

# Draft Caltrain Section for XCAP Report

(I've created a short intro for Ch 1 - why do we need grade separations)

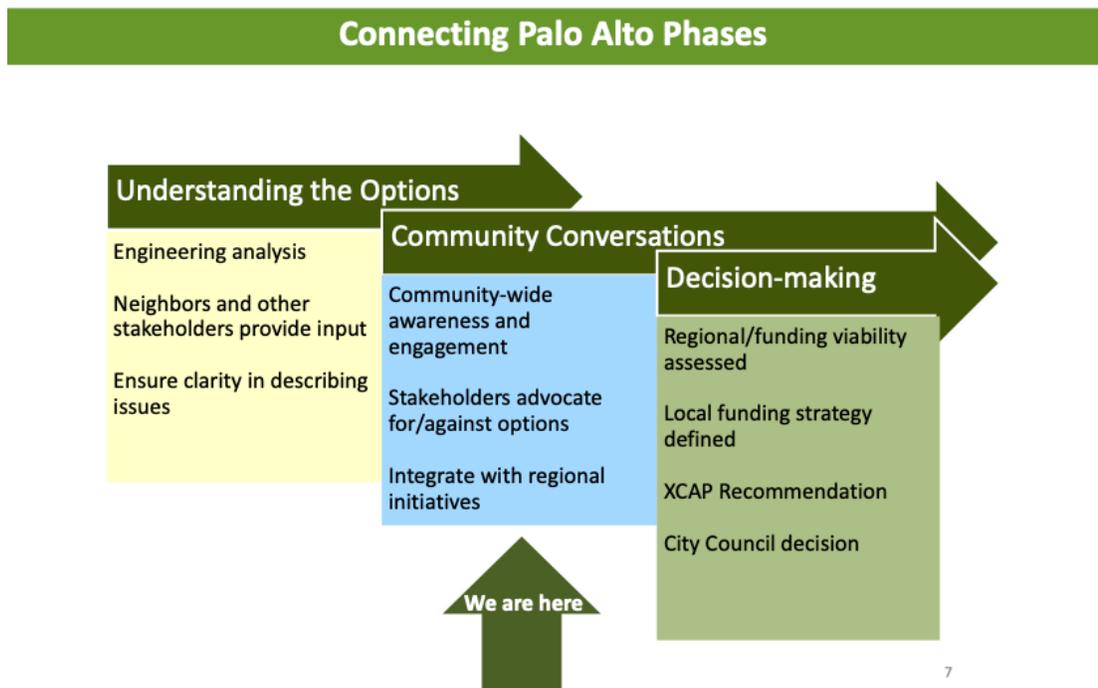
**Note: This chapter will be preceded by an Executive Summary**

## Introduction

### Connecting Palo Alto

Connecting Palo Alto (formerly the Palo Alto Rail Program) is a community-based process to address long-standing challenges associated with at-grade crossings in Palo Alto along the Caltrain corridor. This process will inform decisions affecting both community aesthetics and mobility choices for many future generations. Community feedback and collaboration will be a vital part of the decision-making process. The work presented in this report is part of the Connecting Palo Alto process.

In addition, the City has maintained a lengthy public community engagement process for this project, and has made a concerted effort to engage community members from the start. The City has held numerous workshops, roundtables, community meetings, a Community Advisory Panel (CAP) which evolved into the Expanded Community Advisory Panel (XCAP), and City Council Rail Committee meetings; built a database of interested stakeholders; sent out a questionnaire that received 800 responses; produced a Connecting Palo Alto e-newsletter; posted extensively on social media; and contacted local media about workshops, roundtables and the process and even developed a Virtual Town Hall to try to get the word out during the COVID pandemic.



More information about Connecting Palo Alto can be found on the Connecting Palo Alto website at [www.cityofpaloalto.org/connectingpaloalto](http://www.cityofpaloalto.org/connectingpaloalto).

## What is XCAP?

The City of Palo Alto has been working on what to do with the Caltrain crossings for the last several years. In June 2018, the Palo Alto Council approved a Community Outreach Plan<sup>1</sup> developed by AECOM and Apex Strategies that included plans for a Community Advisory Panel known as CAP. The CAP was made up of 12 community members who were chosen to ideally represent a diversity of thought and neighborhood/geographic representation. The CAP's responsibilities were to connect with other community members/neighbors to help inform the process; amplify both decisions and concerns along the way, and to advise on what grade separation alternatives are best for Palo Alto. The CAP participated in many meetings, but they were unable to create their own agendas and were ultimately only able to respond to what was given to them by Staff and the Consultants and communicate that information to their networks.

