Caltrain Business Plan

DECEMBER 2018

LPMG

December 20, 2018

The 2040 Vision: A Continued Focus on Service Planning

What is the Caltrain Business Plan?

What Addresses the future potential of the railroad over the next 20-30 years. It will assess the benefits, impacts, and costs of different service visions, building the case for investment and a plan for implementation.

Why Allows the community and stakeholders to engage in developing a more certain, achievable, financially feasible future for the railroad based on local, regional, and statewide needs.

What Will the Business Plan Cover?

Technical Tracks

Service

- Number of trains
- Frequency of service
- Number of people riding the trains
- Infrastructure needs to support different service levels

Business Case

- Value from investments (past, present, and future)
- Infrastructure and operating costs
- Potential sources of revenue

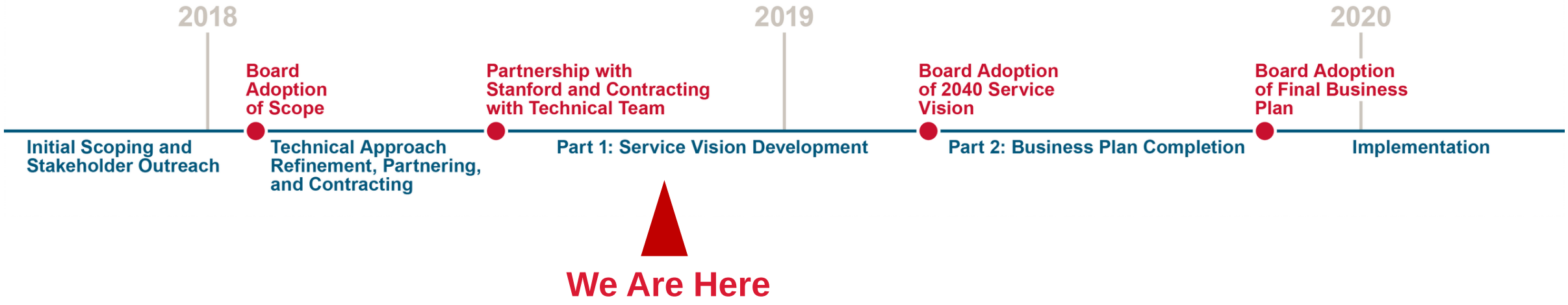
Community Interface

- Benefits and impacts to surrounding communities
- Corridor management strategies and consensus building
- Equity considerations

Organization

- Organizational structure of Caltrain including governance and delivery approaches
- Funding mechanisms to support future service

Where Are We in the Process?



