Corridor Crossings

STRATEGY

LPMG Presentation

1.26.2023

AGENDA

- Program Refresher
- Baseline Conditions Refresher
- Case Study Summary
- Look Ahead

Meeting Goals and Outcomes

Feedback and input on program aspirations

Feedback on case study content

This icon represents additional information provided in the Appendix for your reference.

This icon represents feedback is requested on content. However, questions and feedback are encouraged throughout presentation.

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Program *Refresher*

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What is the Corridor Crossing Strategy (CCS)?

- A stakeholder engaged process that seeks consensus on a shared vision and a corridor-wide, programmatic approach for the following:
  - ✓Organization
  - ✓Delivery
  - ✓Funding
  - ✓Implementation of grade separations and closures
- Identifies how grade separations and closures fit into the future of the Caltrain and UPRR corridor
- ***Note: Active grade separation projects will continue in parallel***

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Outcomes

Project Delivery Opportunities

Communicate roles, responsibilities, processes, and standards for individual projects.

Outcome: *Crossings Delivery Guide*

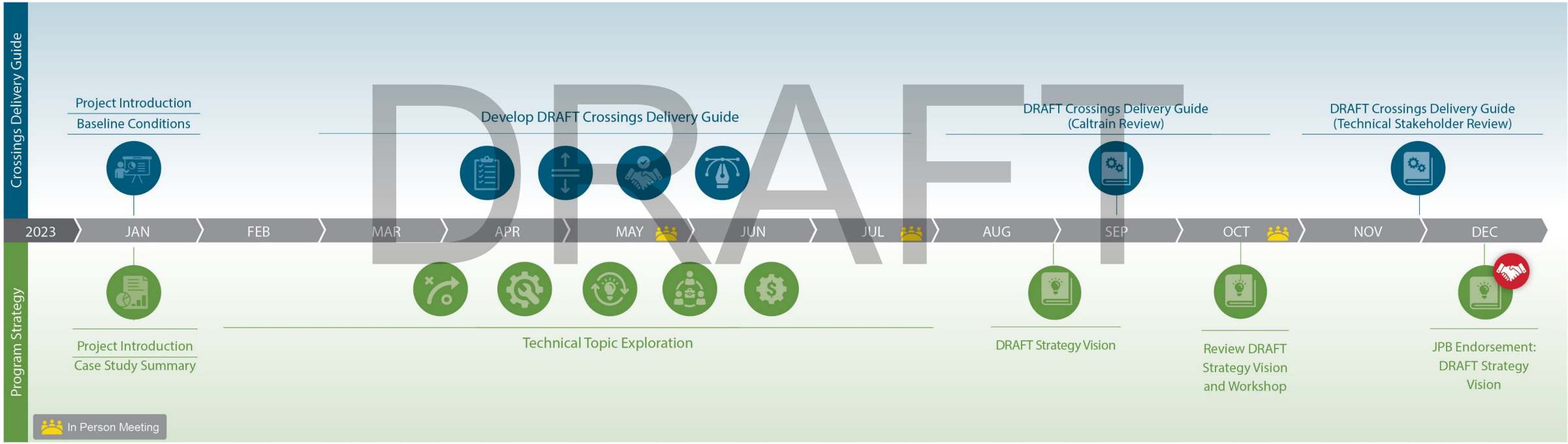
Program Strategy Development

Develop a shared, corridor vision with an incremental and implementable approach for regional benefits resulting in broader funding opportunities.

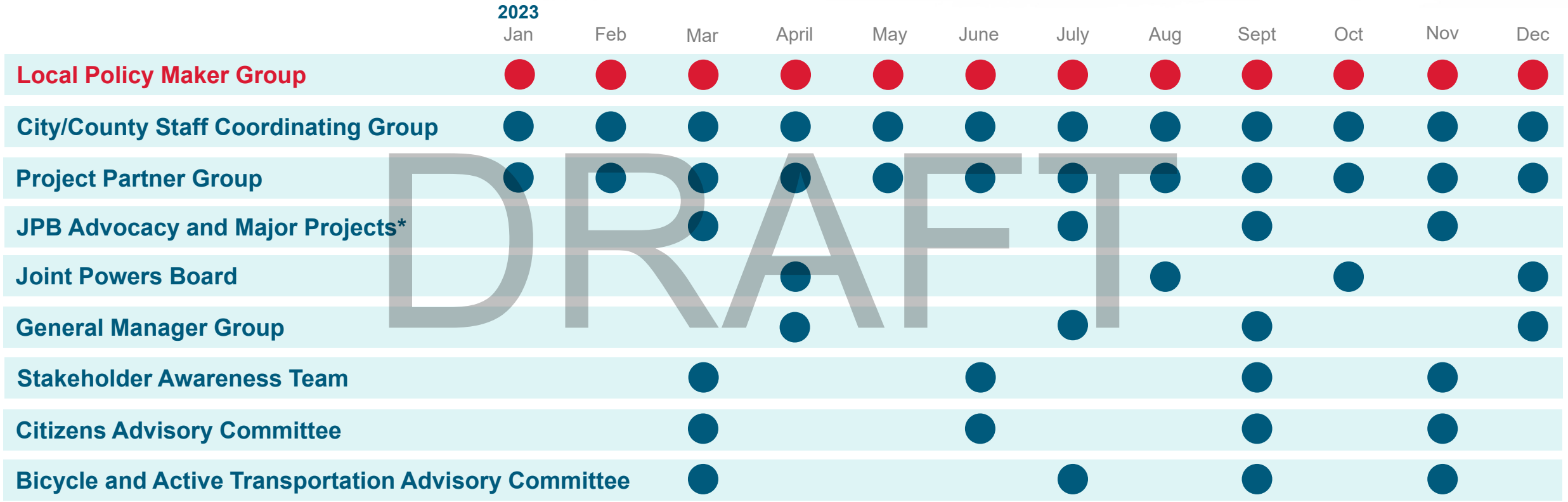
Balance vision with implementable action plan

Outcome: *Program Vision and Strategy*

Timeline


Crossings Delivery Guide
Project Introduction
Baseline Conditions
Develop DRAFT Crossings Delivery Guide
DRAFT Crossings Delivery Guide
(Caltrain Review)
DRAFT Crossings Delivery Guide
(Technical Stakeholder Review)
2023
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Program Strategy
Project Introduction
Case Study Summary
Technical Topic Exploration
DRAFT Strategy Vision
Review DRAFT
Strategy Vision
and Workshop
JPB Endorsement:
DRAFT Strategy
Vision
In Person Meeting
DRAFT

Phase I Engagement Schedule



*JPB Subcommittee

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Baseline Conditions *Refresher*

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Baseline Conditions

- **Current (2022) At-Grade Crossings**
  - ✓ 43 crossings on Caltrain corridor
    - 41 vehicular
    - 2 pedestrian
  - ✓ 28 crossings on Union Pacific Railroad (UPRR) corridor
- **In peak traffic, 4 Caltrain trains currently run per hour in each direction (2022)**
- **Currently implemented on project-by-project basis and funding is largely first come, first serve**
- **Cities are responsible for project identification, inception, and funding**

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Active Projects

- **14 active grade separation, closure, and undercrossing projects *(displayed in table)***

  *Castro Street: Crossing Closure and Construction of New Bike/Ped Undercrossing

  **Middle Avenue: New Bike/Ped Only Undercrossing

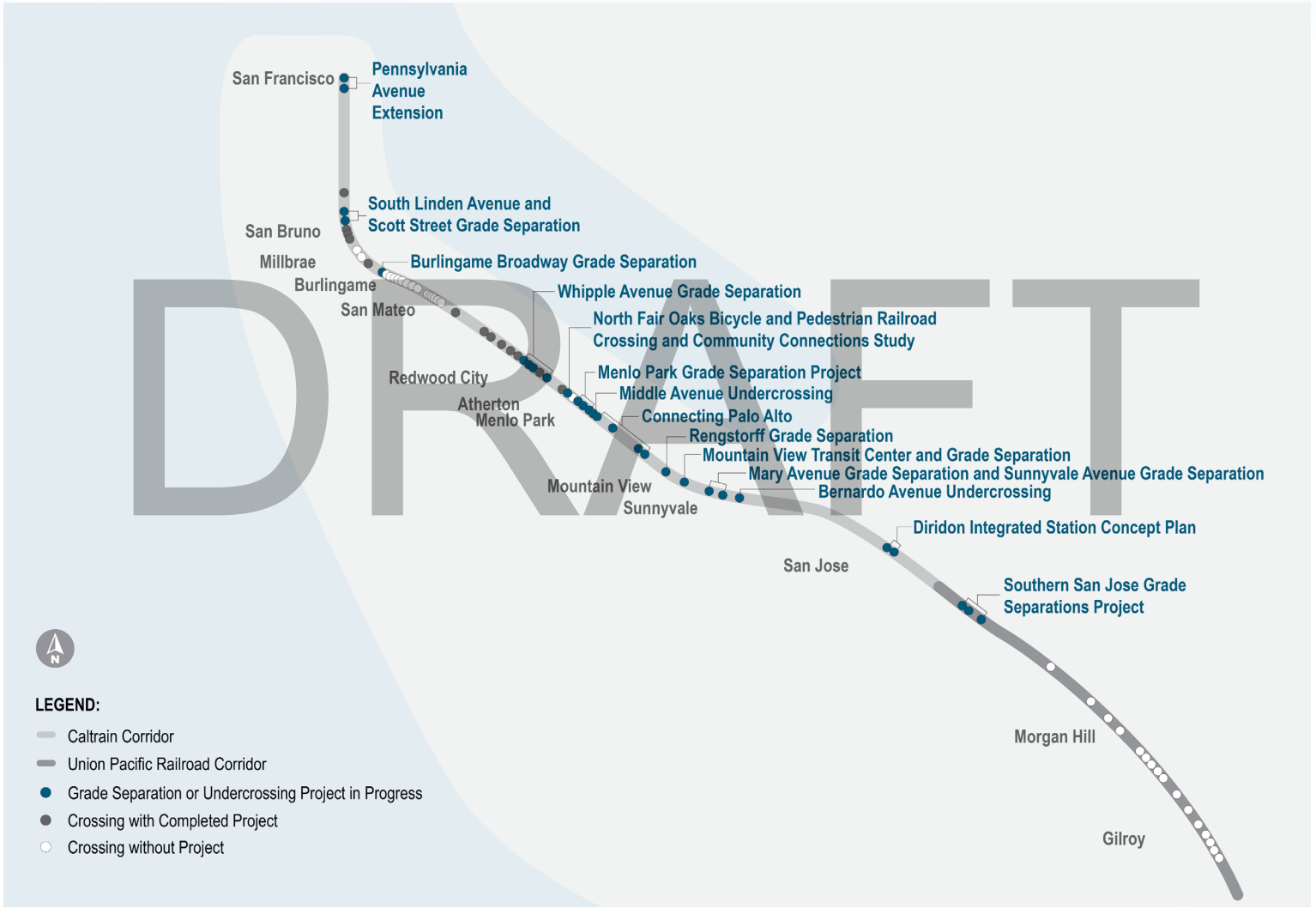
  **Bernardo Avenue: New Bike/Ped Only Undercrossing

- **3 active at-grade crossing projects**
- **8 completed grade separation projects**