In April 2019, the City Council voted<sup>2</sup> to create the Expanded Community Advisory Panel (XCAP) which included nine original members from the CAP, and five new appointees. The transition from CAP to XCAP initially had similar function, where the group was listening to presentations by the consultants and Staff but were not able to set their own agendas. On September 9, 2020, the Expanded Community Advisory Panel was formalized<sup>3</sup> as a Brown Act body that can vote, and make recommendations directly to the City Council with the City Manager's Office providing Staff to the XCAP.

**The Expanded Community Advisory Panel, known as "XCAP," is a group of Palo Altans and other stakeholders tasked with evaluating all the information related to the grade crossing alternatives for rail crossings.** The group, a Brown Act body, has been tasked with making recommendations directly to the City Council with the City Manager's Office providing staff to the XCAP.

(add names of XCAP members?)

## What will happen once XCAP makes its recommendations?

XCAP will present their findings to the City Council beginning in 2021, likely through a series of City Council Study Sessions to be able to answer any in-depth questions the Council might have on the XCAP's report and work completed. The XCAP is a volunteer group that has worked diligently to try to represent the interests, needs and concerns of all stakeholders involved, but ultimately, the elected body of the City Council is responsible for making decisions. The City Council will receive all of the XCAP's work and may choose to follow all, some or none of the XCAP's recommendations.

## Ch 1: Why do we need grade separations?

### What is a Grade Separation?

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<sup>1</sup> <https://www.cityofpaloalto.org/civicax/filebank/documents/66293>

<sup>2</sup> <https://www.cityofpaloalto.org/civicax/filebank/blobdload.aspx?t=67695.84&BlobID=70530>

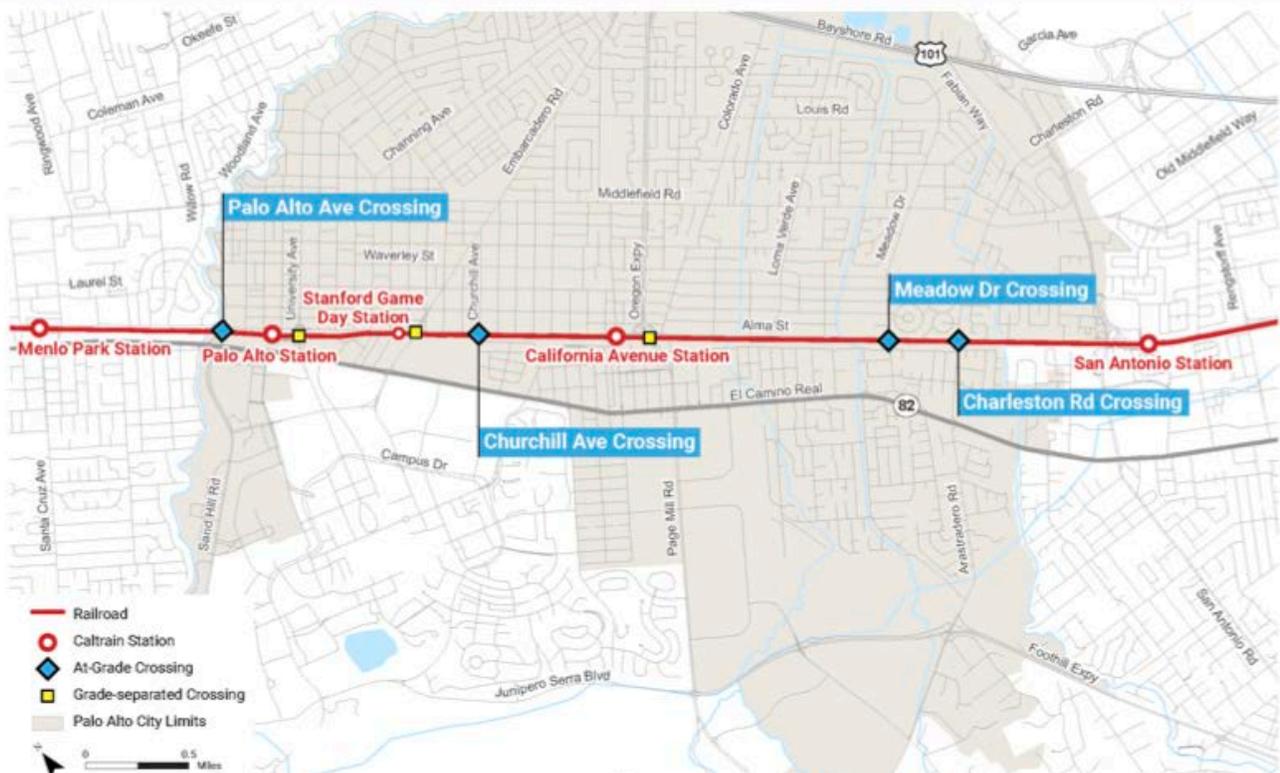
<sup>3</sup> <https://www.cityofpaloalto.org/news/displaynews.asp?NewsID=4689>

A grade separation is a roadway that is re-aligned over or under a railway to eliminate hazards. Elevated grade separations are viaducts, where the train is completely elevated above the roadway on supports, and hybrids, where the train is partially elevated on an earthen berm that forms a wall and the road is sunken down. Below grade separations include tunnels, where the train is completely submerged underground and not visible, and trenches, where the train is in an open ditch, while cars travel flat across the ditch. A level grade crossing is when there is no separation between trains and cars and when a train comes, flashing lights and crossing gates prevent cars from crossing the tracks.

