# Caltrain Electrification

## PROPOSED SERVICE PLAN FOR FALL 2024


Citizens Advisory Committee

September 20, 2023

Agenda Item 10

Caltrain

# Agenda

## Today's Meeting

1. Electrification Update
2. Service Planning Process
3. Market Analysis Summary
4. Proposed Electrified Service Plan
5. Next Steps

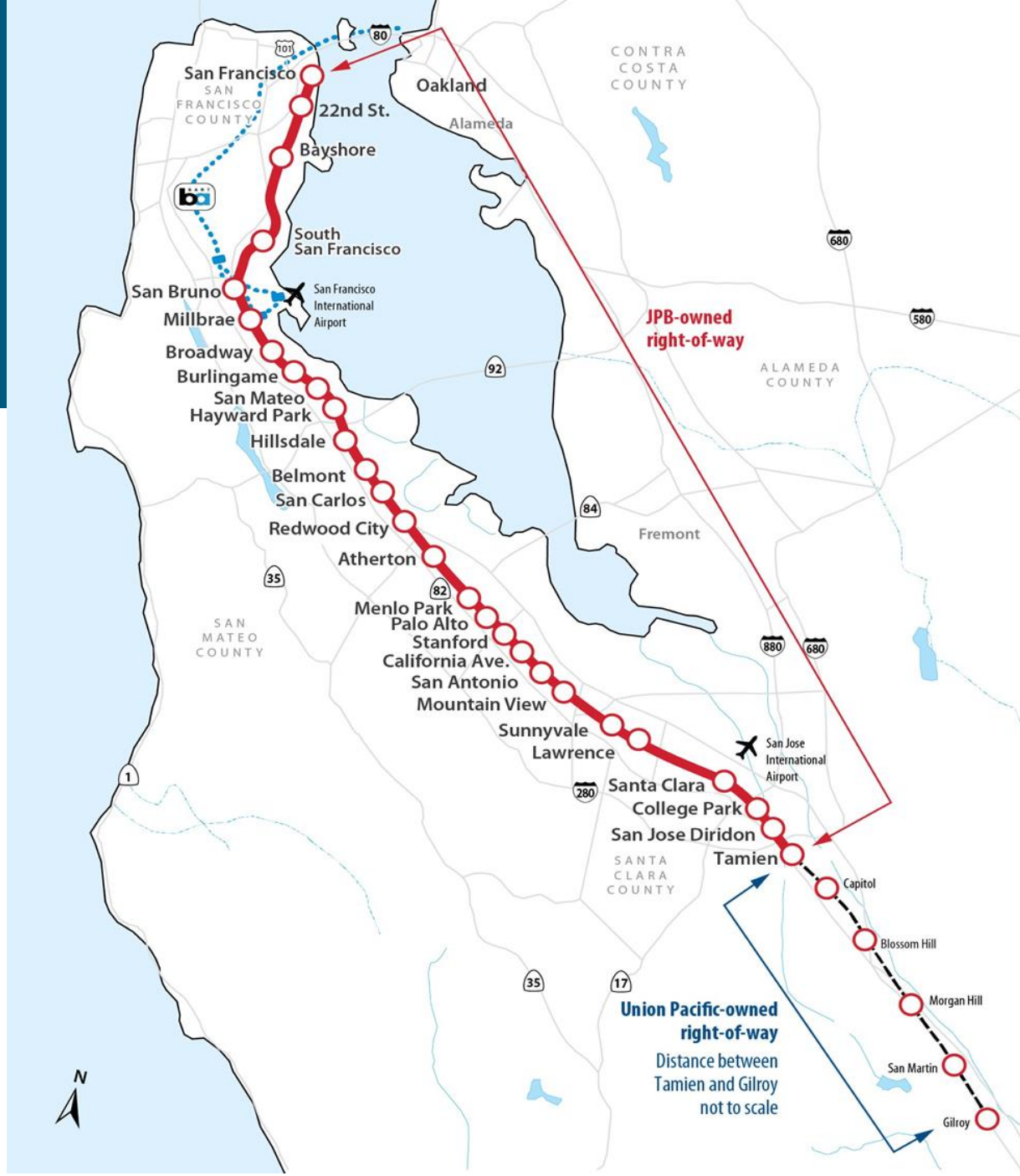
# Electrification Update

# Electrification Project Update

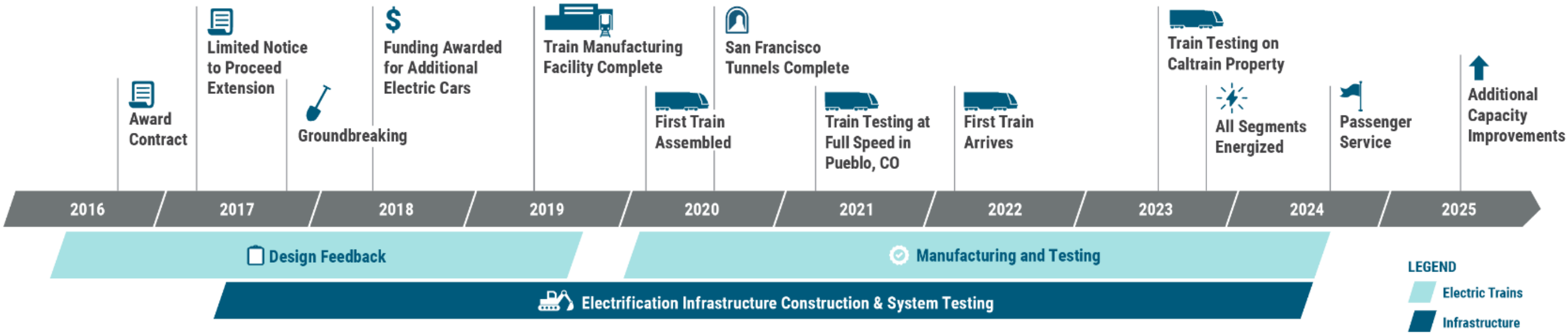
- Caltrain has been working diligently with its partners and the local communities to complete the Electrification Project.
- First new electric trains have arrived & testing is underway through the next year
- **Caltrain's new electrified service will launch in September 2024 with a completely new schedule!**

# About Electrification

- 51 miles from San Francisco to San Jose (Tamien Station) along JPB-owned right-of-way
- Electrification has three components:
  - Overhead contact system
  - Traction power facilities
  - Electric trains (19 trainsets by end of 2024; 23 trainsets by 2027)



# Construction Timeline



# How Does Electrification Improve Rail Service?

## Faster Trains

Electric trains can accelerate/decelerate much faster than diesel trains

Passenger boarding will take less time with more doors available on each train

## Improved Frequency

Stations can receive more frequent service throughout the day and express trains during peaks while maintaining competitive travel times

## Enhanced Comfort

Smoother, quieter, modern, new electric trains

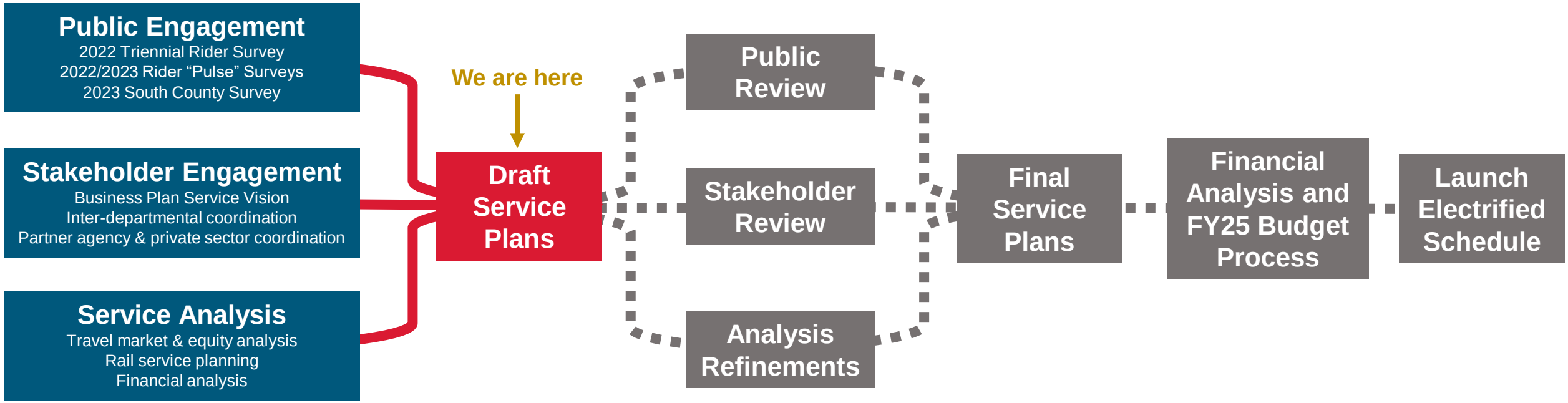
## Sustainability

Reduced greenhouse gas emissions and improved air quality

# Electrified Service Planning Process

# Electrified Service Planning Process

**Caltrain launched its electrified service planning process earlier this year, building upon recent and ongoing engagement, policy, and planning efforts.**



# Electrified Service: Goals & Outcomes

Vision

**Long-Range Service Vision**
(Caltrain Business Plan)

Goals

**Equity**

**Connectivity**

**Recovery & Growth**

Outcomes

**More Frequent Service**
Tailor station frequency to market demand and equity goals

**Competitive Travel Times**
Offer competitive travel times for major markets compared to autos

**Enhanced Off-Peak Service**
Build ridership markets outside of typical commute trips

**Coordinated Transfers**
Coordinate connections with BART and other transit operators

**Simplicity & Legibility**
Provide a schedule that is easy to understand

# What Constraints Remain?

## Infrastructure

Caltrain serves a mostly two track corridor with constrained terminal operations, which limits how it can provide service.