COUNTY	PROJECT NAME	CROSSING STREET	PROJECT STAGE		
			PLANNING	ENVIRO.	DESIGN
San Francisco	Pennsylvania Avenue Extension	• Mission Bay Dr • 16th St At 7th	✓		
San Mateo	South Linden Avenue and Scott Street Grade Separation	• S Linden Ave • Scott St			✓
	Burlingame Broadway Grade Separation	• Broadway			✓
	Whipple Avenue Grade Separation	• Whipple Ave • Brewster Ave • Broadway • Maple St • Main St • Chestnut St	✓		
	North Fair Oaks Bicycle and Pedestrian Railroad Crossing and Community Connections Study	• 5th Avenue	✓		
	Menlo Park Grade Separation Project	• Encinal Ave • Glenwood Ave • Oak Grove Ave • Ravenswood Ave	✓		
	Middle Avenue Undercrossing**	• Middle Ave			✓
Santa Clara	Connecting Palo Alto	• Palo Alto Ave • Churchill Ave • Meadow Dr • Charleston Rd	✓		
	Rengstorff Grade Separation	• Rengstorff Ave			✓
	Mountain View Transit Center and Grade Separation*	• Castro St			✓
	Mary Avenue Grade Separation	• N Mary Ave	✓		
	Sunnyvale Avenue Grade Separation	• N Sunnyvale Ave	✓		
	Bernardo Avenue Undercrossing**	• Bernardo Ave	✓		
	Diridon Integrated Station Concept Plan	• Auzerais Ave • West Virgina St	✓		
	Southern San José Grade Separations Project	• Skyway Dr • Branham Ln • Chynoweth Ave	✓		

*Crossing Closure and Construct Bike/Ped Only Crossings **Bike/Ped Only Crossings

Active Grade Separation/Closure Projects



Active Grade Separation Projects - *San Francisco County*

City	Project Name	Crossing Street	Description	Stage	Estimated Completion*
San Francisco	Pennsylvania Avenue Extension	Mission Bay Dr 16th St At 7th	Study of potential tunnel alignments to remove existing rail crossings at Mission Bay Drive & 16th Street.	**Planning**	Initiation Study – July 2022 Design & Construction – 12-15 Years

**Note: The estimated completion is subject to procurement of funds.*

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Active Grade Separation Projects - *San Mateo County*

City	Project Name	Crossing Street	Description	Stage	Estimated Completion*
South San Francisco and San Bruno	South Linden Avenue and Scott Street Grade Separation	S Linden Ave Scott St	Studying the creation of grade separations at the railroad crossings at South Linden Avenue in South San Francisco and Scott Street in San Bruno.	**Design**	Design – April 2027 Construction – June 2031 Closeout – Jan. 2032
Burlingame	Burlingame Broadway Grade Separation	Broadway	Caltrain in cooperation with the City of Burlingame, is separating the train tracks from the road at Broadway. A new Broadway Station with updated amenities will also be constructed.	**Design**	Design – Jan. 2024 Construction – April 2028 Closeout – Dec. 2028
Redwood City	Whipple Avenue Grade Separation	Whipple Ave Brewster Ave Broadway Maple St Main St Chestnut St	Studying the feasibility of separating all existing at-grade crossings in Redwood City.	**Planning**	Final Conceptual Study – Sept. 2022 Construction – 8-10 years
San Mateo	North Fair Oaks Bicycle and Pedestrian Railroad Crossing and Community Connections Study	5th Avenue	Exploring alternatives for a new grade separated pedestrian and bicycle crossing between 5th Avenue, and potential bicycle and pedestrian improvements on local streets.	**Planning**	Planning – March 2024
Menlo Park	Menlo Park Grade Separation Project	Encinal Ave Glenwood Ave Oak Grove Ave Ravenswood Ave	Evaluating the engineering feasibility of replacing the existing at-grade crossings of the railway by building grade separations.	**Planning**	Design – Dec. 2026 Construction – Nov. 2029 Closeout – Aug. 2030
Menlo Park	Middle Avenue Undercrossing	Middle Ave	Construction of a grade separated pedestrian and bicycle rail crossing under the railway.	**Design**	Design – June 2023 Construction – Sept. 2027

**Note: The estimated completion is subject to procurement of funds.*

Active Grade Separation Projects - *Santa Clara County*

City	Project Name	Crossing Street	Description	Stage	Estimated Completion*
Palo Alto	Connecting Palo Alto	Palo Alto Ave Churchill Ave	Evaluating alternatives for a preferred rail grade separation.	Planning	On Hold
Palo Alto	Connecting Palo Alto	Meadow Dr Charleston Rd	Evaluating alternatives for a preferred rail grade separation.	Planning	Final Conceptual Study – Summer 2023
Mountain View	Rengstorff Grade Separation	Rengstorff Ave	Proposal to depress the intersection of Rengstorff Avenue and Central Expressway to separate the train from vehicle, pedestrian and bicycle traffic on Rengstorff Avenue.	Design	Design – June. 2025 Construction – Feb. 2028
Mountain View	Mountain View Transit Center and Grade Separation	Castro St	Project includes a new ramp to redistribute traffic to Shoreline Blvd, closure of rail crossing, construct pedestrian undercrossings, and expand Caltrain Platforms	Design	Design – July 2024 Construction – Dec. 2026
Sunnyvale	Mary Avenue Grade Separation	N Mary Ave	Project to lower the roadway and create an undercrossing at Mary Avenue to go beneath the Caltrain tracks.	Planning	Environmental – 2024 Design – 2026 Construction – 2028 Closeout – 2029
Sunnyvale	Sunnyvale Avenue Grade Separation	N Sunnyvale Ave	Project to lower the roadway and create an undercrossing at Sunnyvale Avenue to go beneath the Caltrain tracks.	Planning	TBD
Sunnyvale	Bernardo Avenue Undercrossing	Bernardo Ave	Project to provide a separated pedestrian and bicycle pathway. beneath the Caltrain railroad tracks and Central Expressway.	Planning	Environmental – 2023 Design – 2025 Construction – 2028
San José	Diridon Integrated Station Concept Plan	Auzerais Ave West Virginia St	Effort to plan for the expansion and redesign of San José Diridon Station, and its integration with the surrounding community.	Planning	TBD
San José	Southern San José Grade Separations Project	Skyway Dr Branham Ln Chynoweth Ave	Preliminary engineering, design, and environmental review for grade separations between the rail line and road.	Planning	Planning – Dec. 2023 Design – Nov. 2024 Construction - TBD

**Note: The estimated completion is subject to procurement of funds.*

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Active Grade Separation Projects

Feedback and input on active projects

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Case Study
Summary

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Case Studies

GOAL

Understand how other agencies have approached grade separation projects/programs and to identify the possibilities

Peer Agencies include:

METRO LINK

ALAMEDA CORRIDOR-EAST ACE PROJECT

LEVEL CROSSING REMOVAL PROJECT

MTA Long Island Rail Road

Elements of exploration for each case study include:

- Delivery approach
- Organizational model
- Prioritization and responsibility
- Funding types

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Metrolink

- Public transportation system operated by Southern California Regional Rail Authority (SCRRA)
  - > *5 member-county transportation authorities*
- SCRRA is a joint powers authority created in 1991 to plan, design, construct, maintain, and administer the operation of Metrolink regional commuter rail service.

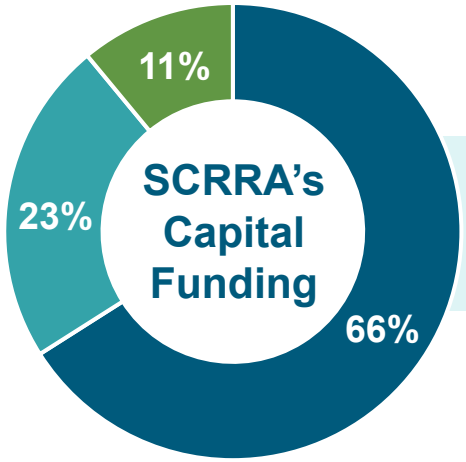
457
Crossings

407
Miles of Tracks

250,000
Weekday Riders

Metrolink System Map

Metrolink



Majority of state funds come from Section 190 Program, funding highway agencies to separate and/or public highway-rail grade crossings.

State | Federal | Local

- Individual projects addressed on case-by-case basis as initiated by the local jurisdictions
- County's transportation authority owns ROW and implements projects to completion
- No established prioritization framework for addressing grade separation projects

Sand Canyon Avenue Grade Separation – Irvine, CA

Alameda Corridor East Project

- Established by San Gabriel Valley Council of Governments (SGVCOG) in 1998 as a single-purpose construction authority to implement a construction program intended to **mitigate vehicle delays and collisions at rail-highway crossings**.

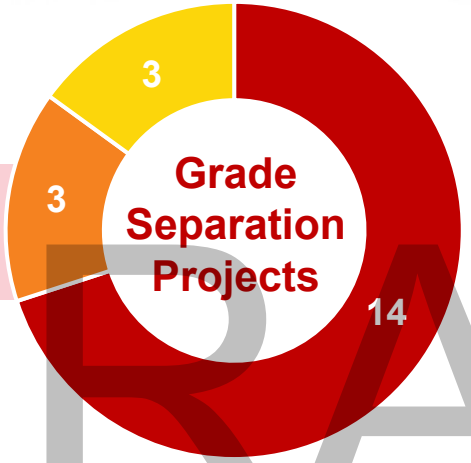
- This rail corridor facilitates UPRR freight cargo to and from the ports of **Los Angeles and Long Beach, carrying 16% of all oceangoing containers in the US**.
  - Train traffic is expected to increase by 150% by 2050

35+
Miles of Tracks

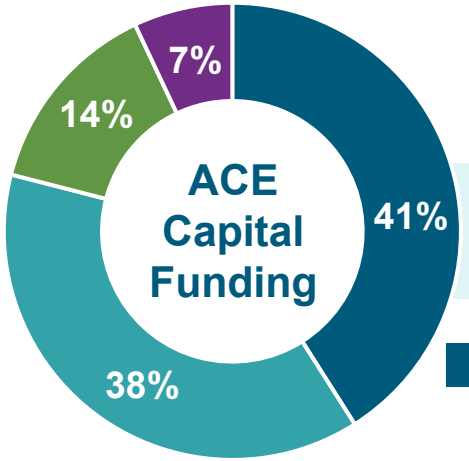
ACE Project Corridor

Alameda Corridor East Project

Complete | Construction | Design

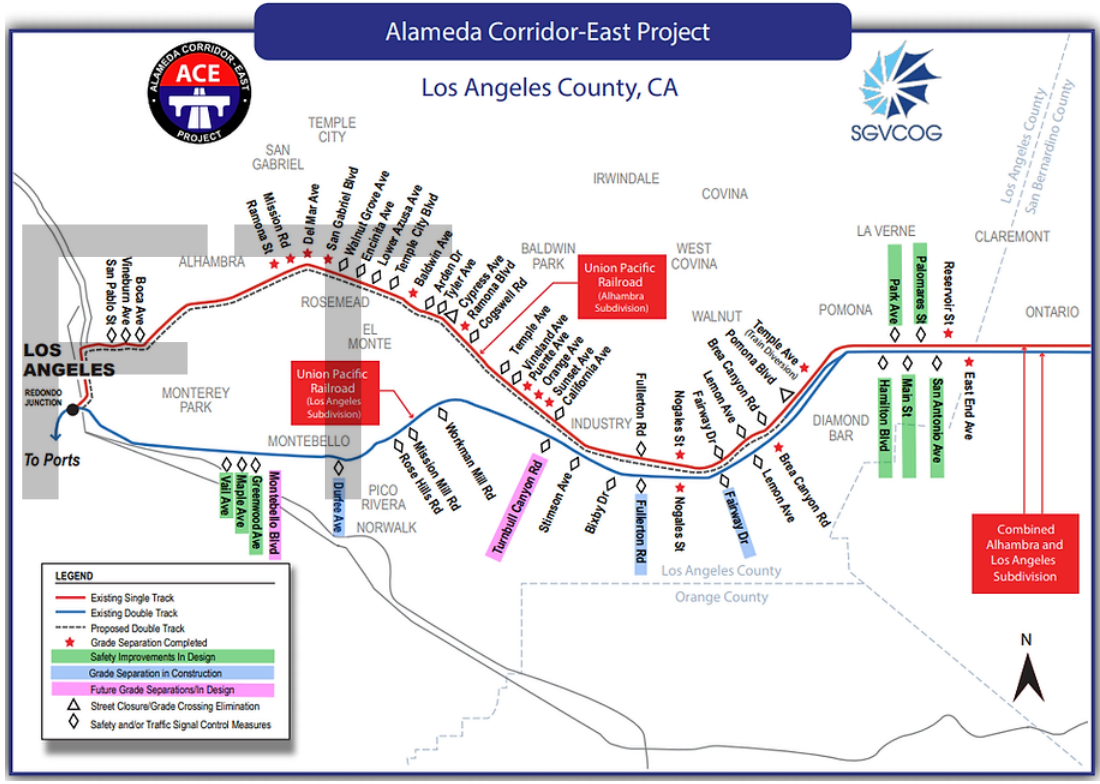


1997 Feasibility Study identified the need to eliminate over 20 at-grade crossings.



Funding was pursued for the entirety of the program, and projects were initiated as funds became available.