## Existing Conditions:

Today, Palo Alto has seven places where the train tracks and roads intersect with the Caltrain tracks. From North to South they are: Palo Alto Avenue, University Avenue, Embarcadero Road, Churchill Avenue, Oregon Expressway, Meadow Avenue, and West Charleston Road. University Avenue (built in 1940) and Embarcadero Road (built in 1936) are both hybrids (where the road is partly depressed and the tracks are raised) and Oregon Expressway (built in 1959) is an underpass (where the road is entirely depressed).

## Palo Alto Existing At-Grade Crossings



The focus of this report is three of the remaining at-grade crossings on the Caltrain Right of Way (ROW): Churchill Avenue, Meadow Avenue and W. Charleston Road. The fourth, Palo Alto Avenue, will be studied as part of the Downtown Coordinated Area Plan.

## Why does the City Council want Grade Separations?

## Caltrain's grade separation plans

Plans to convert the Caltrain system from diesel trains to electric trains have existed since 1998, but were finally realized in May 2017, when the Caltrain Electrification project finally received funds from the Federal Transit Administration as part of funding provided for the California High Speed Rail Project.<sup>4</sup> Electrification of the corridor is currently underway and upon completion, Caltrain will be able to run many more trains with greater efficiency.

Running more trains will benefit Palo Alto, but will cause congestion at intersections due to increased grade crossing gate down time as cars wait for trains. Grade separations are needed to alleviate that congestion and, once built, will help Caltrain continue to expand its service.

In October 2019, the Caltrain Board approved their Business Plan Service Vision which further details the significant expansion of Caltrain service and the need for a fully grade separated corridor, with a price tag of between \$8.5 and \$ 11.1 over \$10 Billion.<sup>5</sup> Caltrain's studies indicated pent-up demand that could increase ridership by 3-4x by 2040 (note: these estimates were pre-pandemic). The forecasted level of ridership would be the equivalent of removing a whole US 101's worth of cars off the freeway - and off the local streets leading to and from the freeway.

According to Caltrain's pre-pandemic plans, Electrification is scheduled to be completed in 2022. Once completed, there will be an expected increase in peak hour service from a total of 10 peak hour trains to 12 trains per hour, which will increase the amount of time that the protective gates are down and therefore increase crosstown travel delays. (See Reduce Congestion section below). In February 2020, before the emergence of the coronavirus crisis, Caltrain had identified a shorter-term set of investments that could increase ridership by 20,000 to 25,000 between 2027 and 2030. These investments would enable increasing frequency to eight trains per direction per hour (16 trains per hour) at peak hours. This change would create noticeable additional delays for crosstown travel above the six trains per hour planned for 2022.

In addition to Electrification, the passage of Santa Clara County's Measure B in 2016 provided funding to begin planning and building these grade separations in Palo Alto. (See Chapter 2 - Funding for grade separations). The Electrification of Caltrain and the availability of Measure B funds has driven the need for Palo Alto to build grade separations.

Grade separations in Palo Alto are needed to:

- 1) Meet the goals of the City of Palo Alto Comprehensive Plan 2030
- 2) Improve Safety
- 3) Reduce Congestion from increased trains
- 4) Support Public Transit goals

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<sup>4</sup> <https://apnews.com/article/47e07949c19f4e0aa905cf126616b06b>

<sup>5</sup> Pg 36 of

<https://www.caltrain.com/Assets/Caltrain+Modernization+Program/Meetings/LPMG/April+2019+Caltrain+Business+Plan+LPMG+Presentation.pdf>

## 1. Meet the Safety goals of the City of Palo Alto Comprehensive Plan 2030

The Palo Alto Comprehensive Plan contains the City's official policies on land use and community design, transportation, housing, natural environment, safety, business and economics and community services. The Plan is used by the City Council and the Planning and Transportation Commission to evaluate land use changes and to make funding and budget decisions. And, it is used by City staff to regulate building and development and to make recommendations on projects. It is used by citizens and neighborhood groups to understand the City's long-range plans and proposals for different geographic areas and it provides the basis for the City's development regulations and the foundation for its capital improvements program.