## Fleet

Caltrain's mixed fleet of diesel and electric trains constrains what kinds of train service can be offered

## Operating Budget

Caltrain's constrained operating budget and lower ridership/farebox revenue currently limit service expansion opportunities

## Service Coordination

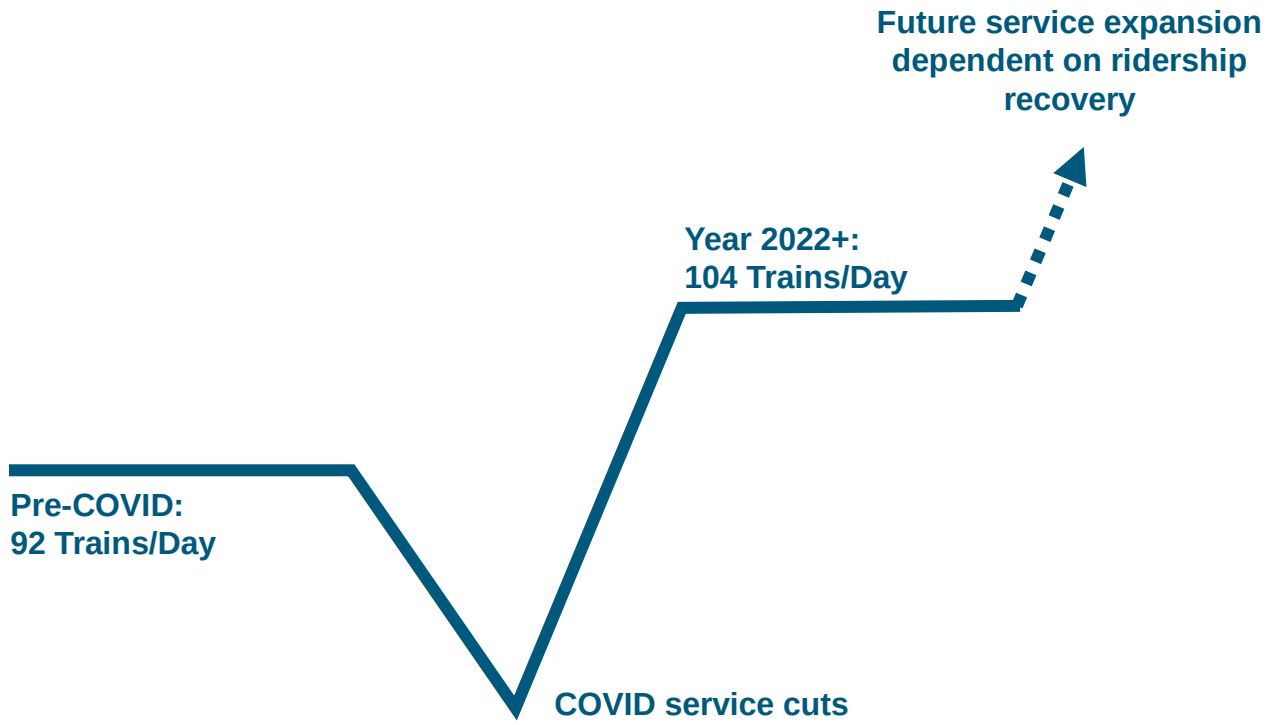
Reduced BART frequency (starting fall 2023) at Millbrae presents challenges for timing transfers

# Weekday Electrification Service Levels

**In fall 2024, Caltrain plans to continue providing 104 weekday trains per day and 4 trains per hour per direction during peak periods, consistent with the FY24-25 Budget.**

With ridership still recovering from the effects of the pandemic, Caltrain is requesting a waiver from the Federal Transit Administration (FTA) to delay further service expansion until ridership returns. Discussions with FTA have been positive and Caltrain expects to receive the waiver in fall 2023.

## Change in Weekday Service Levels over Time



# Market Analysis Summary

## Evaluating Station Service Levels

# Market Analysis Approach

## Ridership Analysis

Considers current and pre-COVID ridership patterns

## Land Use Analysis

Total population and jobs near stations, including recently-completed or under construction projects*

## Equity Analysis

Connections to low income and/or minority communities

## Transit Connections

Presence of high frequency rail, bus, and shuttle connections

*Based on a review of projects listed on City planning websites in Spring 2023

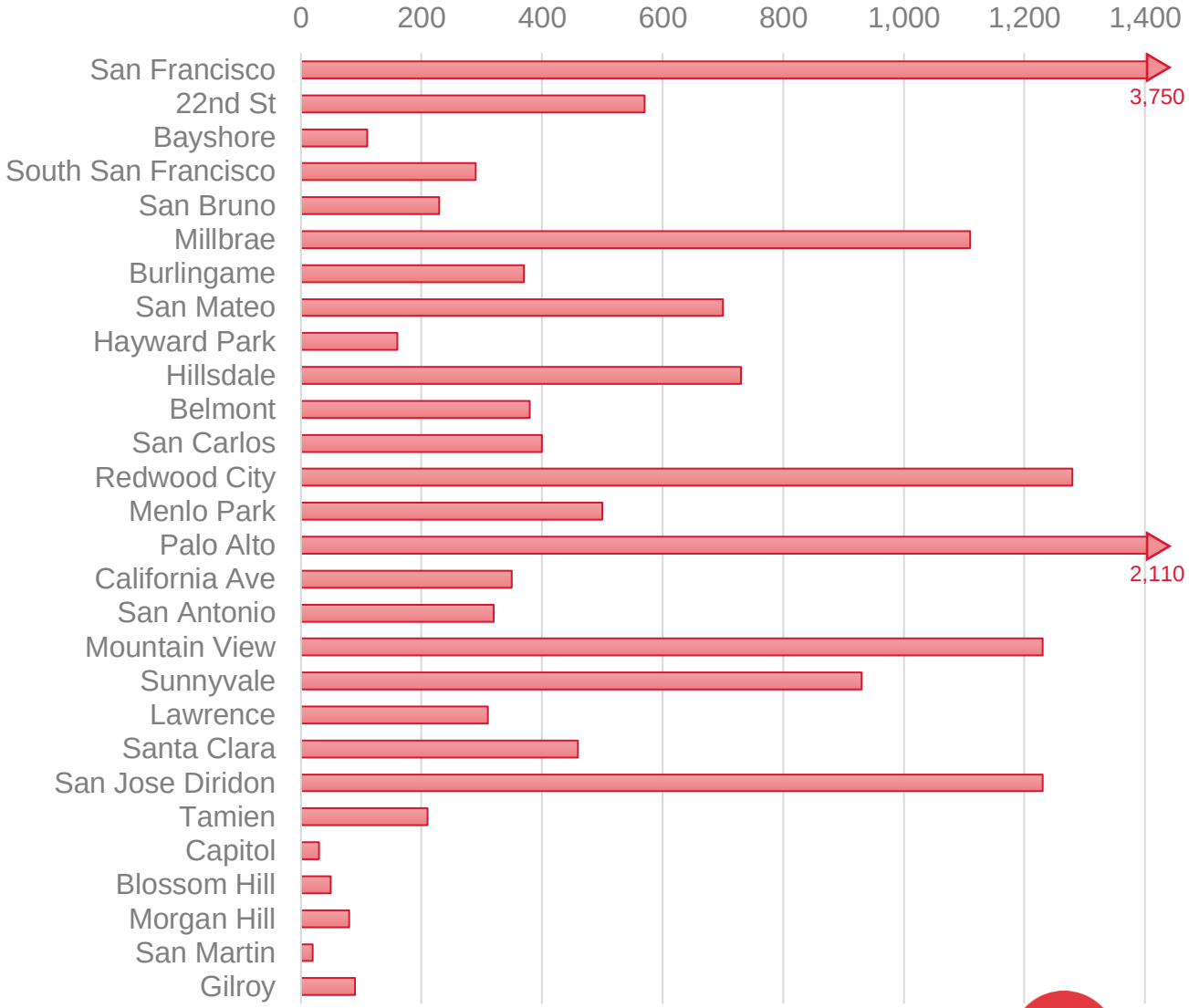
# Ridership Analysis

Caltrain's current ridership remains focused around key stations:

- San Francisco
- Millbrae
- Redwood City
- Palo Alto
- Mountain View
- Sunnyvale
- San Jose Diridon

*Ridership estimates based on Clipper data and limited conductor counts Jan-Mar 2023*