Service Planning: High Growth

Review & Evaluate Concepts

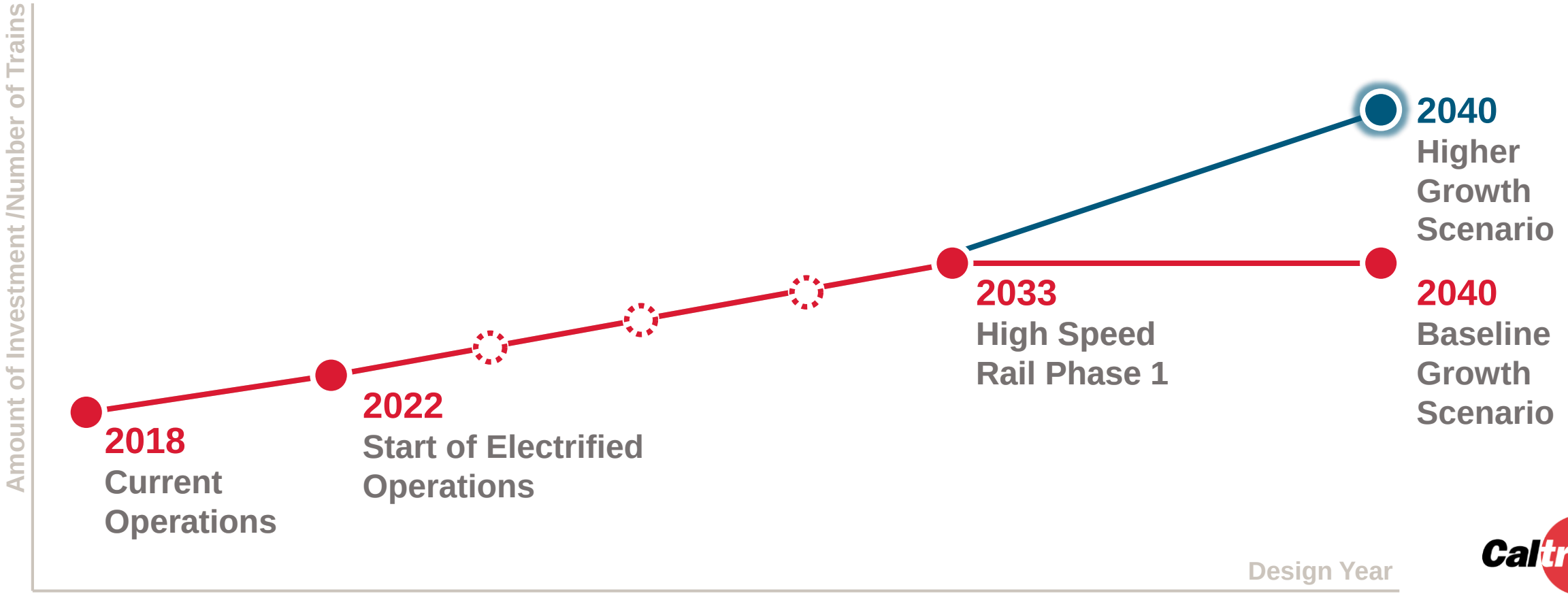
Review & Evaluate Concepts

Off-Peak Service Planning

Terminal Planning

South San Jose & Gilroy Planning

Context: Different Ways to Grow



