

# NORTH FAIR OAKS

## BICYCLE AND PEDESTRIAN RAILROAD CROSSING AND COMMUNITY CONNECTIONS STUDY



## FINAL REPORT

*PUBLIC DRAFT  
NOVEMBER 2023*



OFFICE OF  
SUSTAINABILITY  
COUNTY OF SAN MATEO

Kimley»Horn





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# ACKNOWLEDGEMENTS

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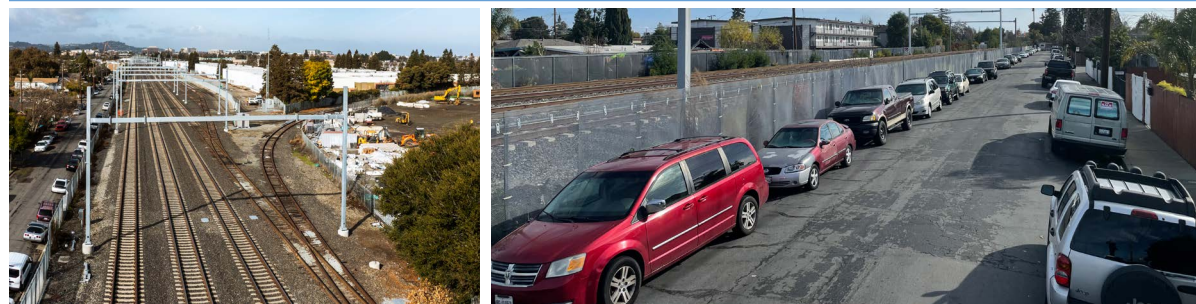
# EXECUTIVE SUMMARY

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## STUDY OVERVIEW



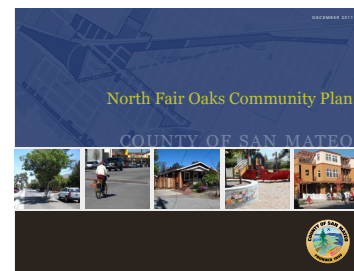
### Introduction

Supported by a Caltrans Sustainable Communities Grant award, the County of San Mateo Office of Sustainability launched the North Fair Oaks Rail Crossing and Community Connections Study in March 2022 (see Study Timeline on the top right) to assess the potential for a new grade-separated bicycle and pedestrian crossing of the Caltrain railroad tracks and additional surface street improvements to support walking and biking in North Fair Oaks.

The unincorporated community of North Fair Oaks has approximately 14,000 residents and is one of the more densely populated unincorporated communities in San Mateo County. North Fair Oaks has both the highest potential demand for walking and bicycling and the highest concentration of bicycle and pedestrian collisions per square mile of the County's unincorporated communities.<sup>1</sup> As shown in the Area Map on the bottom right, the Study area for this project is bounded by Middlefield Road, El Camino Real, Fifth Avenue, and the Redwood City border. The Study area has been identified as a Priority Equity Community by the Metropolitan Transportation Commission (MTC), as it contains a significant concentration of underserved populations that include households with low income and people of color.

### Purpose and Need

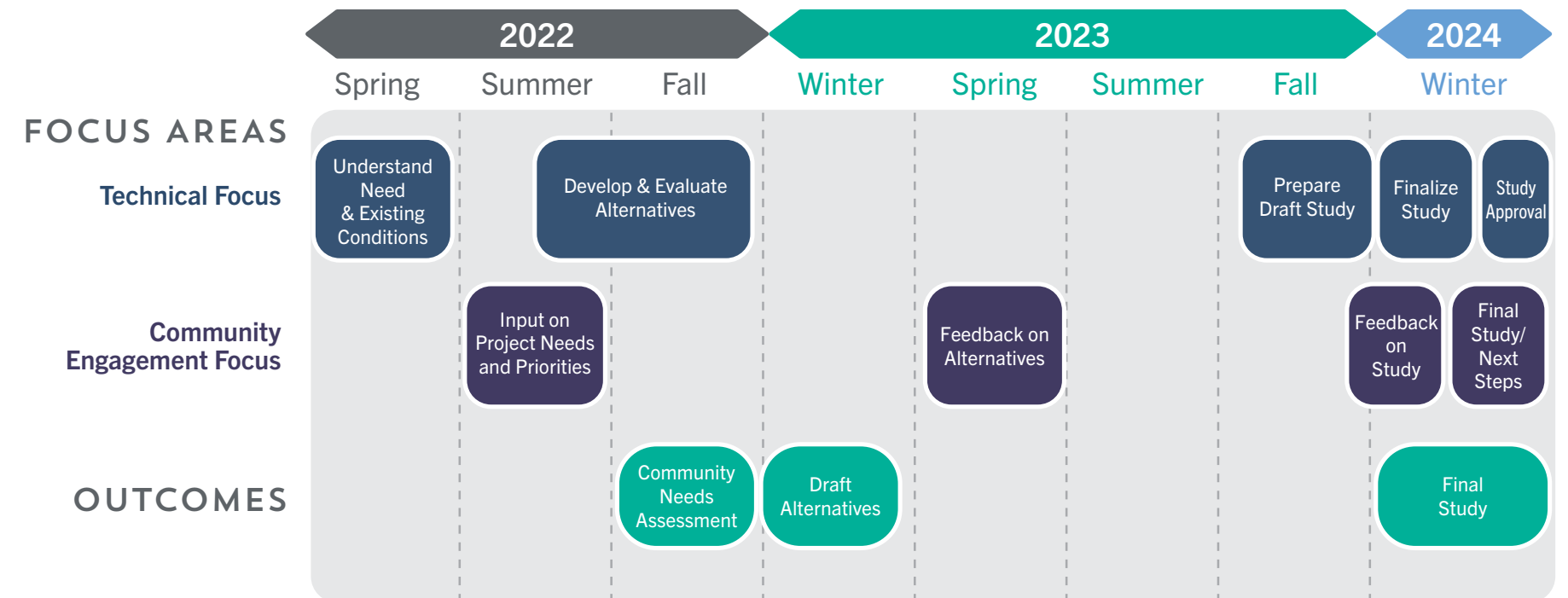
This Study builds upon past recommendations from the 2011 North Fair Oaks Community Plan & the 2021 Unincorporated San Mateo County Active Transportation Plan to determine the best alignment for a potential new crossing of the Caltrain railroad corridor. This Study considers where a potential rail crossing might be located, what it might look like and what might be possible with the identification of constraints and trade-offs. As a companion effort, the Study also further explores opportunities for better bicycle and pedestrian connectivity, access, and safety improvements within the neighborhoods on both sides of the railroad tracks.



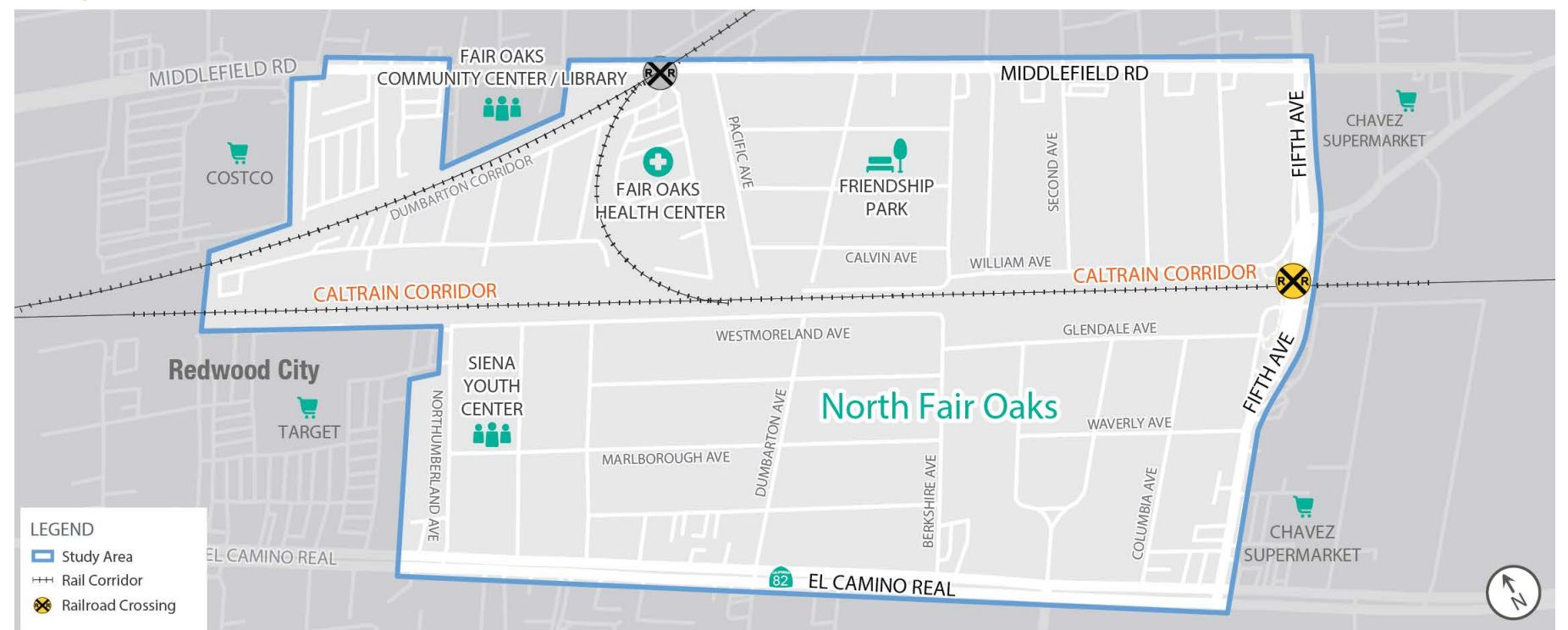
Residents within North Fair Oaks face widespread mobility challenges, including a need for improved bicycle and pedestrian facilities, and better access to local destinations across the Caltrain railroad tracks, which bifurcate the community. Fifth Avenue is the only existing crossing of the Caltrain railroad tracks in North Fair Oaks, with Woodside Road being the next nearest, creating a crossing gap of over one mile. As a result, many residents, especially those without access to an automobile, may be required to walk or bike up to a mile or more to reach destinations that could otherwise be a short trip over the railroad tracks.

<sup>1</sup> Unincorporated San Mateo County Active Transportation Plan (2021)

## Study Timeline



## Study Area Map







## STUDY APPROACH

### Tasks Performed

Multiple inputs were considered to inform the process for recommending a preferred new bicycle and pedestrian crossing of the Caltrain railroad tracks with accompanying surface street improvements. Additional investigation of key constraints and challenges is needed before a recommendation is made for a preferred option for a railroad crossing. The following is an overview of the tasks performed as part of the Study.



#### Community Engagement

Conducted multi-channel and in-language community engagement to establish project needs, guide project priorities, learn about community preferences, and receive input on potential alternatives.



#### Coordination with Advisory Committees

Engaged with community stakeholders through a Community Advisory Committee (CAC) and received input from participating public agencies through a Technical Advisory Committee (TAC) at key points throughout the Study process.



#### County Advisory Body Engagement

Engaged with the North Fair Oaks Community Council, the Planning Commission, and the Pedestrian and Bicycle Advisory Committee (BPAC) to inform and receive feedback.



#### Goals and Priorities

Based on stakeholder and community input, established a set of comprehensive needs, goals, and objectives for the project, which were used to develop evaluation criteria.



#### Existing Conditions

Assessed existing community needs and opportunities within the study area.



#### Option Development and Refinement

Identified potential solutions for grade-separated railroad crossing facilities and community connections and assessed engineering feasibility.

Screened range of potential solutions to three that were selected for further development and community input.



#### Evaluation

Further evaluated three project options, assessing implementation impacts, community integration, and high-level project costs.



#### Implementation Planning

Coordinated with Caltrain on constructability and permitting. Assessed steps toward implementation and key areas for further investigation in future project phases.

### Project Goals

Throughout the Study, community input was continuously solicited and guided each phase of project development. In the first phase of this Study, the team collected extensive community input to establish a set of overarching goals intended to guide the development and evaluation of the railroad crossing alternatives and associated surface street improvements. Each of the three rounds of community engagement efforts are discussed in more detail on ES-4.

After receiving input from several key sources within the community, the team developed the following set of project goals:



**Access**  
Provide widely accessible pedestrian and bicycle connections across the railroad corridor and to adjacent communities to create a more useful, inclusive, and safer transportation network.



**Community Integration**  
Confirm that newly constructed facilities enhance the sense of community and the aesthetics of North Fair Oaks through improved connections and by incorporating public art, public spaces, and attractive structures.



**Constructability**  
To the extent possible, limit adverse impacts to the surrounding community and infrastructure during construction, while striving to minimize construction and maintenance costs given limited funding.



**Equity**  
Prioritize equitable transportation implementation, especially for those without access to a car, while limiting community impacts to housing, and adhering to larger community and regional sustainability goals.



**Safety**  
Design facilities guided by the prioritization for the most vulnerable populations, and create safe, well-lit spaces that are comfortable to access and utilize, with personal security in mind.