## Average Weekday Ridership by Station (2023)



# Land Use Analysis

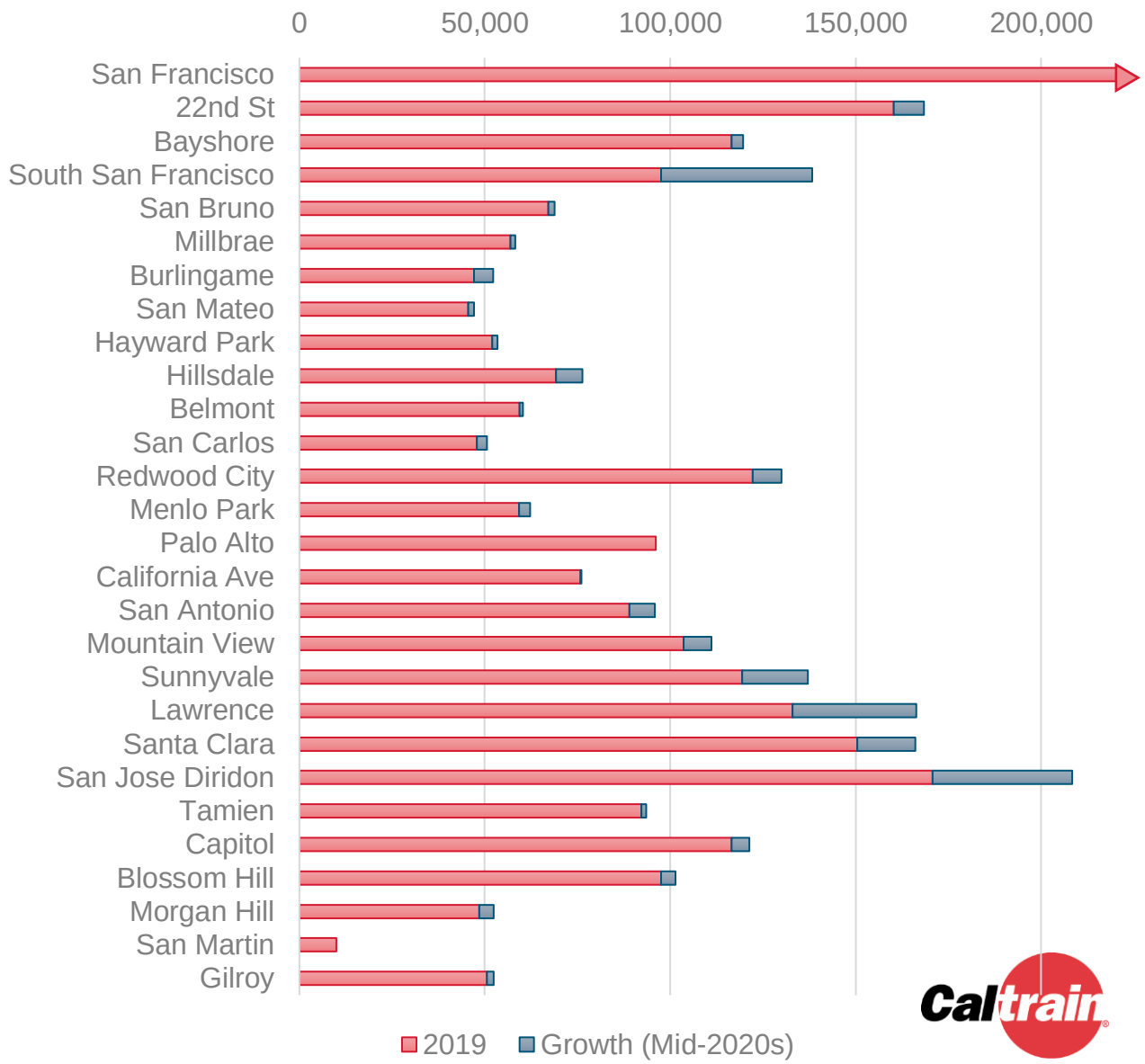
Proximity to population and jobs is an indicator of potential latent demand for Caltrain.

Some Caltrain station areas are experiencing substantial growth, particularly:

- South San Francisco
- Sunnyvale
- Lawrence
- Santa Clara
- San Jose Diridon

*Growth based on inventory of projects under construction or completed since 2019*

## Population and Jobs within 2 Miles of Caltrain Stations: Mid-2020s Estimate

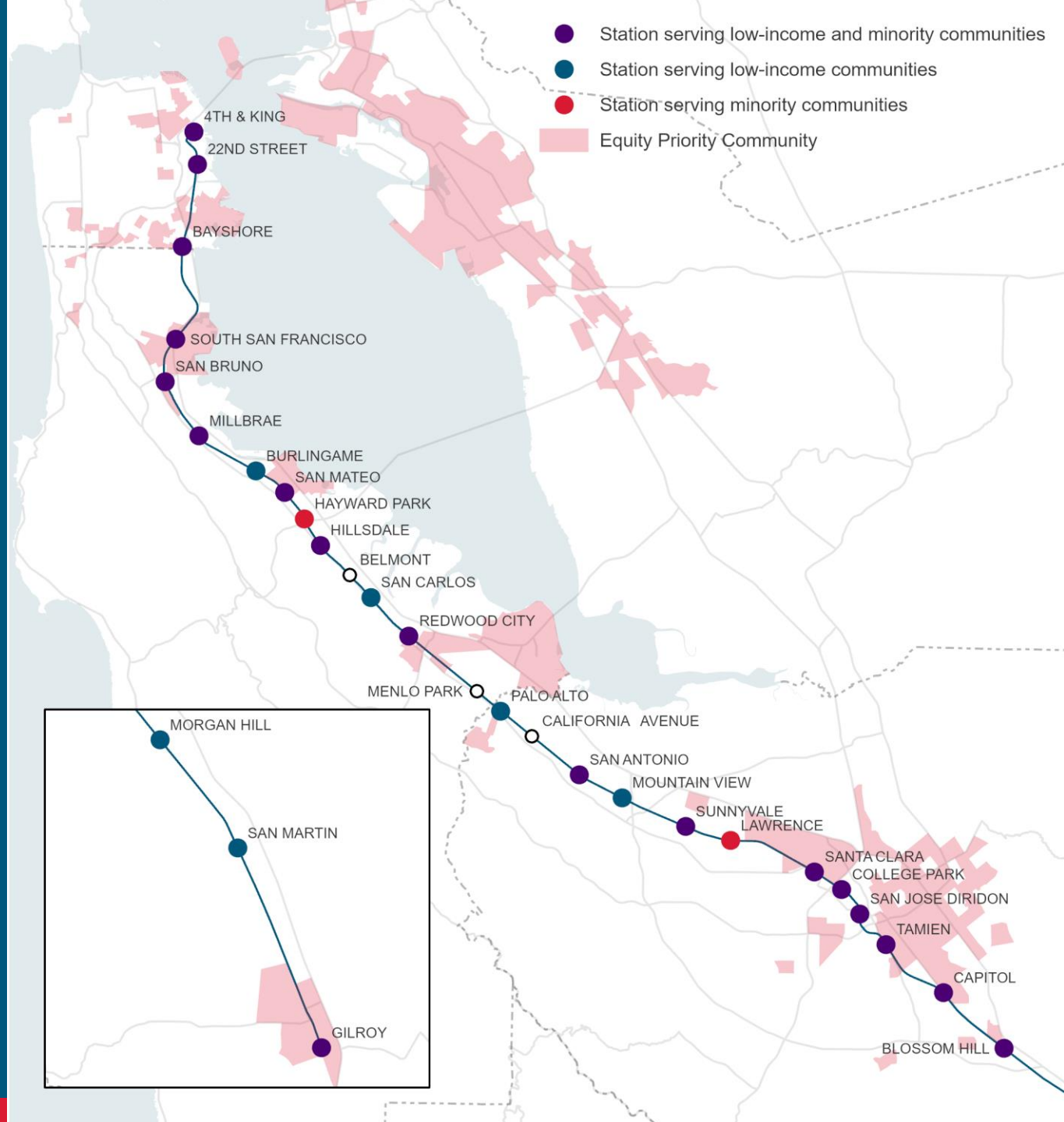


# Equity Need

The Metropolitan Transportation Commission designates Equity Priority Communities across the region. Caltrain also identifies specific stations that serve minority or low-income riders for Title VI purposes.

Caltrain has historically underserved the following stations that serve equity priority populations:

- Bayshore
- South San Francisco
- San Bruno
- San Mateo
- Menlo Park
- Sunnyvale
- Lawrence
- Santa Clara
- Tamien
- Capitol
- Blossom Hill
- Gilroy



# Transit Connections

Most Caltrain stations include connections to other transit operators that serve communities along the Caltrain corridor, including but not limited to:

- ACE
- BART
- Capitol Corridor
- Commute.org
- SamTrans
- SFMTA
- VTA

| Caltrain Station | Connecting Transit Operator(s) | Other Transit Operators' Peak Hour Trips per Direction |
|---|---|---|
| San Francisco | SFMTA | 28 |
| 22nd Street | SFMTA | 7 |
| Bayshore | Commute.org | 3 |
| South San Francisco | SamTrans, Commute.org, City Shuttle | 17 |
| San Bruno | SamTrans | 2 |
| Millbrae | BART, SamTrans, Commute.org | 17 |
| Burlingame | SamTrans | 2 |
| San Mateo | SamTrans | 4 |
| Hayward Park | Commute.org | 1 |
| Hillsdale | SamTrans, Commute.org | 13 |
| Belmont | SamTrans | 6 |
| San Carlos | SamTrans | 6 |
| Redwood City | SamTrans, Commute.org | 22 |
| Menlo Park | SamTrans, City Shuttle | 10 |
| Palo Alto | VTA, SamTrans, Stanford, Dumbarton | 68 |
| California Ave | VTA | 1 |
| San Antonio | VTA | 2 |
| Mountain View | VTA , MVGO Shuttle | 36 |
| Sunnyvale | VTA | 13 |
| Lawrence | - | - |
| Santa Clara | VTA, ACE, Capitol Corridor | 24 |
| San Jose Diridon | VTA , ACE, Capitol Corridor, Highway 17 Express | 27 |
| Tamien | VTA | 9 |
| Capitol | VTA | 7 |
| Blossom Hill | VTA | 2 |
| Morgan Hill | VTA | 7 |
| San Martin | VTA | 6 |
| Gilroy | VTA, County Express | 11 |

Gray = Caltrain stations with greater than 10 peak hour trips from connecting transit operators

# Candidate Stations for Service Expansion

All stations north of San Jose* will receive a base service level of half-hourly service.