2040 Demand

The Caltrain corridor is growing

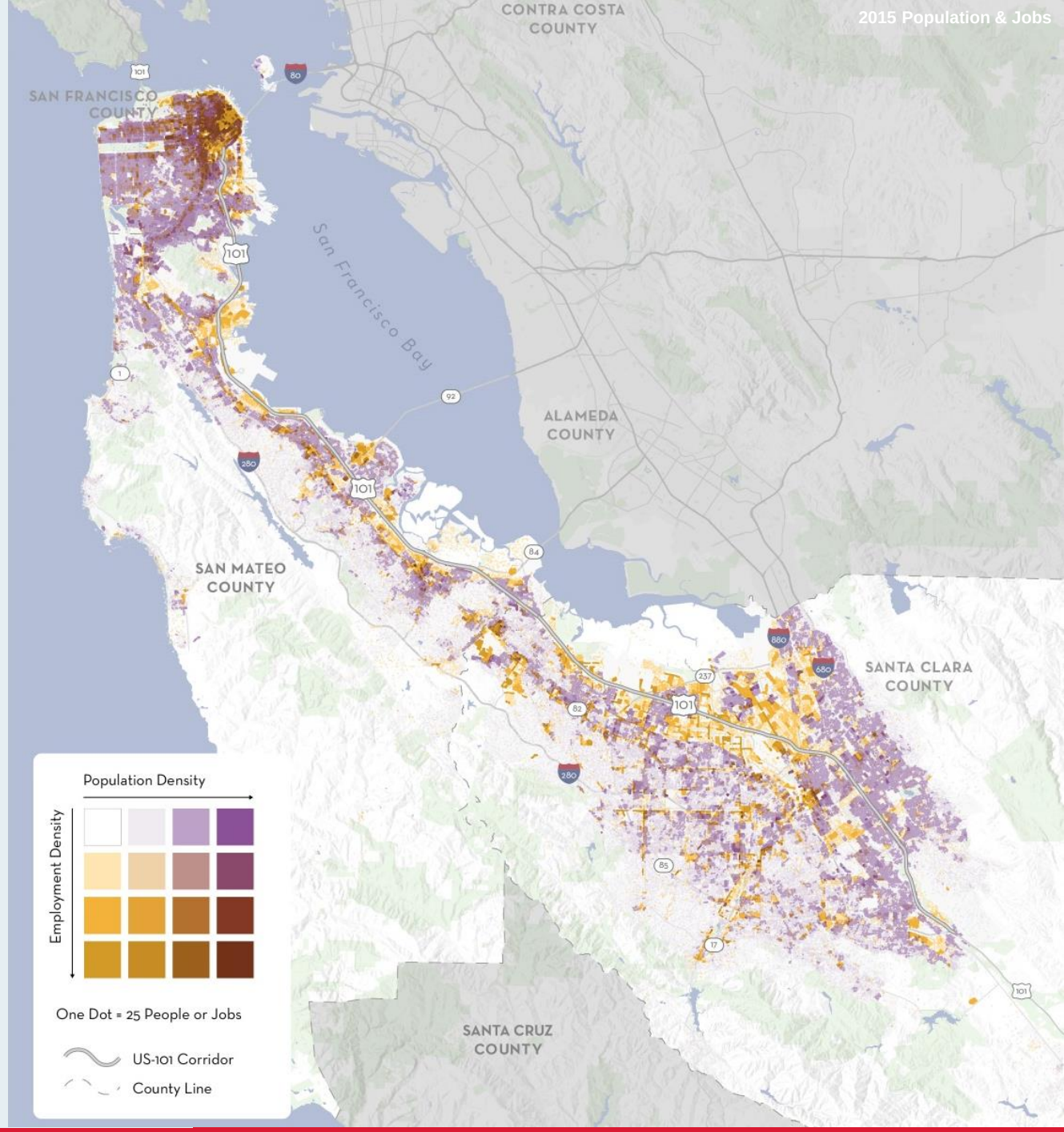
- Corridor expected to add 1.2 million people and jobs within 2 miles of Caltrain (+40%)[1]
- 80% of growth expected in San Francisco and Santa Clara Counties