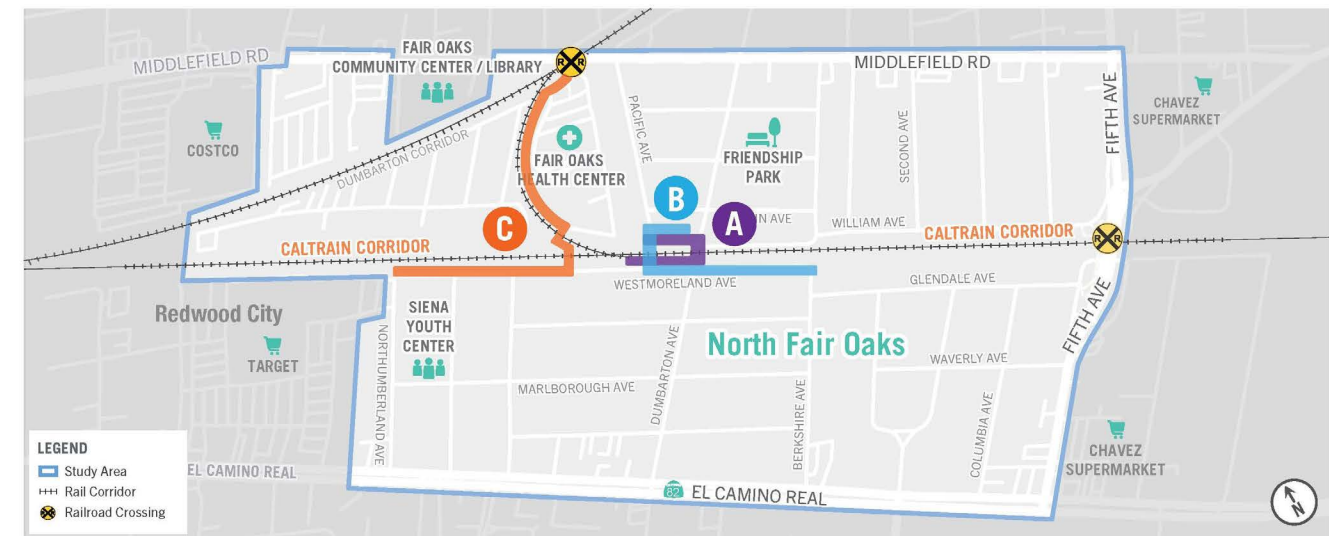
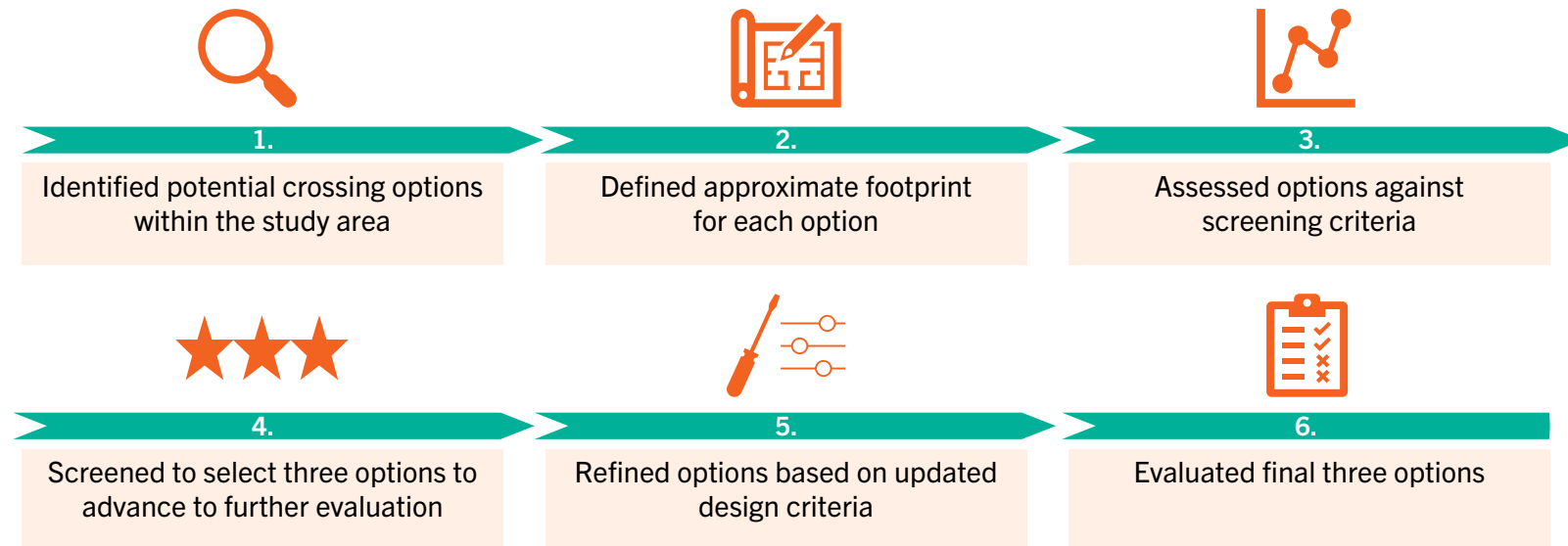




## RAILROAD CROSSING OPTIONS DEVELOPMENT PROCESS

### Development Process

The diagram below displays the development process for the three advanced railroad crossing options. The map to the right displays the location of each option. The three railroad crossing options are described and illustrated below.



### Option A: Dumbarton Avenue Tunnel

**Option A** is a tunnel roughly aligned with Dumbarton Avenue. The north side of the railroad tracks has stair and ramp access on Pacific Avenue and stair access on Dumbarton Avenue, while the south side has ramp and stair access along Westmoreland Avenue.



*Note: Concepts and renderings were prepared prior to several design guidance changes from Caltrain. Future concepts may look different based on the evolving guidance.*

### Option B: Dumbarton Avenue Bridge

**Option B** is a bridge that crosses the railroad tracks around Pacific Avenue. The north side of the railroad tracks has stair access at Pacific Avenue and ramp access at Dumbarton Avenue, while the south side has accesses on either side of Dumbarton Avenue, with the stairs to the west and the ramp to the east.



### Option C: Middlefield Junction Bridge

**Option C** is a bridge that crosses the railroad tracks around Buckingham Avenue and ties into the Middlefield Junction site to the north. Travelers would use ramps or stairs located in the current Health Center parking lot north of the tracks, while users south of the tracks can use the stairs east of Buckingham Avenue or the ramp along Northumberland Avenue.



### Community Connections

Additionally, this Study explores surface street improvements in the neighborhoods on both sides of the tracks that make walking and biking in the community easier and safer. Residents expressed an interest in the following street improvement options:



#### Sidewalk and Crosswalk Lighting

Pedestrian-scale lighting along key corridors to provide a better sense of security and more attractive facilities for users.



#### ADA Curb Ramp

Graded curb ramps designed for users in compliance with the Americans with Disabilities Act.



#### High-Visibility Crosswalk

Crosswalks striped with patterns designed to enhance pedestrian visibility.






# OUTREACH OVERVIEW


## Outreach Summary

Engagement activities were conducted as part of a partnership between the County, the Study’s consultant team, and Nuestra Casa and their trusted local team of promotoras as well as other key community partners, including representatives from the Study CAC. Outreach activities were conducted primarily in Spanish, with English language support provided.


Over the course of the project, the Study’s team reached the community through a variety of strategies (see below) to inform and engage:




E-mail blasts  
and newsletters




Distribution of  
mailers and flyers




Door-to-door  
canvassing close to  
proposed rail crossings




Pop-ups  
and special events




Social media posts



On-line and  
paper surveys



Presentations to  
community groups



Focused Community  
Conversations

The team conducted a number of outreach events at three key points (see below) in the Study to engage with residents and businesses.

## Outreach Round 1

### Summer 2022

Introduced the project to the community, gained an understanding of community values and transportation needs, and informed refinement of project goals and priorities.



## Outreach Round 2

### Spring 2023

Residents were presented with the final three crossing options, including renderings and preliminary evaluation findings, and community connections strategies. Feedback was solicited on community preferences and expected level of use of the railroad crossing solutions.



## Outreach Round 3

### Winter 2023

Shared outcomes of the Study and discussed next steps with the community based on closer evaluation and further coordination with stakeholder partners.





## CONCLUSIONS AND NEXT STEPS

### Conclusions

A key goal of this Study was to identify a preferred new railroad crossing of the Caltrain tracks. Throughout the Study, the community expressed support for a new bicycle and pedestrian crossing of the Caltrain railroad tracks. Thirteen different potential preliminary crossing options were explored and after a screening review they were reduced to three. Each of the remaining three rail crossing concepts were further assessed with extensive community input and feasibility considerations, including compatibility with other infrastructure facilities and projects. Given these complexities, a single preferred option is not being identified. Instead, this report provides a summary of the preferred locations and conceptual designs, a technical evaluation and associated community feedback, should agencies revisit this project.

### Study Considerations

Should conditions change at a future point in time, some key considerations that would need to be further addressed include, but are not limited to the following:

- Coordination with the **San Francisco Public Utilities Commission (SFPUC)** to further assess and resolve impacts with the potential relocation of a major water line
- Coordination with **Caltrain** to study the feasibility of lowering electrification infrastructure (overhead contact system) to allow for a lower bridge crossing to reduce elevation change, ramp and stair length and visual impacts
- Coordination with **SamTrans** and the **Union Pacific Railroad**, to address future plans for transit and freight along the Dumbarton Corridor where one of the bridge crossings is proposed

Concepts may need to be refined and re-designed where necessary, with more significant changes contingent upon feasibility findings considering construction concerns and methodology. The continued inclusion of community input is essential prior to the selection of a recommended railroad crossing option. Before a preferred railroad crossing option can proceed into the environmental review, design and construction phases of development, approval from Caltrain will be required to confirm that a new crossing is compatible with the existing and planned future use and operation of the Caltrain corridor.

Some of the community connections elements (as noted on pages 11-14) could be implemented separate from a rail crossing, providing improved community access and mobility to local destinations within the neighborhoods on both sides of the tracks.

### Complexities Associated with a Potential Rail Crossing

|  |   |  |   |  |  |
|--|---|--|---|--|--|
|  | Impacts to SFPUC facilities and conflict coordination                     |  | Potential to Lower Caltrain's OCS Wires   |  | Contract Delivery Method                     |
|  | Potential UPRR encroachment during construction and conflict coordination |  | Bridge Width  |  | Alternate Tunnel Options                     |
|  | Parking Impacts   |  | Construction Methodology <ul style="list-style-type: none"><li>Staging</li><li>Schedule</li><li>Impact to Revenue Service</li><li>Costs</li></ul> |  | Community Connections Improvements           |
|  | Visual and Privacy Impacts  |  |   |  | Community Sentiment towards Updated Concepts |





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## INTRODUCTION

### Project Need and Background

Unincorporated North Fair Oaks contains a concentration of underserved populations that include households with low income and people of color. Historic mobility and equity barriers within the community have led the Study area to be designated by the Metropolitan Transportation Commission (MTC) as an Equity Priority Community. North Fair Oaks is bifurcated by the Caltrain railroad corridor, and there is no crossing of the railroad tracks for a one-mile segment through the community. With only one existing railroad crossing (Fifth Avenue), the population's mobility is limited, especially for many residents who do not have access to a personal automobile.

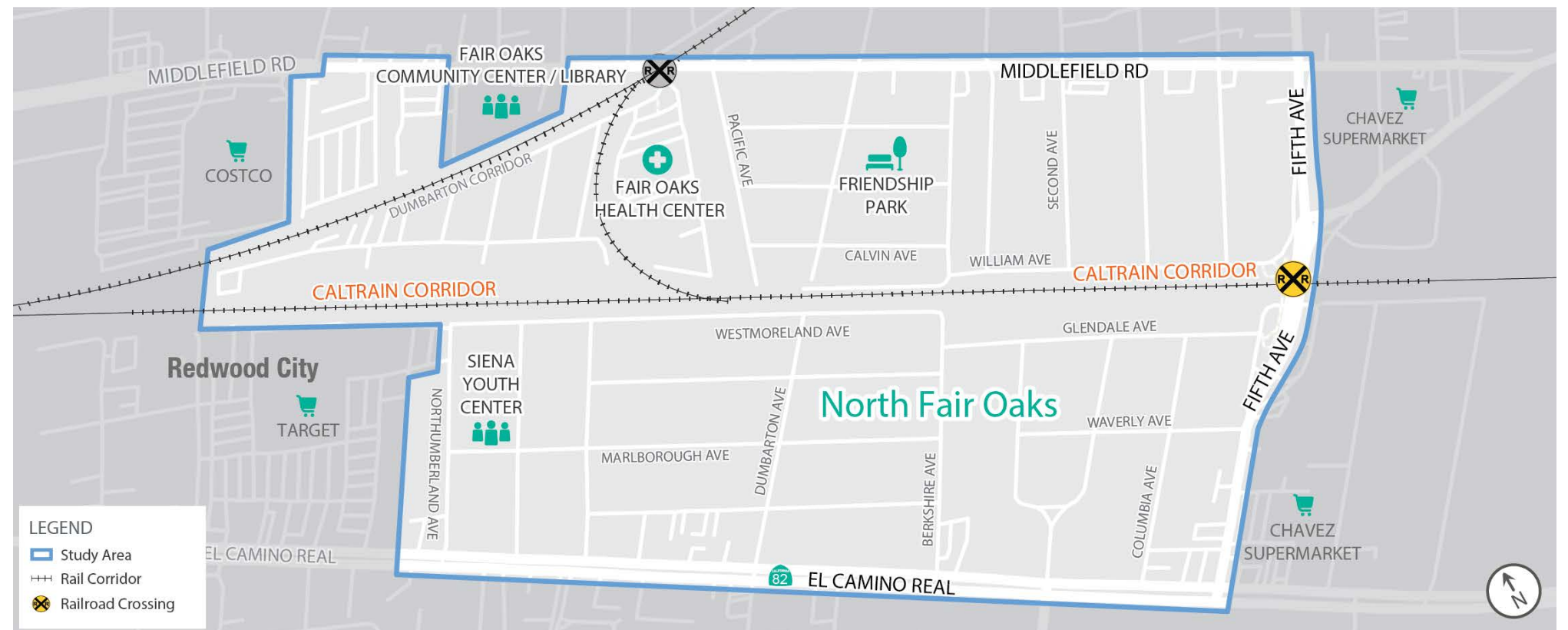
Consequently, planning documents, like the 2011 *North Fair Oaks Community Plan*, have identified crossing(s) of the railroad tracks as a major mobility priority. Successive planning efforts, the most recent being the 2021 *Unincorporated San Mateo County Active Transportation Plan* (ATP), have continued to identify North Fair Oaks as a community with high potential multi-modal transportation demand but limited or inadequate infrastructure. The purpose of this Study is to build on past County planning efforts, as part of a community-driven process, to determine the location and design of a potential new railroad crossing facility while identifying constraints and trade-offs associated with potential crossing options. As a companion effort, this Study also seeks to explore smaller-scale opportunities to improve existing community roadway facilities to make them safer, more accessible, and more connected to better serve neighborhoods on both sides of the tracks.

