

CALTRAIN BUSINESS PLAN

# A LONG-RANGE VISION FOR CALTRAIN



## CITY OF PALO ALTO BOOKLET


REFLECTS 2040 SERVICE VISION POLICY ADOPTED BY THE JPB IN 2019



# CALTRAIN BUSINESS PLAN

## A LONG-RANGE VISION FOR THE CORRIDOR



 Daily Riders (2017)  
**62,000**

 Local Jurisdictions  
**21**

The Caltrain Business Plan was a joint effort with agency partners and communities along the corridor to plan for growth. The Business Plan helped us develop a better understanding of the region's future transportation needs and identified opportunities and strategies for how the Caltrain system can help.

### WHY THINK ABOUT THE FUTURE OF THE CORRIDOR?

The Bay Area population and economy have continued to grow, leading to:



Traffic congestion and longer, unreliable commutes



Over-crowded trains and longer rush hours



Increased cost of transportation and housing

**Caltrain provides a cost effective, convenient alternative to driving and connects jobs and housing, but the system will need to grow to meet future demand.**



Electrification of the Caltrain corridor is already underway and will allow Caltrain to run faster, more frequent service while reducing noise and emissions.



Electrification also creates the potential for expanded Caltrain service that will meet the current and future needs of our region. The Business Plan identified the best strategies for maximizing this potential by developing a long-term service vision for the corridor, defining the infrastructure needed to support that service vision, and identifying opportunities to fund the implementation of these improvements.

### WHAT IS THE CALTRAIN BUSINESS PLAN?

The Caltrain Business Plan includes four major focus areas that address key questions shaping the future of the railroad:



#### SERVICE

What is the best service Caltrain can provide to meet the needs of our customers and the communities we serve? How many trains should we run? How do we best match service to riders' needs? What infrastructure improvements will be needed to provide the service? How can Caltrain effectively connect to other transit services?



#### COMMUNITY INTERFACE

What are the benefits and impacts of increasing service on the corridor to each community? How can we work together to grow the railroad in a way that balances the needs of all communities along the corridor with the need to expand service and operate a safe and efficient railroad? How can we ensure this planning process and the outcomes are equitable?



#### BUSINESS CASE

Why should we choose one service vision over another? How can we maximize the value of current and future investments in the Caltrain corridor? How much will the service cost to operate? How will we fund it?



#### ORGANIZATION

What is the best organizational structure for overseeing and growing Caltrain service in the future?



# RIDER STATS (2017)

Caltrain operates a commuter-focused service that carries more than 60,000 riders every weekday.