One of the eight major themes of the Comprehensive Plan is reducing dependency on single occupancy vehicles. The City's multipronged strategy includes improving bicycle and pedestrian access throughout the City while also supporting the development of further transit options in the City and throughout the region.

**The Comp Plan states "Caltrain grade separations will be prioritized to improve east-west connections for automobiles, transit, pedestrians and bicyclists, and to reduce traffic congestion, improve safety and reduce noise impacts."** (pg 3 2020 Comprehensive Plan Palo Alto). There are also several other policies related to grade separations and creating better East/West bicycle and pedestrian connectivity across the Caltrain tracks (See appendix pg X with Policies, goals and programs from Comp Plan - ). The plan also "recognizes the regional nature of its transportation system" and **seeks to prioritize "Caltrain service improvements and railroad grade separations."** (pg 55 Comp Plan).

The four unseparated grade crossings on the Caltrain Right of Way (ROW) have automated gates and signals which stop cars, bikes and pedestrians when a train is approaching or crossing the tracks.

## 2. Improve Safety

Safety is another primary reason for removing at-grade crossings. Every time cars, pedestrians, and cyclists are in close proximity to trains there is potential for conflict. Pre-COVID, 96 trains a day traveled the Palo Alto corridor at speeds up to 79 miles per hour, and between the four at-grade separations there are over 50,000 crossings per day. According to the Federal Railway Administration, Charleston Avenue has the 19th highest<sup>6</sup> "accident prediction value" in California, and the second highest on the Caltrain system. Caltrain recently provided the following information for the corridor<sup>7</sup>:

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<sup>6</sup> Charleston Avenue's rank used to be much higher – today 15 out of the top 20 scores in the FRA's system are occupied by a light rail system in San Diego with a top speed of 30 miles per hour. Charleston has the fourth highest score in California amongst non-light-rail systems.

<sup>7</sup> Excerpt from:

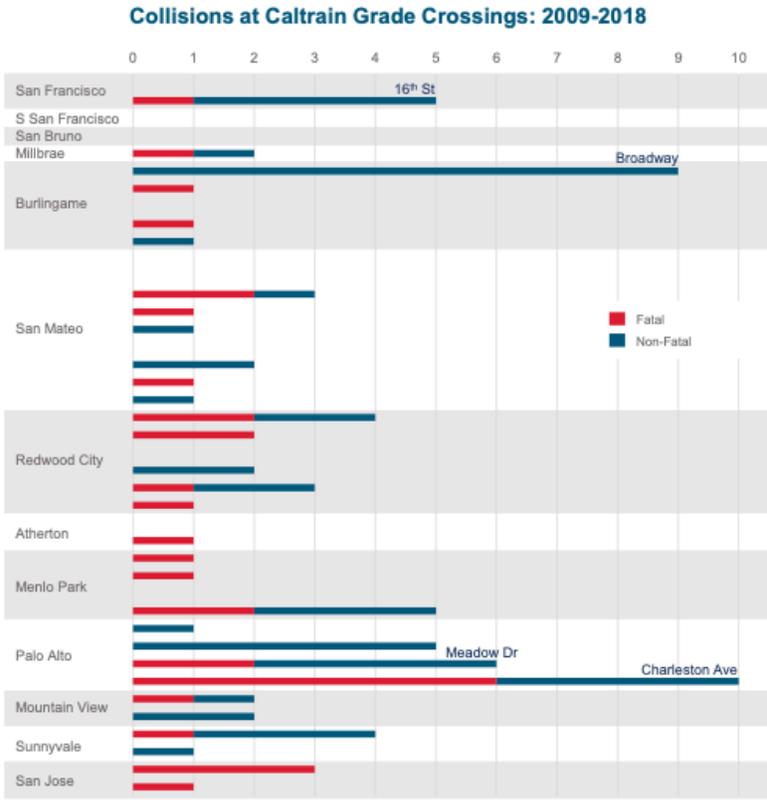
<https://www.caltrain.com/Assets/Caltrain+Modernization+Program/Meetings/LPMG/April+2019+Caltrain+Business+Plan+LPMG+Presentation.pdf>

## Background Safety

Over 80 collisions occurred at Caltrain's grade crossings in the 10 years from 2009-2018. More than 30 of these collisions involved a fatality

- 11 crossings had 0 collisions
- 8 crossings had 4 or more collisions
- 21 crossings had 1 or more fatalities

Data presented for Caltrain-owned corridor Only. Collision data from FRA reports



With Palo Alto's strong support of Safe Routes to School, the number of children riding across the tracks is a cause for significant concern. Sadly, we have seen the result of this in Palo Alto, with 25 grade crossing incidents in the last ten years, and eight deaths. (Most, but not all, of these deaths were ruled a suicide according to FRA records.) Chapter 6 includes more detail on both the history of rail accidents in Palo Alto and specific suggestions to ensure that anything that we construct is as safe as we can make it.