San Mateo County is committed to advancing equity, with the goal of just and fair inclusion into a society which all can participate, prosper, and reach their full potential. To achieve equity, the County must create conditions that allow all people to reach their full potential, and work to eliminate disparities by race, income, place, and other characteristics. As described above, this Study seeks to advance equity by eliminating mobility barriers. The Study approach was designed to understand impacts to different groups, reach those most likely to be affected by the project, and increase understanding while minimizing unintended adverse consequences.

To properly align the goals of the Study with the needs and desires of the North Fair Oaks community, the project team worked to obtain extensive input from community members, community groups, and other relevant stakeholders throughout the course of the project. Through separate rounds of community outreach, the project team engaged hundreds of individuals who could be affected by the project and collected their input. In addition to interfacing with community residents, the project team also engaged members of the Study's Community Advisory Committee (CAC) and Technical Advisory Committee (TAC). The CAC was comprised of representatives from public service agencies and community-based organizations that directly serve the community and who could share community sentiment and advise and assist with community engagement. The TAC was comprised of representatives from County departments and other public agencies to inform and provide input on technical considerations and requirements. These advisory committees provided valuable insight into the mobility needs of the community throughout each phase of the Study.

### Study Area

The Study area encompasses the portion of the North Fair Oaks community that is bounded by Middlefield Road, El Camino Real, Fifth Avenue and the Redwood City border. The figure below shows the North Fair Oaks community as well as the surrounding areas and the roadway network.



### Previous Planning Efforts

Several documents were reviewed to guide the initial phases of the Study, as noted in the Existing Conditions Memorandum contained in **Appendix A**. Some of these, such as the Middlefield Road Improvement Project, planning efforts undertaken for the Dumbarton Rail Corridor Project, and the Caltrans Safety Project Initiation Document (PID), are projects and focused planning efforts that can expand the reach of improvements proposed as part of this Study through linkages to the surrounding regional active transportation network. Among these documents, the 2011 *North Fair Oaks Community Plan* conducted the most detailed review of the North Fair Oaks community, ultimately identifying the lack of sufficient crossings of the Caltrain railroad tracks as a key mobility barrier to the community. Policy 1B of the Community Plan is to identify optimal multi-modal railroad crossings in order to improve overall neighborhood connectivity, and close gaps in the community's active transportation network. Subsequent planning studies, like the *Unincorporated San Mateo County Active Transportation Plan* and the 2021 *C/CAG Countywide Bicycle and Pedestrian Plan*, continued to identify these gaps in the circulation network as a major mobility barrier, ultimately spurring this North Fair Oaks Bicycle and Pedestrian Railroad Crossing and Community Connections Study.





## Project Goals

To guide the development and evaluation of the railroad crossing alternatives and associated surface street improvements, the project team obtained extensive community input on overarching goals for the project. Based on the feedback received from the TAC, CAC, and community members, the project team developed a set of project goals to guide subsequent project efforts, including the alternatives evaluation. More information regarding Round One of the outreach process and the project goals development are provided in **Appendix B** and **Appendix C**, respectively. The ultimate project goals and their definition include (in alphabetical order):



### Access

Provide widely accessible pedestrian and bicycle connections across the railroad corridor and to adjacent communities to create a more useful, inclusive, and safer transportation network.



### Community Integration

Confirm that newly constructed facilities enhance the sense of community and the aesthetics of North Fair Oaks through improved connections and by incorporating public art, public spaces, and attractive structures.



### Constructability

To the extent possible, limit adverse impacts to the surrounding community and infrastructure during construction, while striving to minimize construction and maintenance costs given limited funding.



### Equity

Prioritize equitable transportation implementation, especially for those without access to a car, while limiting community impacts to housing, and adhering to larger community and regional sustainability goals beyond the immediate Study goals and considering all stakeholder input.



### Safety

Design facilities guided by the prioritization for the most vulnerable populations, and create safe, well-lit spaces that are comfortable to access and utilize, with personal security in mind.

## Study Approach



### Coordination with Advisory Committees

Engaged with community stakeholders through a Community Advisory Committee (CAC) and received input from participating public agencies through a Technical Advisory Committee (TAC) at key points throughout the Study process.



### County Advisory Body Engagement

Engaged with the North Fair Oaks Community Council, the Planning Commission, and the Pedestrian and Bicycle Advisory Committee (BPAC) to inform and receive feedback.



### Goals and Priorities

Based on stakeholder and community input, established a set of comprehensive needs, goals, and objectives for the project, which were used to develop evaluation criteria.



### Existing Conditions

Assessed existing community needs and opportunities within the study area.



### Community Engagement

Conducted multi-channel and in-language community engagement to establish project needs, guide project priorities, learn about community preferences, and receive input on potential alternatives.



### Option Development and Refinement

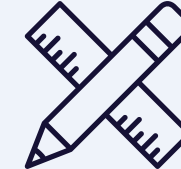
Identified potential solutions for grade-separated railroad crossing facilities and community connections and assessed engineering feasibility.

Screened range of potential solutions to three that were selected for further development and community input.



### Evaluation

Further evaluated three project options, assessing implementation impacts, community integration, and high-level project costs.



### Implementation Planning

Coordinated with Caltrain on constructability and permitting. Assessed steps toward implementation and key areas for further investigation in future project phases.





## BASELINE CONDITIONS

### Existing/Planned Transportation Network

Within North Fair Oaks, there are four major roadways that bound the Study area: SR 82 (El Camino Real), SR 84 (Woodside Road), Middlefield Road, and 5th Avenue. The only Caltrain railroad crossings are at 5th Avenue and Woodside Road, which are separated by over a mile. An overview of the community’s transportation network is shown in the map to the right.

Within the Study area, most other roadways are local facilities surrounded by primarily residential land uses. These roadways typically are two-lane sections, and nearly all local roadways provide heavily used on-street parking. Curb-to-curb widths for the residential facilities range from 34’ to 40’, while the overall public right-of-way width is typically 50’-60’. Dumbarton Avenue is an exception, as it features a right-of-way width closer to 70’. The Study area for this project, showing existing and planned bicycle and pedestrian facilities is located to the right. A more detailed depiction of the area’s transportation network is shown on the following page. Additional details on existing conditions can be found in the Existing Conditions Memorandum in **Appendix A**.



**Transit** - The community of North Fair Oaks is served by SamTrans bus and Redi-Wheels paratransit, provided by the San Mateo County Transit District. The Caltrain railroad corridor runs through the Study area; however, there is no station in North Fair Oaks. The closest operational stations are in Redwood City and Menlo Park. The number of continuous tracks along the railroad corridor is expanded within the Study area, increasing from two to four tracks for a little over a one-mile-long span. An overhead contact system (OCS) is under construction as part of the electrification of the corridor.



**Bike** - North Fair Oaks has limited existing bicycle facilities. There are bike lanes on 5th Avenue and bike lanes under construction on Middlefield Road. The *Unincorporated San Mateo County Active Transportation Plan* offers a long-term vision for bicycle travel in the area, recommending Class III bicycle boulevards on many local residential streets within the adjacent neighborhoods on both sides of the Caltrain railroad tracks. The proposed bicycle network is shown in the Transportation Network Overview on the next page.



**Pedestrian** - North Fair Oaks features sidewalks on most streets, which are generally continuous. Major streets, such as El Camino Real and Middlefield Road, typically have sidewalks on both sides measuring from four to 10 feet wide. Smaller residential streets have four- to five-foot-wide sidewalks on both sides, but many lack landscape buffers between the sidewalk and street and do not have street trees to provide shade canopy on hot days. Street-adjacent trees on private property are common throughout the study area. Residents have expressed a desire for greater lighting at night. Planned and proposed pedestrian improvements within and along the study area are shown in the Transportation Network Overview map on the next page.



### EXISTING AND PLANNED BICYCLE AND PEDESTRIAN FACILITIES

#### LEGEND

|                                   |  |                                 |                                |
|-----------------------------------|--|---------------------------------|--------------------------------|
| Study Area                        | North Fair Oaks Border                     | PROPOSED BIKEWAYS               |                                |
| Rail Corridor                     | Traffic Signal                             | Class I Shared Use Path         | Class I Shared Use Path        |
| Railroad Crossing At-Grade        | Pedestrian Crossing                        | Class II Bicycle Lane           | Class II Bicycle Lane          |
| Railroad Crossing Grade-Separated | Pedestrian Hybrid Beacon Crossing          | Class III Bicycle Boulevard     | Class II Buffered Bicycle Lane |
| SFPUC Hetch Hetchy Corridor       | Rectangular Rapid Flashing Beacon Crossing | Class IV Separated Bicycle Lane | Class III Bicycle Boulevard    |

0 0.1 0.2 0.3 Miles  
Sources: County of San Mateo, Department of Public Works; Unincorporated San Mateo County, Active Transportation Plan (2021); County of San Mateo, Middlefield Road Improvement Plans

### Middlefield Junction Affordable Housing Project

Middlefield Junction is a three-acre site located behind the Fair Oaks Health Center and directly adjacent to the Caltrain railroad tracks that will be developed into a 179-unit affordable housing apartment building, with space for a childcare and community center. The Middlefield Junction project is currently moving into the first stages of construction.

### Utilities

The Bay Division Pipelines (Hetch Hetchy corridor) run diagonally through the study area, crossing the Caltrain railroad corridor near Pacific Avenue. The Palo Alto Pipeline runs along Westmoreland Avenue on the southwest side of the railroad corridor. Both of these critical water utilities are operated by the SFPUC. Other utilities, such as power lines, also cross the Caltrain railroad tracks and beneath roadways in the study area.





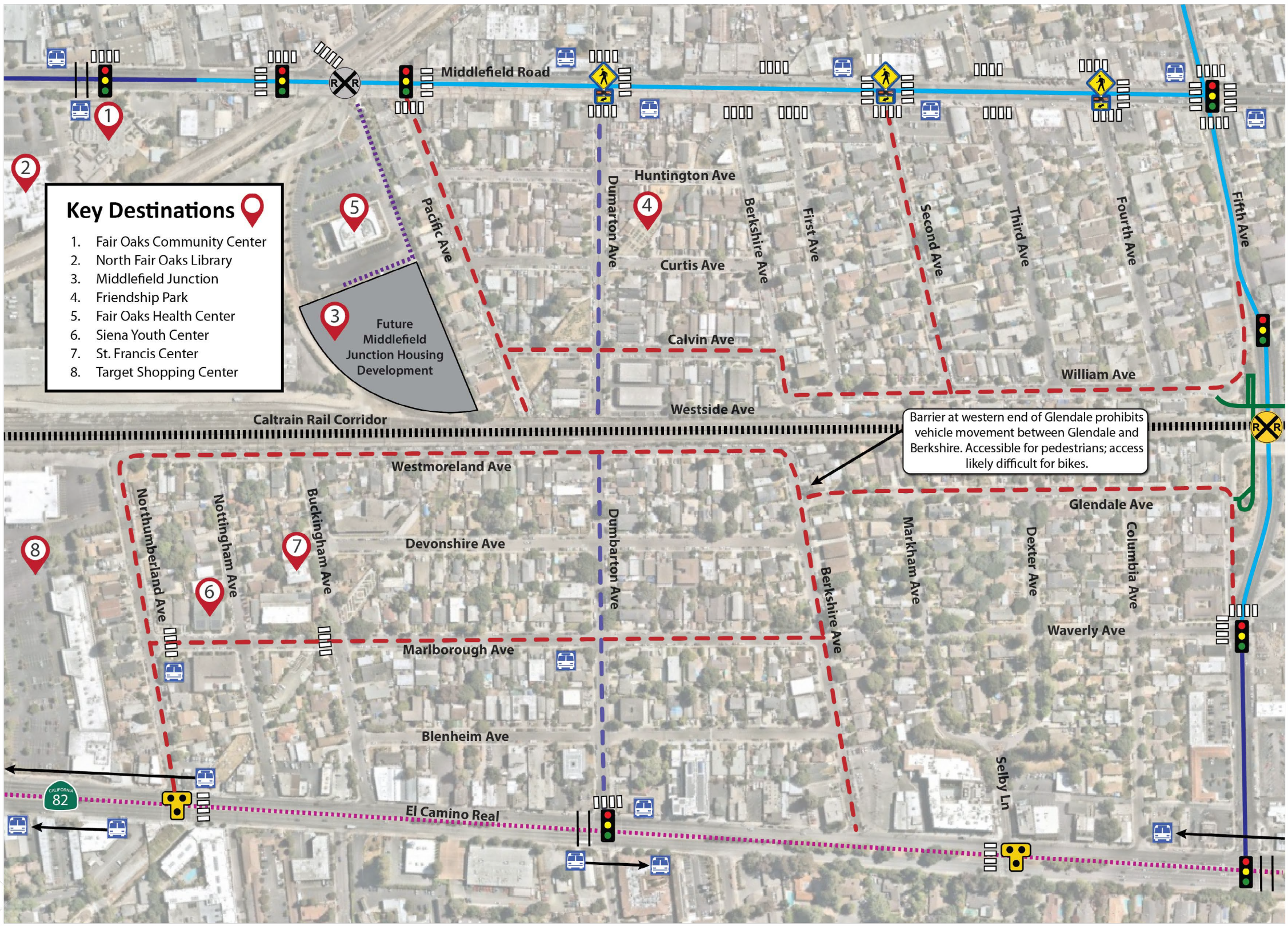
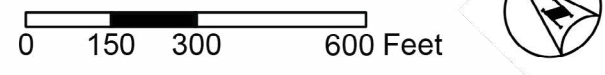