Based on market analysis, the following stations demonstrate the strongest need for additional service frequency:

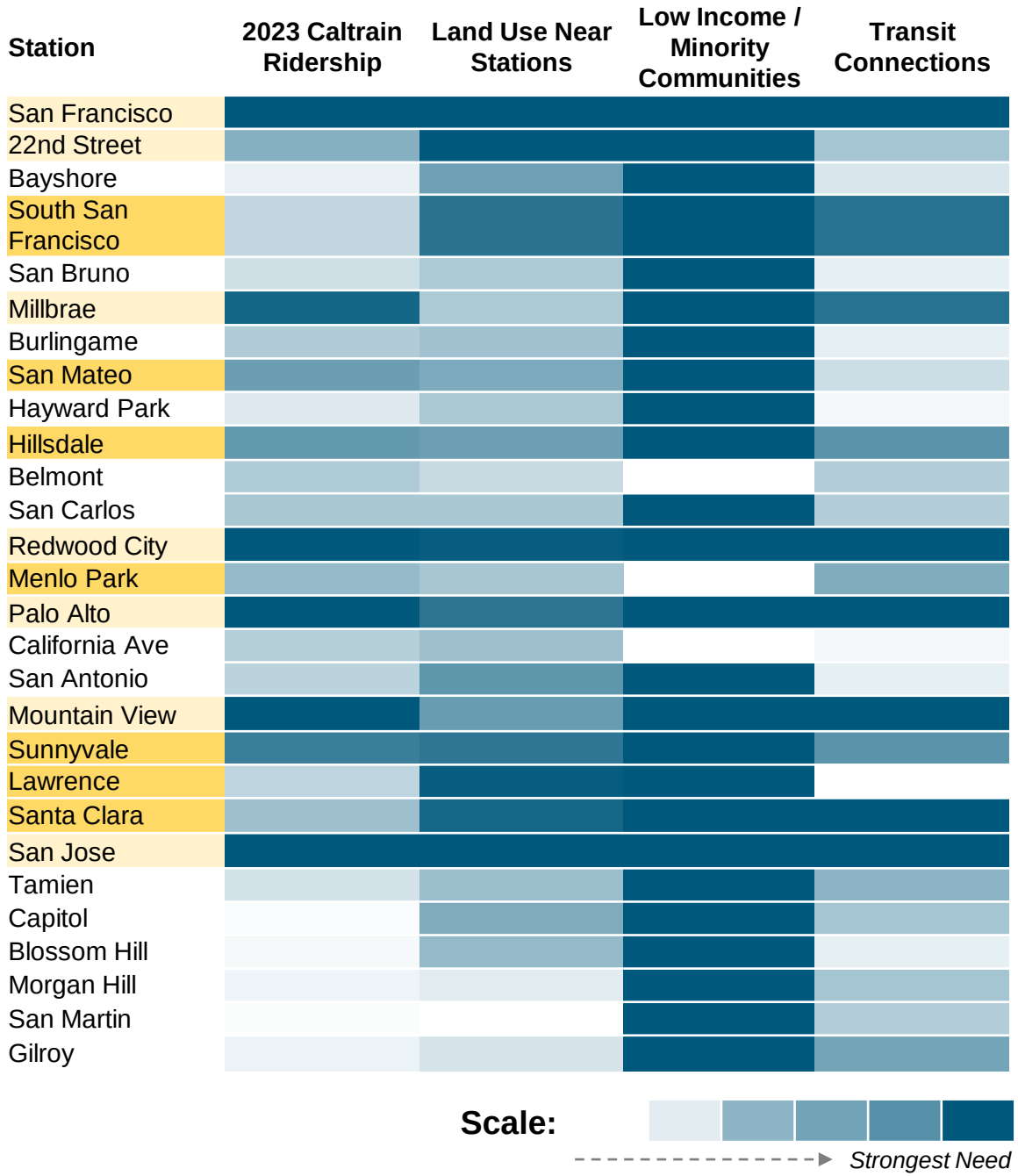
- South San Francisco
- San Mateo
- Hillsdale
- Menlo Park
- Sunnyvale
- Lawrence
- Santa Clara

The results of this analysis were incorporated into the service planning process alongside operational considerations.

*South of San Jose (Tamien – Gilroy), on UP-owned territory, Caltrain will provide 4 roundtrips per day.

Stations already at maximum service level (4 TPHPD)

Stations demonstrating the strongest need for increased frequency



# Proposed Electrified Service Plan

# Proposed Weekday Peak Period Service Concept

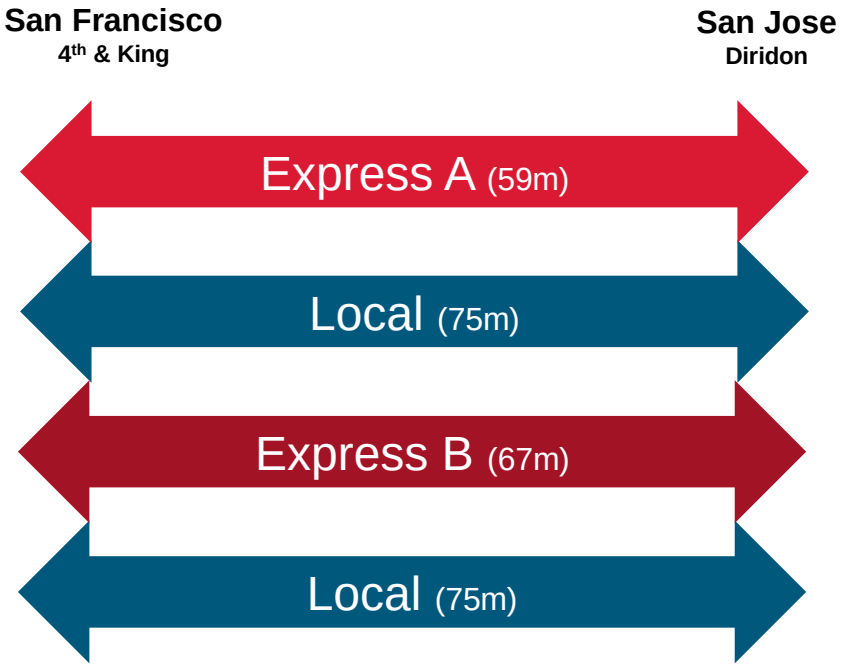
**(San Francisco to San Jose)**

**Faster service *and* more stops with all-electric trains**

- 4 trains per hour per direction
- Alternating express and local trains
- SF-SJ travel times of 59 to 75 minutes*
- 20% increase in stops at stations

## Weekday Peak

**Approximately 6:30am-9:30am and 3pm-7pm**



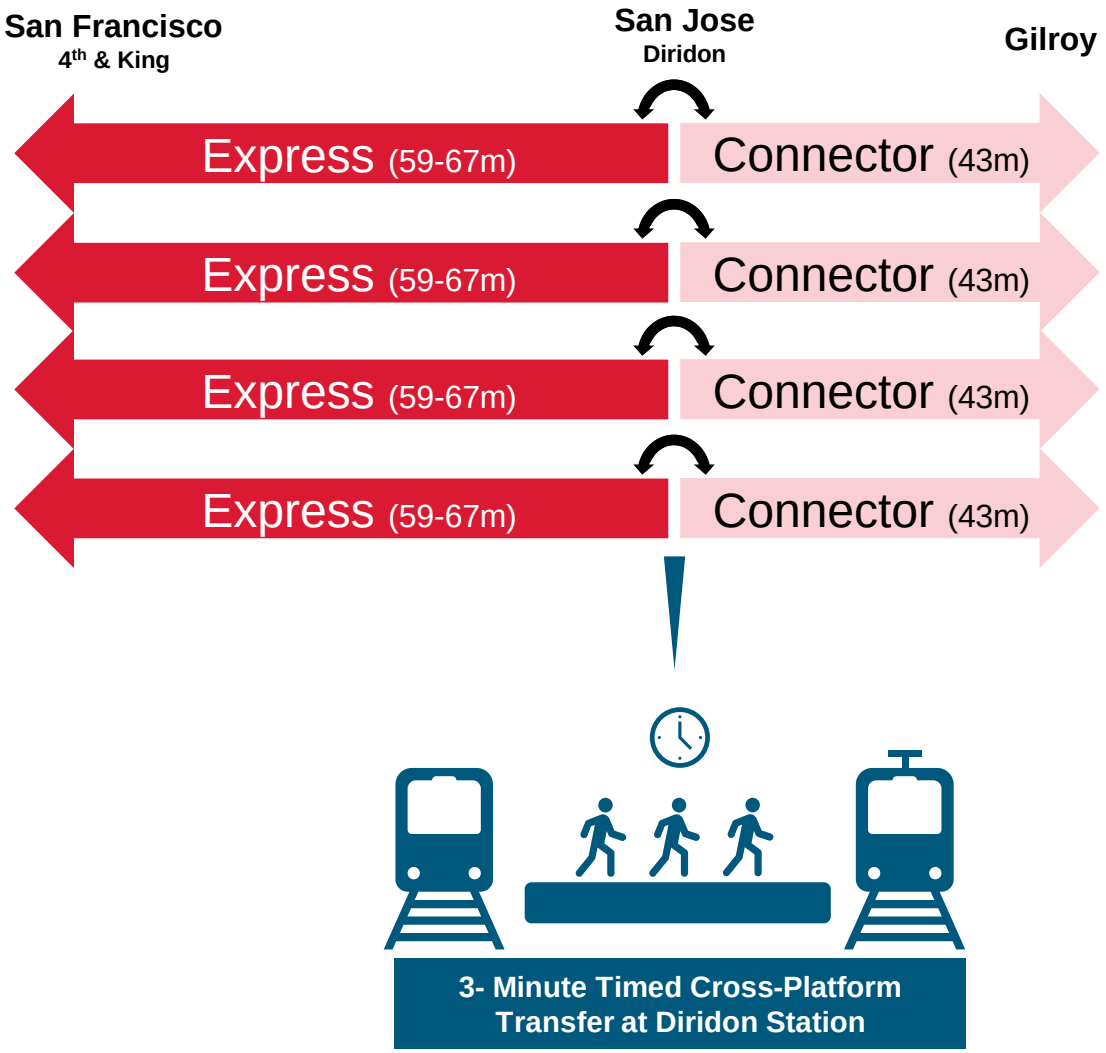

*Travel times subject to change pending further testing as new electric trains arrive and are prepared for revenue service.