## Daily Riders

62,000

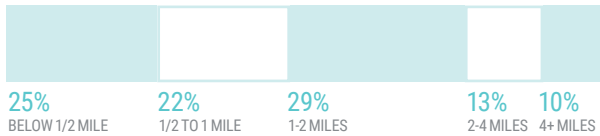


## Riding 5+ Days Per Week

52%



## Access Distance to Station



## Weekday Trains

92

62 PEAK      30 OFF-PEAK

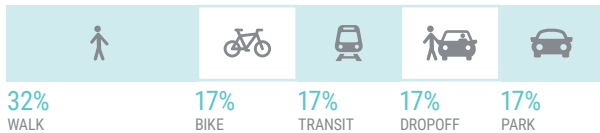


## Riding to Work

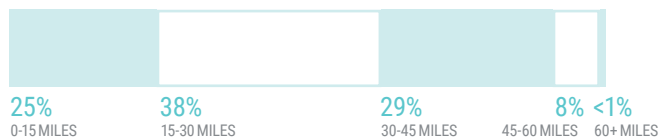
~85%



## Mode of Access



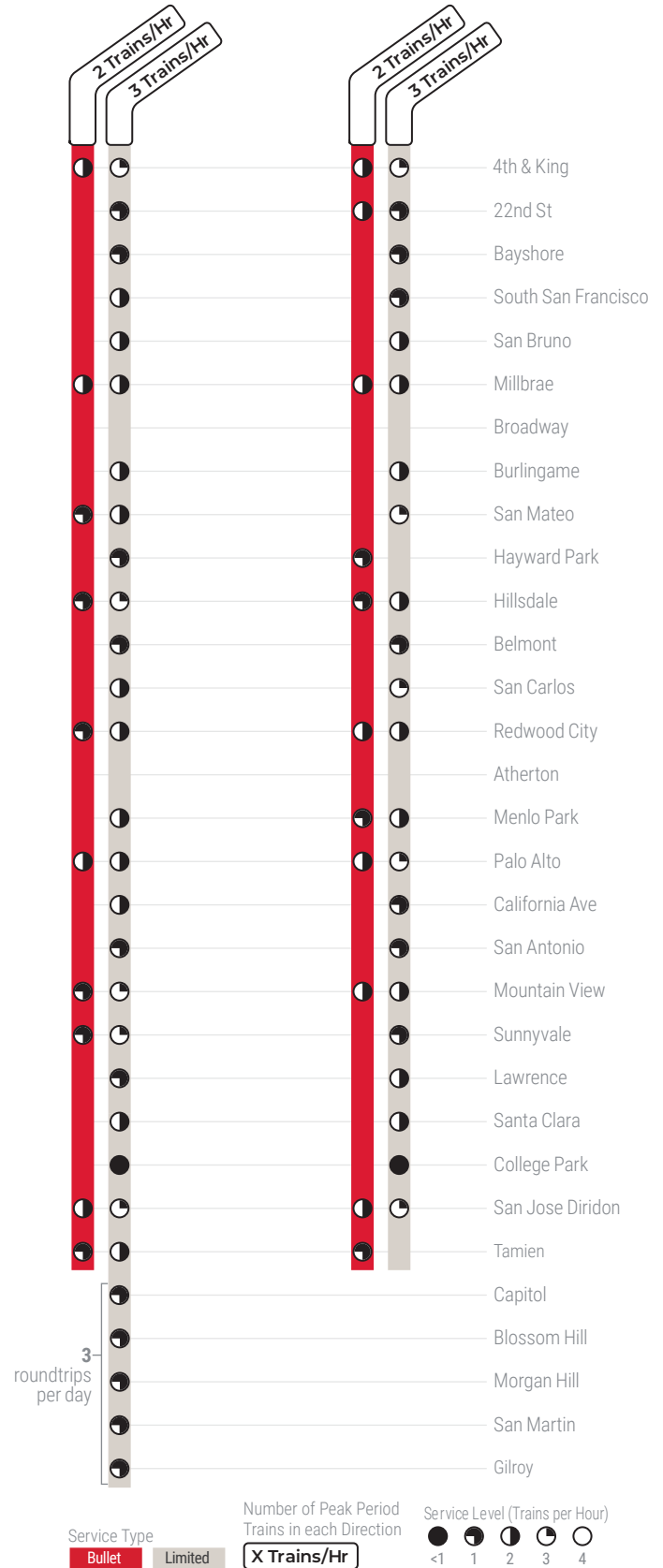
## Distance on Train



# PEAK HOUR SERVICE (2018)

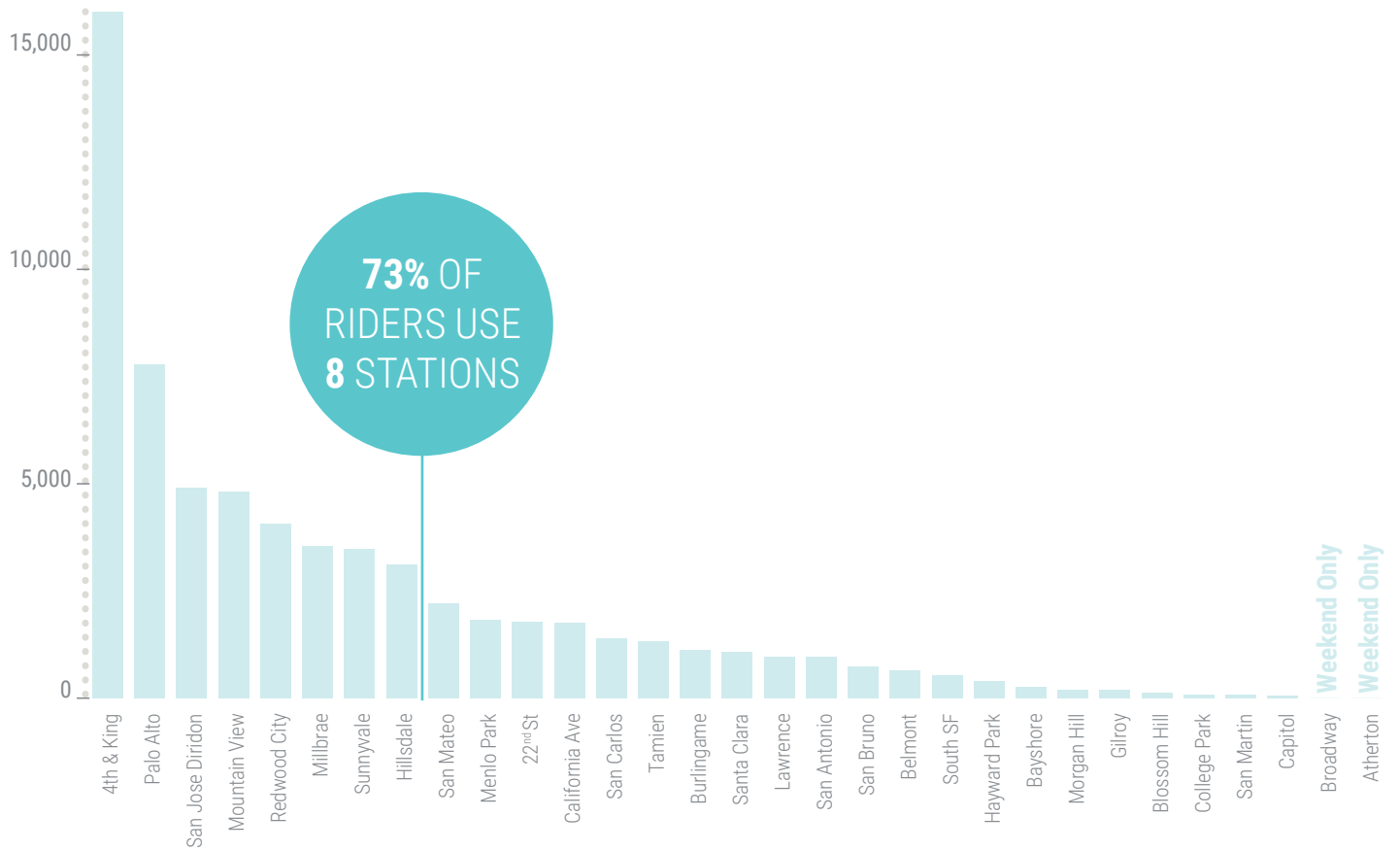
AM Northbound/  
PM Southbound  
(5 Trains)

AM Southbound/  
PM Northbound  
(5 Trains)

