancements and elimination projects along the Caltrain corridor under two programs: the Safety Enhancement Program and the Elimination Program. Guided by shared overarching principles, the CCS Programs are designed to improve safety, mobility and connectivity by reducing conflicts between road and rail traffic through a corridor-wide, sequenced and coordinated approach to funding and delivery of crossing projects. The CCS Programs introduce a new organizational structure and delivery tools to support strategic and transparent planning of corridor investments. The strategy balances cost-effective near-term safety enhancements, large-scale grade separations, and targeted closures. The CCS establishes the Corridor Crossings Sequence List (Sequence List) which will guide resource allocation, planning of funding and delivery for both programs.

This Report documents the foundational components needed for the successful implementation of the Corridor Crossings Strategy: Guiding Principles, Program Structure, Implementation and Oversight, and development and purpose of the Sequence List as well as Caltrain's proposed role in funding activities and implementation of both programs.

Guiding Principles



Safe and Access First

Advance a safer, more connected corridor for all people who live, work, and travel along the Caltrain corridor.



One Corridor, Shared Approach

Align Caltrain, cities, and transportation partners around a common framework for planning, prioritizing, and delivering crossing projects collaboratively to generate safety, mobility, environment and community benefits.



Visible Local Benefits

Prioritize improvements that enhance crossing safety, improve neighborhood connectivity and mobility, and create more accessible and welcoming communities.



Strategic, Transparent Investments

Apply a data-informed, corridor-wide approach to direct limited funding toward projects on the sequenced list.



Accountable Implementation

Provide structured program oversight that promotes alignment, consistency, and accountability for measurable outcomes.

Background

The CCS was identified as part of the Caltrain Business Plan as an effort necessary to enhance the grade separation process and develop corridor-wide alignment on how to fund and deliver crossing improvements (at-grade and grade separations). There are 71 at-grade crossings on the corridor Caltrain serves, including 43 on Caltrain-owned 51-mile corridor and 28 at-grade crossings on the 26 miles the Union Pacific Railroad owns. The entire corridor counts around 20 grade-separation projects in active conversations (see **Appendices**). These projects currently compete for limited funding, resources, and construction windows on an active, electrified railroad, making it difficult for grade separation project goals to realize.

Caltrain recognizes grade separations as essential to enhancing public safety, enabling multimodal transportation, supporting regional mobility, and accommodating future service expansion. As a result of extensive analysis and corridor partner engagement between Caltrain, transportation authorities, corridor jurisdictions and other key corridor partners, the CCS establishes the Safety Enhancement Program and Elimination Program.

Figure 1: Caltrain Corridor Crossings



Figure 2: Union Pacific Railroad Corridor Crossings



Program Structure

Safety Enhancement Program

A corridor-wide approach to identify, prioritize, and deliver near-term at-grade crossing safety improvements in a coordinated and integrated manner to advance community benefits. Individual project timelines will vary depending on the scope of crossing-specific design, permitting, and construction efforts. Potential improvements may include signage, striping, warning devices, channelization, pedestrian treatments, and other targeted safety measures.

Enhancement Types

★ **Baseline Safety Enhancements:** With an average cost ranging below \$1M* per crossing, the baseline safety enhancements represent quick build upgrades that can improve conditions at crossings in less than a year from start to finish. This set of improvements will be implemented together at all crossings in the next few years upon funding availability.

-  Pavement Markings/Signage/Hatching
-  Solar Lane Markers
-  Delineators
-  Coordination with City for Traffic Timing Adjustments

★ **Advanced Safety Enhancements:** The next Grade Crossing Hazard Analysis will determine which advanced safety enhancement types need to be implemented at each location based on the hazards that require specific mitigation measures. Therefore, the array of advanced safety enhancements will be applied individually or combined on a crossings-by-crossing basis. When combined, these improvements cost in average between \$1M and \$6M* per crossing and take up to two years to be implemented.

-  Fencing
-  Quad Gates
-  Drainage Improvements
-  Concrete Work
-  Lighting Warning
-  Median Installation/Roadway Channelization
-  Gates and Gate Warning Signals
-  Intrusion Detection & Monitoring

**Based on 2025 cost estimates and subject to change.*

Note: While Caltrain does not have delivery authority on UPRR-owned right-of-way, Caltrain supports crossings in cities along this section of the right-of-way in receiving Safety Enhancements. Caltrain is committed to partnering with cities, VTA and UPRR on developing a path forward for implementation.