### 3. Reduce Congestion From Increased Trains

The single biggest cause for traffic in Palo Alto is the existence of at-grade crossings along the Caltrain tracks which run the length of the City and which cause all-east west traffic to come to a standstill when trains pass. In order to meet State goals of reducing greenhouse gas emissions, state law favors public transit over car traffic - hence trains have a priority over cars when traveling through a City.

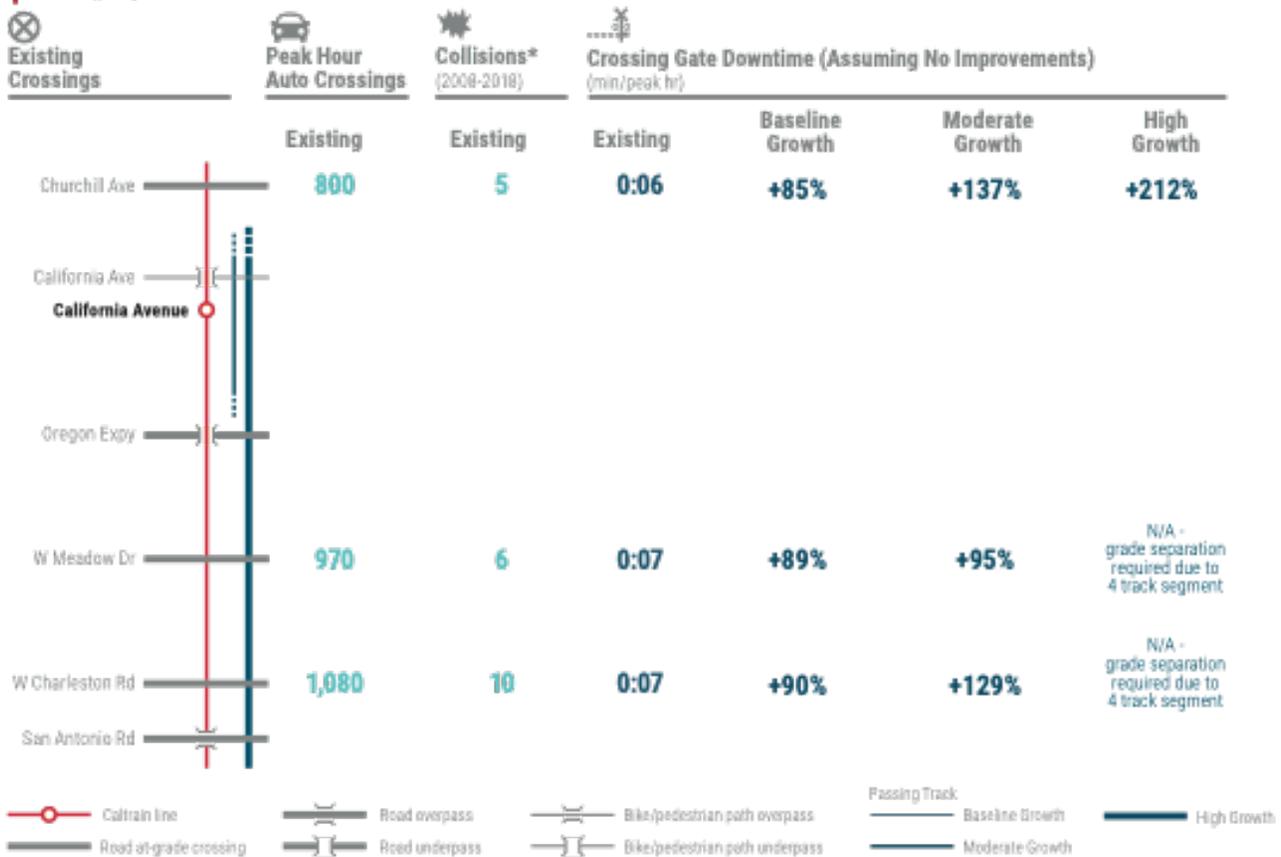
Normal traffic signals at intersections have a sequence that allows all 4 directions (in a 4 way signal) to take turns getting through the intersection before restarting the sequence. On the west side of Alma on streets such as Churchill, Meadow and Charleston, cars sometimes are waiting on the tracks to be able to make their way through the intersection. When the train is coming, the traffic signals at the intersection are interrupted, causing the traffic signal to switch modes to clear the intersection of any cars that might be on the tracks. The red warning lights flash and the crossing gates come down to stop cars, bikes and pedestrians from proceeding and giving priority to the train.