Regional | State | Federal | Other



ACE Project Status Map

Projects were organized by priority (high or low), cost (high or low), timeline (near- or long-term), and geography (proximity to one another).

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Long Island Rail Road

- Long Island Rail Road (LIRR) operates under the umbrella of the Metropolitan Transportation Authority (MTA) in the New York City metro area.
- **LIRR is the busiest commuter railroad in North America**

LIRR System Map

700+
Miles of Tracks

300,000
Weekday Riders

735
Daily Trains

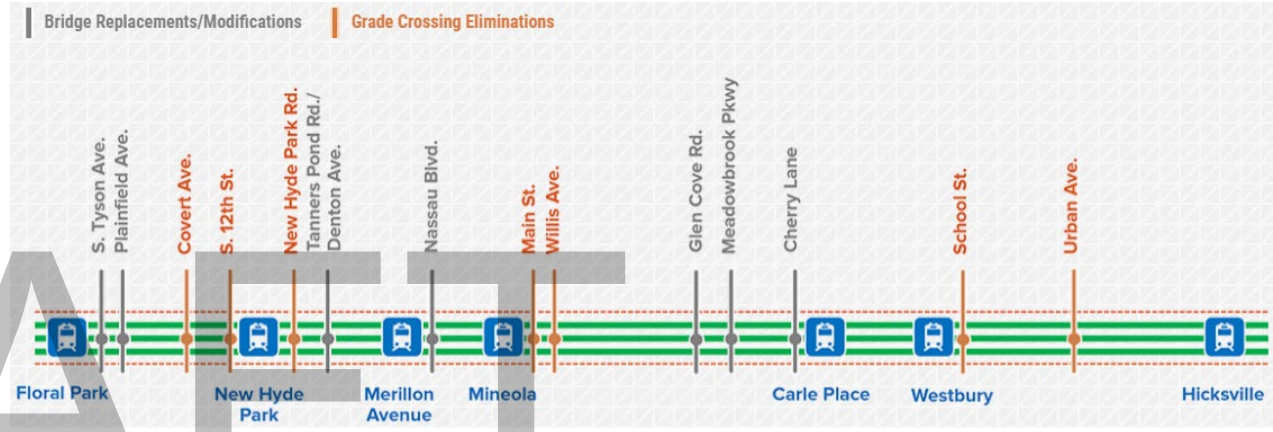
11
Different Branches

Long Island Rail Road

Long Island Rail Road

Main Line Expansion project began in 2018 and will be completed by 2023, consisting of:

- ✓ 9.8 miles of new third track
- ✓ Elimination of eight at-grade crossings
- ✓ Modifications to seven rail bridges
- ✓ Installation of sound and retaining walls
- ✓ ADA improvements and enhanced stations
- ✓ New substations, parking facilities, landscaping, and more



Project Cost: **$2.6 billion**

Largely funded through MTA's capital program budget and long-term MTA debt

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Melbourne Level Crossing Removal Project

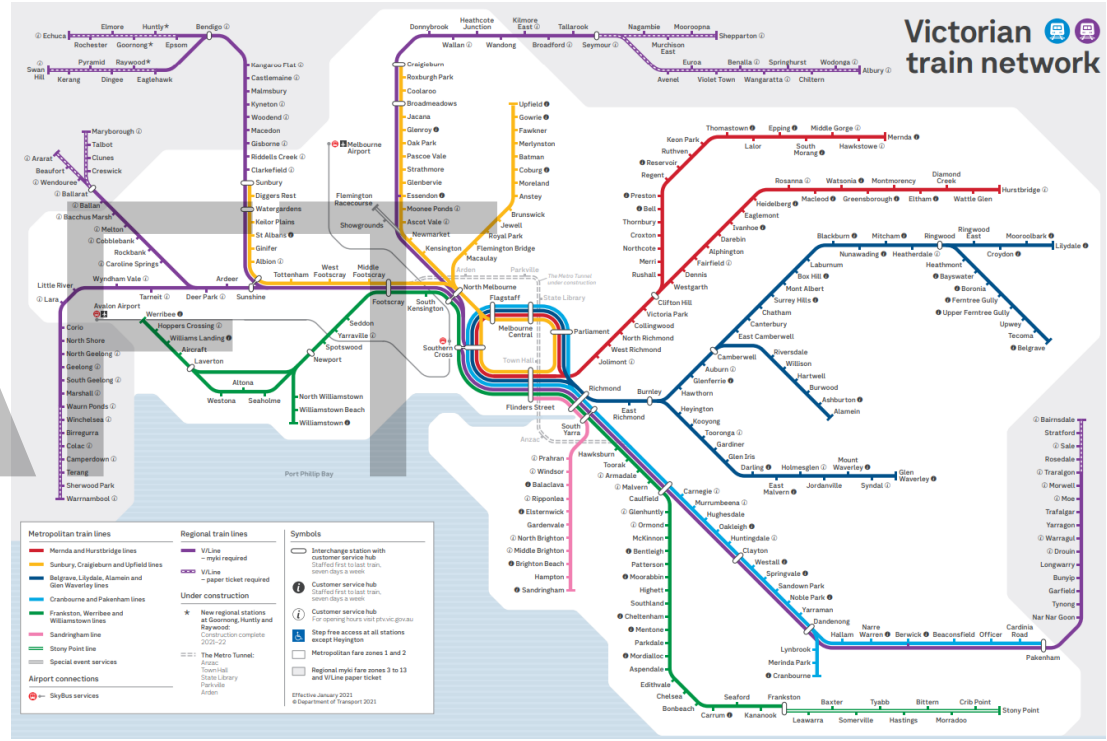
LEVEL CROSSING REMOVAL PROJECT

- Metro Trains is a state-run train network that operates throughout the greater Melbourne metro area.

170 Crossings | **15** Lines

620 Miles of Tracks

450,000 Daily Riders



Melbourne Train Network

- Level Crossing Removal Project (LXRP) was established in 2015 to **eliminate 50 at-grade crossings across Melbourne by 2022**
  - Also included new train stations, track duplication, and train stabling yards

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Melbourne Level Crossing Removal Project

LEVEL CROSSING REMOVAL PROJECT

- Program expanded to include a total of **110 level crossing removals by 2030**.
  - 67 level crossings have been removed so far
- Funding from state sources via funding packages.
  - Projects are grouped by priority, assessing need based on ***movement, place, safety, and delivery efficiency***.
- Unique procurement approaches (alliance contracting) and government backing proved to accelerate the program's execution of removal projects.

Redeveloped Station Area in Melbourne

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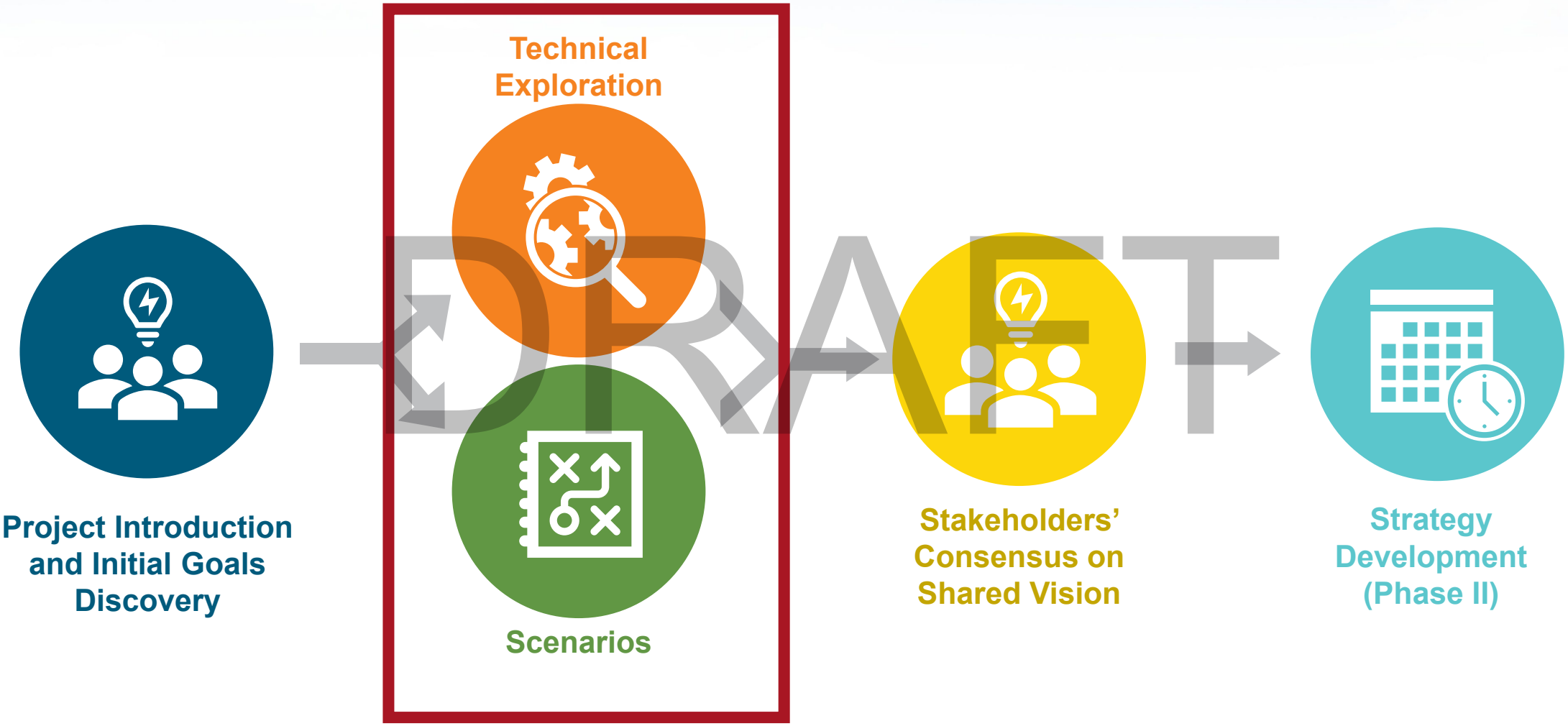
Case Study Comparison

Case Study	At-Grade Crossings Addressed	Primary Funding Sources	Implementation Lead	Timeframe
MetroLink/SCRRA	Project-by-Project	State + Federal (Local secondary)	County Transportation Authority	Not set (as funding available)
Alameda Corridor East (ACE)	20	Regional + State (Federal + Other secondary)	Single-Purpose Construction Authority	Started in 1998, final projects in design
Long Island Rail Road (LIRR)	8	MTA Capital Funds	LIRR	Construction began 2018, complete 2023
Melbourne, Australia	110 (Initially 50)	Federal + Regional	Level Crossing Removal Authority	Began 2015, anticipated complete in 2030

How Case Studies Relate to Draft Vision



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Scenario Spectrum

Scenario A: Independent Projects

- Project-by-project approach/management
- Local funding plan
- Aspirational goal, but no timeline
- Current approach for Caltrain