Elimination Program

A corridor-wide approach to advance crossing elimination projects—including closures and grade separations—through an integrated project development and delivery framework. This program would support the phased implementation of projects across the corridor. Given the complexity, cost, and coordination required for crossing elimination efforts, project delivery would occur over the near, medium, and long term.



Closures: Closures are where the road is closed on both sides of the railroad. These projects may include bicycle and pedestrian access to accommodate active transportation routes. A closure project costs between \$6M and \$15M on average, in 2025 dollars.



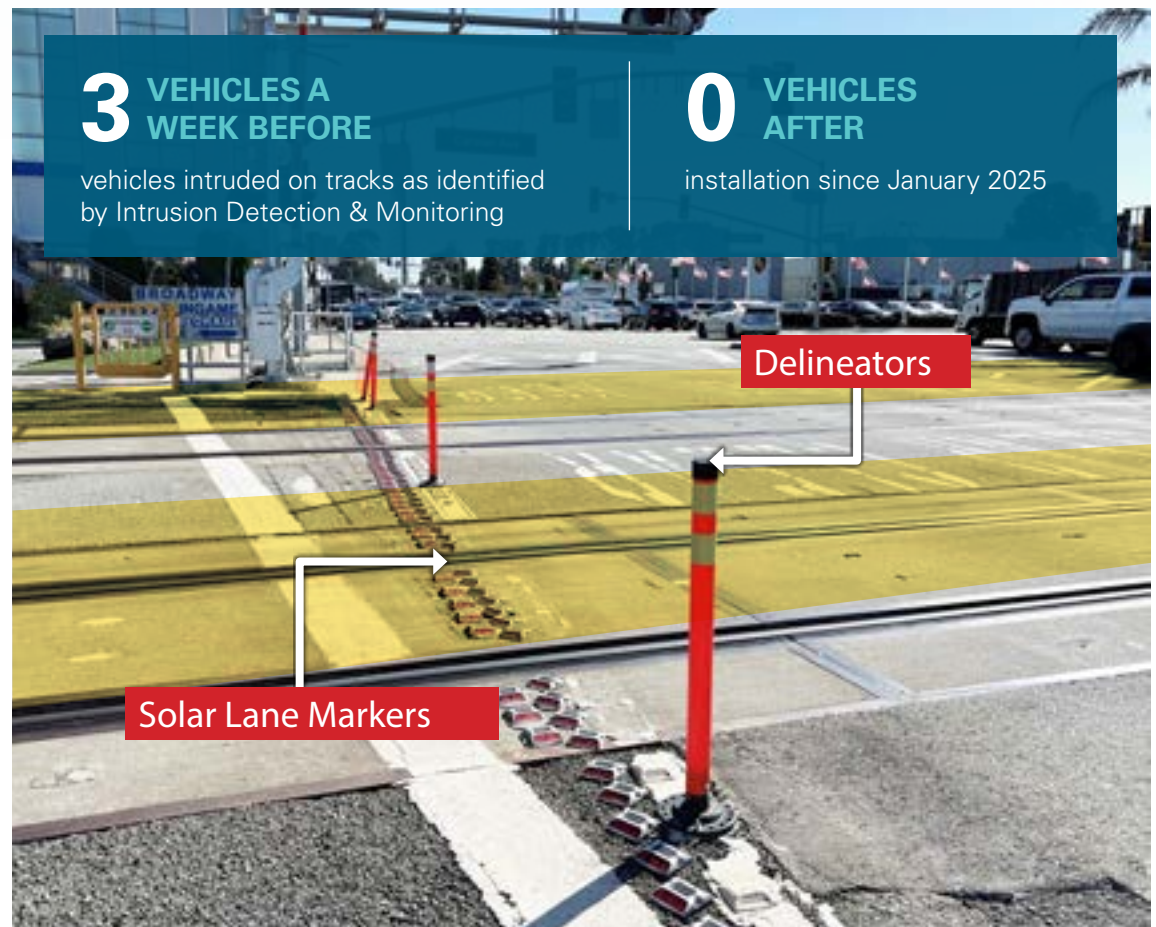
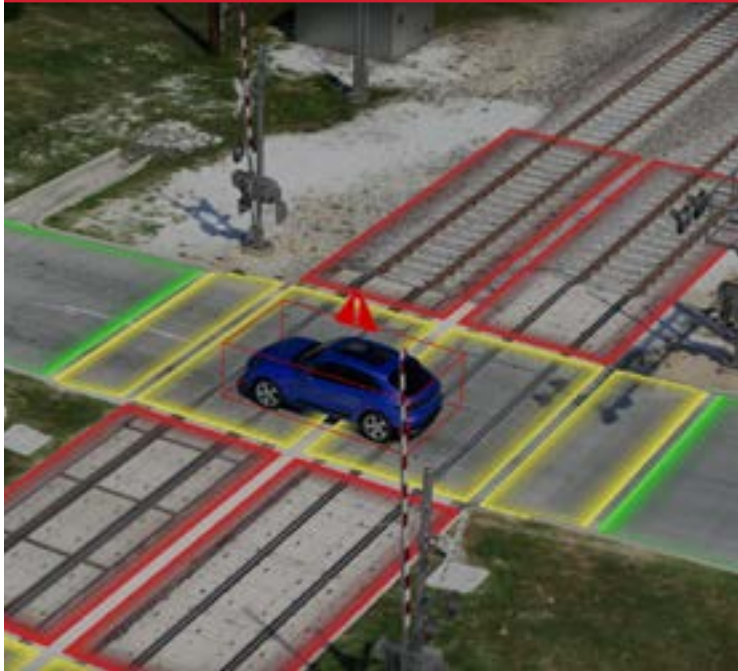
Grade Separations: Grade-separation projects eliminate conflict between the roadway and the railroad by having the roadway cross above or below the railroad. This category of projects includes new grade-separated bike and pedestrian crossings. Grade-separation projects cost range from \$100M in average for a new bike and pedestrian crossing to more than \$500M for a vehicular grade-separation project.