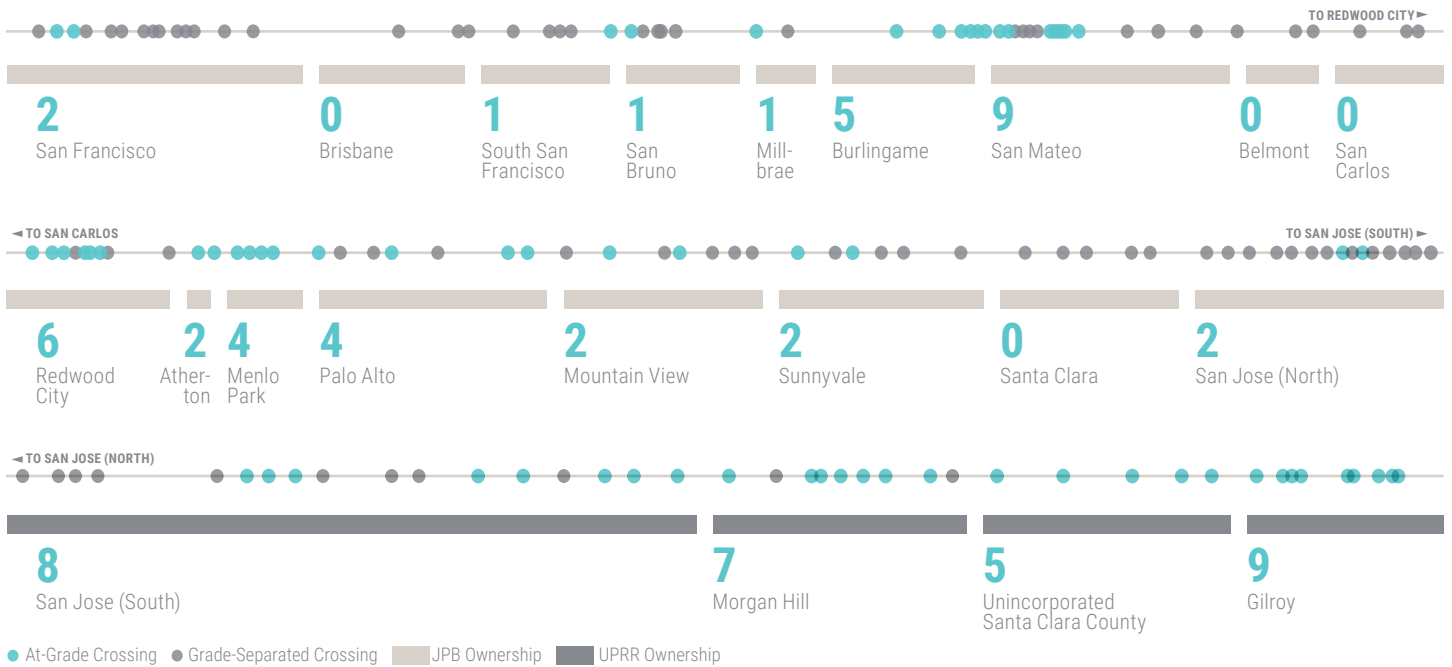


**Note:** This diagram provides a simplified representation of one hour of peak period service.

# STATIONS BY WEEKDAY RIDERSHIP (2017)



# CORRIDOR TRACK CROSSINGS



Sources: Caltrain Ridership Data, 2017; Caltrain Timetables, 2018; Caltrain Parking Occupancy Report, 2017; Caltrain 2014 On-Board Transit Survey; CPUC Collision Database, 2016; Fehr&Peers Traffic Counts, 2016; Caltrain Electrification EIR; US Census Bureau Population Estimates Program.

# CALTRAIN IN PALO ALTO (2018)



Riders Living in the City

1,576



Riders Working in the City

2,166



Residents or Employees Riding 5+ Days Per Week

48%



Resident Riders Per Capita

2.3%

## STATION CHARACTERISTICS



Station

**Palo Alto**

Local  
Limited  
Bullet

**California Avenue**

Local  
Limited



Parking Spaces

**389/272**

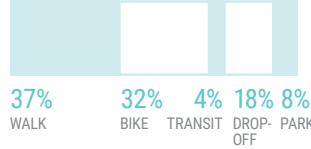
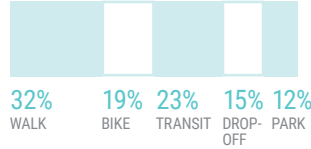
99%  
VEHICLE PARKING OCCUPANCY (MAX.)

**185/75**

61%  
VEHICLE PARKING OCCUPANCY (MAX.)