Major transit investments are opening new travel markets to Caltrain

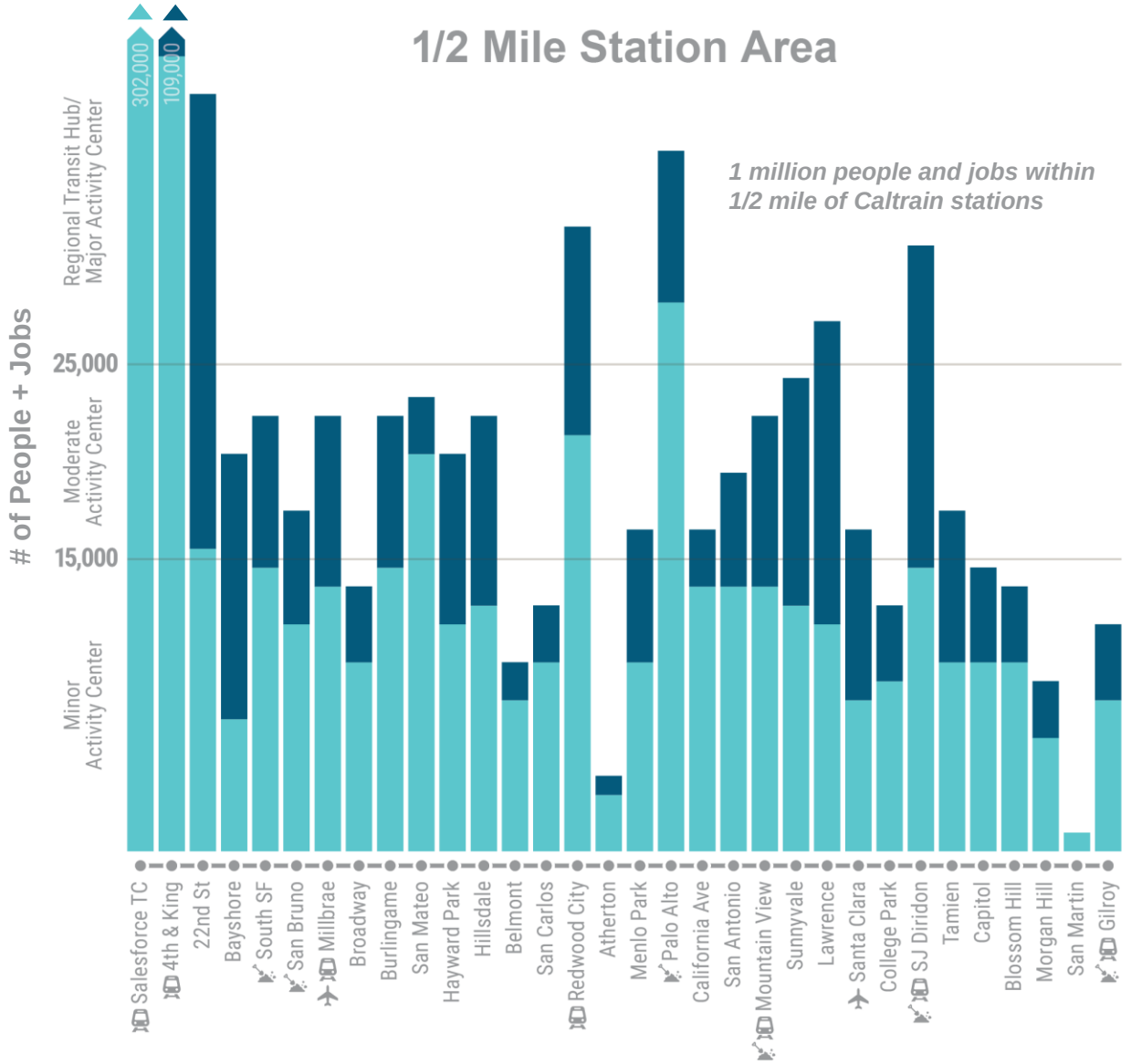
- Downtown Extension and Central Subway to provide more direct connections to downtown San Francisco
- Dumbarton Rail, BART to San Jose, and improvements to Capitol Corridor and ACE to strengthen connectivity with East Bay
- HSR and Salinas rail extensions to increase interregional travel demand