As the number of trains increases, signal preemption events increasingly interrupt the ability of the traffic signals to complete their normal sequence. When this happens repeatedly, as is the case when multiple trains come in a short period of time, cars are unable to clear the intersections (unclearable queues) leading to traffic.

The below graphic from Caltrain estimates the delay times that could occur with their future service models (see Support Public Transit section for more detail).<sup>8</sup>

### Crossing the Tracks - Gate Down Times

Gate down times shown are indicative projections extrapolated from existing crossing performance. They are examples of "worst case" gate downtimes that could occur if no grade separations or grade crossing improvements were made. The financial component of the Caltrain Business Plan is planning for substantial investments in grade separation and crossing improvements across all scenarios.



Note: Conceptual 4 Track Segment to be refined through further analysis and community engagement.

\* Includes all accidents and incidents.

Source: CALTRAIN BUSINESS PLAN DEVELOPING A LONG-RANGE VISION FOR CALTRAIN CITY OF PALO ALTO BOOKLET, May 2019.

<sup>8</sup> Pg 22 of

# 2040 Gate Downtimes

In 2040, projected crossing gate down times vary by scenario. This evaluation does not take into consideration planned or potential grade separations

## Gate Down Time by Scenario

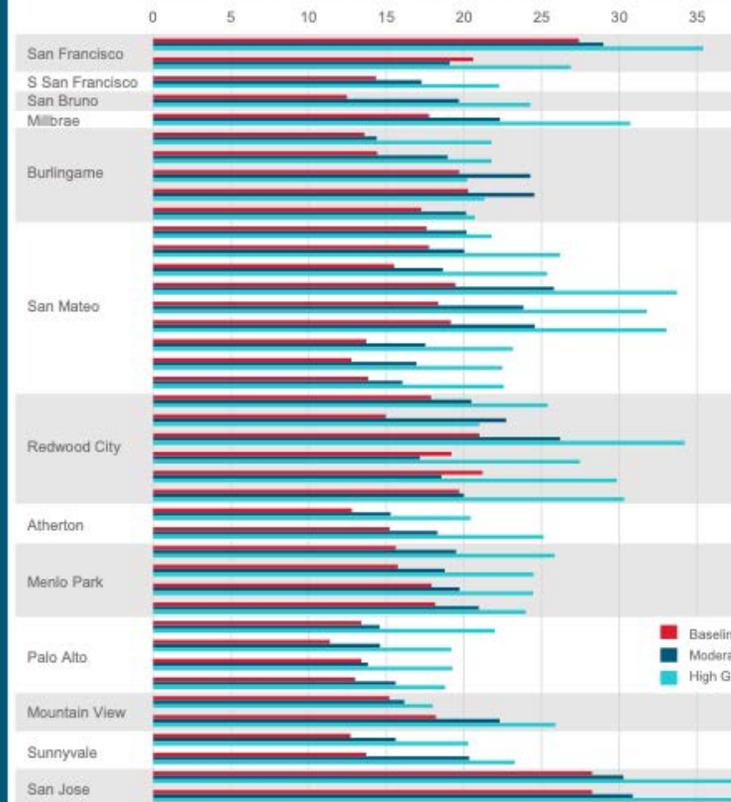
	Shortest	Average	Maximum
Baseline	11	17	28
Moderate	14	20	31
High	18	25	39

Minutes per Peak Hour

*Note: Gate downtimes shown reflect the average time crossing gates are down only. Depending on individual crossing and roadway configuration traffic signals may stay red for longer and auto users may experience longer delays*

Data presented for Caltrain-owned corridor only.

## Estimated Gate Down Time: 2040 (Minutes per Peak Hour)



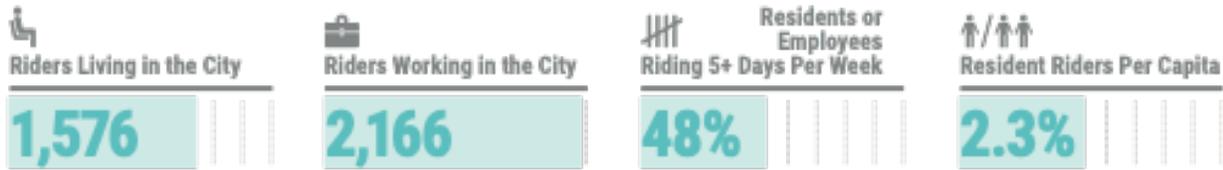
Pre-COVID, at peak hours in the morning and afternoon, traffic signals were disrupted up to ten times in a 60 minute period. Due to inconsistencies in the boarding process, the train schedule is not precise, which means traffic signals cannot be easily synchronized to deal with multiple preemption events. The benefit of grade separations to improve crosstown travel is strongly driven by the frequency of rail service, which affects the amount of time people need to wait to cross the tracks when the gates are down (gate downtime) to allow trains to pass safely.