Mode of Access



Top 3 Origins/Destinations

San Francisco  
22nd Street  
San Jose

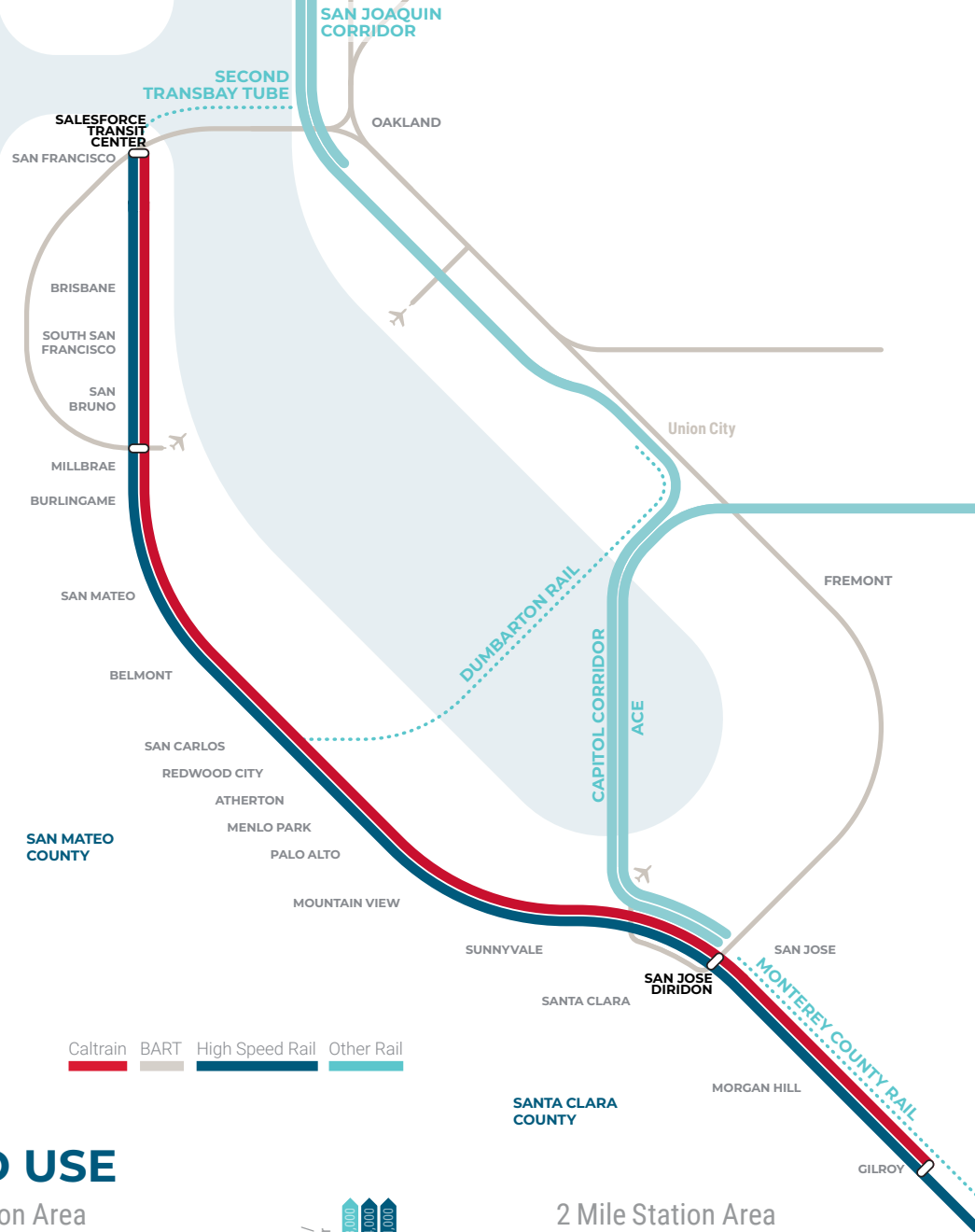
San Francisco  
San Jose  
San Mateo



# CALTRAIN IN 2040

The Caltrain Business Plan asked the question "How should Caltrain Grow?" To do this we are considering what the corridor and region will look like in 2040, including how many people will want to live and work along the Caltrain corridor and what the role of the railroad should be in helping keep everyone moving.

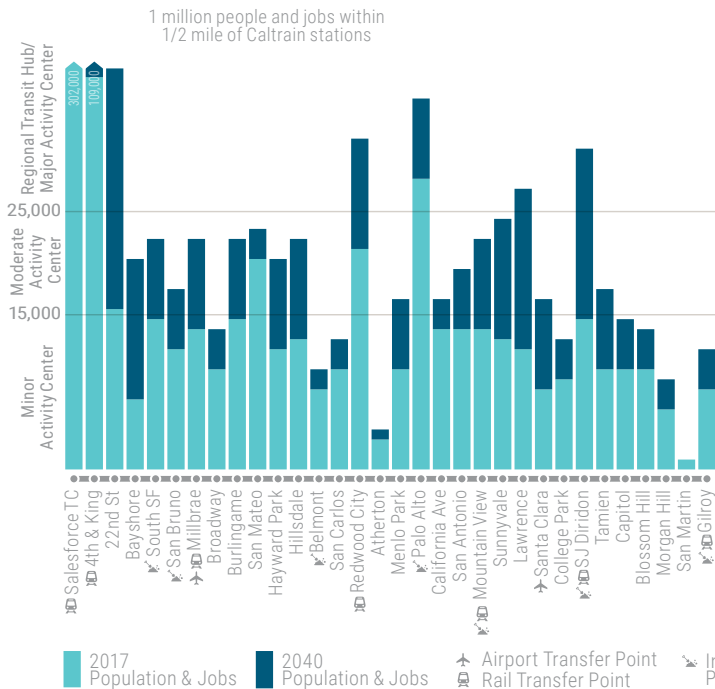
The following pages provide an overview of the Service Vision and show what it could mean for communities along the corridor.