Transportation Network Overview

Legend

- Standard Crosswalk
- High-Visibility Crosswalk\*
- Traffic Signal
- Rapid Rectangular Flashing Beacon (RRFB)\*
- Pedestrian Hybrid Beacon (PHB)\*
- Bus Stop\*\*
- Grade-Separated Railroad Crossing
- At-Grade Railroad Crossing
- Class I Bikeway
- Class II Bikeway\*
- Bicycle Boulevard
- Planned Pedestrian Pathway
- Planned Bikeway (mix of Class II & IV)
- Recommended Bikeway – San Mateo County ATP
- Recommended Bikeway – North Fair Oaks Community Plan

\*Includes Under-Construction and Funded Improvement Projects  
\*\*Some existing bus stops proposed to be moved or consolidated by the ECR Bus Speed & Reliability Study







## Community Outreach Round 1

The first phase of engagement introduced the project to the broader community and informed the team's understanding of community values, issues, and transportation needs. The outreach team was comprised of County staff, consultants (including Nuestra Casa), and other key community partners many of whom were represented on the Study CAC. The team sought input from a wide variety of stakeholders on specific barriers to walking and bicycling in the project area, key destinations in need of connection, opportunities to improve safety and enhance access, and community priorities that served to help inform the Study's goals and evaluation criteria. The team hosted 10 pop-up events, including one that was supplemented with a community bike ride, held two virtual presentations, distributed flyers, sent mailers to all property owners and occupants within the study area and 300 feet beyond, and conducted an online and in-person survey (a total of 349 completed surveys were received). Updates on activities were provided on the Study's website, through social media and via community partner listservs and newsletters. All materials were provided in Spanish and English. Some relevant takeaways from the first round of community outreach are listed below.

Of all survey respondents, 52% live within the study area, and 70% live in North Fair Oaks

37%



About 37% of participants currently drive to destinations on the other side of the railroad tracks but would prefer to walk or bike if it were possible

30%



About 30% of respondents currently walk, bike, or take the bus to the other side of the railroad tracks but find it challenging because of the distance

22%



About 22% of respondents don't travel to places on the other side of the railroad tracks or do so less often because it is difficult to get there

High car speeds and poorly lit streets/sidewalks were the main factors that affect participants' sense of safety, while unsafe street crossings ranked as a close third



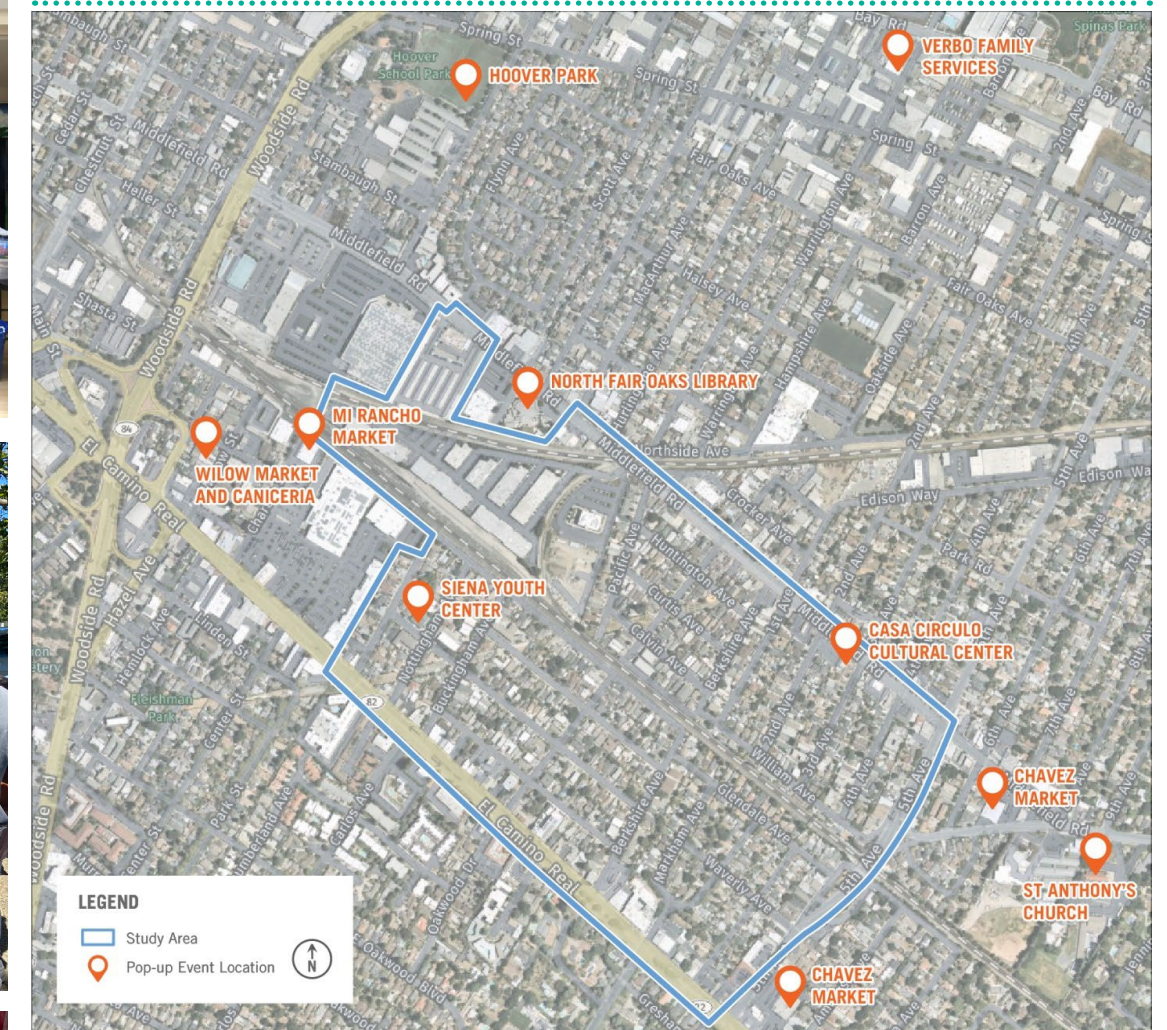
Personal convenience, security, and access were the three highest priorities identified for the Study



A summary of Round 1 of the community engagement can be found in Appendix B.



## Pop-Up Event Map - Outreach Round 1



## Demographics



- 76% identify as Hispanic or Latinx/a/o
- 70% North Fair Oaks or Redwood City residents
- 60% took the survey in Spanish
- 24% over 60 years old

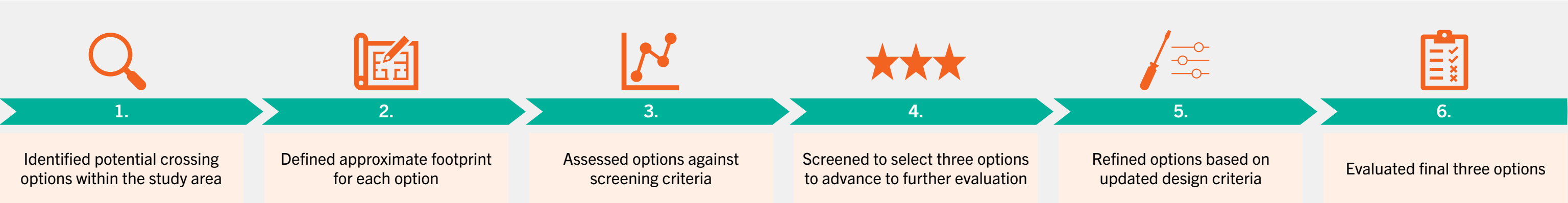




# PROJECT PRIORITIES AND EVALUATION

## Option Development and Evaluation

Initially, a wide array of potential railroad crossing options were developed to find the most optimal alignments. The process of designing these preliminary options is shown below:



## Evaluation Considerations

With a variety of different crossing options sketched, the team developed a set of considerations to guide the screening of the preliminary options and the ultimate selection of three options to move forward. These screening considerations are shown below.

### Parcel Impacts

Does the footprint encroach into any privately-owned parcels?

**Design Approach:** Minimize parcel impacts where possible and completely avoid residential displacement

### Parking Impacts

Do required roadway modifications limit the amount of parking options near the crossing?

**Design Approach:** Minimize parking loss wherever possible. At least some parking loss is expected for most options.

### Access Impacts

Would access to any parcels be impacted?

**Design Approach:** Avoid ramps and configurations that preclude residential access. Minimize changes in circulation to residential access, although some changes are unavoidable.

### Fire/Emergency Access

Will emergency vehicles be able to access the crossing and surrounding properties?

**Design Approach:** Identify roadway clear widths less than 20'. Confirm intersections are navigable for emergency vehicles.

### SFPUC Utilities

Would construction conflict with the Hetch Hetchy Bay Division pipeline?

**Design Approach:** Design ramps in a way that avoids conflict with Bay Division pipeline.

### Caltrain Infrastructure

Does facility adhere to Caltrain-specified standards?

**Design Approach:** Confirm facility meets all separation requirements from OCS poles as well as track clearance requirements.

Crossing options that resulted in the removal of homes were not moved forward to prevent residential displacement. After completion of the screening process, the range of potential options was reduced from 13 concepts to three preferred options for further design and analysis.





Evaluation Criteria

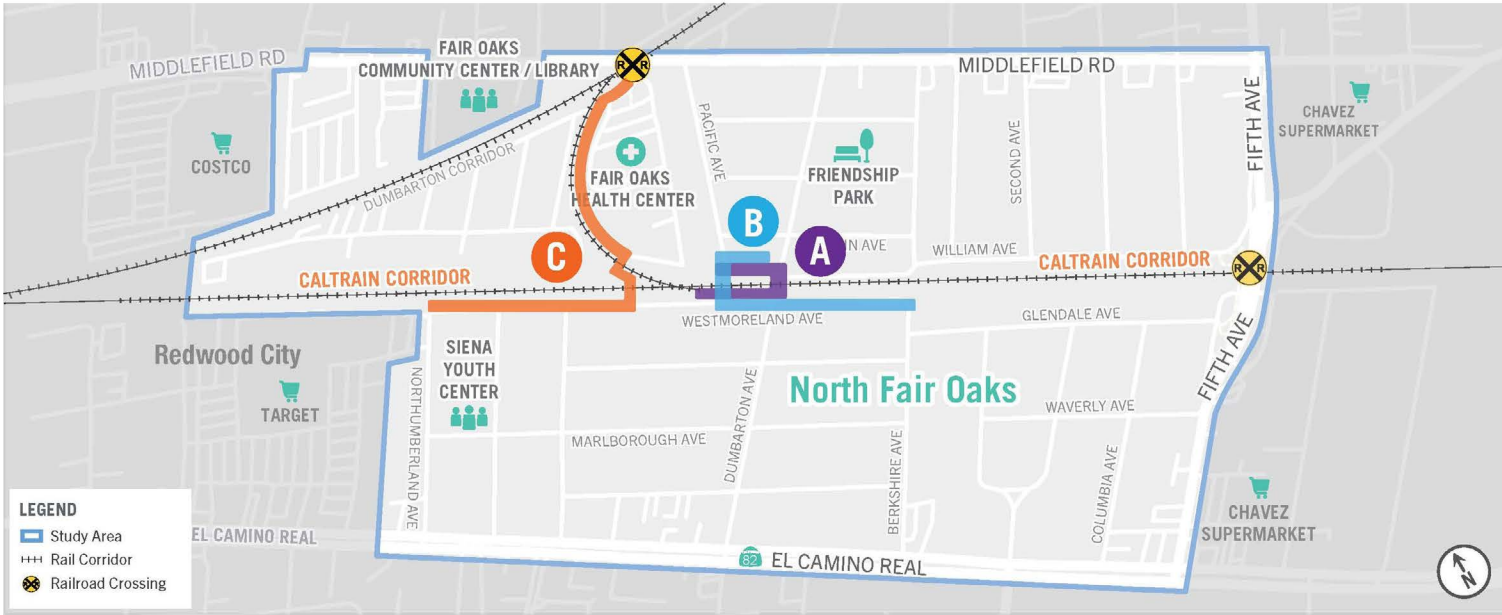
Derived predominantly from the overarching project goals and extensive input from Community Engagement Round 1, specific, targeted evaluation criteria were selected to assess each option, inclusive of a railroad crossing alignment and the corresponding local street bicycle and pedestrian improvements. Each of the Study goals are linked to specific criteria, with measurable outcomes, that were used to evaluate the final three options. The development of the project goals and evaluation criteria is described in more detail in the Goals and Evaluation Criteria Memorandum in **Appendix C**.