Success Story: Broadway Burlingame Crossing

In early 2025, Caltrain installed solar lane markers, delineators and a pilot Intrusion Detection & Monitoring system at Broadway in Burlingame in conjunction with the city adjusting adjacent traffic signal timing. The crossing monitoring system, enabled by the CCTV cameras that were installed, showed that the solar lane markers and delineators installed at the crossing resulted in a reduction of vehicle intrusions on the track. Caltrain and the City of Burlingame used the CCTV cameras to identify excessive queuing and as a result, modify traffic signal pre-emption times. These traffic signal timing adjustments allowed for more effective clearance of vehicle queuing on and around the railroad tracks and traffic control. As such, solar lane markers, delineators, and traffic signal modification have been included in the suite of baseline safety enhancements for all crossings. In addition to the physical improvements installed (illustrated below), Caltrain worked with GPS navigation companies to enhance audio and visual cues at the crossing to guide drivers to go past train tracks before turning.



Caltrain is deploying **Intrusion Detection & Monitoring** learning software that uses a combination of LiDAR and cameras to observe crossings and send alerts to operations about potential hazards to mitigate collisions.



Implementation and Oversight

The CCS programs will be implemented by integrated, cross-functional teams that standardize designs, reduce redundancies, leverage economies of scale, and pursue innovative delivery methods that streamline construction and minimize service disruptions. This integrated structure enables faster, more consistent, and more cost-effective project delivery across the corridor. Caltrain is designating dedicated Caltrain in-house program directors to lead each program.

Oversight of the two programs will be strengthened both internally and externally. Internally, Caltrain is establishing the **CCS Executive Steering Committee**, composed of all Department Chiefs, to ensure programmatic policy and funding issues are addressed at the corridor-wide level.

Externally, the **Corridor Crossings Leadership Group** composed of executives from Caltrain, corridor cities, and transportation authorities, will ensure transparency and shared accountability of programmatic policy and funding decisions.

Boards and Councils of Caltrain, transportation authorities, and corridor jurisdictions will retain their individual decision-making authority and guide staff on transparency and accountability.

Additionally, each elimination project will benefit from a **Change Management Committee** gathering representatives from the relevant corridor partners to approve changes to a project that have significant impacts on project cost, schedule and outcome.