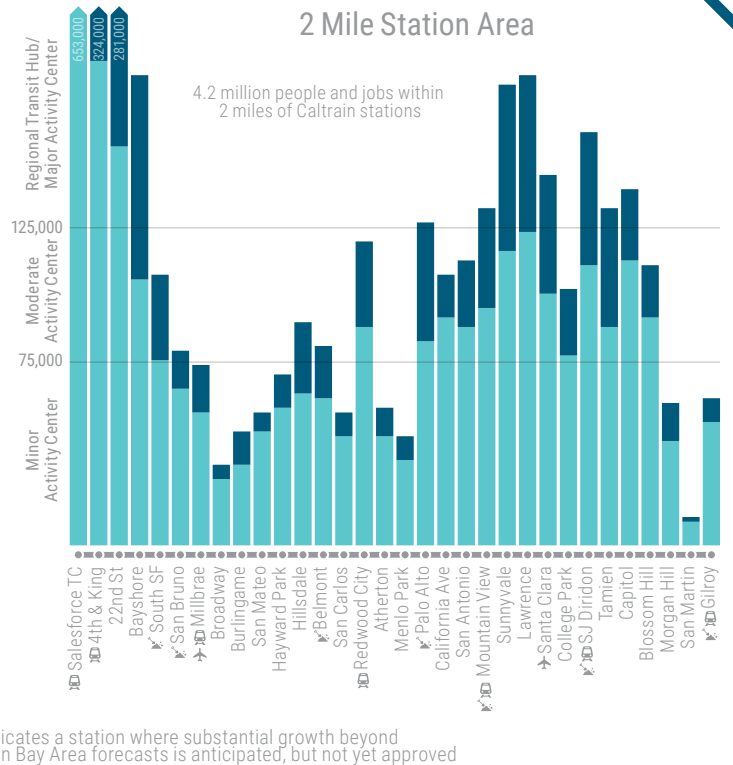
SERVICE VISION

## CHANGING LAND USE

1/2 Mile Station Area



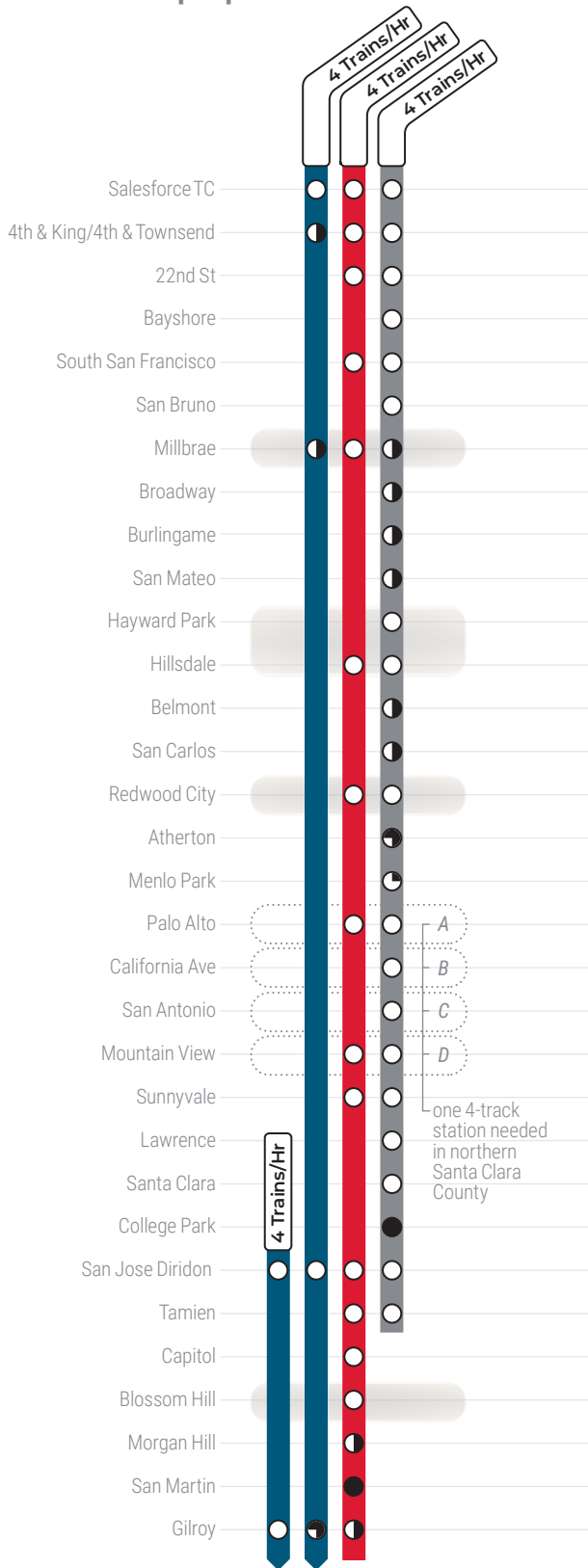
2 Mile Station Area



■ 2017 Population & Jobs    
 ■ 2040 Population & Jobs    
 ✈ Airport Transfer Point    
 ✈ Indicates a station where substantial growth beyond Plan Bay Area forecasts is anticipated, but not yet approved

# SERVICE VISION

Per direction  
**8 Caltrain Trains per peak hour &  
 4 HSR Trains per peak hour**



## How we want to grow:

The team developed service plans that attempt to balance coverage and market demand goals, emphasize clock-face schedules, integration with the state and regional transportation network and timed-transfers.



**BALANCING  
 MARKET &  
 COVERAGE  
 SERVICE**



**CLOCK-FACE  
 SCHEDULING**



**SEAMLESS  
 NETWORK  
 INTEGRATION**



**COORDINATED  
 TRANSFERS**

## Growing in a constrained corridor:

Developing the Service Vision is an exercise in compromise. The Caltrain corridor is physically constrained and the Joint Powers Board must balance competing objectives of changing markets and land uses, historic station spacing, and multiple types and speeds of train service. There are no perfect solutions and any future service plan must reconcile technical challenges related to service differentiation, infrastructure investments, and the total volume of trains running in the corridor.



**SERVICE  
 DIFFERENTIATION**



**PEAK  
 SERVICE  
 VOLUME**



**SERVICE  
 INVESTMENTS**

## Growing beyond our vision

Caltrain is ready for additional investment as planning for expanded Bay Area rail continues. With additional passing tracks and infrastructure, we can expand service from 12 to 16 trains per hour, creating opportunities for even more service and enhanced connectivity to other regional rail corridors.