| Evaluation Criteria  | Measure   | Access | Community<br>Integration | Constructability | Equity | Safety |
|--|---|--------|--------------------------|------------------|--------|--------|
| Service Population*  | Existing population within ¼ mile walking distance from rail crossing access points.  | ✖      |                          |                  | ✖      |        |
| Motor Vehicle Circulation  | Extent to which changes to the roadway network would be anticipated to cause diversion and congestion.  | ✖      |                          |                  |        |        |
| Bicycle and Pedestrian Comfort                                     | Ability of the improved bicycle and pedestrian network to meet the mobility needs of all ages and abilities.  | ✖      | ✖                        |                  | ✖      | ✖      |
| Connectivity with Community-wide & Regional Transportation Network | Connectivity between proposed Study improvements and the greater transportation network on surrounding streets, including El Camino Real, Middlefield Road, and Fifth Avenue. | ✖      | ✖                        |                  | ✖      | ✖      |
| Parking Impacts  | Number of net parking spaces lost.  |        |                          | ✖                |        |        |
| Public Space   | Potential to create new public spaces.  |        | ✖                        |                  | ✖      |        |
| Green Infrastructure   | Potential to implement green infrastructure, like solar panels or bio-retention facilities.   |        | ✖                        |                  | ✖      |        |
| Connections to Local Destinations                                  | Directness of travel path to local destinations (e.g., schools, community center, medical facilities, etc.).  | ✖      | ✖                        |                  | ✖      |        |
| Rail Crossing Length*  | Total length of crossing facility.  | ✖      | ✖                        | ✖                |        |        |
| Visual Impact*   | Level of disruption to views and privacy.   |        | ✖                        |                  | ✖      |        |
| Public Infrastructure Impact                                       | Level of disruption to existing and planned utilities (e.g., SFPUC) and transportation service (e.g., Caltrain).  |        |                          | ✖                |        |        |
| Construction Cost  | Rough order of magnitude (ROM) of project construction cost.  |        |                          | ✖                |        |        |
| Construction Impact  | Magnitude of short-term adverse effects to residents and businesses during construction, including traffic diversion and access restrictions                                  | ✖      |                          | ✖                | ✖      |        |
| Operations and Maintenance Cost                                    | Magnitude of projected annual cost of operations and maintenance.   |        |                          | ✖                |        |        |
| Direct Parcel Impacts*   | Number of parcels needed, all or in part, to construct railroad crossing.   |        |                          | ✖                | ✖      |        |
| Emergency Access   | Effects on emergency vehicle access (e.g., fire/police).  |        |                          |                  |        | ✖      |
| Personal Security  | Alignment of facility configuration with Crime Prevention Through Environmental Design (CPTED) best practices.  | ✖      | ✖                        |                  |        | ✖      |

\*These criteria are specific to the rail crossing alternatives

Rail Crossing Options Selected for Evaluation

After screening the array of potential railroad crossing options, three crossing facilities were selected for further study and development: Option A - Dumbarton Avenue Tunnel; Option B - Dumbarton Avenue Bridge; Option C – Middlefield Junction Bridge. The locations of the final three crossing options are shown in the Option Map below and discussed in more detail on the following pages. Concept plans for the three final options can be found in **Appendix D**.







## RAIL CROSSING OPTIONS

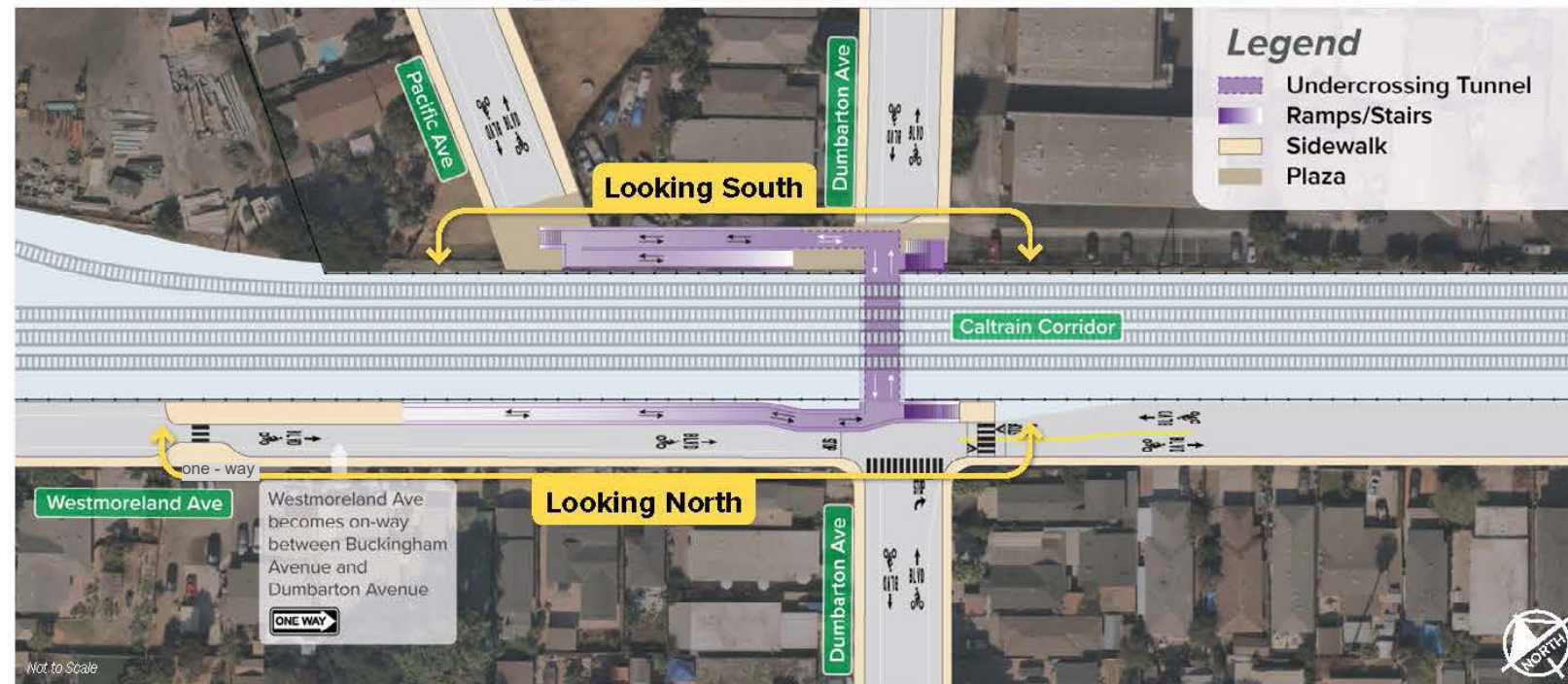
### Option A: Dumbarton Avenue Tunnel

Option A is a tunnel roughly aligned with Dumbarton Avenue. The north side of the railroad tracks has stair and ramp access on Pacific Avenue and stair access on Dumbarton Avenue, while the south side has ramp and stair access along Westmoreland Avenue.

#### Design Considerations

- The tunnel has the shortest crossing length and least elevation change among the three options
- The tunnel will provide direct access to Friendship Park, Siena Youth Center, and St. Francis Center
- Parts of Westmoreland Avenue would be converted to a one-way street
- Approximately 51 parking spaces will be removed on Westmoreland Avenue, and approximately 6 parking spaces will be removed on Pacific Avenue and Dumbarton Avenue north of the railroad tracks
- Provides opportunity to build small plazas and add new landscaping and public art
- The Dumbarton Avenue Tunnel is underground, minimizing impact on views from the street level
- During construction, travelers would have limited access on Westmoreland Avenue and at the end of Dumbarton Avenue north of the railroad tracks
- Less noise and vibration from tunnel construction compared to bridges
- No housing displacement; however, one to two empty lots would be acquired

#### Looking South



#### Looking North



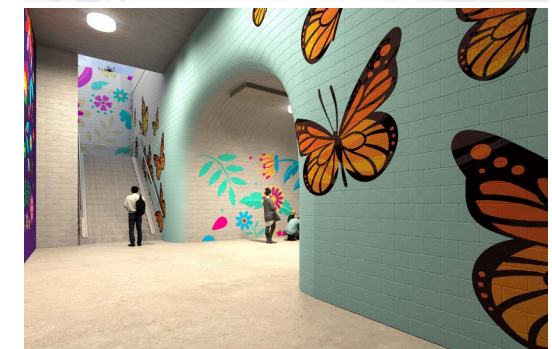
Plaza on Dumbarton Avenue north of the tracks



Westmoreland Avenue entrance to tunnel with art along ramp walls



Proposed plaza at Dumbarton Avenue stairs



Inside of the tunnel, with artwork on walls





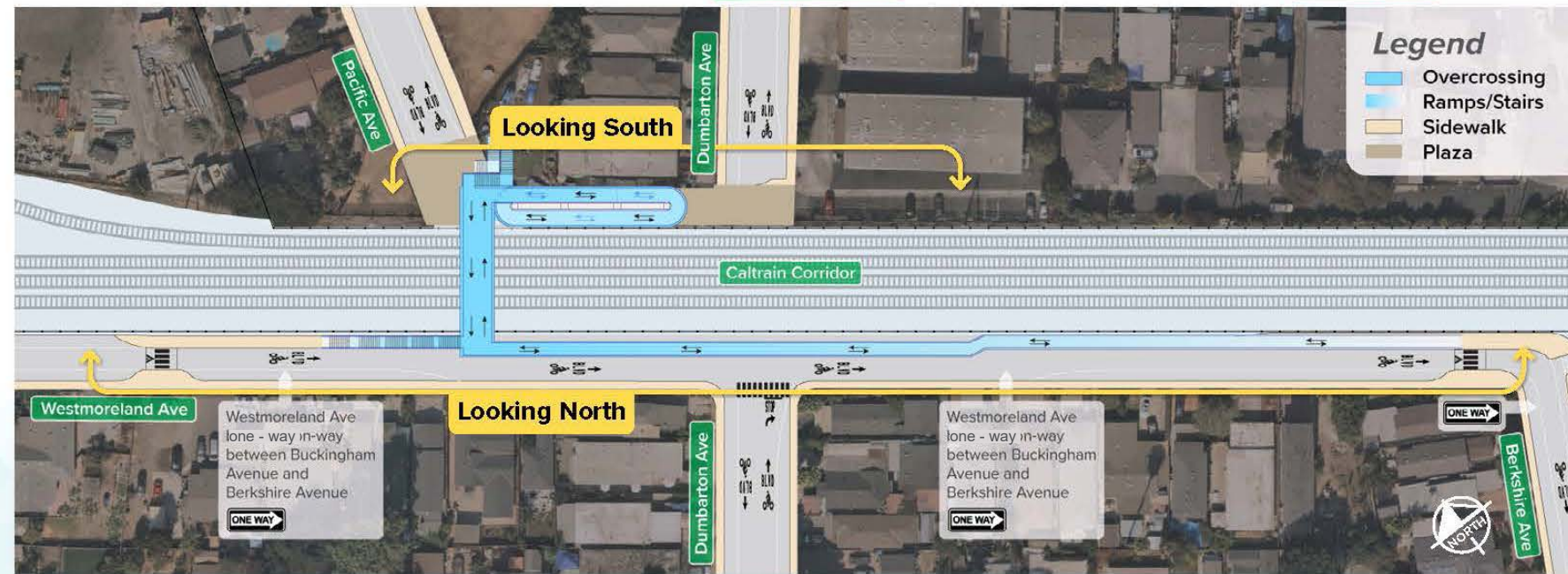
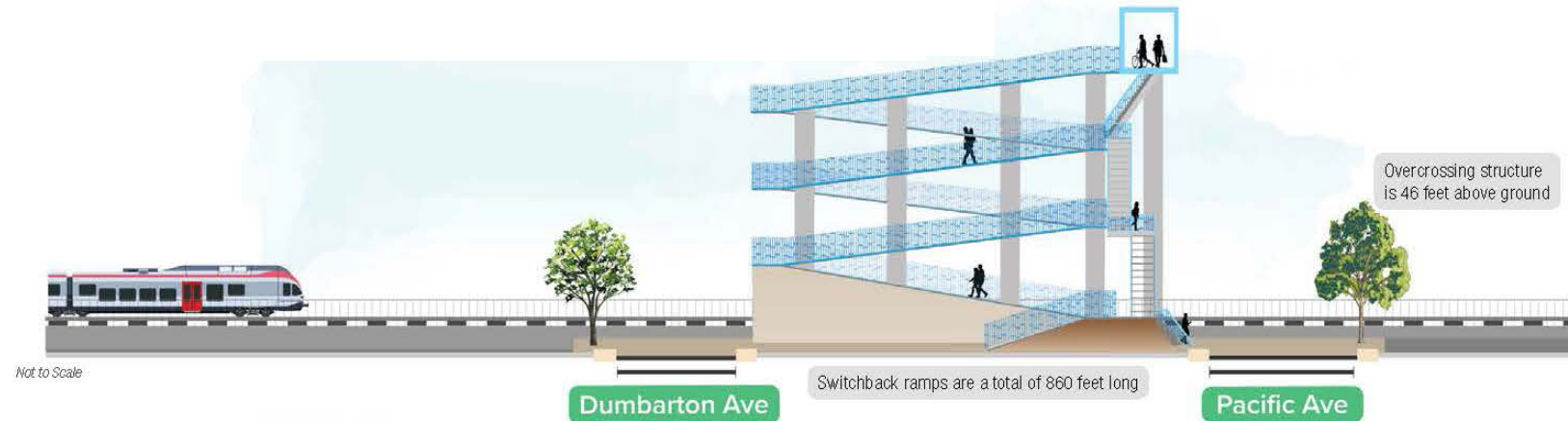
### Option B: Dumbarton Avenue Bridge

Option B is a bridge that crosses the railroad tracks around Dumbarton Avenue and Pacific Avenue. The north side of the railroad tracks features stair access at Pacific Avenue and ramp access at Dumbarton Avenue, while the south side has accesses on either side of Dumbarton Avenue, with the stairs to the west and the ramp to the east.