# Proposed Weekday Peak Period Concept for South County Connector

## Service Tailored to Community Needs

- 4 daily roundtrips (schedules tailored to survey feedback from South County residents in June 2023)
- Timed cross-platform transfer to Express Trains (3-minute connection) at Diridon Station
- SF-Gilroy travel times of 102-110 minutes, a reduction of up to 28 minutes compared to existing service
- Maximizes flexibility within constraints imposed by agreement with Union Pacific

**4 Daily Roundtrips with Timed Cross-Platform Connection**

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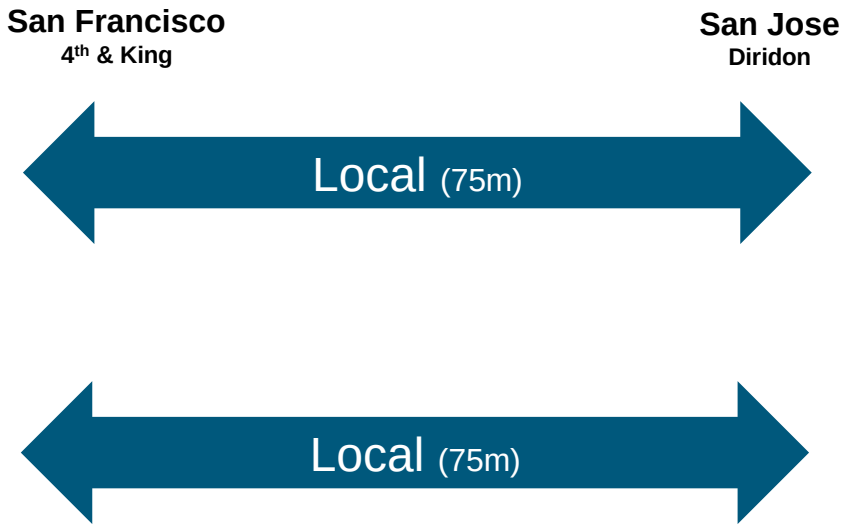
# Proposed Weekday Off-Peak Service Concept

**(San Francisco to San Jose)**

## Half-Hourly Off-Peak Service at All Stations

- All stations receive half-hourly local service throughout the day
- SF-SJ travel times of 75 minutes
- Fully electrified service – all electric trains

**Weekday**
**Off Peak**
**Approximately 5-6:30am, 9:30am-3pm, and 7pm-1am**

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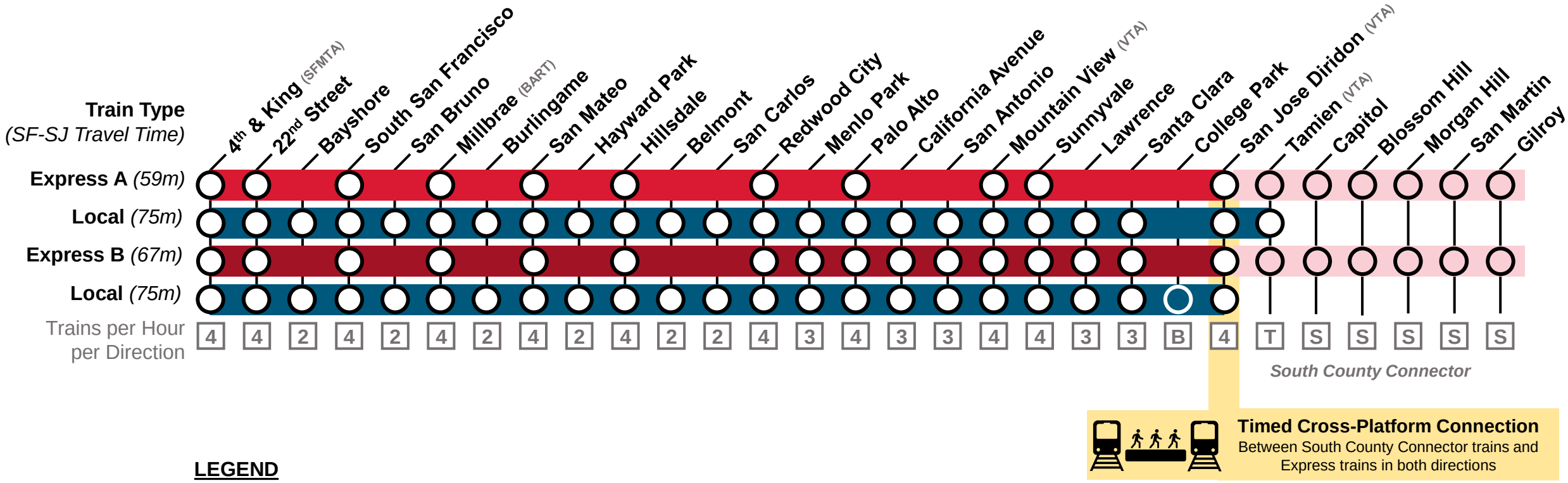
# Proposed Weekday Peak Period Station Service Levels

Peak periods vary by station, generally covering 6:30am-9:30am and 3-7pm on weekdays



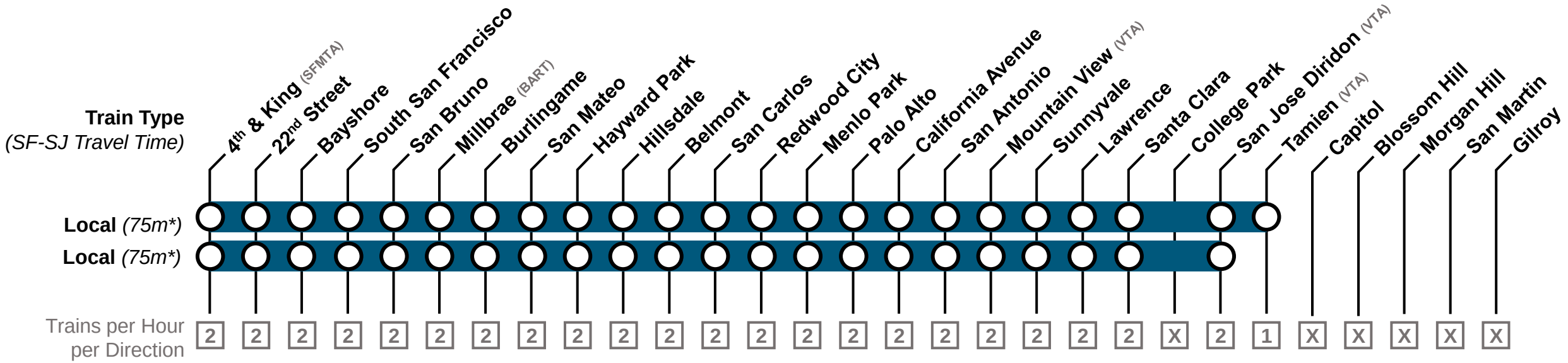

**LEGEND**

- ○ Stop (one per hour per direction)
- # Stops per hour per direction
- T Tamien Service
  2 to 3 stops per hour in peak direction, 1 stop per hour in reverse-peak direction
- B Bellarmine Service
  2 stops per day per direction
- S South County Connector Service
  4 stops per day per direction with 1-2 trains per hour in the peak direction

*Travel times subject to change pending further testing as new electric trains arrive and are prepared for revenue service.

# Proposed Weekday Off-Peak Station Service Levels

Off-peak periods generally 5am-6:30am, 9:30am-3pm, and 7pm-1am




**LEGEND**

- ○ Stop (one per hour per direction)
- X No Service — Peak Period service only
- # Stops per hour per direction