Service Type



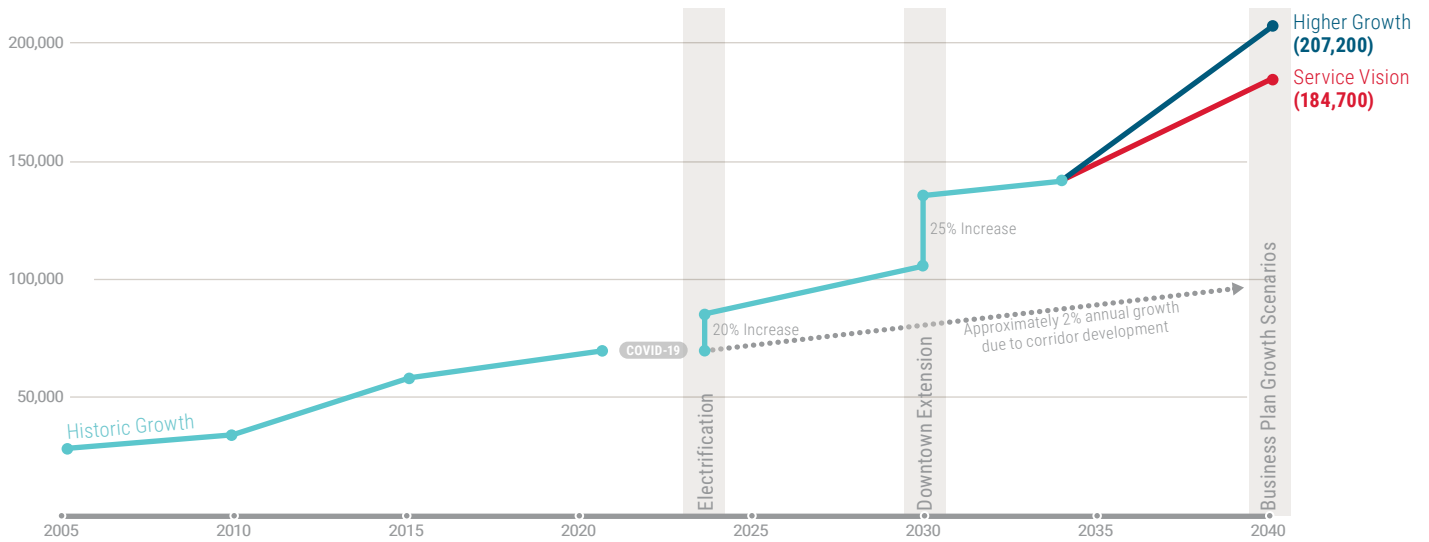
Service Level (Trains per Hour)



Conceptual 4 Track Segment or Station to be refined through further analysis and community engagement.