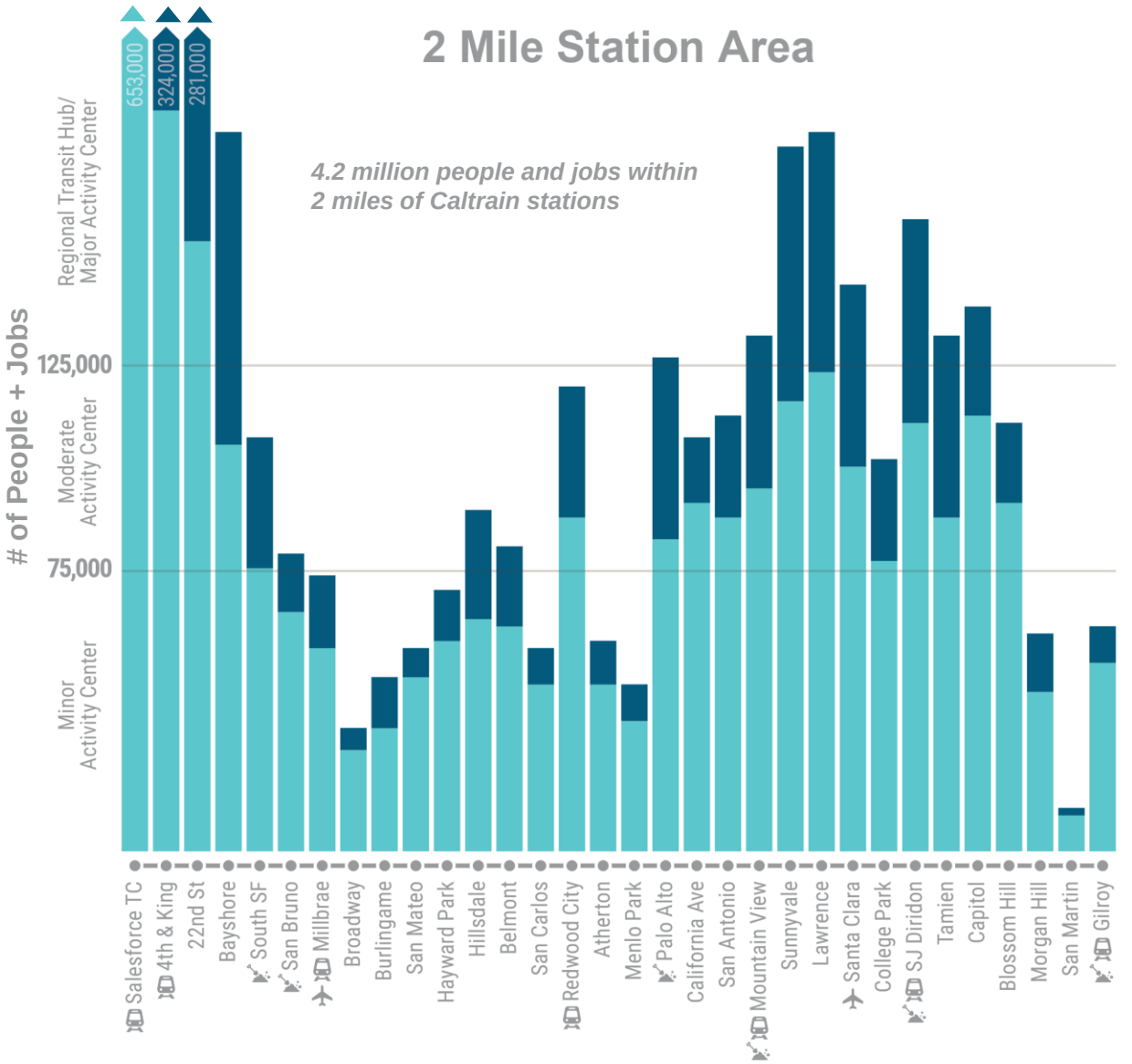
With greatly improved service, 2040 Ridership demand could reach up to 240,000 riders per day[2]

[1]Based on Plan Bay Area forecasts and approved projects by individual cities
[2]Derived from a rough order-of-magnitude sensitivity test using the C/CAG Model