#### Design Considerations

- The bridge provides direct access to Friendship Park, Siena Youth Center, and St. Francis Center
- Parts of Westmoreland Avenue would be converted to a one-way street
- Approximately 55 parking spaces would be removed on Westmoreland Avenue, and approximately 5 parking spaces will be removed on Pacific Avenue and Dumbarton Avenue north of the railroad tracks
- The bridges require longer crossing distances and greater elevation changes compared to the tunnel alternative
- Travelers remain above ground, although the height of the bridge may make it difficult to see travelers from the street level
- Provides opportunity to build small plazas and add new landscaping and public art
- The Dumbarton Avenue Bridge will be adjacent to residential areas and will be taller than nearby buildings
- During construction, travelers would have limited access along Westmoreland Avenue
- More noise and vibration would result from bridge construction compared to the construction of a tunnel
- No housing displacement; however, two empty lots will be acquired for the bridge

#### Looking South



#### Looking North



Aerial view of bridge facing west



Entrance to ramp on Westmoreland Avenue



View of plaza, ramp, and bridge on Dumbarton Avenue north of tracks



Dumbarton Avenue pedestrian plaza, facing west

Note: Options B and C may see further changes given the conflicts and requirements with the Caltrain OCS electrification infrastructure. These items could include, but are not limited to, decreasing the height of the bridge, adding enclosed fencing to open air areas, and reducing the width of the bridge.



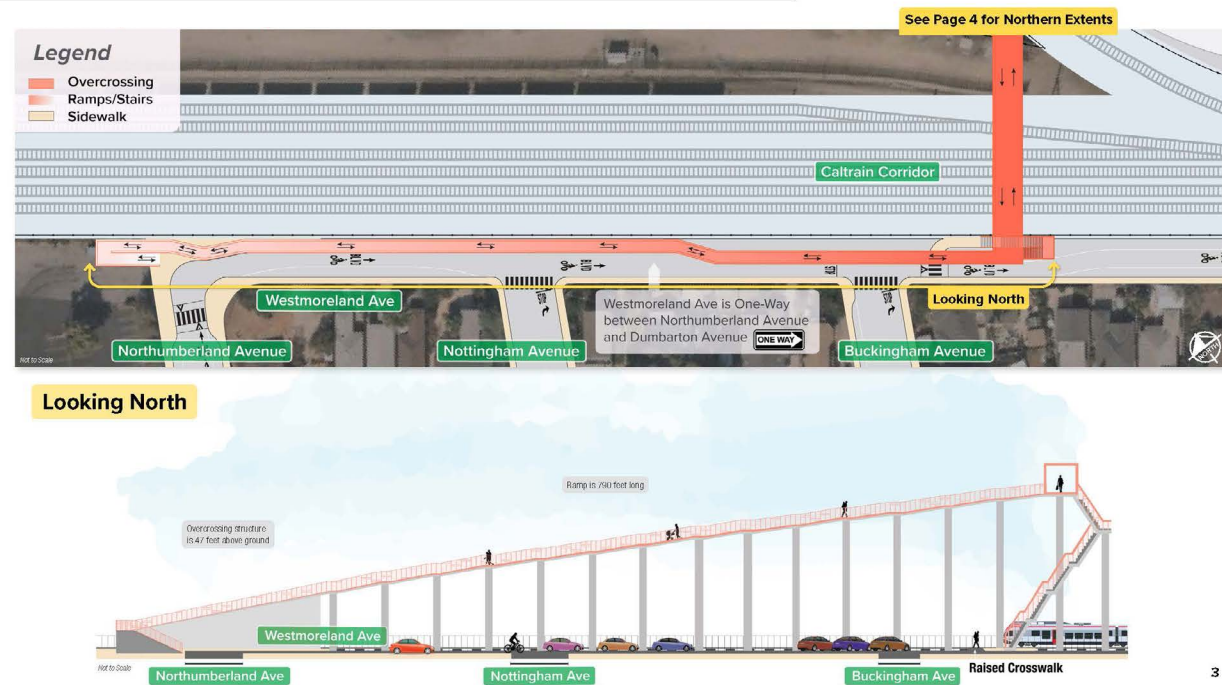


### Option C: Middlefield Junction Bridge

Option C is a bridge that crosses the railroad tracks around Buckingham Avenue and connects with the Middlefield Junction site to the north. Ramps can be accessed from the front of the Health Center and stairs can be accessed between the Health Center and Middlefield Junction housing development north of the railroad tracks, while users south of the railroad tracks can use the stairs east of Buckingham Avenue or the ramp along Northumberland Avenue.

#### North Fair Oaks Bicycle and Pedestrian Railroad Crossing Alternative C: Middlefield Junction Overcrossing (Southern Extents)

Kimley»Horn



#### North Fair Oaks Bicycle and Pedestrian Railroad Crossing Alternative C: Middlefield Junction Overcrossing (Northern Extents)

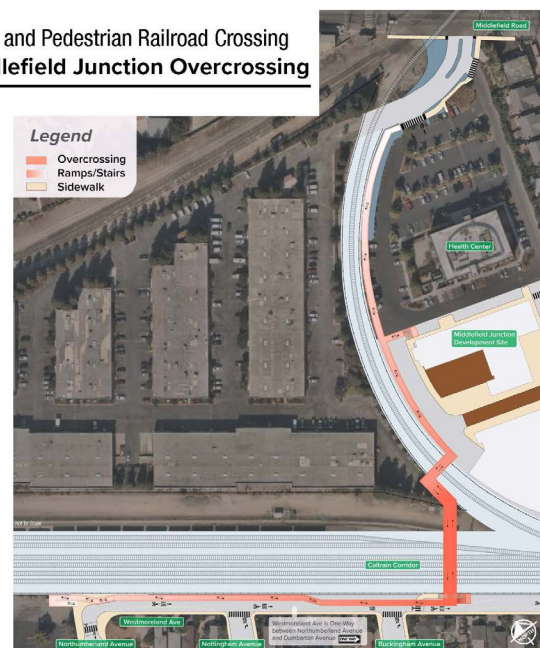
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#### Design Considerations

- Provides most direct access to Middlefield Junction affordable housing complex, the childcare center, Fair Oaks Community Center, the North Fair Oaks Library, and the County Health clinic to the north. Provides access to St. Francis Center, Siena Youth Center, and the Target shopping center to the south.
- Parts of Westmoreland Avenue would be converted to a one-way street
- Approximately 46 parking spaces would be removed on Westmoreland Avenue and approximately 20 parking spaces would be removed from the Fair Oaks Health Center
- The bridges require longer crossing distances and greater elevation changes compared to the tunnel alternative
- Travelers remain above ground, although the height of the bridge may make it difficult to see travelers from the street level
- Long ramp length between access points
- The construction of the bridge would remove several trees from the Health Center parking lot
- No opportunity to build plazas and add new landscaping
- The Middlefield Junction Bridge will be taller than nearby buildings and close to the Middlefield Junction multifamily housing buildings

#### North Fair Oaks Bicycle and Pedestrian Railroad Crossing Alternative C: Middlefield Junction Overcrossing



View of the bridge from Westmoreland Avenue



Northwest-facing view of the proposed Middlefield Junction Bridge.

Note: Options B and C may see further changes given the conflicts and requirements with the Caltrain OCS electrification infrastructure. These items could include, but are not limited to, decreasing the height of the bridge, adding enclosed fencing to open air areas, and reducing the width of the bridge.





## COMMUNITY CONNECTIONS

### Recommendation Development

While identifying a preferred railroad crossing option is a primary aim of this Study, an additional purpose is to recommend surface street improvements throughout the Study area that make walking and biking in the community easier and safer. Local facilities were evaluated based on available right-of-way, adjacent land uses, and circulation considerations, among other factors. Routing for new bicycle and pedestrian infrastructure relied on previously developed Plan recommendations, though specific alignments and improvements are directly linked to the layout of each crossing option. Generally, recommendations made for the community connections will create a more pedestrian and cyclist-friendly environment by reducing vehicle speeds, improving lighting conditions, establishing clear bicycle routes, and enhancing the accessibility of community facilities.

- Bike/Pedestrian Railroad Crossing
- Railroad Crossing Facility Access and Plaza (if feasible)
- Bike Boulevard, including Signage, Markings, and Traffic Calming
- Improve Street Lighting
- Contra-Flow Bikeway
- One-Way Conversion
- Curb Bulb-outs and ADA Ramps
- Two-Stage Turn Queue Box (Bikes)
- Traffic Circle with ADA Ramps
- High-Visibility Crosswalk and ADA Ramps
- Raised, High-Visibility Crosswalk and ADA Ramps
- Pedestrian Pathway
- Stop Sign

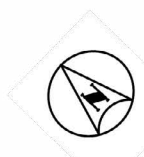
#### Existing Infrastructure

Shown with Semi-Transparency

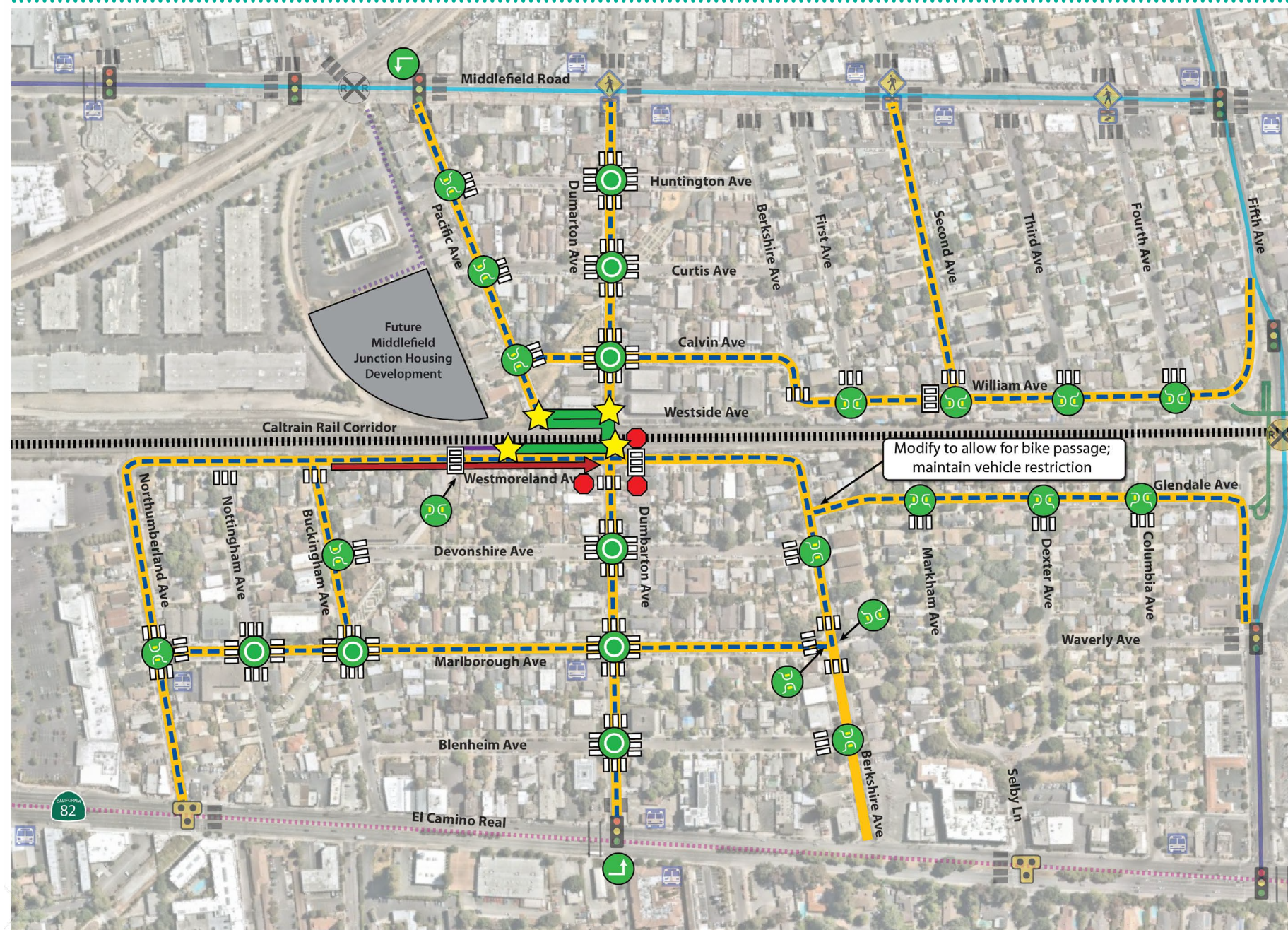
- Traffic Signal
- Class I Bikeway
- Existing Crosswalk\*
- Class II Bikeway\*
- Bus Stop
- Bicycle Boulevard
- At-Grade Railroad Crossing
- Planned Bikeway (mix of Class II & IV)
- Grade-Separated Railroad Crossing
- Planned Pedestrian Pathway
- Pedestrian Hybrid Beacon (PHB)\*
- Rapid Rectangular Flashing Beacon (RRFB)\*