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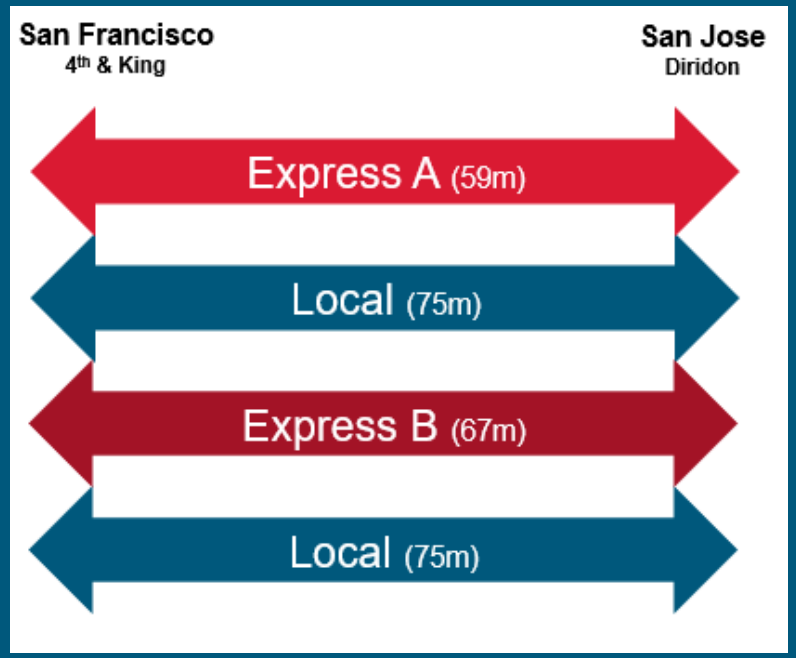
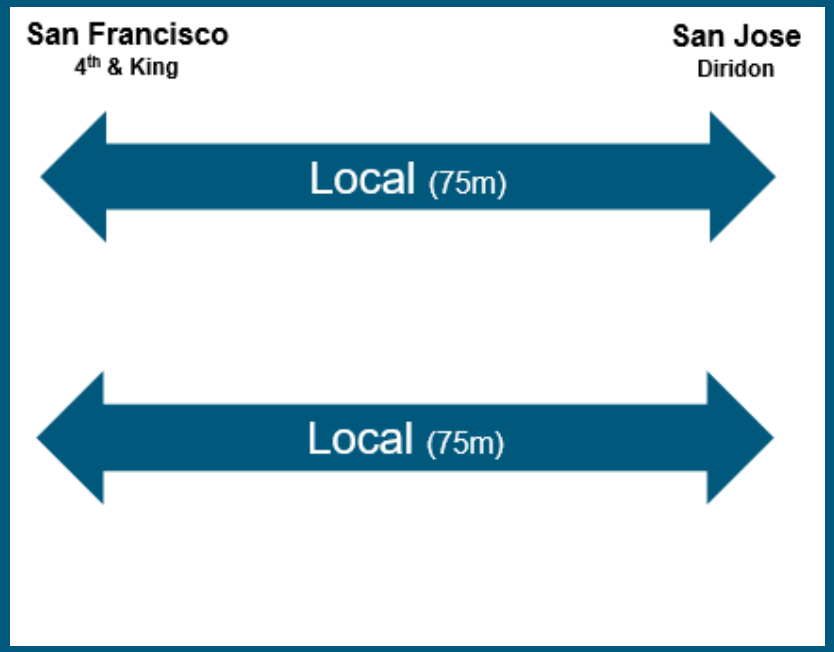
# Benefits of the Proposed Weekday Peak Period Service




| Metric | | Existing Service | Proposed Fall 2024 Service | Explanation of Key Benefits |
|---|---|---|---|---|
| Total Stops per Hour (All Stations) | | 66 stops | 79 stops | Increased number of station stops across corridor |
| Number of Stations with 3 or 4 Stops per Hour per Direction | | 9 stations | 16 stations | Increased frequency, as more stations receive 3 or 4 train stops per hour per direction |
| San Francisco – San Jose Travel Time | Express Trains | 65 to 81 minutes | 59 and 67 minutes | Substantially quicker travel times, with time savings between 6-25 minutes |
| | Local Trains | 100 minutes | 75 minutes | |

*Travel times subject to change pending further testing as new electric trains arrive and are prepared for revenue service.

# Benefits of Proposed Weekday Off Peak Service




| Topic | Existing Service | Proposed Fall 2024 Service | Explanation of Key Benefits |
|---|---|---|---|
| Total Stops per Hour (All Stations) | 34 stops | 44 stops | Increased frequency, as more stations receive more stops per hour per direction |
| San Francisco – San Jose Travel Times (Minutes) | 100 minutes | 75 minutes | Substantially quicker travel times, with time savings up to 25 minutes |

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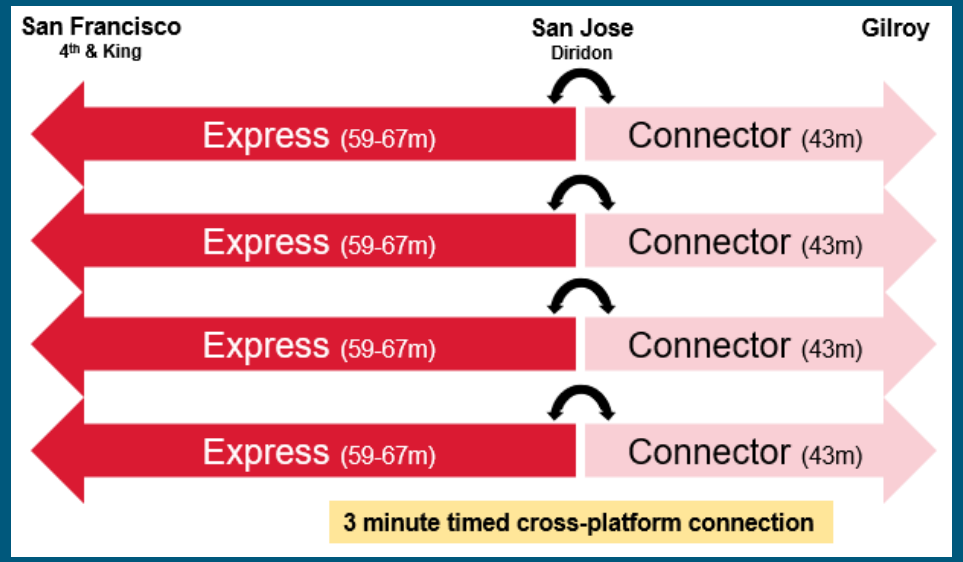
# Benefits of the Proposed South County Connector Service




| Topic | | Existing Service | Proposed Fall 2024 Service | Explanation of Key Benefits |
|---|---|---|---|---|
| Weekday Roundtrips | | 3 roundtrips | 4 roundtrips | One additional weekday trip in each direction |
| Travel Time | Gilroy – San Jose | 49-52 minutes | 43 minutes | Travel time savings between 6-9 minutes |
| | Gilroy – Palo Alto | 76-86 minutes | 66-72 minutes | Travel time savings between 4-20 minutes |
| | Gilroy – SF | 126-133 minutes | 105-113 | Travel time savings between 20-28 minutes |

*Travel times subject to change pending further testing as new electric trains arrive and are prepared for revenue service.

# Benefits of Proposed Service Plan

**With this Proposed Electrified Service Plan, Caltrain will deliver improved service to *all riders*:**

## Faster Trips

Provides faster travel times for *all* Caltrain riders

Largest savings in southern Santa Clara County due to new Connector service

On average, passengers would experience 13% faster travel times (about 5 minutes of savings)

## Increased Frequency at Stations

20% increase in total stops

27% at stations serving Equity Priority Communities

23% increase at stations serving minority riders

16% increase at stations serving low-income riders

Half-hourly all-day service at all stations

## Improved Connections

Consistent 30 minute frequencies for coordinated bus and rail connections

15 minute peak period frequencies at major mid-corridor stations

## Fully Electrified Service north of San Jose

Maximizes use of quieter, cleaner, more comfortable electrified fleet north of Tamien Station

Reduces Caltrain's greenhouse gas emissions by 250K $MTCO_2$ per year

# Millbrae BART Connection Times

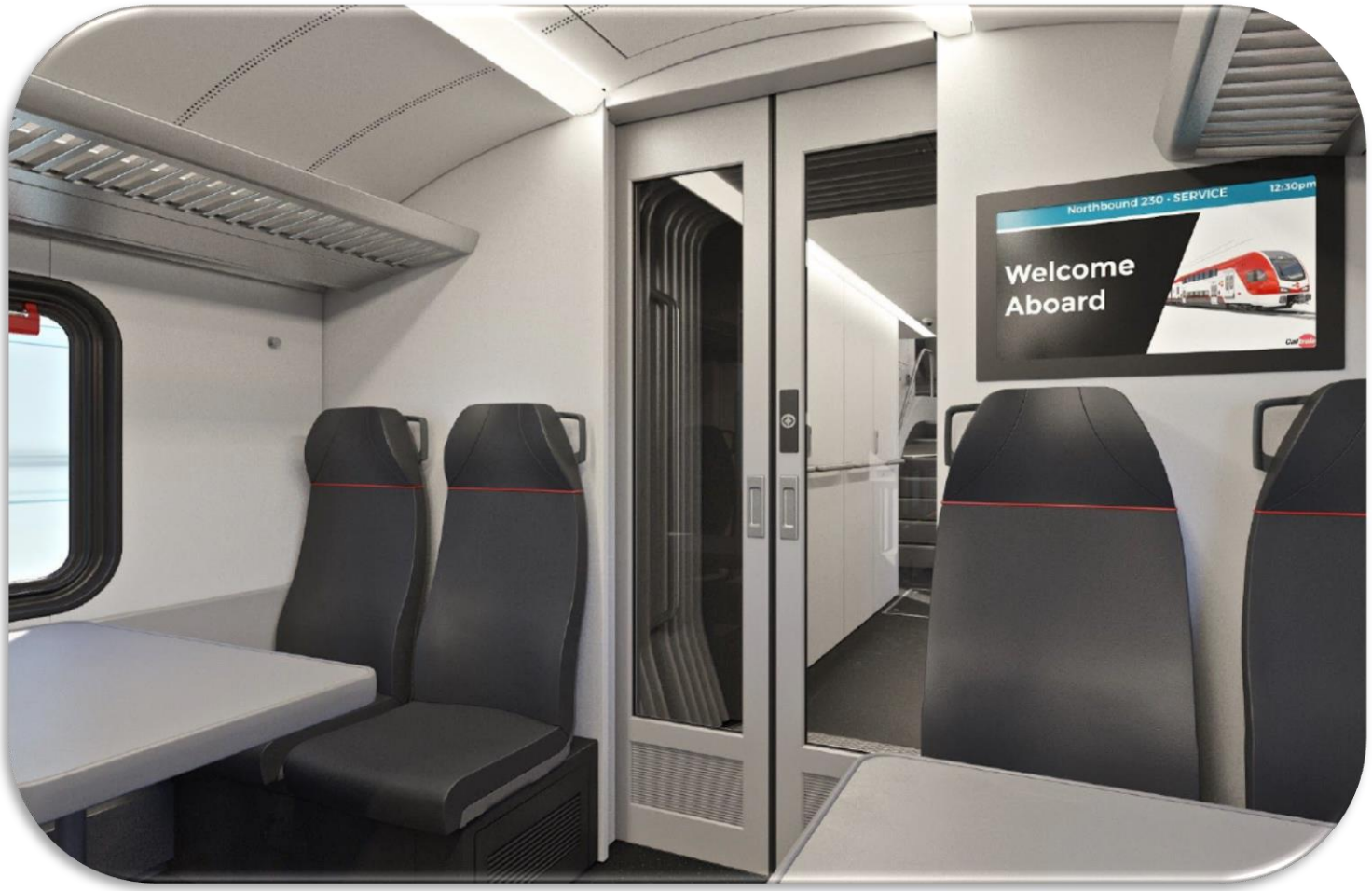
Connections at Millbrae are important to many riders. Caltrain will provide 4 stops per direction in peak period (104 trains per weekday).