Scenario B: Coordinated Projects

- Regionally coordinated approach to corridor funding
- Interjurisdictional communication about resources and schedule
- Coordinated corridor project delivery
- Aspirational goal with timeline

Scenario C: System-wide

- Transparent and consistent methodology
- Robust and centralized project delivery
- Corridor-wide and regional funding
- Consistent project champion
- Aggressive goal with timeline

Scenario Planning

Technical Exploration

Scenarios

Stakeholders' Consensus on Shared Vision

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Discussion

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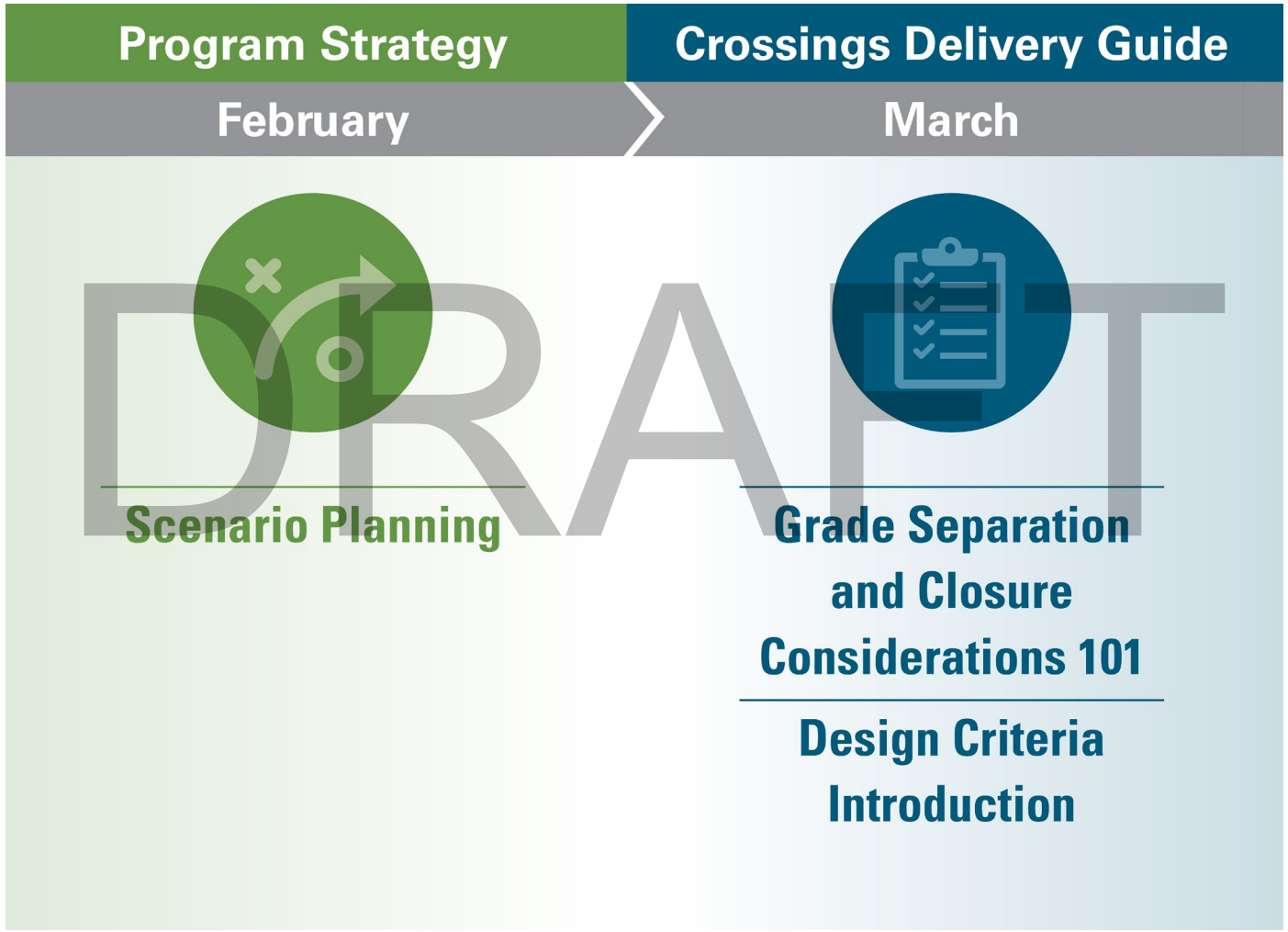
Questions

- What aspects of program scenarios do you think are most important for cities?
- Which case study do you think is most relevant to the CCS?
- What element of the case studies do you think is most relevant (funding, implementation, timeframe)?
  - Should any additional elements be considered?
- As we work toward a consensus vision, how would you define success?
- Any other feedback or questions about the presentation content?

2-Month Look Ahead



Corridor Crossings

STRATEGY

Caltrain

Appendix

DRAFT*

Baseline Conditions

**In process of obtaining additional baseline data to include more current information for some data sets as well as additional data categories.*

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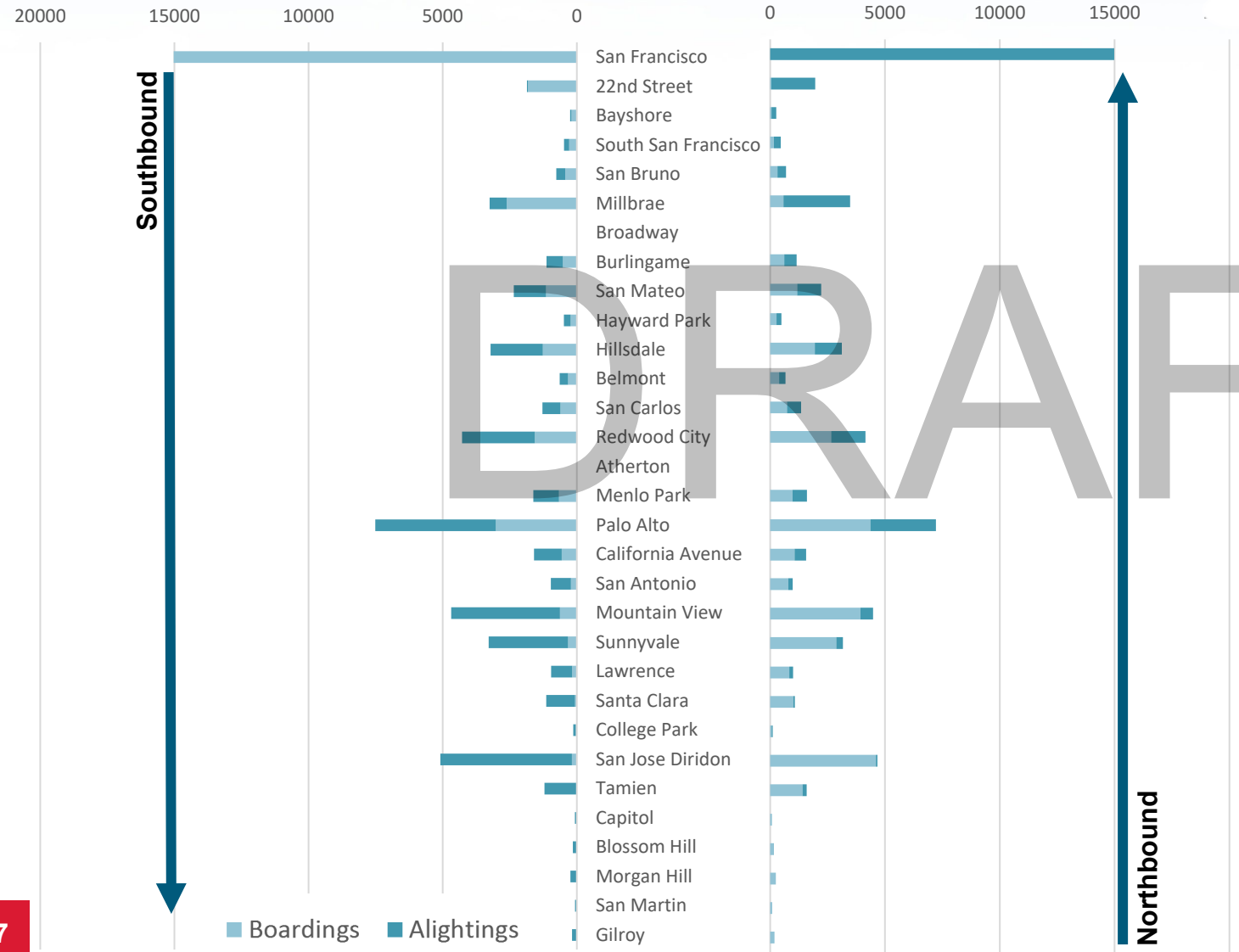
Baseline Conditions Discovery

- **High level overview of circulation, mobility, land use, and placemaking baseline data discovery**
  - Caltrain ridership by station
  - Daily traffic volume on roads intersecting at-grade crossings
  - Collision data
    - Transportation Injury Mapping System (TIMS)
    - Federal Rail Administration (FRA)
  - Population demographics within 1 mile of Caltrain corridor
    - Population and employment
    - Equity priority communities
    - Vulnerable populations
- **Baseline conditions discovery sets the foundation for future technical topics**

Ridership at Caltrain Stations



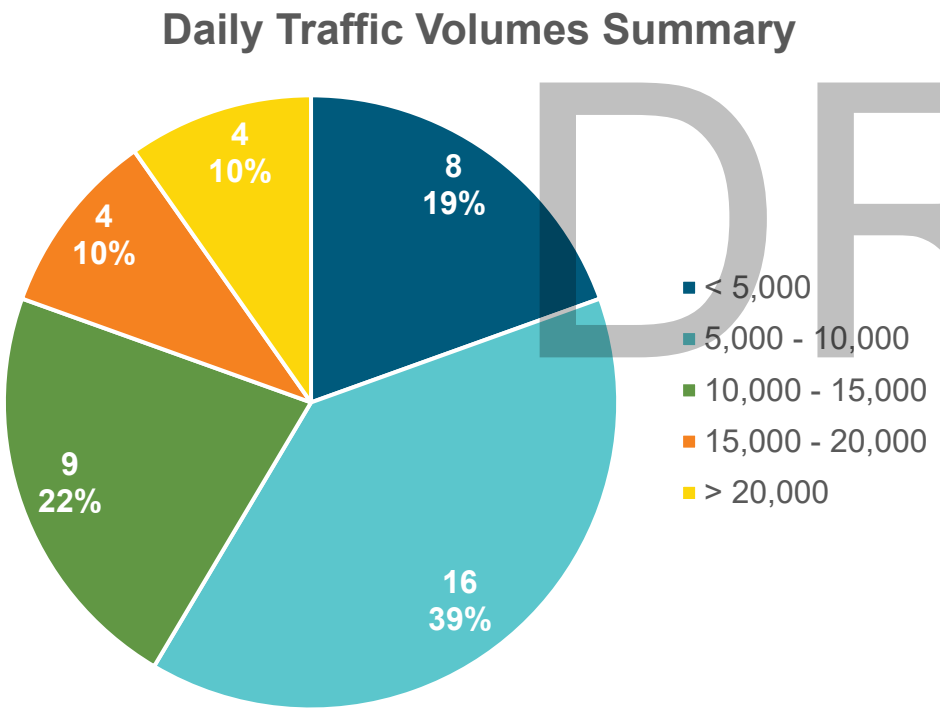
Average Passenger Counts by Train, Weekdays during Peak Period (2019)