The CCS represents a step-change for the corridor—bringing partners into one coordinated system to more efficiently deliver safety and community benefits improvements.

Caltrain's Role

- ★ **Closure:** Caltrain will lead delivery of closure projects in partnership with corridor jurisdictions.
- ★ **Safety Enhancement Program:** Caltrain will lead delivery of all safety enhancement projects and the development of the funding strategy to support delivery in partnership with corridor jurisdictions. Caltrain will administer awarded funds.
- ★ **Elimination Program:** Caltrain will take a leadership role in grade-separation and bike/ped crossing projects implementation as early as possible but after the city has performed their initiation phase. Caltrain will support the city while it leads the initiation phase of the project – including partnering on alternative analysis when applicable. Caltrain will organize - with corridor partners - the corridor funding strategy, sequencing, and advocacy. Caltrain will coordinate with partners, develop competitive grant applications and administer awarded funds where feasible.

Roles and responsibilities may be adjusted through a different integrated project delivery approach based on the specific project, funding structure, and agreements with corridor cities and partner agencies.

Corridor Crossings Sequence List

The Corridor Crossings Sequence List will guide funding strategy and delivery planning for both safety enhancement and crossing elimination programs. **The roadmap will be informed by objective, data-driven criteria, while retaining flexibility to respond to Notices of Funding Opportunity and to advance projects with the strongest combination of readiness, competitiveness, and likelihood of securing funding.** Caltrain and corridor partners will seek a consensus-based approach to corridor funding priorities whenever practicable.

The sequence list is the result of a scoring process. This process assigns a score to each advanced safety enhancement and grade-separation project based on data-driven criteria **developed through corridor partners engagement. Projects are then assigned to a funding group in the Corridor Crossings Sequence List, based on their score.** This process helps guide the corridor's funding priorities for both programs. It ensures that resources and investments are directed toward the most critical and funding-ready projects, promoting strategic decision making and effective use of staff time.

The sequencing process criteria and methodology are described below. They differ between enhancement and elimination projects to reflect their distinct objectives and project maturity.

The sequence list complements Caltrain's Capital Improvement Plan (CIP) by providing an updated and prioritized roadmap of crossing projects.

Scoring Safety Enhancements Projects

Advanced safety enhancement projects are scored based on safety needs, using criteria such as the number of fatal rail incidents, fatal/severe street incidents, and the ratio of total street incidents to average daily traffic. The crossings are then sorted into four funding groups (1 through 4), based on their scores. Baseline safety enhancement projects are not scored and will be deployed across all Caltrain crossings upon funding availability.

Scoring Elimination Projects

Elimination projects are given a score between 0 and 23 based on evaluation criteria that assess each project against broader corridor objectives: Safe and Equitable Mobility, Equitable Community Benefits, Cost Efficiencies and Reliable Funding, Implementable Program, and Maximize Rail Corridor Utility. Elimination projects are then sorted into four funding groups (A, B, C and D) based on their scores. Group A includes projects that score 12 or higher.

Closure Projects

Caltrain is committed to prioritizing closures over safety enhancement and other elimination projects as they provide the most safety benefits for the lowest project cost and are amongst the fastest projects to implement. Therefore, closure projects are not scored.

Appendix B describes the methodology and scoring for sequencing the safety enhancement program and **Appendix C** does the same for the elimination program.

Table A: Safety Enhancement and Elimination (Closure & Grade Separations) Program Sequence List