Caltrain has minimized connection times at Millbrae to the extent feasible. Passengers would have 8 minute or 18-minute connections to/from BART.

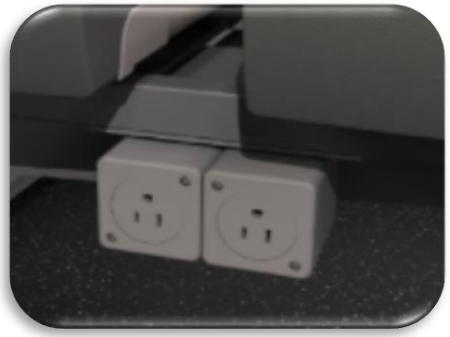
BART's service reduction (fall 2023) from 4 to 3 trains per hour limits Caltrain's ability to provide efficient connections for all trains.

| Train Connection | Transfer Time |
|---|---|
| Express A - BART | 8 Minutes |
| Local - BART | 8 Minutes |
| Express B - BART | 18 Minutes |
| Local - BART | 18 Minutes |

# New Electric Trains Provide Enhanced Amenities for Riders




Onboard Electronic Displays w/ Trip Information & Pre-Recorded Announcements



Plentiful Power Sources

Baby-Changing Station

# Next Steps

# Next Steps

**2023**

**September** Proposed Service Plan shared with stakeholder groups.
Community tabling events to share Draft Service Plan.

**October** Proposed Service Plan shared with Caltrain Board.
More community tabling events to share Draft Service Plan.
Feedback used to revise service ideas for Final Service Plan.

**November** Final Service Plan shared with the public.

**December** Final Service Plan shared with Caltrain Board.

**2024**

**Spring** Corridor fully electrified, electric train testing.

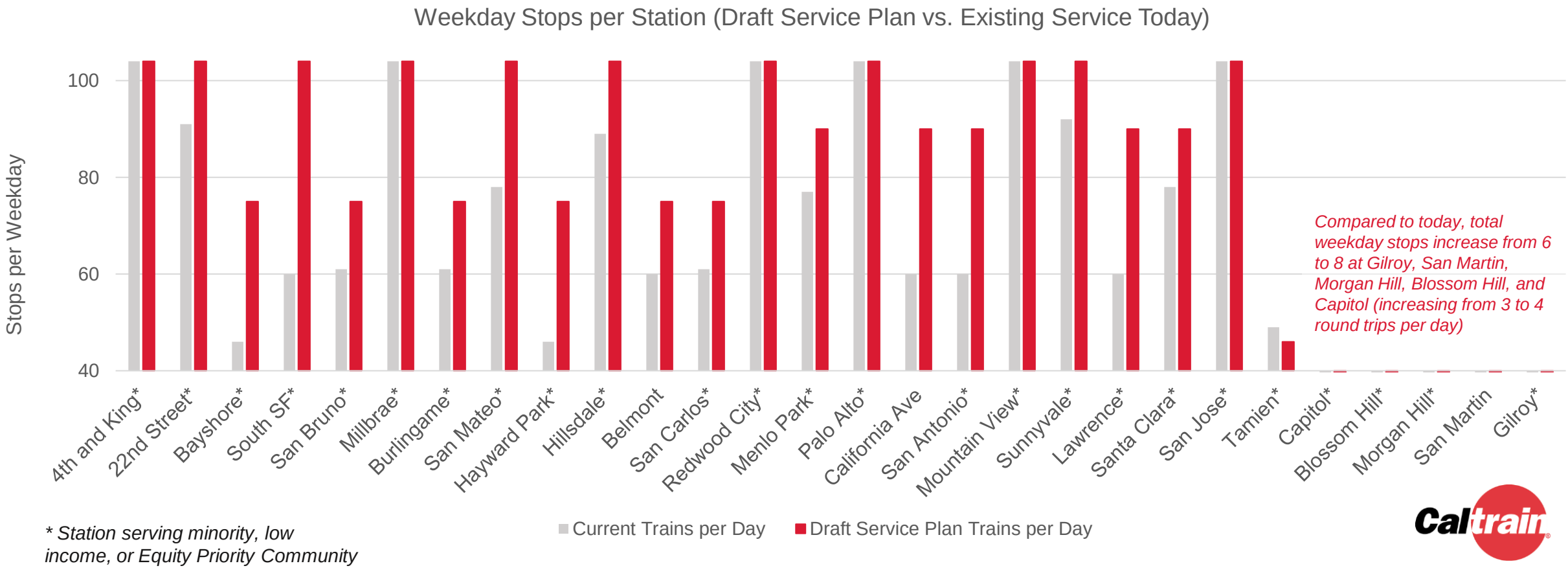
**Summer** Service plan testing, more electric trains arrive.

**Fall** Electrified service open for riders, using new Final Service Plan!

# Appendix

# Weekday Stop Frequency by Station

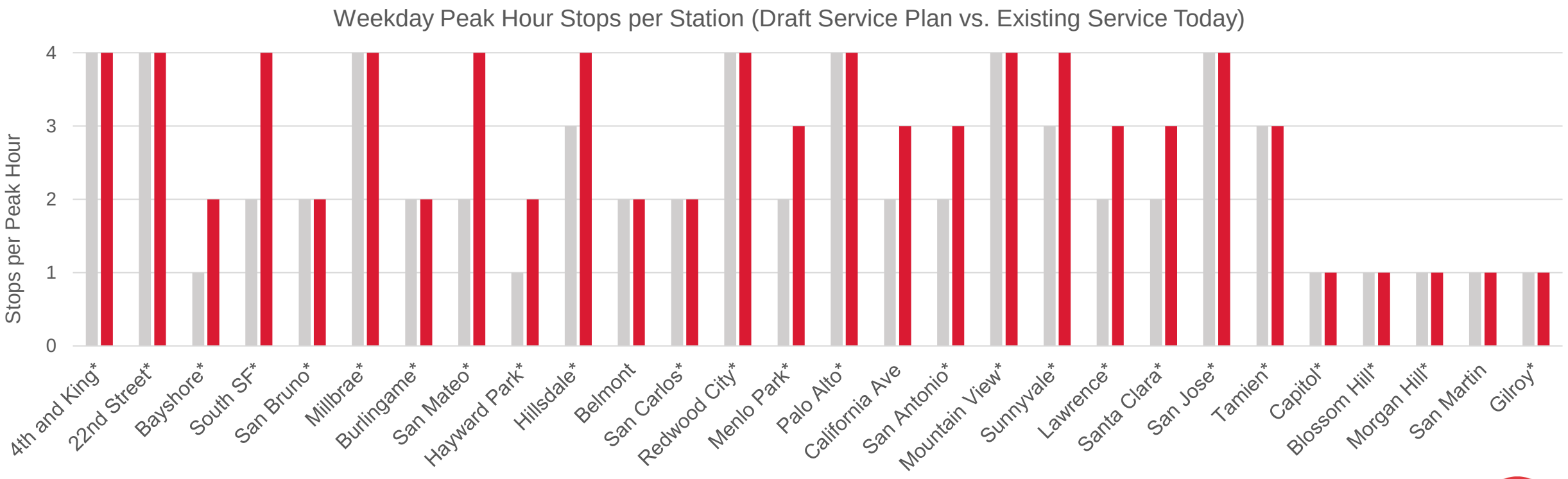
Total weekday stops increase by 20% corridor-wide