Source: Caltrain

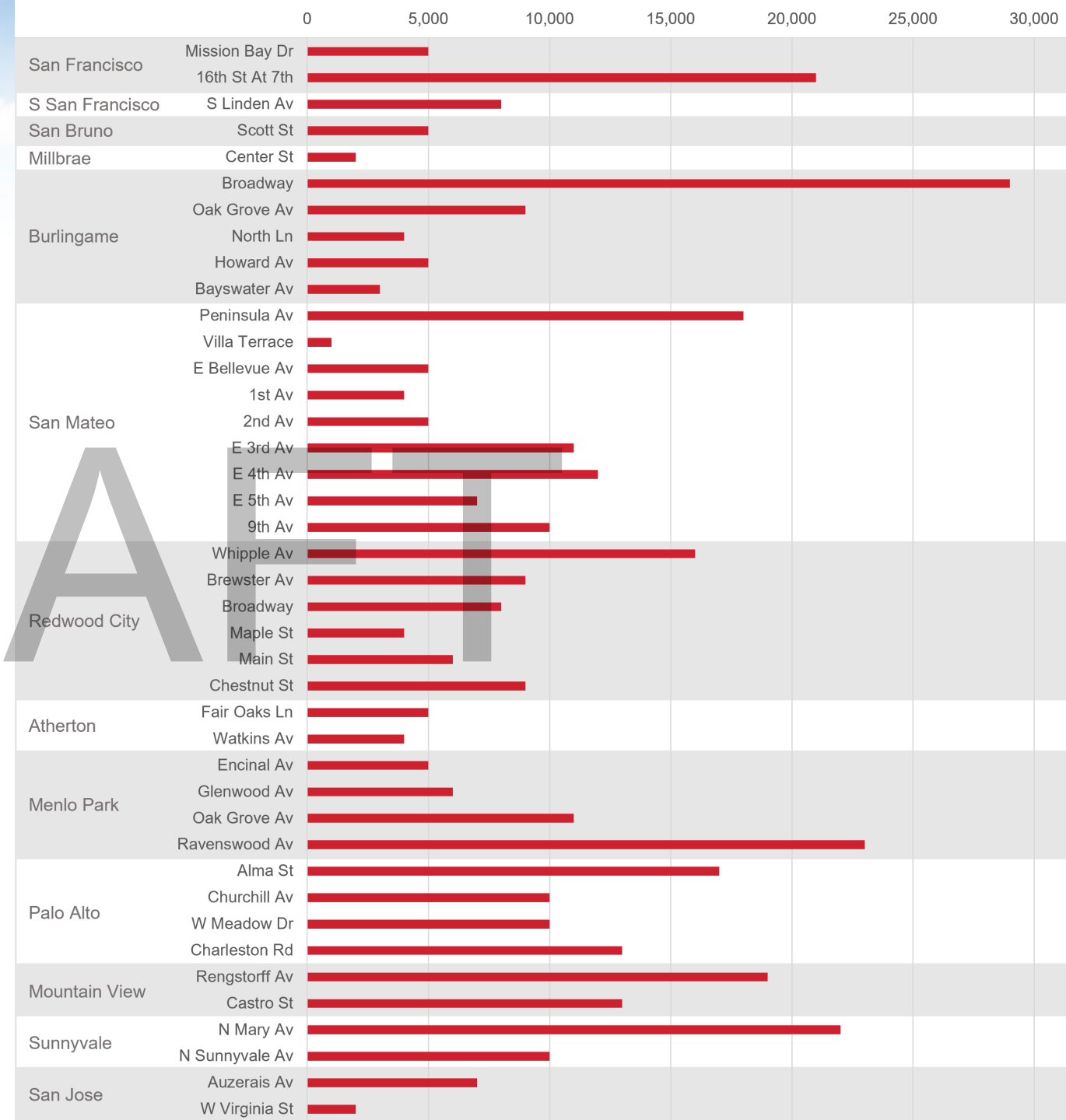
Stations with Highest Ridership

Location	Boardings	Alightings
San Francisco	15,027	14,984
Palo Alto	7,384	7,351
San Jose Diridon	4,795	4,965
Mountain View	4,560	4,606
Redwood City	4,220	4,214

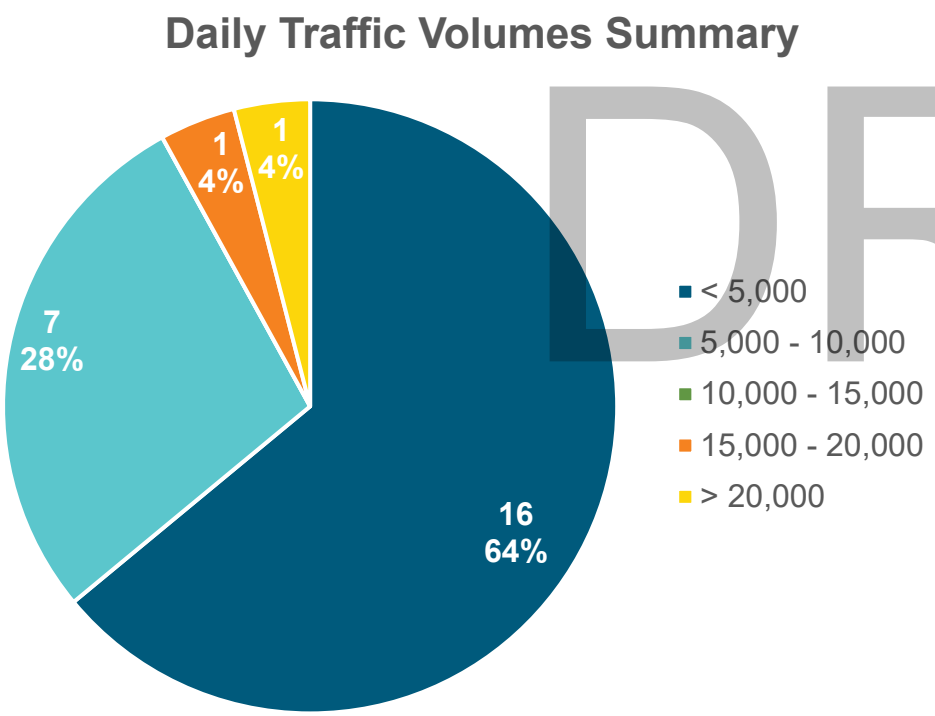
Volumes on Roads Intersecting At-Grade Crossings (North | Caltrain ROW)



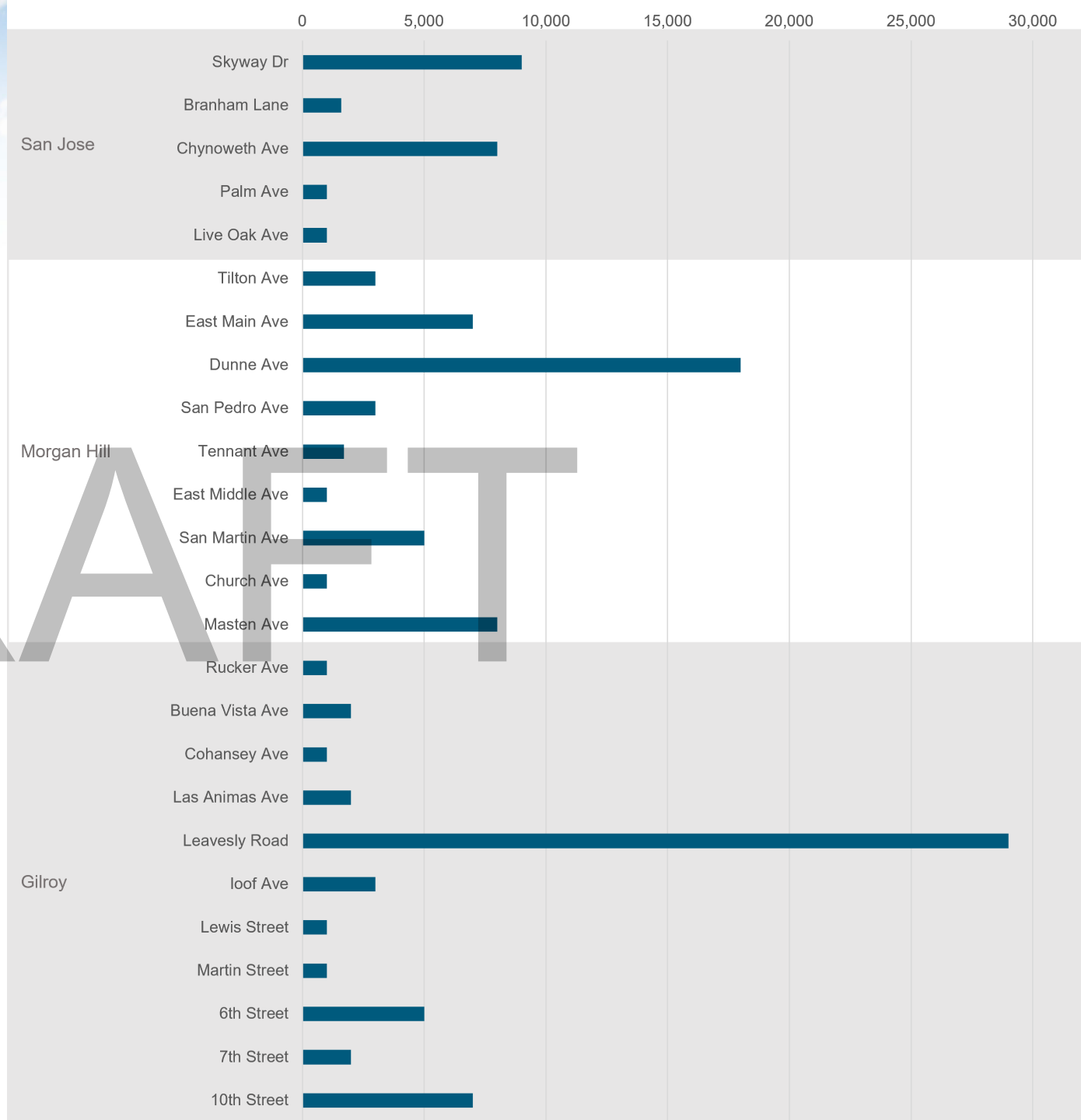
Source: Caltrain Business Plan (2018)



Volumes on Roads Intersecting At-Grade Crossings (South | UPRR ROW)

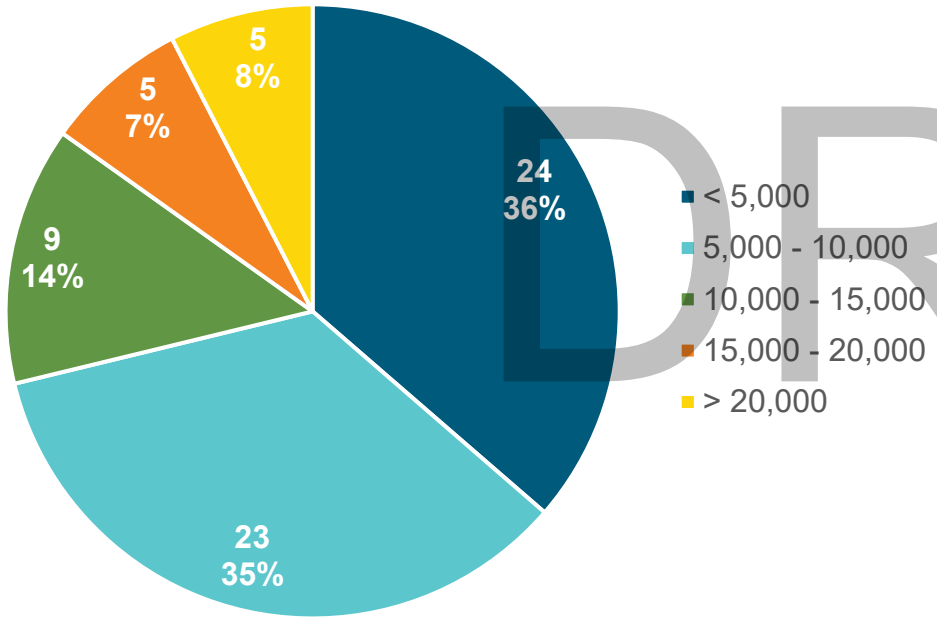


Source: Replica model volume (2019)