City	Crossing	Safety Enhancement Program		Elimination Program Group	City	Crossing	Safety Enhancement Program		Elimination Program Group
		Baseline	Advanced Group				Baseline	Advanced Group	
San Francisco	Mission Bay Drive	+	1	C	Atherton	Fair Oaks Lane	+	4	--
	16th Street	+	2	C		Watkins Avenue	+	No advanced enhancements proposed.	
South San Francisco	Linden Avenue	+	4	B	Menlo Park	Encinal Avenue	+	4	D
San Bruno	Scott Street	+	1	B		Glenwood Avenue	+	4	D
Millbrae	Center Street	+	4	--		Oak Grove Avenue	+	3	D
	Santa Paula Ped Crossing	+	4	--		Ravenswood Avenue	+	4	D
Burlingame	Broadway	+	1	A		Middle Avenue Bike/ Ped Undercrossing	No existing At-Grade Crossing		B
	Morrell Avenue Pedestrian Crossing	+	No advanced enhancements proposed.		Palo Alto	Palo Alto Avenue	+	4	D
	Oak Grove Avenue	+	4	--		Churchill Avenue	+	1	B
	North Lane	+	2	--		East Meadow Drive	+	1	B
	Howard Avenue	+	4	--		Charleston Road	+	2	B
	Bayswater Avenue	+	3	--		South Palo Alto Bike/ Ped Crossing	No existing At-Grade Crossing		D
	Peninsula Avenue	+	4	--	Mountain View	Rengstorff Avenue	+	1	A
San Mateo	Villa Terrace	Closure				Castro Street	Closure		
	Bellevue Avenue	Closure			Sunnyvale	Bernardo Avenue Undercrossing	No existing At-Grade Crossing		B
	1st Avenue	+	4	D		Mary Avenue	+	3	C
	2nd Avenue	+	4	D		Sunnyvale Avenue	+	4	C
	3rd Avenue	+	4	D	Santa Clara	Benton Street and Brokaw Road Grade Separation	No existing At-Grade Crossing		D
	4th Avenue	+	4	D		San Jose	Auzerais Avenue	+	4
	5th Avenue	+	4	D	Virginia Street		+	4	D
	9th Avenue	+	4	D	Morgan Hill	Morgan Hill Station Undercrossing	Caltrain supports safety enhancements implementation on UPRR-owned corridor.		D
Redwood City	Whipple Avenue	+	3	C		Dunne Avenue			D
	Brewster Avenue	+	1	C		Tennant Avenue			D
	Broadway/ Marshall Street	+	3	C					
	Maple Street	+	4	C					
	Main Street	+	1	C					
	Chestnut Street	+	4	C					

Safety Enhancement Program Group Description and Activities

Table B below provides examples of activities Caltrain will perform that are specific to each advanced safety enhancement group.

Table B: Safety Enhancement Program Group Description and Activities

Funding Group	Near-Term Objective	Funding Activities	Implementation Activities
Baseline safety enhancements will be deployed across all Caltrain crossings.			
Group 1	Design and construct safety enhancements to address highest priority safety crossings.	<ul style="list-style-type: none"> • Caltrain will collaborate with corridor partners to identify funding sources and funding opportunities. • Caltrain will complete GO-88B applications and CPUC coordination/approvals. 	<ul style="list-style-type: none"> • Caltrain will design and construct safety enhancements.
Group 2	Advance design of safety enhancements to address next highest priority safety crossings.	<ul style="list-style-type: none"> • Caltrain will collaborate with corridor partners to identify funding sources and funding opportunities. • Caltrain will complete GO-88B applications and CPUC coordination/approvals. 	<ul style="list-style-type: none"> • Caltrain will collect and monitor annual safety trends. • Caltrain will design safety enhancements. • When possible, Caltrain will advance Group 2 projects into construction when Group 1 is constructed, and funding is secured.
Group 3	Monitor annual safety trends for crossings with low safety indicators.	<ul style="list-style-type: none"> • Caltrain will identify and track future funding opportunities. 	<ul style="list-style-type: none"> • Caltrain will collect and monitor annual safety trends. • When possible, Caltrain will advance Group 3 projects into design when Group 2 advances and funding is secured.
Group 4	Monitor annual safety trends for crossings with lowest safety indicators.	<ul style="list-style-type: none"> • Caltrain will identify and track future funding opportunities. 	<ul style="list-style-type: none"> • Caltrain will collect and monitor annual safety trends.

Elimination Program Group Description and Activities

Table C below outlines specific objectives and provides examples of actions Caltrain will perform for each elimination group. Activities may be adjusted based on the specific project needs, funding availability, and agreements with corridor cities and partner agencies. Caltrain always requires an agreement to participate in elimination project advancement.