#### 4. Support Public Transit Goals

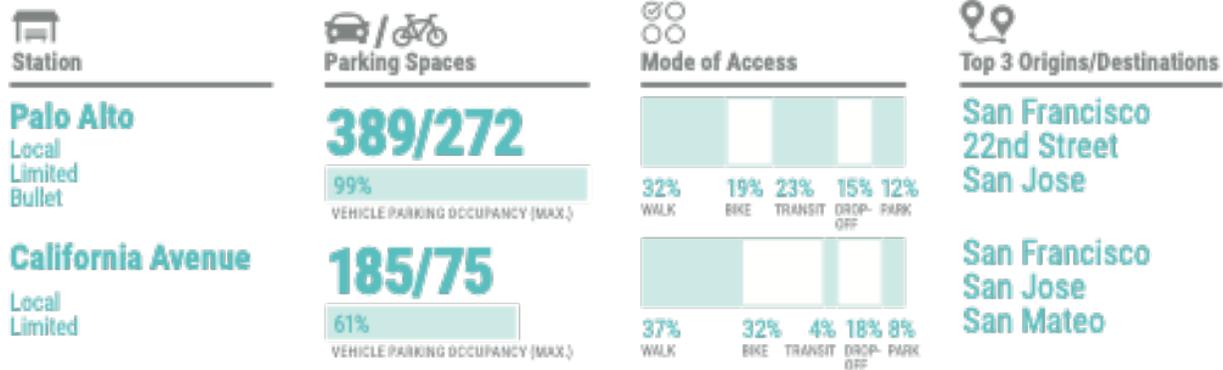
Among the goals in the Comprehensive Plan is to support public transit alternatives to reach the goal of reducing single occupancy vehicle use. Caltrain is the backbone of the transportation systems on the Peninsula and plays a significant transportation role for Palo Alto and the region. Pre-COVID, Palo Alto had the second highest ridership outside of San Francisco given it is a significant job center in the region. As part of their Caltrain Business Plan, Caltrain created a booklet highlighting key statistics related to Caltrain in Palo Alto. <sup>9</sup>

<sup>9</sup> Pdf page 6 of [https://caltrain2040.org/wp-content/uploads/CBP\\_CIA\\_R2\\_Booklet\\_PaloAlto-2.pdf](https://caltrain2040.org/wp-content/uploads/CBP_CIA_R2_Booklet_PaloAlto-2.pdf)

## HOW CALTRAIN IN PALO ALTO IS USED TODAY



## STATION CHARACTERISTICS



Caltrain’s growth in the region (prior to COVID) and it’s expected future expansion are fueled by a number of factors including electrification, worsening of congestion and overall Bay Area growth, and the eventual completion of the Central Subway project<sup>10</sup> (linking the Muni Metro light rail system to Caltrain at 4th and King streets and Chinatown, with stops in South of Market (SoMa) and Union Square.) allowing a Caltrain connection into the densest parts of San Francisco. The potential arrival of California High Speed Rail operations on the Peninsula and the additional trains they might run only exacerbates the need for grade separations.

Caltrain also plays a key role in Palo Alto’s relationship with Stanford University. Stanford’s growth is limited by the General Use Permit between Stanford and Santa Clara County whereby Stanford is committed to keep single occupancy vehicle trips to a minimum. If Stanford goes over the agreed amount, they must pay for mitigations. As a result, Stanford has developed a commuter program that relies heavily on Caltrain. In fact, Stanford recently donated \$1 million dollars to Caltrain and signed an agreement to help in the development of Caltrain’s Business Plan to ensure expanded service to help mitigate Stanford’s goal to continue to grow.<sup>11</sup>

<sup>10</sup>[https://www.sfmta.com/projects/central-subway-project?utm\\_source=Legacy&utm\\_medium=centralsubwaysf.com&utm\\_campaign=Vanity+domain&utm\\_content=](https://www.sfmta.com/projects/central-subway-project?utm_source=Legacy&utm_medium=centralsubwaysf.com&utm_campaign=Vanity+domain&utm_content=)

<sup>11</sup>[https://www.caltrain.com/about/MediaRelations/news/Caltrain\\_and\\_Stanford\\_University\\_to\\_Collaborate\\_on\\_Business\\_Plan.html](https://www.caltrain.com/about/MediaRelations/news/Caltrain_and_Stanford_University_to_Collaborate_on_Business_Plan.html)

## Impacts of COVID19:

As of the date of this report, the US economy has been severely impacted in response to the corona virus outbreak. Caltrain's ridership has plummeted given the increased number of people working from home. Caltrain ridership suffered a greater than 90% drop since April 2020<sup>12</sup>. And, Caltrain's ridership relative to other transit agencies has been more severe because the majority of Caltrain riders prior to the pandemic were typically riders with greater economic means and who owned vehicles, but still chose to commute by train.<sup>13</sup>