Volumes on Roads Intersecting At-Grade Crossings (Full Corridor)

Daily Traffic Volumes Summary



Source:
Caltrain ROW = Caltrain Business Plan (2018)
UPRR ROW = Replica Model Volumes (2019)

Roads with Highest Daily Volume

City	Road	Average Daily Volume
Burlingame	Broadway	25,000 – 30,000
Gilroy	Leavesly Road	25,000 – 30,000
Menlo Park	Ravenswood Avenue	20,000 – 25,000
Sunnyvale	N Mary Avenue	20,000 – 25,000
San Francisco	16th Street	20,000 – 25,000
Mountain View	Rengstorff Avenue	15,000 – 20,000
Morgan Hill	Dunne Avenue	15,000 – 20,000
San Mateo	Peninsula Avenue	15,000 – 20,000
Palo Alto	Alma Street	15,000 – 20,000
Redwood City	Whipple Avenue	15,000 – 20,000

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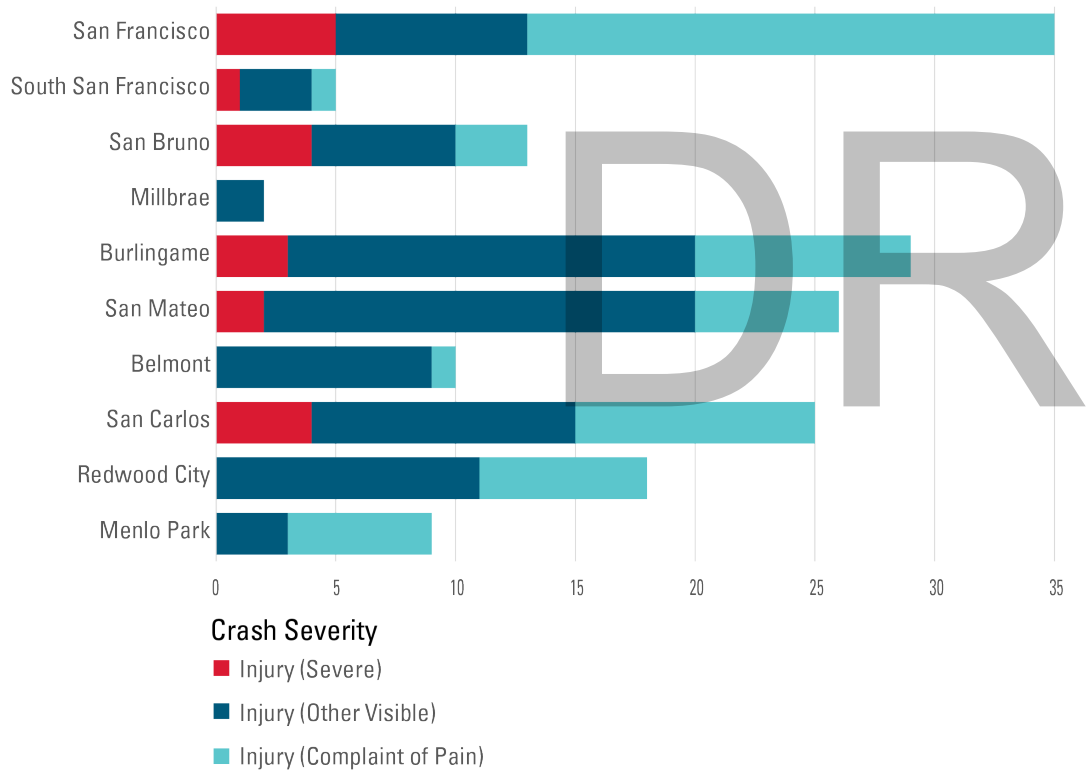
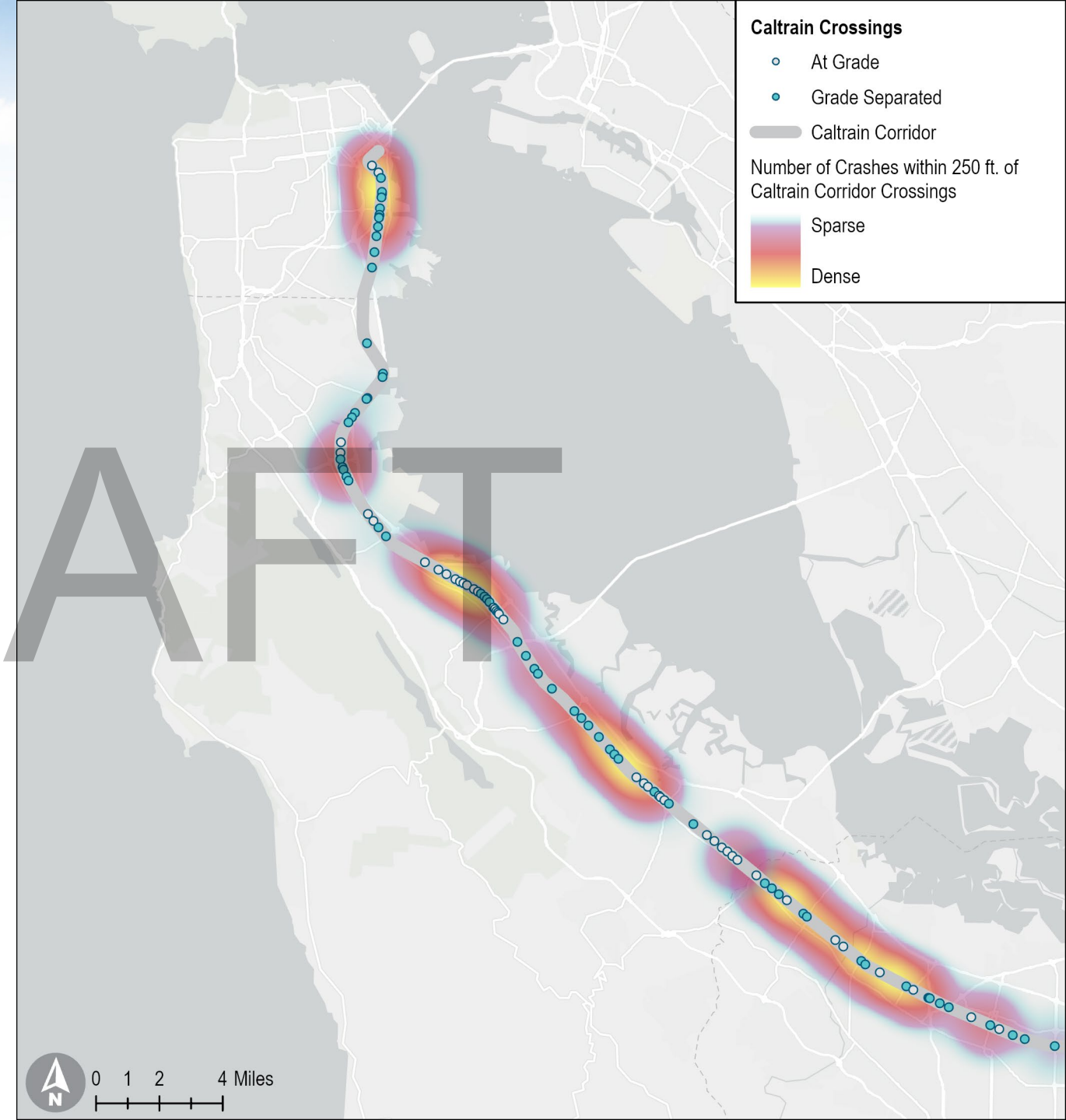
Baseline Collision Data: TIMS 2017-2021 (North)