Table C: Elimination Program Group Description and Activities

Funding Group	Near-Term Objective	Funding Activities	Implementation Activities
Group A	Advance projects through construction.	<ul style="list-style-type: none"> • Caltrain will lead grant application and administration of construction funds. • Caltrain will lead project funding strategy and advocacy with Corridor Partners. Caltrain will coordinate with corridor partners to apply for funds for construction. 	<ul style="list-style-type: none"> • Caltrain will be the lead implementation agency from design through construction and project closeout. • Caltrain, the City and TA will enter into an agreement that defines roles and responsibilities for all phases of project delivery. The agreement will also address roles and responsibilities for maintaining the new and/or modified assets. • Caltrain will lead and manage preconstruction work, advance design to be shovel ready. • Caltrain will lead construction planning and track access workshops with Rail Operations and define project construction work windows and access constraints. • Caltrain will manage early work activities (i.e., construction packages, utilities relocation and right-of-way acquisitions). • When CMGC is selected, Caltrain will perform a cost estimate update at 65% design and negotiate with CMGC for Construction Guarantee Maximum Price (GMP) when project closes final design.
Group B	Advance projects through final design.	<ul style="list-style-type: none"> • Caltrain will collaborate with corridor partners to identify and apply for funds to complete design. • Caltrain will lead administration of grants if it has a relationship with the funding entity and if Caltrain is an eligible recipient. 	<ul style="list-style-type: none"> • Caltrain will be the lead implementation agency. • Caltrain will manage the Designer, finalize preferred alternative and complete value engineering to advance design. • Caltrain will lead the environmental clearance process (CEQA and NEPA). • Caltrain will identify early work activities (utilities relocation and right-of-way acquisitions). • Caltrain will perform construction and project cost estimate at 35% design and 65% design. • Caltrain will lead constructability workshop with the Designer and Rail Operations. • Caltrain will perform risk-based alternative delivery workshop and recommend preferred delivery method.

Funding Group	Near-Term Objective	Funding Activities	Implementation Activities
Group C	Advance through preliminary engineering and environmental clearance.	<ul style="list-style-type: none"> • Caltrain will support funding applications for design funds. • Caltrain will support funding applications that do not compete with Groups A and B projects. • Caltrain will lead administration of grants if it has a relationship with the funding entity and if Caltrain is an eligible recipient. 	<ul style="list-style-type: none"> • Caltrain will be the lead implementation agency. • Caltrain will work with corridor partners to define scope of project. • Caltrain will work with city and manage concept design and develop design alternatives for more cost-effective solutions given constrained funding environment.
Group D	Advise project to explore viable and feasible alternative solutions.	<ul style="list-style-type: none"> • Caltrain will support funding application for planning funds. • Caltrain will support funding applications that do not compete with Groups A-C projects. • Caltrain will lead administration of grants if it has a relationship with the funding entity and if Caltrain is an eligible recipient. 	<ul style="list-style-type: none"> • Caltrain will take a leadership role at the beginning of conceptual design, after the city has performed the initiation phase of the project. • Caltrain and the City will enter into an agreement that defines roles and responsibilities for the entire pre-construction project delivery cycle. The agreement will also address the funding strategy for the project. • Caltrain will partner with the city while it performs the initiation phase.

Moving Forward

As stewards of the Corridor Crossings Strategy, Caltrain Board and staff will continue to focus their actions on facilitating the corridor-wide, coordinated and sequenced approach to the CCS programs implementation, building alignment with corridor partners, seeking resources and activating partnerships.

The following Caltrain Board and staff actions will be key to the CCS operationalization:

- ✓ **Sequence List Update and Annual Board Ratification:** Staff will update the list throughout the year to reflect the most recent data on safety, mobility and equity, actual project progress, project readiness, and emerging funding opportunities, and will present the revised list to the Caltrain Board annually for ratification.
- ✓ **Progress Updates:** Staff will provide frequent updates, up to every quarter, on near-term project progress, as well as program-level updates, to the Board, relevant Board committees, transportation agencies, city managers, and the Local Policy Maker Group.
- ✓ **Corridor Crossings Delivery Guide Update:** Once the CCS Programs implementation is well underway, staff will reflect relevant changes into the Delivery Guide.
- ✓ **Funding Strategy and Advocacy:** Staff will continue to build out the important venues for corridor partners to speak with one corridor voice, and work with corridor partners on developing funding strategies and advocacy plans to close funding gaps.

More information and CCS documentation are available on the CCS website: www.caltrain.com/projects/ccs

Caltrain

← Buses

Transit Connections

Bike Station