** Station serving minority, low income, or Equity Priority Community*

# Weekday Peak Hour Stop Frequency

## Total peak hour stops increase by 20% corridor-wide

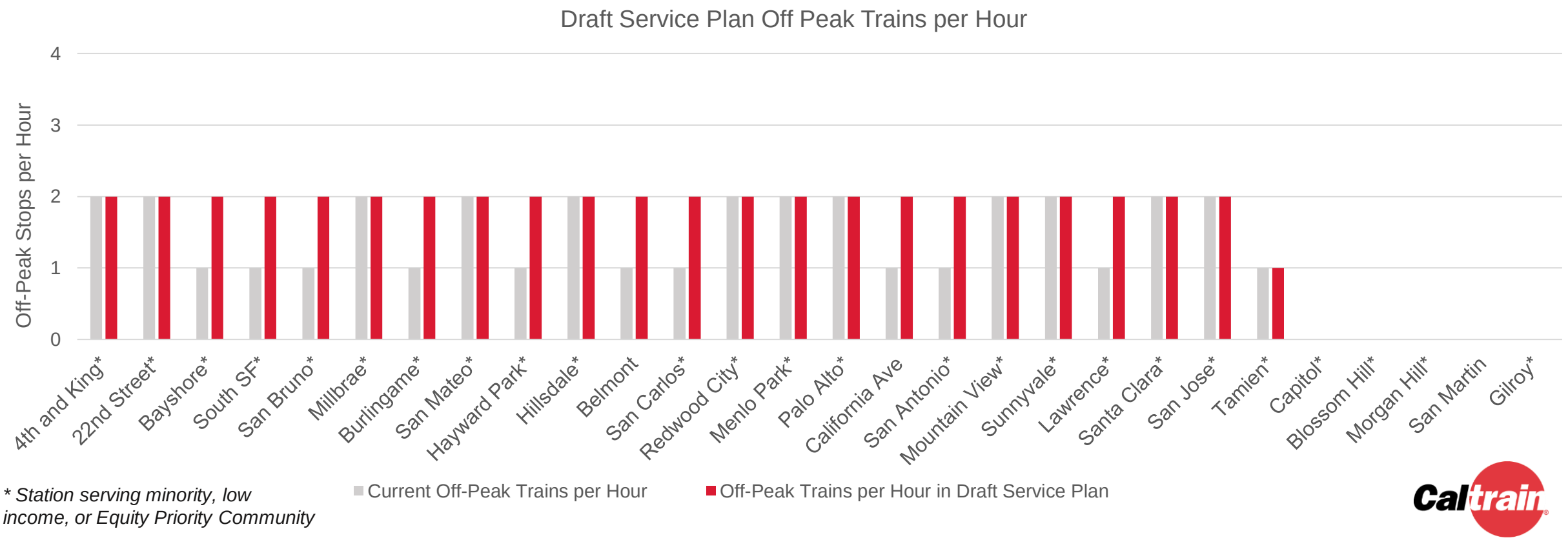



** Station serving minority, low income, or Equity Priority Community*

*22nd St: 4 TPH peak direction, 2 TPH reverse-peak direction. Tamien: 2-3 TPH peak direction, 1 TPH reverse-peak direction.

# Off-Peak Stop Frequency

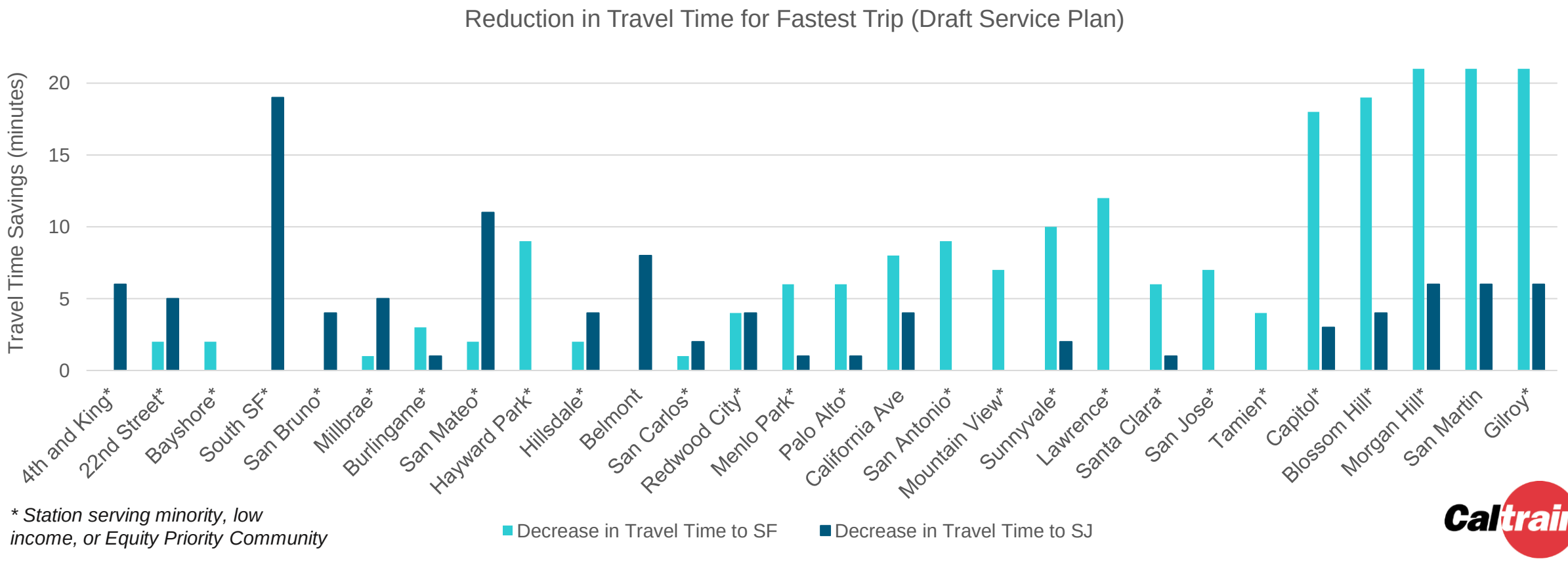
Total off-peak stops per hour increase by 30% corridor-wide




** Station serving minority, low income, or Equity Priority Community*

# Travel Time Savings to SF & SJ

## Most stations will see 3 to 5 minutes of savings to San Francisco or San Jose (comparing the fastest trains)




** Station serving minority, low income, or Equity Priority Community*

# Southern Santa Clara County Corridor Survey: Priorities

- Online survey for South County was conducted in June 2023 and targeted residents in those communities; 1,552 responses received
- Respondents ranked frequency, later morning service, and shorter travel time as top priorities
- 85% of passengers traveled within Santa Clara County or southern San Mateo County (<10% traveled to San Francisco)*

*Data from 2022 Triennial Survey

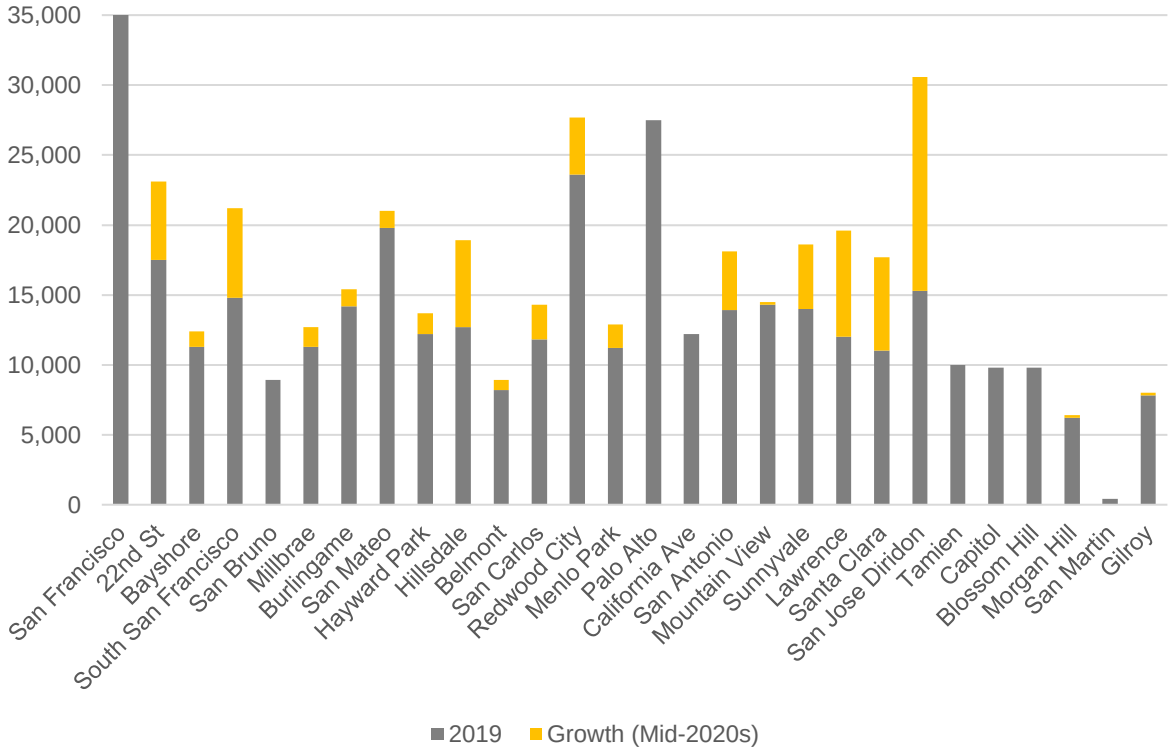
## Service Improvement Preferences in Ranking Order

| | Frequency | Earlier AM service | Later AM service | Earlier PM service | Later PM service | Shorter trip time | One seat ride |
|---|---|---|---|---|---|---|---|
| **Capitol** | 1 | 4 | 3 | 6 | 7 | 2 | 5 |
| **Blossom Hill** | 1 | 5 | 2 | 4 | 7 | 3 | 6 |
| **Morgan Hill** | 1 | 5 | 2 | 6 | 4 | 3 | 7 |
| **San Martin** | 1 | 5 | 2 | 4 | 6 | 3 | 7 |
| **Gilroy** | 1 | 4 | 2 | 5 | 6 | 3 | 7 |

*Ranking Order: 1=most requested improvement; 7=least requested improvement*

# Corridor Development Inventory

**Population and Jobs within ½ Mile of Caltrain Stations: Mid-2020s Estimate**




*Growth based on inventory of projects under construction or completed since 2019*

## Projects Under Construction or Completed Since 2019