2040 Land Use & Transportation Context

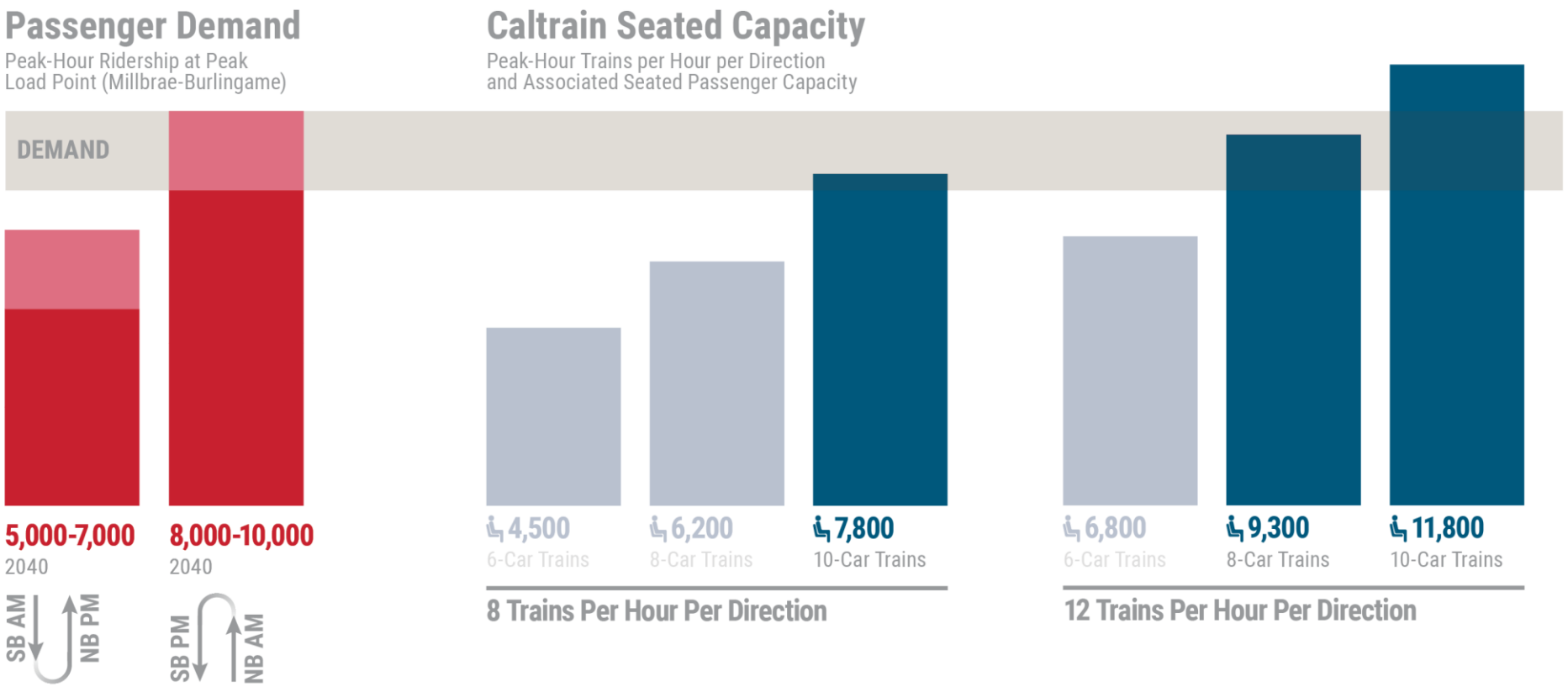




Indicates a station where substantial growth beyond Plan Bay Area forecasts is anticipated, but not yet approved

Throughput Demand vs. Capacity

To comfortably serve the potential market for rail in 2040, Caltrain would need to operate 8 trains per hour, per direction (TPHPD) with 10 car trains or 12 TPHPD with 8 or 10 car trains



Seated capacity based on Stadler EMU with different door and bike car configurations. Does not include consideration of potential HSR capacity to serve demand