Number of Crashes Within 250 feet of Caltrain Corridor Crossings

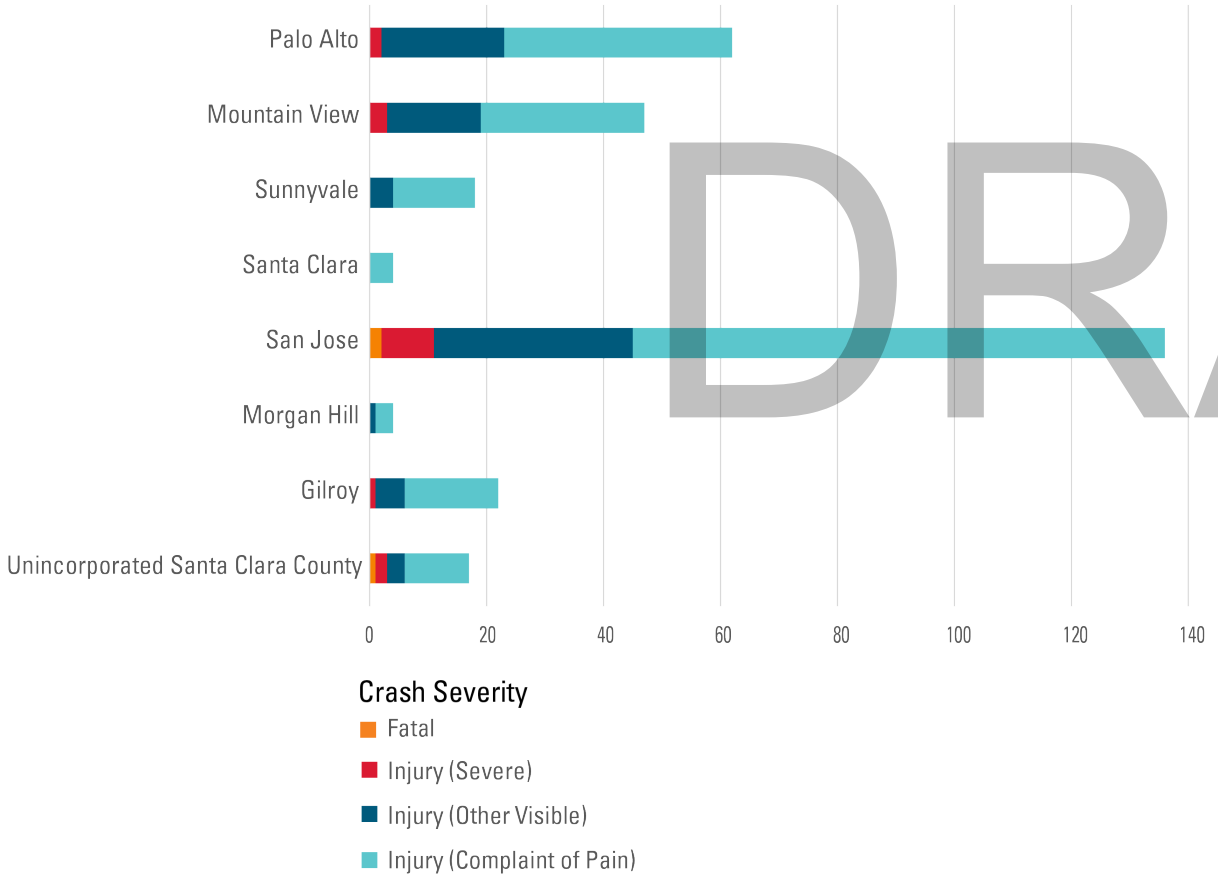


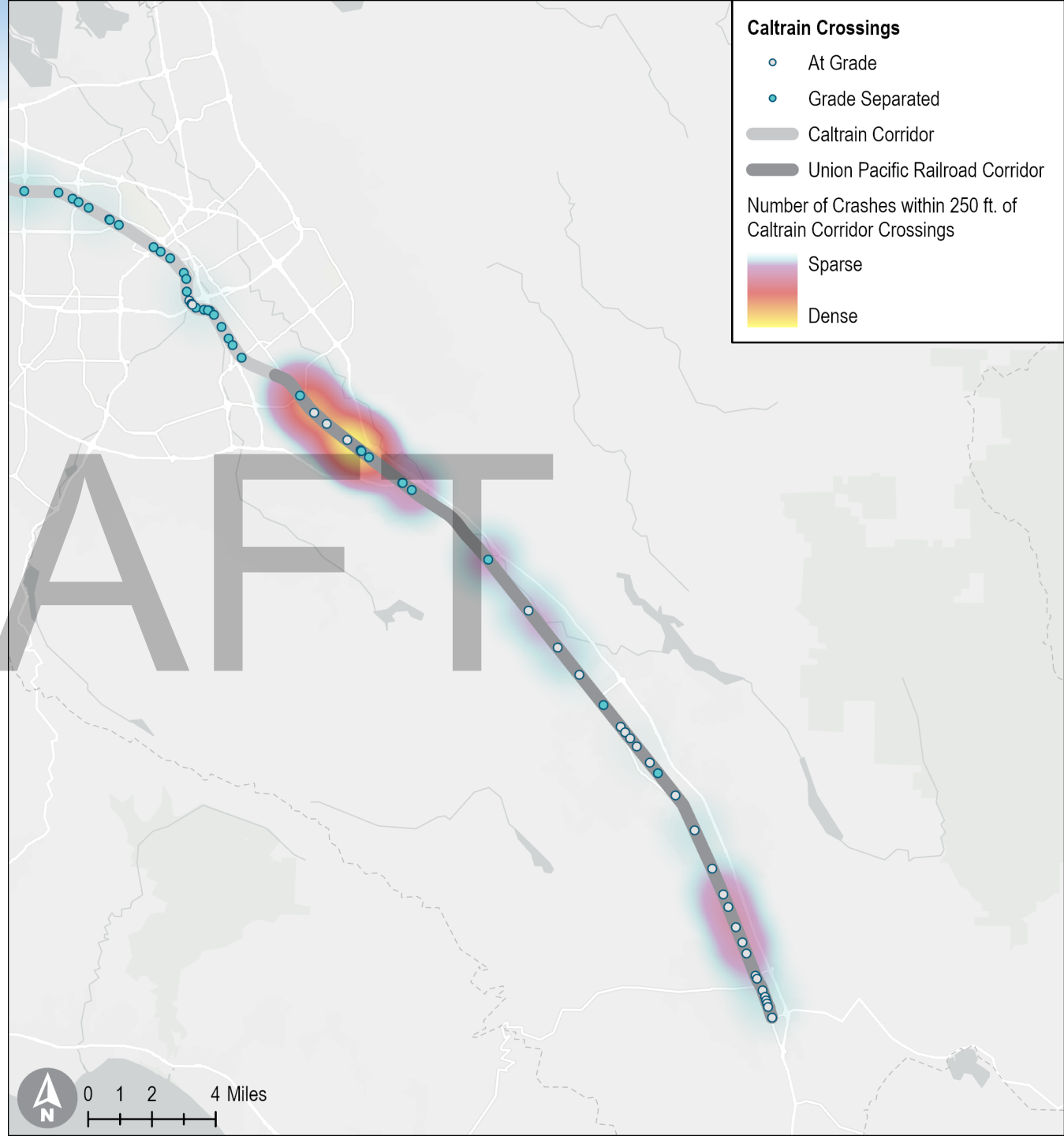


Source: TIMS (2022)
Note: excludes collisions on freeways

Baseline Collision Data: TIMS 2017-2021 (South)

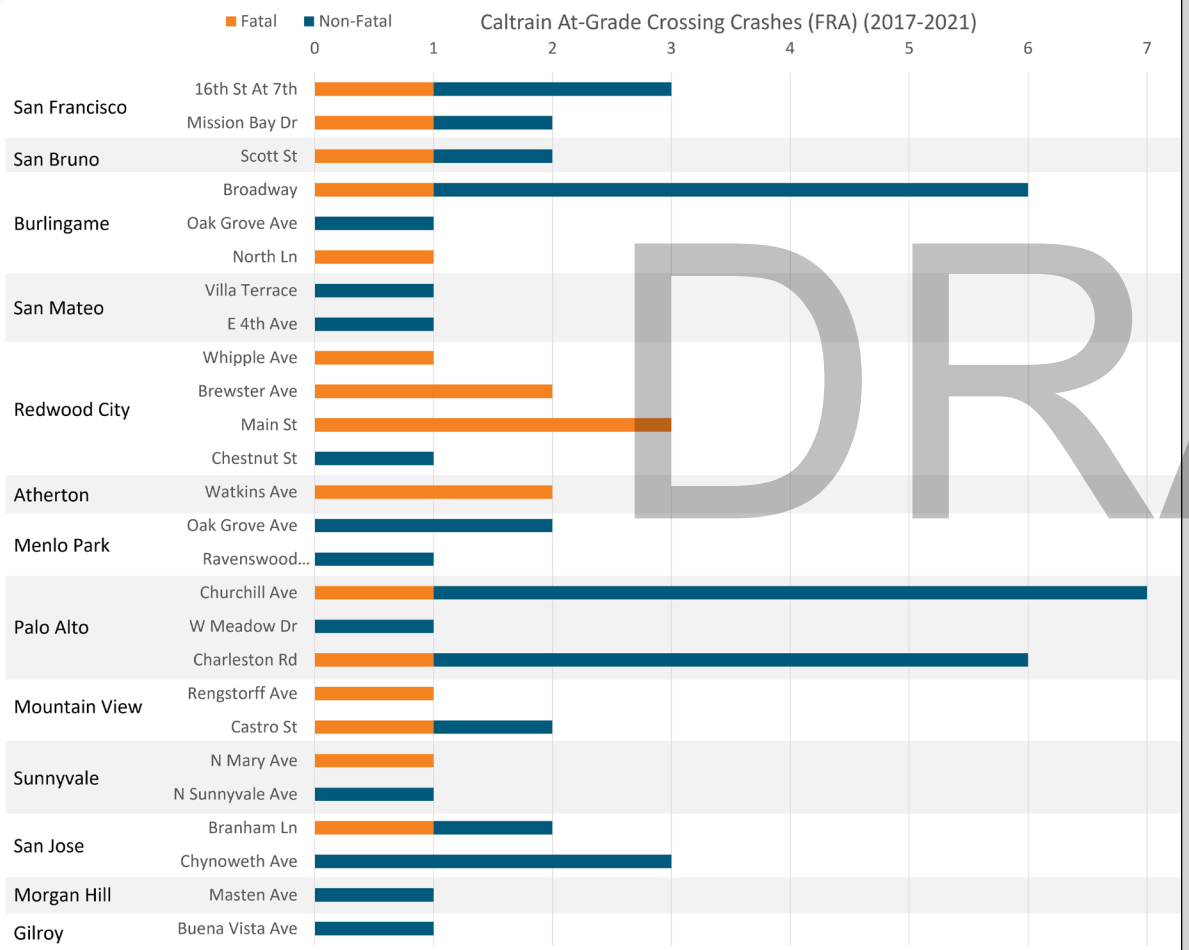
Number of Crashes Within 250 feet of Caltrain Corridor Crossings