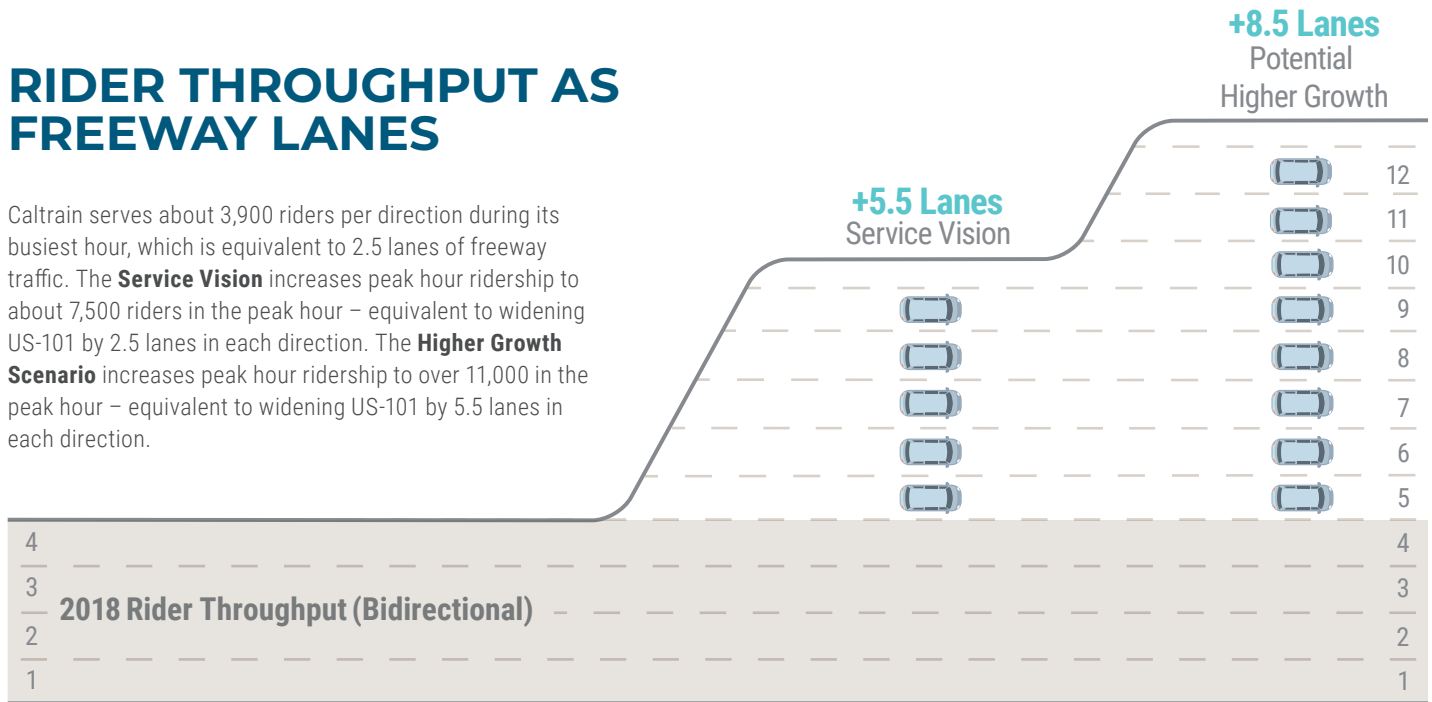


# WEEKDAY RIDERSHIP DEMAND OVER TIME



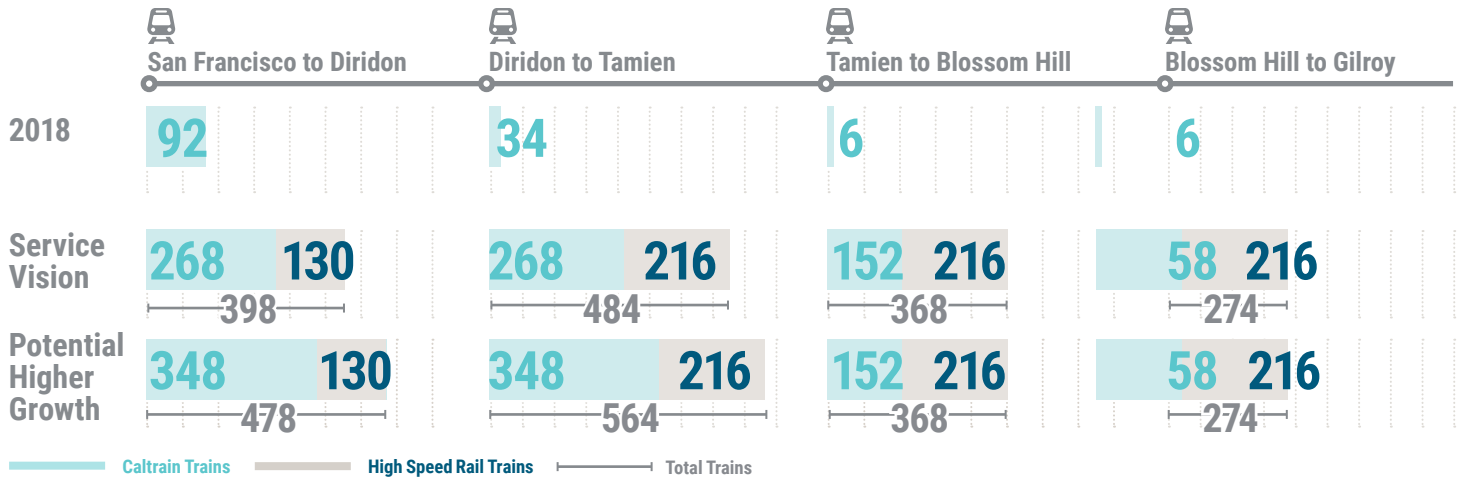
## RIDER THROUGHPUT AS FREEWAY LANES

Caltrain serves about 3,900 riders per direction during its busiest hour, which is equivalent to 2.5 lanes of freeway traffic. The **Service Vision** increases peak hour ridership to about 7,500 riders in the peak hour – equivalent to widening US-101 by 2.5 lanes in each direction. The **Higher Growth Scenario** increases peak hour ridership to over 11,000 in the peak hour – equivalent to widening US-101 by 5.5 lanes in each direction.



\*Assumes vehicle occupancy of 1.1 persons/vehicle and lane capacity of 1,500 vehicles/hour.

## HOW MANY TRAINS PER DAY?



Note: Graphic includes only Caltrain and HSR service and does not account for ACE, Capitol Corridor, or Freight/Amtrak trains.

# SERVICE CONCEPTS IN PALO ALTO

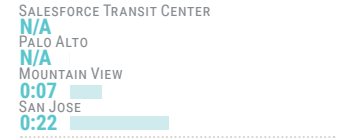
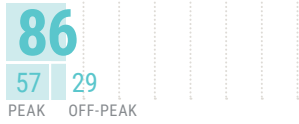
 Station

 Weekday Train Stops

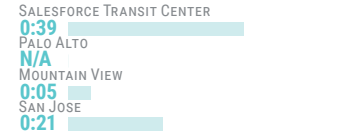
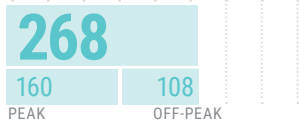
 Daily Boardings

 Quickest Travel Time (min)