\*Includes Under-Construction and Funded Improvement Projects

0 150 300 600 Feet



### Recommendations - Option A



All traffic circles, stop signs, and other traffic calming elements will need to be evaluated and approved by the Department of Public Works before implementation





COMMUNITY CONNECTIONS

Bike/Pedestrian Railroad Crossing

★

Railroad Crossing Facility Access and Plaza (if feasible)

---

Bike Boulevard, including Signage, Markings, and Traffic Calming

—

Improve Street Lighting

—

Contra-Flow Bikeway

→

One-Way Conversion

Curb Bulb-outs and ADA Ramps

Two-Stage Turn Queue Box (Bikes)

Traffic Circle with ADA Ramps

High-Visibility Crosswalk and ADA Ramps

Raised, High-Visibility Crosswalk and ADA Ramps

—

Pedestrian Pathway

●

Stop Sign

Existing Infrastructure

Shown with Semi-Transparency

Traffic Signal

Existing Crosswalk\*

Bus Stop

At-Grade Railroad Crossing

Grade-Separated Railroad Crossing

Pedestrian Hybrid Beacon (PHB)\*

Rapid Rectangular Flashing Beacon (RRFB)\*

Class I Bikeway

Class II Bikeway\*

Bicycle Boulevard

Planned Bikeway (mix of Class II & IV)

Planned Pedestrian Pathway

\*Includes Under-Construction and Funded Improvement Projects

0150300600 Feet

Recommendations - Option B



All traffic circles, stop signs, and other traffic calming elements will need to be evaluated and approved by the Department of Public Works before implementation





COMMUNITY CONNECTIONS

- Bike/Pedestrian Railroad Crossing
- ★

Railroad Crossing Facility Access and Plaza (if feasible)
- Bike Boulevard, including Signage, Markings, and Traffic Calming
- Improve Street Lighting
- Contra-Flow Bikeway
- One-Way Conversion
- ⦿

Curb Bulb-outs and ADA Ramps
- ⦿

Two-Stage Turn Queue Box (Bikes)
- ⦿

Traffic Circle with ADA Ramps
- ⦿

High-Visibility Crosswalk and ADA Ramps
- ⦿

Raised, High-Visibility Crosswalk and ADA Ramps
- Pedestrian Pathway
- Stop Sign

- Existing Infrastructure

Shown with Semi-Transparency
- ⦿

Traffic Signal
- ⦿

Existing Crosswalk\*
- ⦿

Bus Stop
- ⦿

At-Grade Railroad Crossing
- ⦿

Grade-Separated Railroad Crossing
- ⦿

Pedestrian Hybrid Beacon (PHB)\*
- ⦿

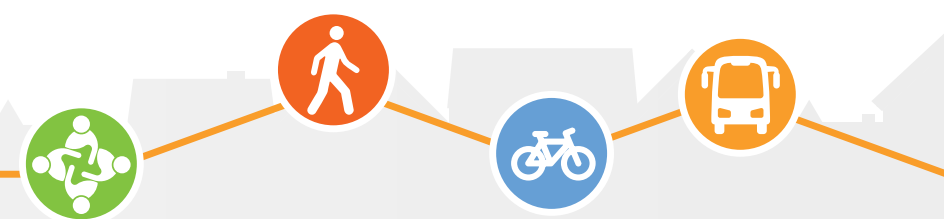
Rapid Rectangular Flashing Beacon (RRFB)\*
- Class I Bikeway
- Class II Bikeway\*
- Bicycle Boulevard
- Planned Bikeway (mix of Class II & IV)
- Planned Pedestrian Pathway
- 0 150 300 600 Feet
- ⦿

Recommendations - Option C



All traffic circles, stop signs, and other traffic calming elements will need to be evaluated and approved by the Department of Public Works before implementation





## Community Connections Improvements

The images below represent the street improvements that garnered the most support in the Community Engagement Round 2



### Sidewalk and Crosswalk Lighting



### High-Visibility Crosswalk



### ADA Curb Ramp



#### Sidewalk and Crosswalk Lighting

Pedestrian-scale lighting along key corridors can provide a better sense of security and more attractive facilities for users.



#### High-Visibility Crosswalk

Crosswalks striped with patterns designed to enhance pedestrian visibility.



#### ADA Curb Ramp

Graded curb ramps designed for users in compliance with the Americans with Disabilities Act.



#### Speed Humps

Raised deflection in the roadway to reduce vehicle speeds. Includes pass through for emergency vehicles.



#### Raised Crosswalk

Crosswalk constructed at or near sidewalk level to increase pedestrian visibility while also slowing vehicle speeds.



#### Traffic Circle

Raised circle placed in the middle of an intersection to reduce vehicle speeds and conflicts.



#### Curb Bulb-outs

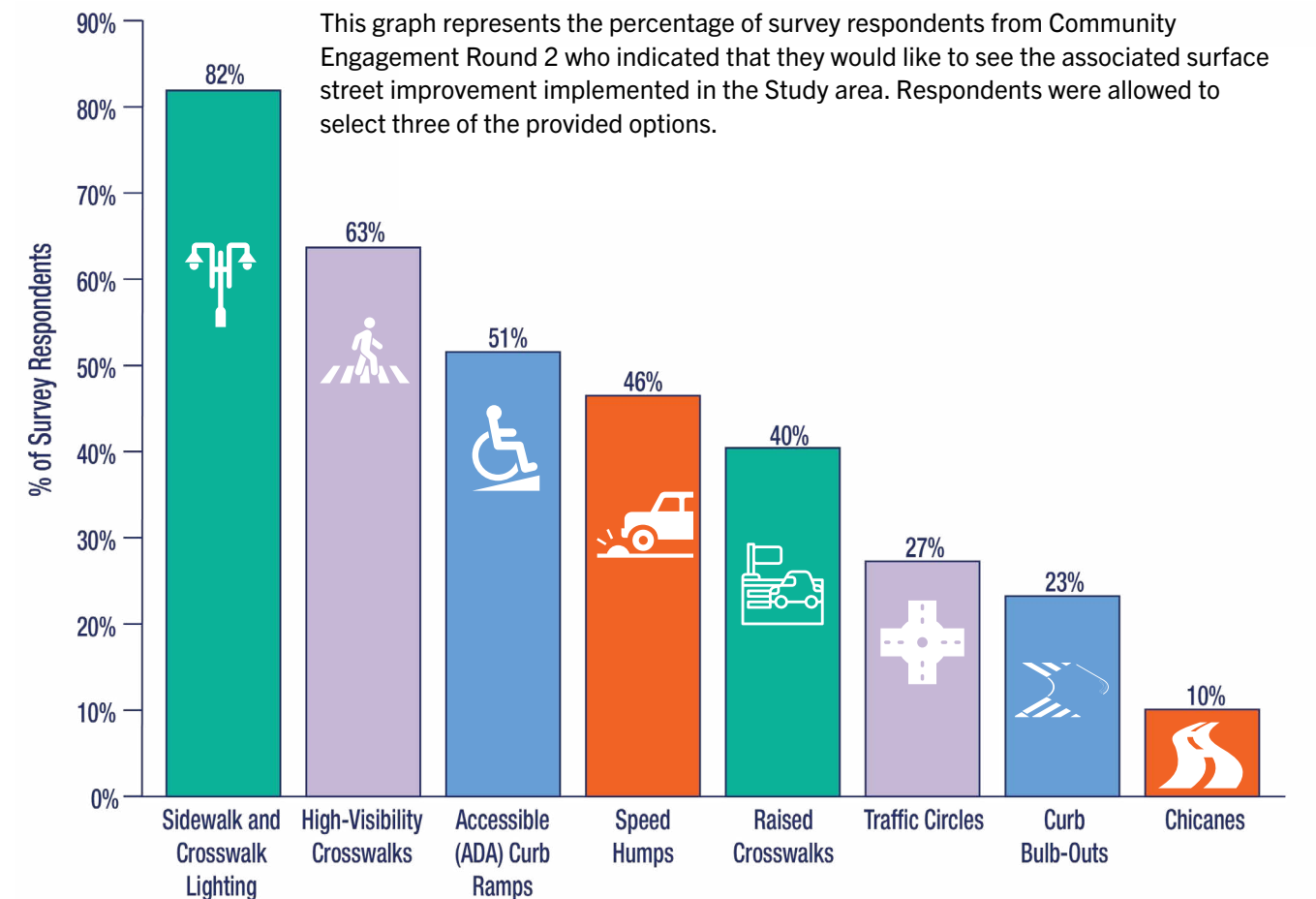
Extension of the curb at a crosswalk designed to decrease pedestrian crossing distance, improve crossing distance, improve pedestrian visibility, and reduce vehicle speeds



#### Chicanes

Striping strategy that narrows a road at select points to reduce vehicle speed.

### Input Received during Round 2 of Community Engagement





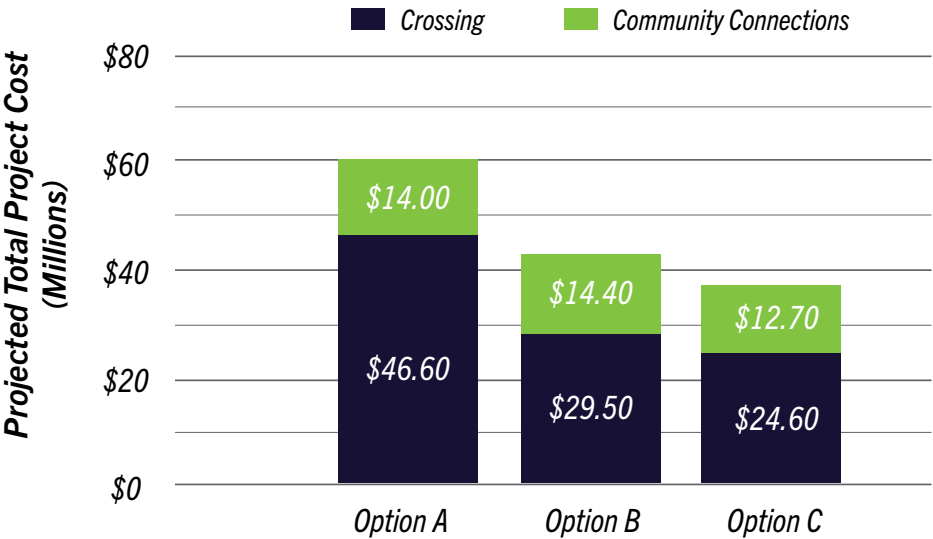


OPTION EVALUATION

Options Evaluation Summary

|  | Low (least desirable)High (most desirable) |   |   |
|--|--|---|---|
|  | A  | B | C |
| Service Population                           |  |   |   |
| Rail Crossing Length                         |  |   |   |
| Regional Transportation Network Connectivity |  |   |   |
| Local Destination Connectivity               |  |   |   |
| Motor Vehicle Circulation                    |  |   |   |
| Bicycle and Pedestrian Comfort               |  |   |   |
| Public Space                                 |  |   |   |
| Visual Impact                                |  |   |   |
| Green Infrastructure                         |  |   |   |
| Emergency Access                             |  |   |   |
| Personal Security                            |  |   |   |
| Public Infrastructure Impact                 |  |   |   |
| Construction Impact                          |  |   |   |
| Direct Parcel Impact                         |  |   |   |
| Parking Impacts                              |  |   |   |
| Operation and Maintenance Cost               |  |   |   |
| Construction Cost                            |  |   |   |

Cost Estimates



Evaluation Summary

The project team completed a technical evaluation of the alternatives, considering both the railroad crossing alternatives and the corresponding community connections improvements. The results of this evaluation are shown in the evaluation table on the left side of this page. Each crossing and community connections option was evaluated on a five-point scale for each criteria using measures developed in the previous project phase. Note that the results of these evaluations are based primarily on engineering expertise and are one of several considerations in the process of seeking a locally preferred option. The findings were shared with the community for feedback and reaction in Community Engagement Round #2.

**Connectivity**  
All three options will connect to planned bike/pedestrian facilities on both sides of the railroad tracks.

**Service Population**  
Options A and B have twice the population (1,280 people) within 1/8 mile of crossing access in comparison to Option C (690 people).

**Railroad Crossing Length**  
Option A has the shortest stairs-to-stairs length (220 feet) and ramp landing-to-ramp landing (675 feet) out of the three options.

**Local Destinations**  
Option C does not provide convenient access to existing residents on the northern side of the railroad tracks.  
All three options will connect to planned bike/pedestrian facilities on both sides of the railroad tracks.

**Motor Vehicle Circulation**  
While all three options require conversion of a portion of Westmoreland Avenue into a one-way street, Option A has the shortest impact (850 ft).

**Bike/Pedestrian Comfort**  
Option A has the smallest total grade change (40 feet), roughly half of the elevation of the other two options.

**Public Space**  
Options A and B provide space to construct pedestrian plazas.

**Visual Impact**  
Options B and C would be prominent relative to the height of nearby buildings and thus very visible throughout the community.

**Green Infrastructure**  
Options A and B provide more opportunities for landscaping, benches, and bio-retention in the plaza areas.

**Emergency Access**  
All three options are designed to maintain sufficient emergency vehicle access.

**Personal Security**  
All three options have reduced visibility of users from street level, with the undercrossing below ground and the overcrossings significantly above ground with long distances between access points.

**Construction Impact**

- Option A requires tunneling during construction, which will impact access to adjacent residential parcels during construction.
- Options A and B likely require the relocation of the Palo Alto Pipeline along Westmoreland Avenue.
- Option C likely requires the relocation of the planned PG&E transformer on the Middlefield Junction site.
- Options B and C pose several conflicts with overhead Caltrain infrastructure and were deemed by Caltrain as riskier from a construction standpoint.