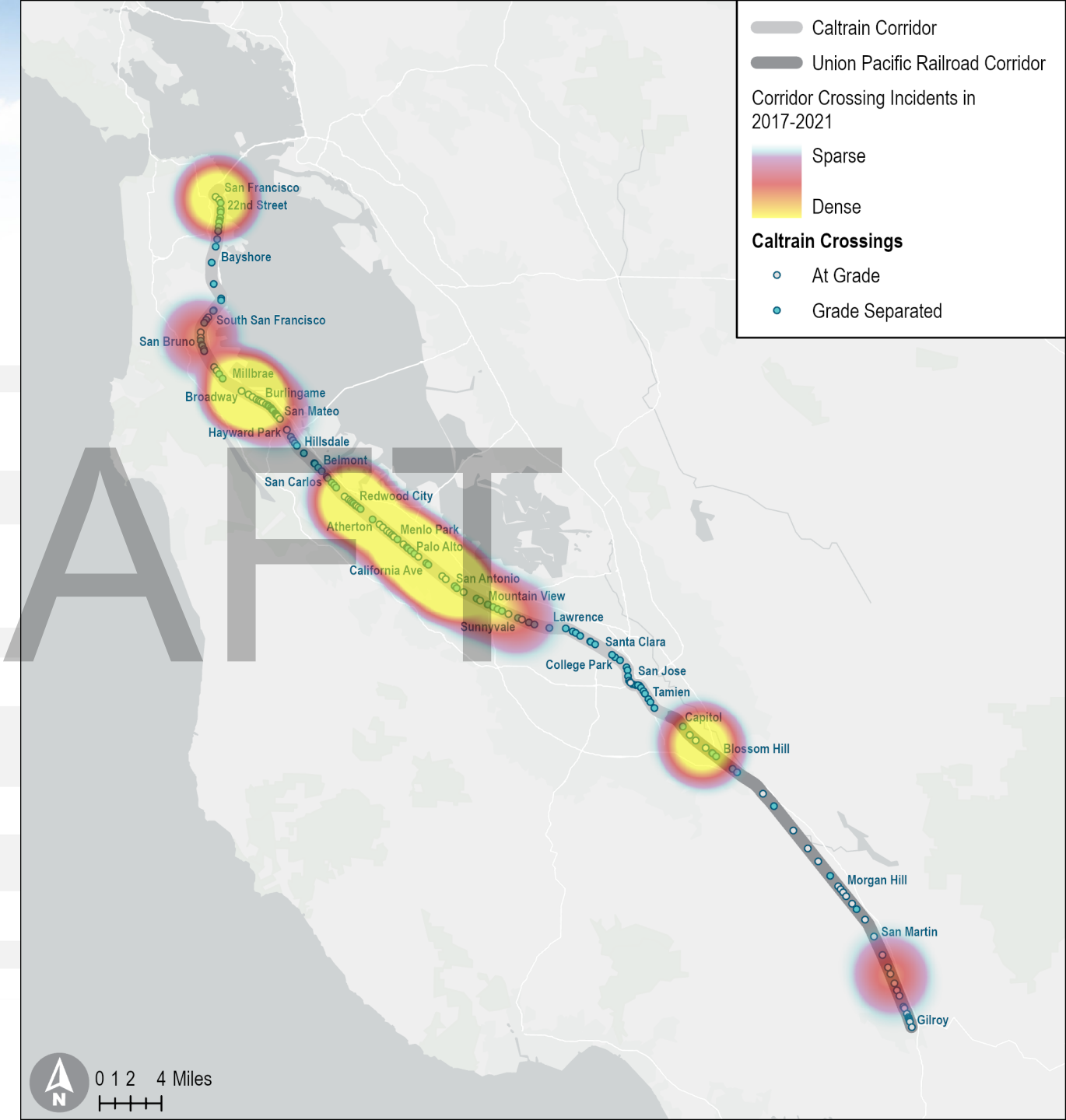




Source: TIMS (2022)
Note: excludes collisions on freeways

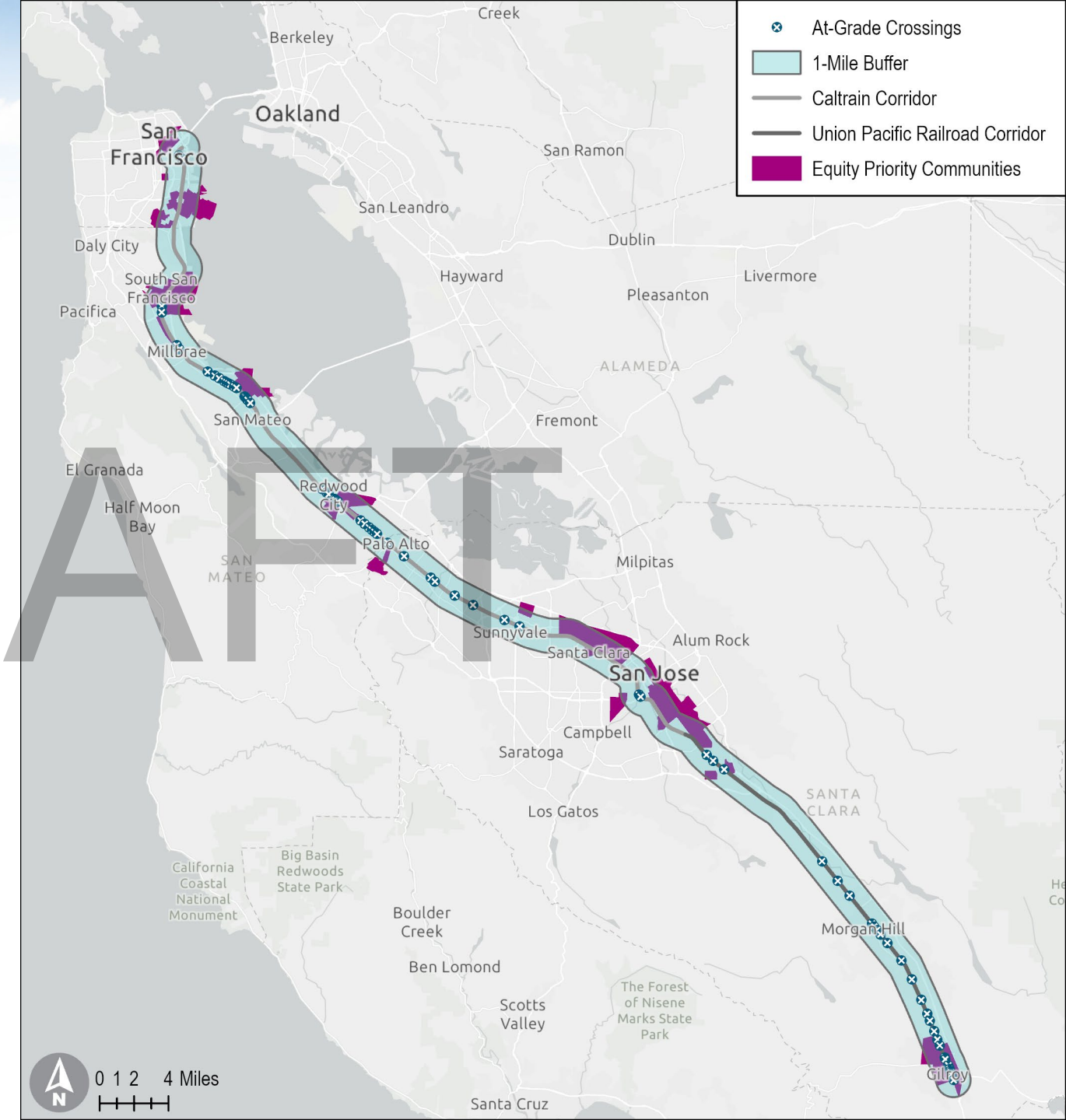
Baseline Collision Data: FRA 2017-2021





Source: FRA (12/22/2022)

Baseline Population Demographics (Within 1 mile of Caltrain Corridor)



Source: Equity Priority Communities - Plan Bay Area 2050 (MTC Open Data Published 6/18/2020)

Baseline Population Demographics by City (Within 1 mile of Caltrain Corridor | North)

City	Total Jobs	Total Population	Number of Equity Priority Communities (Tracts)	Total Population of Persons 75 Years and Older	Total People of Color Population	Total Low-Income Population	Total Zero-Vehicle Household Population
San Francisco	366,781	215,448	26	12,322	157,051	65,331	32,234
Daly City	865	4,173	0	279	3,909	911	106
Brisbane	6,677	5,182	0	296	3,008	669	78
South San Francisco	60,021	37,700	3	2,634	29,987	9,611	1,032
San Bruno	14,702	24,409	1	1,261	16,909	4,853	432
Unincorporated San Mateo	12,704	34,396	2	2,002	20,235	7,657	309
Millbrae	5,465	22,703	0	2,297	14,930	2,601	459
Burlingame	33,404	31,291	0	2,105	14,058	3,894	802
Hillsborough	681	11,439	0	1,085	4,709	570	70
San Mateo	41,858	96,385	4	7,027	56,021	19,552	1,765
Foster City	87	6,614	0	402	4,102	384	42
Belmont	4,729	20,412	0	1,621	9,107	1,925	349
San Carlos	17,399	28,874	0	2,113	9,040	2,431	398

Source: Equity Priority Communities - Plan Bay Area 2050 (MTC Open Data Published 6/18/2020)

Baseline Population Demographics by City (Within 1 mile of Caltrain Corridor | South)

City	Total Jobs	Total Population	Number of Equity Priority Communities (Tracts)	Total Population of Persons 75 Years and Older	Total People of Color Population	Total Low-Income Population	Total Zero-Vehicle Household Population
Redwood City	55,802	62,204	5	2,619	40,211	18,951	1,582
Atherton	2,255	7,185	0	698	2,156	431	29
Menlo Park	11,188	21,914	0	1,546	6,496	2,421	400
Palo Alto	66,155	63,150	0	5,748	29,479	6,774	1,726
Unincorporated Santa Clara	15,458	100,615	2	4,945	56,360	16,252	1,813
Los Altos	3,951	18,300	0	1,507	7,336	1,319	261
Mountain View	48,705	70,228	0	3,597	39,440	12,048	1,862
Sunnyvale	42,750	95,375	1	4,550	67,121	14,557	2,506
Santa Clara	60,597	78,182	1	3,633	50,619	16,151	1,324
San Jose	137,681	301,288	20	12,773	210,164	76,570	7,384
Morgan Hill	16,295	18,868	0	895	10,756	4,057	230
Gilroy	15,245	40,592	5	1,824	30,904	13,427	716

Source: Equity Priority Communities - Plan Bay Area 2050 (MTC Open Data Published 6/18/2020)

Active
Crossing Projects

Caltrain | Corridor Crossings STRATEGY

City of Mountain View

City of Mountain View

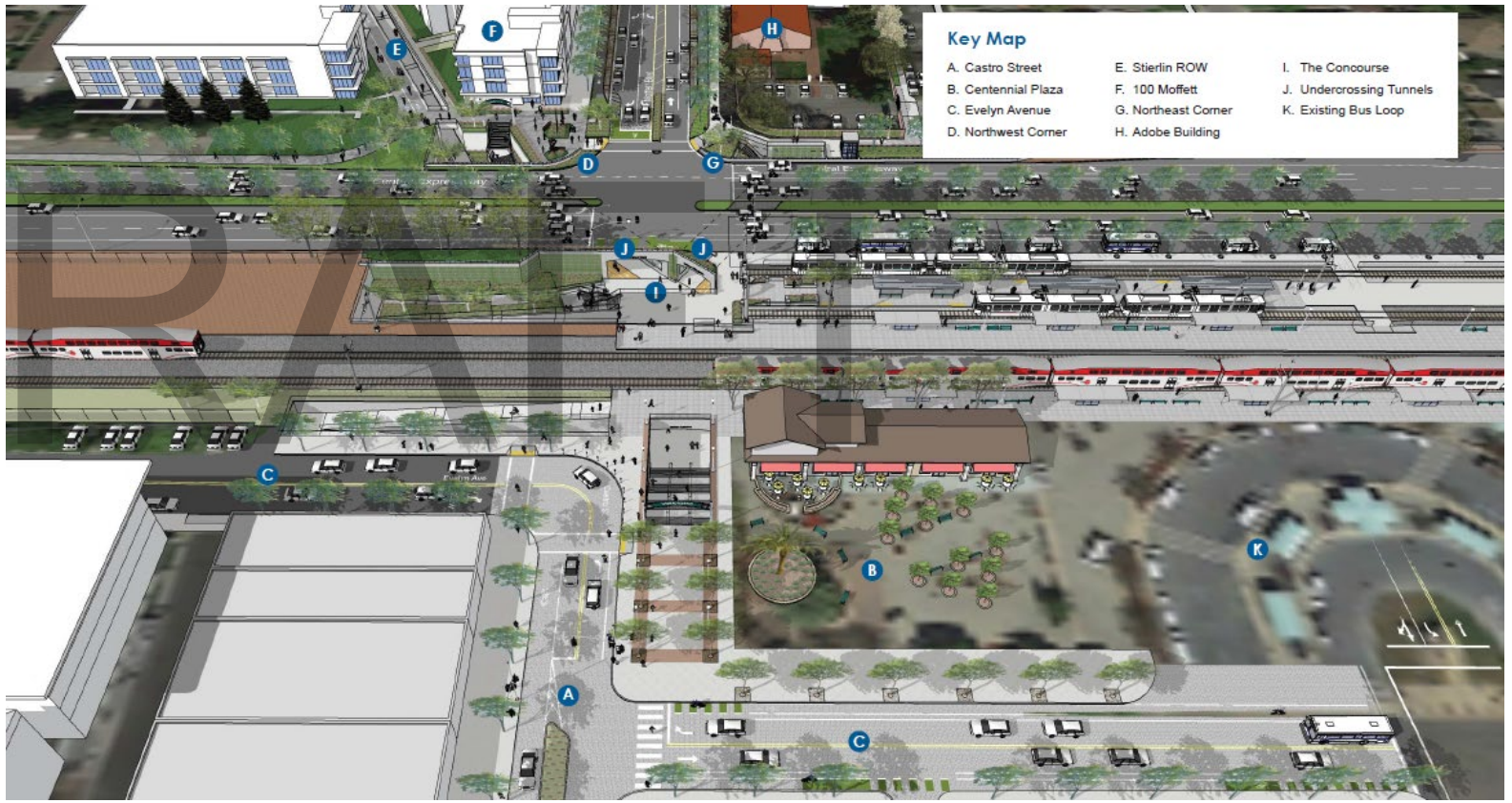
- **Project Name:** Rengstorff Avenue Grade Separation
- **Project Phase**: Design & ROW
- **Timeline:**
  - **Design Completed By:** June 2025
  - **Construction Completed By:** February 2028

Caltrain | Corridor Crossings STRATEGY

City of Mountain View

City of Mountain View

- **Project Name:** Transit Center Grade Separation and Access Project
- **Project Phase:** Design
- **Timeline:**
  - **Design Completed By:** July 2024
  - **Construction Completed By:** December 2026



Caltrain | Corridor Crossings STRATEGY

Active At-Grade Crossing Projects

San Mateo County

- **Quad Gates & Pavement Markings**
  - 4th and 5th Avenues (San Mateo)
    - April 2024 completion
  - Watkins Avenue (Atherton)
    - May 2024 completion

Santa Clara County

- **Pedestrian Facility Improvements**
  - Churchill Avenue (Palo Alto)
    - June 2023 completion

Caltrain | Corridor Crossings STRATEGY

Completed Grade Separation Projects

Local transit authorities have directly paid for the majority of grade separation costs the recent grade separation projects along the corridor. This funding has been instrumental in leveraging state and local funding sources to make up the balance of project needs.

Crossings (City)	Date Completed	Local TA	Other	Total
Oyster Point (South San Francisco)	1994	45%	55%	$24.2
Millbrae Ave. (Millbrae)	1996	55%	45%	$24.0
Ralston/Harbor/Holly (Belmont and San Carlos)	2000	61%	39%	$99.6
Brittan/ Howard (San Carlos)	1995	49%	51%	$23.0
Jefferson Ave. (Redwood City)	1999	57%	43%	$14.2
Fifth Ave. (North Fair Oaks)	1995	59%	41%	$17.0
San Bruno/ San Mateo / Angus (San Bruno)	2014	62%	38%	$165.1
25th Ave (San Mateo)	2022	48%	52%	$201.9