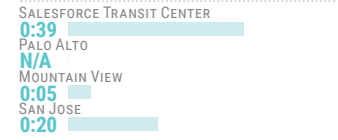
**Palo Alto**  
2018



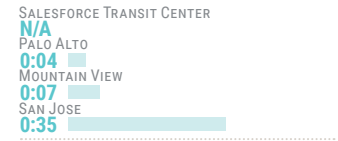
**Service Vision**



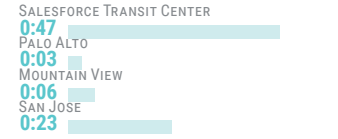
**Potential Higher Growth**



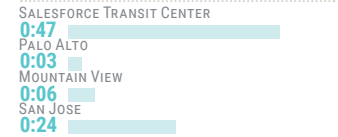
**California Ave**  
2018



**Service Vision**



**Potential Higher Growth**

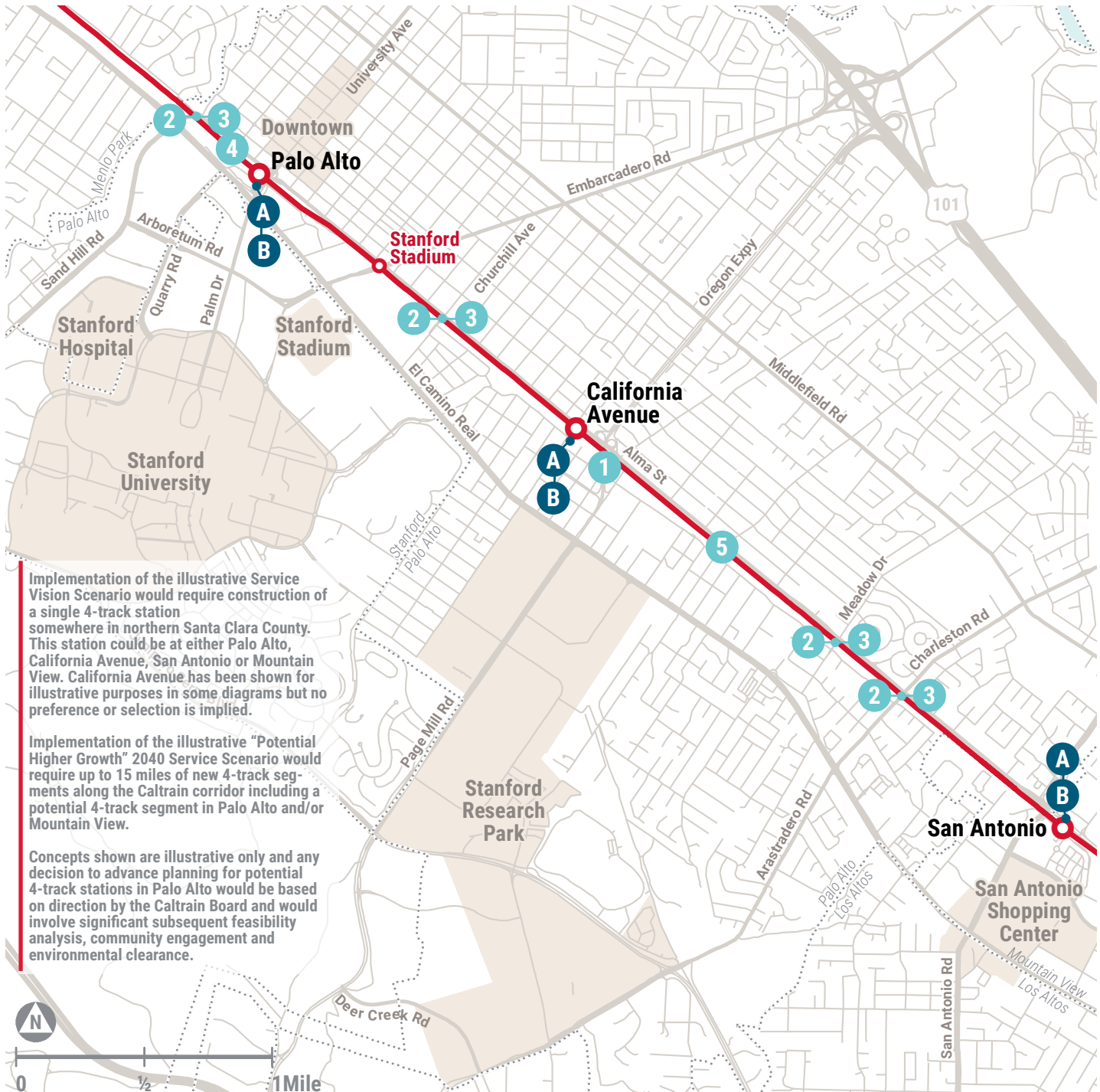


SERVICE VISION

**Notes:** These service patterns represent illustrative concepts carried forward for business planning purposes. Actual service patterns may vary depending on corridor-wide and jurisdiction-specific feedback as well as Board direction and subsequent analysis. Ridership projections are derived from analysis of potential service patterns and land use changes in Plan Bay Area or subsequently approved by local jurisdictions.

# CORRIDOR CONTEXT & CAPITAL PROJECTS

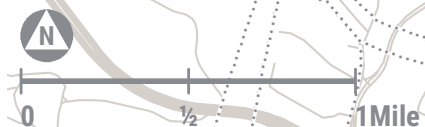
SERVICE VISION



Implementation of the illustrative Service Vision Scenario would require construction of a single 4-track station somewhere in northern Santa Clara County. This station could be at either Palo Alto, California Avenue, San Antonio or Mountain View. California Avenue has been shown for illustrative purposes in some diagrams but no preference or selection is implied.

Implementation of the illustrative "Potential Higher Growth" 2040 Service Scenario would require up to 15 miles of new 4-track segments along the Caltrain corridor including a potential 4-track segment in Palo Alto and/or Mountain View.

Concepts shown are illustrative only and any decision to advance planning for potential 4-track stations in Palo Alto would be based on direction by the Caltrain Board and would involve significant subsequent feasibility analysis, community engagement and environmental clearance.



Legend	Current Projects	Potential Projects
Caltrain line	Paralleling Station	Station enhancements and platform extensions
Key Destination	Connecting Palo Alto Grade Separation Study	Possible location for conceptual 4-track station
	Caltrain Grade Crossing Improvements - Palo Alto Ave, Churchill Ave, Meadow Dr, Charleston Rd	
	Everett Ave Bike/Ped Grade Separation	
	Loma Verde Ave Bike/Ped Grade Separation	
	Electrification	

**Notes:** These infrastructure projects represent concepts carried forward for business planning purposes. Actual infrastructure may vary depending on corridor-wide and jurisdiction-specific feedback.  
**Sources:** Caltrain Ridership Data, 2017; Caltrain Timetables, 2018; Caltrain Parking Occupancy Report, 2017; Caltrain 2014 On-Board Transit Survey; CPUC Collision Database, 2016; Fehr&Peers Traffic Counts, 2016; Caltrain Electrification EIR; US Census Bureau Population Estimates Program.

# CROSSING THE TRACKS

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.