Selecting a "High Growth" Service Concept

Why

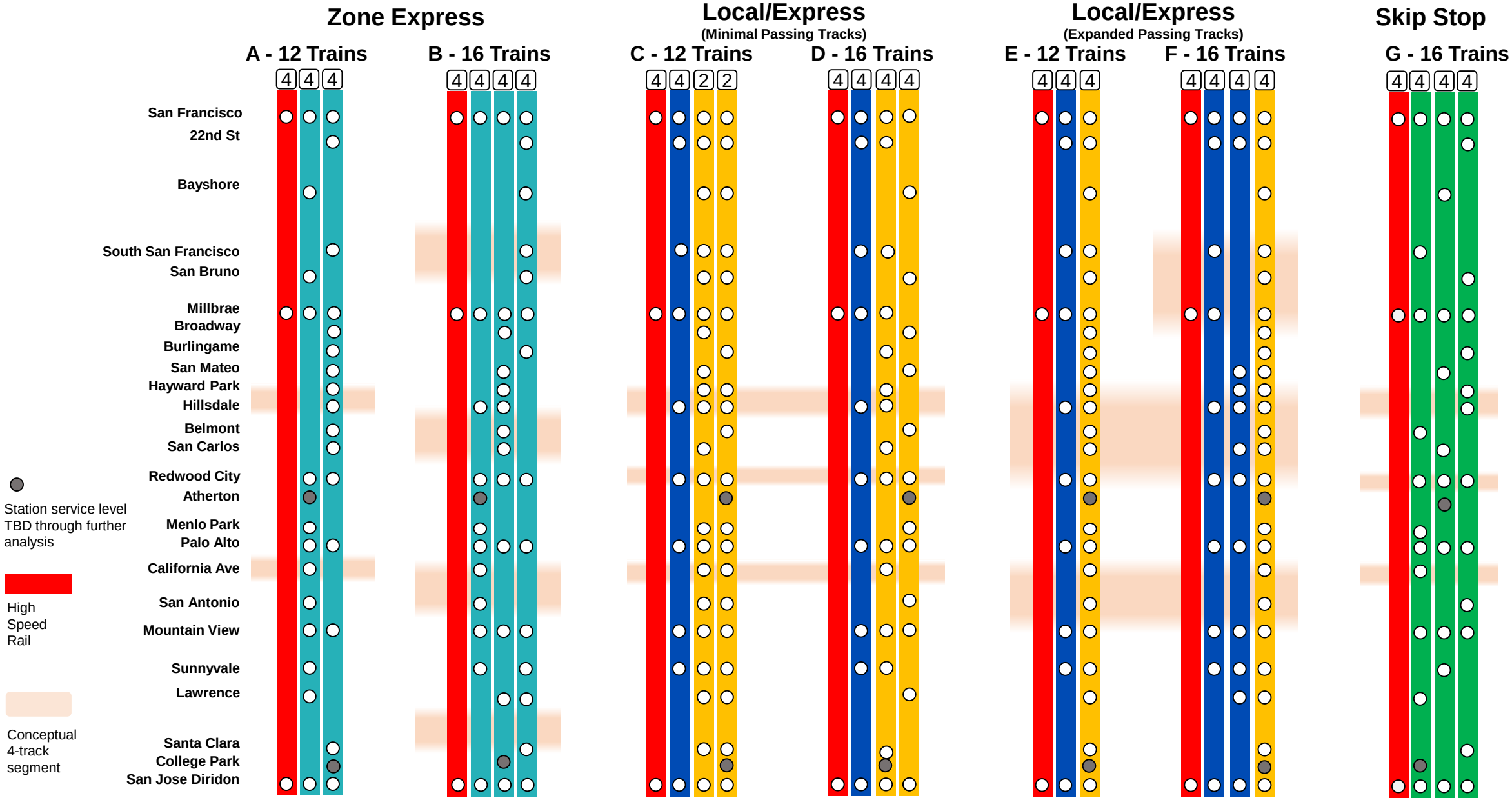
Last month we reviewed seven different "High Growth" service concepts. We now want to evaluate these concepts and select an option that provides the best illustrative example of a "High Growth" service strategy for the corridor. This will allow us to pursue a more detailed analysis and comparison with the "Baseline Growth" Scenario

Next Steps

The selected "High Growth" concept will be further refined and expanded into a full day service plan including Gilroy service, off-peak service and terminal operations.