The near-term economic outlook is highly uncertain and the timing and shape of the economic recovery cannot be predicted with any certainty. During the recovery period there will likely be a transition period during which Caltrain regains some ridership. Thus, it is not possible now to predict exactly when Caltrain will need to increase its services to accommodate the forecasted ridership levels compared to prior Caltrain forecasts. However, the economy of the country has always recovered from prior economic downturns including the Great Depression, the "Great Recession" of 2008-2009, and the local "tech bubble" of 2000-2001, as well as a number of Panics and recessions in the 19th century. There is every reason to believe that the Bay Area will recover and thrive, because the fundamental drivers of Caltrain ridership, current population jobs and expected population and jobs growth, are still in place. Directly to this point, a Caltrain "Covid-19" ridership survey with over 1600 responses indicated that 55% of respondents will ride Caltrain post-Covid as often as or more often than before.<sup>i</sup> Less than 1% of respondents answered that their company will expect all employees to work remotely<sup>ii</sup>.

In the meantime, the impacts of COVID have shifted Caltrain ridership patterns, with Palo Alto now being the top transit stop, surpassing San Francisco.

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<sup>12</sup> PDF pg 27 <https://www.caltrain.com/Assets/replaced+ppt.pdf>

<sup>13</sup> <https://www.caltrain.com/Assets/Caltrain+Modernization+Program/Meetings/LPMG/LPMG+June+2020+Business+Plan+Connectivity+and+Equity.pdf>

# Where are riders traveling?

Caltrain ridership patterns have shifted during COVID-19, with ridership comprised of essential workers in healthcare, life sciences, government, and related fields.

## Rider Trip Purposes:

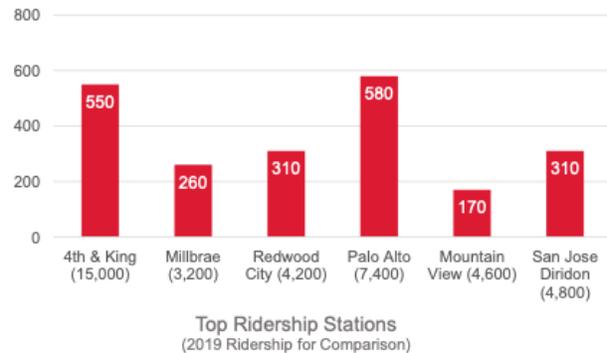
**70%** of riders commuting to work

**50%** of riders work in healthcare, life sciences, or government

**10%** of riders traveling to medical appointments

Ridership during COVID-19 has been more concentrated around stations with major medical centers like Palo Alto and Redwood City, with fewer riders commuting to offices around stations like 4<sup>th</sup> & King and Mountain View.

## August 2020 Weekday Ridership (3,500/Day)



Ridership decline south of Tamien to Gilroy (50 riders per day) mirrors systemwide trends.



Source: <https://www.caltrain.com/Assets/Caltrain+Modernization+Program/Meetings/LPMG/Caltrain+Business+Plan+LPMG+Presentation+Oct+2020.pdf>

In addition, on November 3, 2020 Measure RR passed, finally providing dedicated funding for Caltrain (see XX chapter - Measure RR - currently in proposed Ch 2). The fact that during a pandemic in which Caltrain's ridership has plummeted, Measure RR surpassed the 67% threshold in San Francisco, San Mateo and Santa Clara Counties is a strong indication of the voters' confidence that Caltrain remains an important part of the regional transit system that continues to merit significant investment.

In addition, it is also possible that grade crossing separation projects would be included in a future "economic stimulus" passed by Congress as part of its response to the current economic situation or as part of a major infrastructure bill. If history is a guide, qualifying projects will need to be "shovel ready" within several years of passage of such laws. For these reasons, **XCAP believes it is prudent to continue planning work on grade separation projects in Palo Alto.**

<sup>i</sup> [https://www.caltrain.com/Assets/\\_MarketDevelopment/pdf/Caltrain+COVID-19+Rider+Survey+Topline+Results.pdf](https://www.caltrain.com/Assets/_MarketDevelopment/pdf/Caltrain+COVID-19+Rider+Survey+Topline+Results.pdf)

<sup>ii</sup> [https://www.caltrain.com/Assets/\\_MarketDevelopment/pdf/Caltrain+COVID-19+Rider+Survey+Topline+Results.pdf](https://www.caltrain.com/Assets/_MarketDevelopment/pdf/Caltrain+COVID-19+Rider+Survey+Topline+Results.pdf), p. 6.