**Direct Parcel Impact**  
Option B requires the greatest number of parcels to be acquired, while Option C does not require any parcel acquisition. However, none of the three options displace existing residential units.

**Parking Impacts**  
Option C removes a net total of approximately 76 parking stalls, compared to an estimated 57 parking stalls for Option A and 60 for Option B.

**O&M Costs**  
All three options are likely to have similar maintenance costs.

**Construction Costs**  
Option A is currently estimated to be the most expensive to build, with current projections estimating it to be roughly 38% more expensive than Option B and roughly 62% more expensive than Option C. However, further study is needed to determine additional cost associated with the construction risks presented by each Option.





## Community Outreach Round 2

The second phase of engagement (Outreach Round 2) was conducted during March and April 2023 and was intended to introduce the three advanced alternatives to the community and solicit feedback on the alternatives and the associated community connections improvements.

To reach and engage with the community during Outreach Round 2, a variety of community engagement activities were utilized: 10 pop-up events; an open house event; door-to-door canvassing of homes closest to the proposed railroad crossing locations; presentations at in-person and virtual meetings (a total of three community presentations); distributed flyers, and sent mailers to all property owners and occupants within the study area and 300 feet beyond; and conducted an online and in-person paper survey (a total of 770 completed surveys were received). A short video was also produced to inform the public of the proposed railroad crossing options and encourage participation in Outreach Round 2. Updates on activities were provided on the Study's website, through social media and via community partner listservs and newsletters. All materials were provided in Spanish and English.

### Key Takeaways



The Dumbarton Avenue Bridge (Option B) was the most common first preference among survey respondents, followed closely by the Middlefield Junction Bridge (Option C), which was the most common second choice among survey respondents. Option A ranked least popular with respondents but was still significantly more popular than the option to not build a crossing.



78% of survey respondents indicated that they would use the crossing frequently.



The majority of respondents preferred a railroad crossing over no crossing, with 127 respondents ranking "do not build a rail crossing" as their last choice.



A majority of respondents would use an active mode of transportation to access the railroad crossing – 80% reported that they would walk or use a mobility device, 24% would bike, and 18% of respondents would take transit as part of their trip using the crossing.



Sidewalk and crosswalk lighting, high-visibility crosswalks, and accessible (ADA) curb ramps were the top three infrastructure improvements survey respondents would like to see incorporated on neighborhood streets.

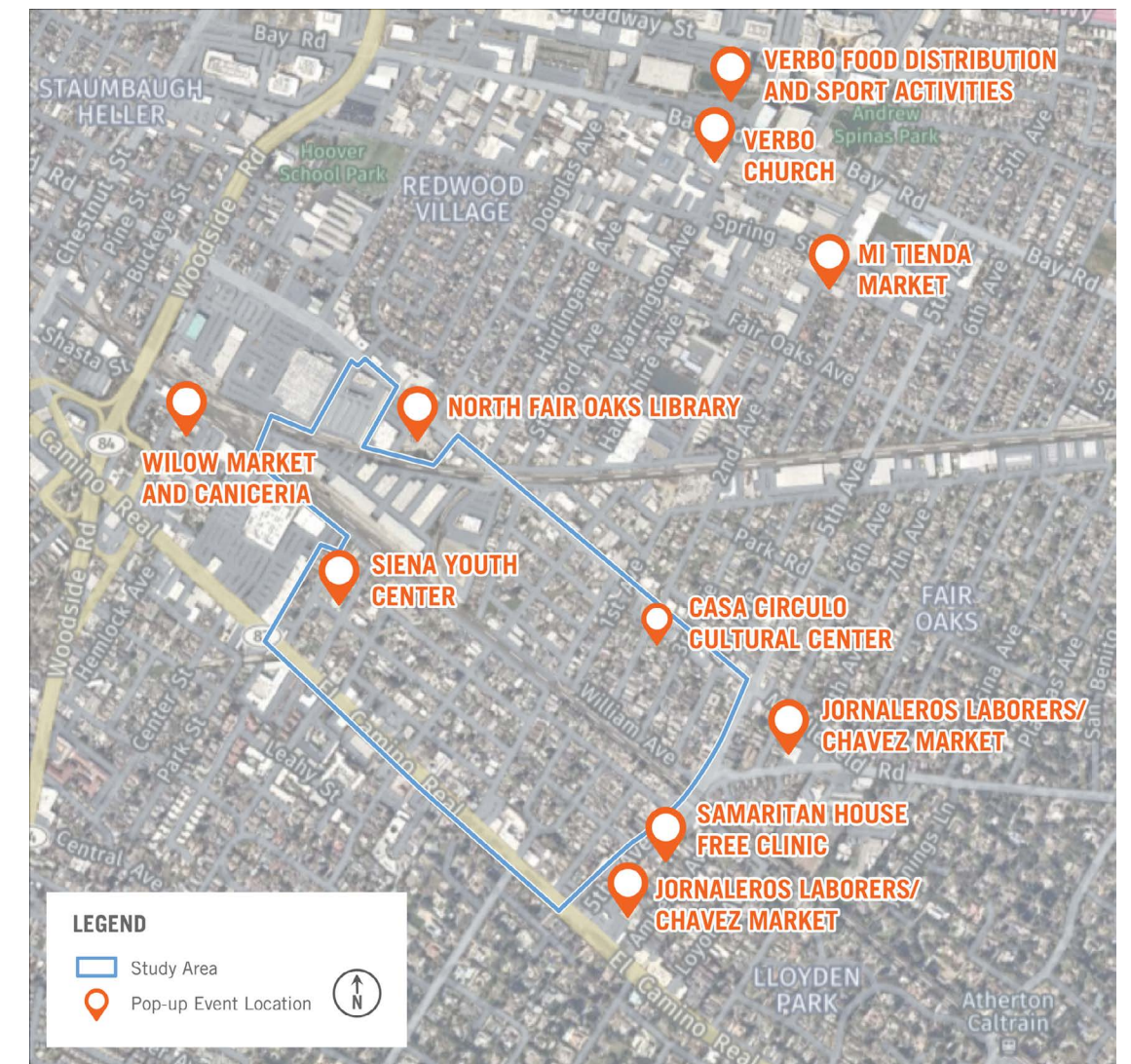


Many residents who preferred the bridge options were concerned about with personal security issues associated with a sub-terranean crossing.

A summary of Round 2 of the community engagement can be found in **Appendix E**.

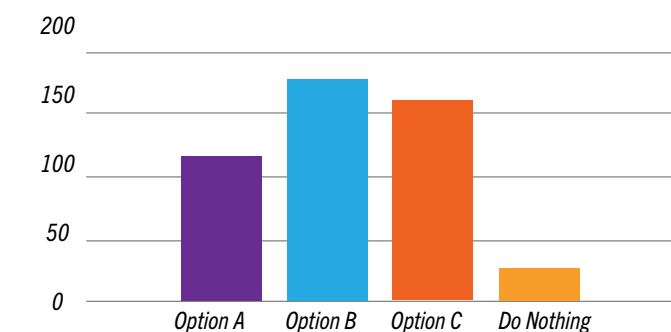


## Pop-Up Event Map - Outreach Round 2



## Crossing Preference of Study Area Residents

Responses from the 68% of survey participants that live in the Study area (between Middlefield Road and El Camino Real)



## Demographics



- 91% identify as Hispanic or Latinx/a/o
- 84% North Fair Oaks or Redwood City residents
- 60% took the survey in Spanish
- 13% over 60 years old





## IMPLEMENTATION CONSIDERATIONS

### Bridge Constructability Review

Caltrain commissioned a *Bridge Constructability Review* for Options B and C to determine the feasibility and magnitude of impacts of constructing an overhead crossing above the soon-to-be electrified Caltrain railroad corridor. This review is included in its entirety as **Appendix E**. The Constructability Review found that the construction of an overhead crossing was feasible under certain conditions. However, the review also identified areas of risk and recommended potential modifications to the concepts, including bridge width, construction technique, and effects impacts during construction on adjacent properties.

Upon completion of the initial constructability review, Caltrain performed its own review to offer more detailed guidance for the project team. Based on their internal analysis of the *Bridge Constructability Review*, Caltrain staff prepared a memorandum and determined that the impacts from the overcrossing options could be acceptable with careful planning and conditions that minimize impacts to revenue service. The memorandum provided by Caltrain is included in **Appendix F**. While the initial review of the overcrossing options deemed both feasible from an engineering standpoint, further investigation would be required to address the construction and maintenance of a bridge structure over an active railroad, refine construction methodology, and assess impacts to adjacent residents during construction. The memorandum made it clear that the tunnel option posed the least risk to Caltrain infrastructure and operations, however the tunnel was identified as the least preferred option by the community during outreach efforts.



### Study Considerations

A key goal of this Study was to identify a preferred new railroad crossing of the Caltrain tracks. Throughout the Study, the community expressed support for a new bicycle and pedestrian crossing of the Caltrain railroad tracks. Thirteen different potential preliminary crossing options were explored and after a screening review they were reduced to three. Each of the remaining three rail crossing concepts were further assessed with extensive community input and feasibility considerations, including compatibility with other infrastructure facilities and projects. Given these complexities, a single preferred option is not being identified. Instead, this report provides a summary of the preferred locations and conceptual designs, a technical evaluation and associated community feedback, should agencies revisit this project.

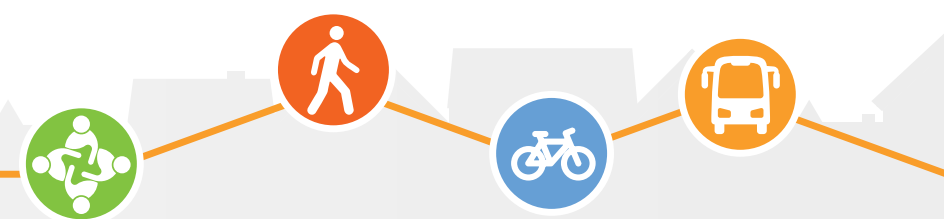
Should conditions change at a future point in time, some key considerations that would need to be further addressed include, but are not limited to the following:

- Coordination with the **San Francisco Public Utilities Commission (SFPUC)** to further assess and resolve impacts with the potential relocation of a major water line
- Coordination with **Caltrain** to study the feasibility of lowering electrification infrastructure (overhead contact system) to allow for a lower bridge crossing to reduce elevation change, ramp and stair length and visual impacts
- Coordination with **SamTrans** and the **Union Pacific Railroad**, to address future plans for transit and freight along the Dumbarton Corridor where one of the bridge crossings is proposed

Concepts may need to be refined and re-designed where necessary, with more significant changes contingent upon feasibility findings considering construction concerns and methodology. The continued inclusion of community input is essential prior to the selection of a recommended railroad crossing option. Before a preferred railroad crossing option can proceed into the environmental review, design and construction phases of development, approval from Caltrain will be required to confirm that a new crossing is compatible with the existing and planned future use and operation of the Caltrain corridor.

Some of the community connections elements (as noted on pages 11-14) could be implemented separate from a rail crossing, providing improved community access and mobility to local destinations within the neighborhoods on both sides of the tracks.





## Complexities Associated with a Potential Rail Crossing

The following is a more detailed list of the constraints and challenges for each of the three rail crossing options:

### Option A: Dumbarton Avenue Tunnel

- Coordination with the SFPUC to resolve/avoid impacts to the Palo Alto water pipeline on Westmoreland Avenue
- Need to revisit community sentiment regarding personal security of a tunnel
- Potential to explore alternative tunnel alignments with fewer adverse impacts
- Impacts to underground utilities during tunneling
- Substantial removal of on-street parking spaces on Westmoreland Avenue
- Property acquisition of two vacant parcels on north side of railroad corridor
- Conversion of a portion of Westmoreland Avenue from a two-way to a one -way street
- Access and circulation impacts during construction

### Option B: Dumbarton Avenue Bridge

- Coordination with the SFPUC to resolve/avoid impacts to the Palo Alto Pipeline on Westmoreland Avenue
- Potential to lower the OCS feeder wires to reduce elevation change, ramp length and visual impacts
- Potential temporary relocation of some residents on the north side of the proposed bridge crossing during specific stages of construction.
- Investigation of crane staging to limit impacts to SFPUC Bay Division water pipelines
- Risks/impacts to Caltrain revenue service from small construction work windows
- Risk impacts from damage to Caltrain OCS during construction & maintenance
- Substantial removal of on-street parking spaces on Westmoreland Avenue
- Conversion of a portion of Westmoreland Avenue from a two-way to a one -way street
- Property acquisition of three vacant parcels on the north side of the corridor
- Access and circulation impacts during construction
- Reduction of bridge width based on the outcome of the Caltrain Bridge Constructability Review

### Option C: Middlefield Junction Bridge

- Coordination with the SamTrans and the Union Pacific Railroad for future use of the Dumbarton Corridor and encroachments during construction/need for easements
- Potential to lower the OCS feeder wires to reduce elevation change, ramp length and visual impacts
- Coordination with the Fair Oaks Health Center to address parking loss from bridge ramp
- Coordination with the County Department of Housing to relocate a PG&E transformer on the Middlefield Junction housing site
- Risks/impacts to Caltrain revenue service from small construction work windows
- Risk impacts from damage to Caltrain OCS during construction & maintenance
- Substantial removal of on-street parking spaces on Westmoreland Avenue
- Conversion of a portion of Westmoreland Avenue from a two-way to a one -way street
- Access and circulation impacts during construction
- Reduction of bridge width based on the outcome of the Caltrain Bridge Constructability Review