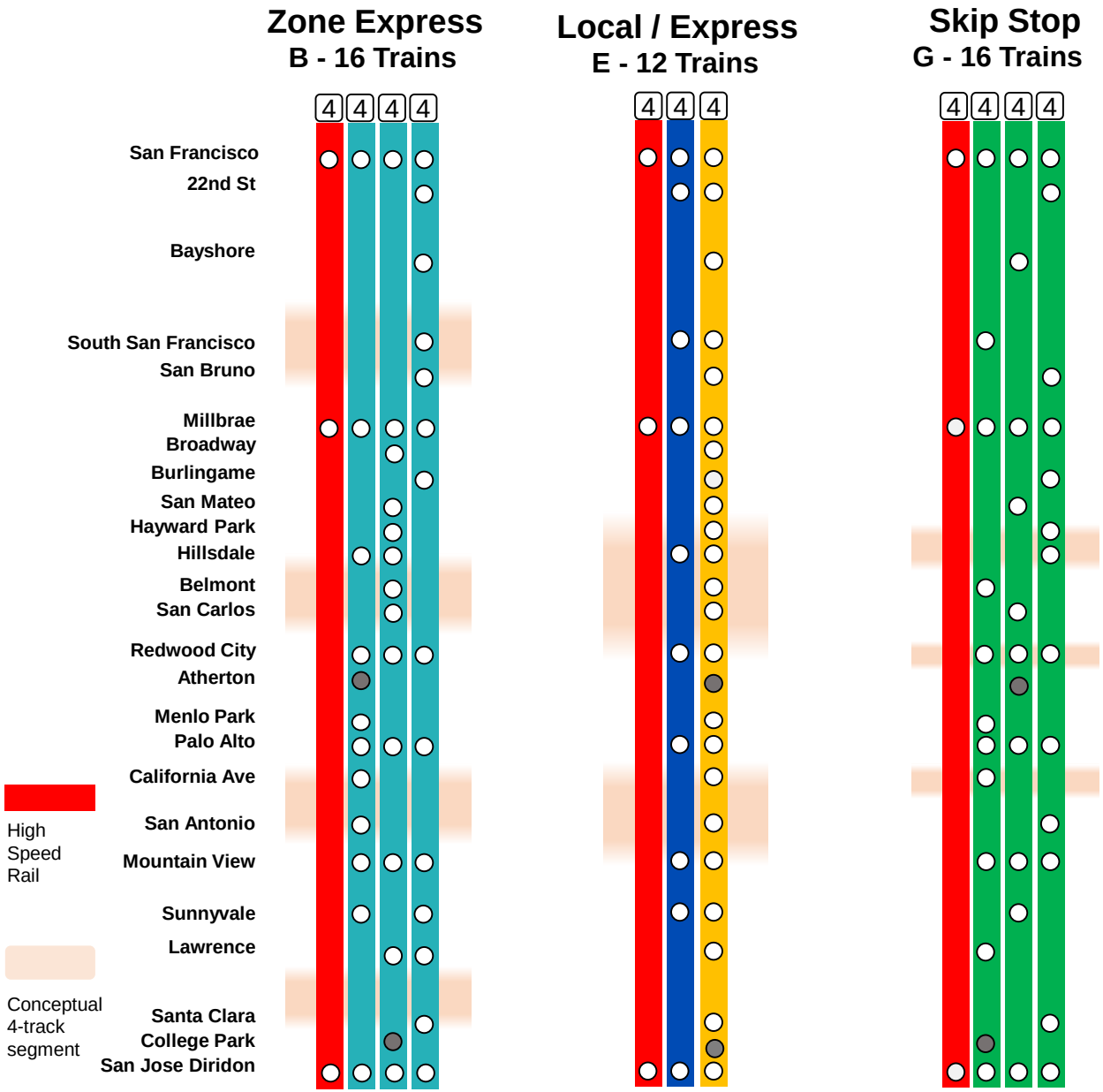
The "High Growth" and "Baseline" service plans will then be compared as part of a "business case" analysis that includes full ridership runs, operations simulation, infrastructure and operations costing, and economic benefit assessments.

Service Concepts - Recap



Assumes standardized HSR service; the 2018 HSR Business Plan expects 2 trains per hour, per direction at Millbrae

Initial Screening Not Recommended for Further Evaluation



B - Zone Express 16 Trains

- Infrastructure needs are extensive and incompatible with other service options
- Increased train throughput does not result in additional service at most stations

E - Local/Express 12 Trains (More Passing Tracks)

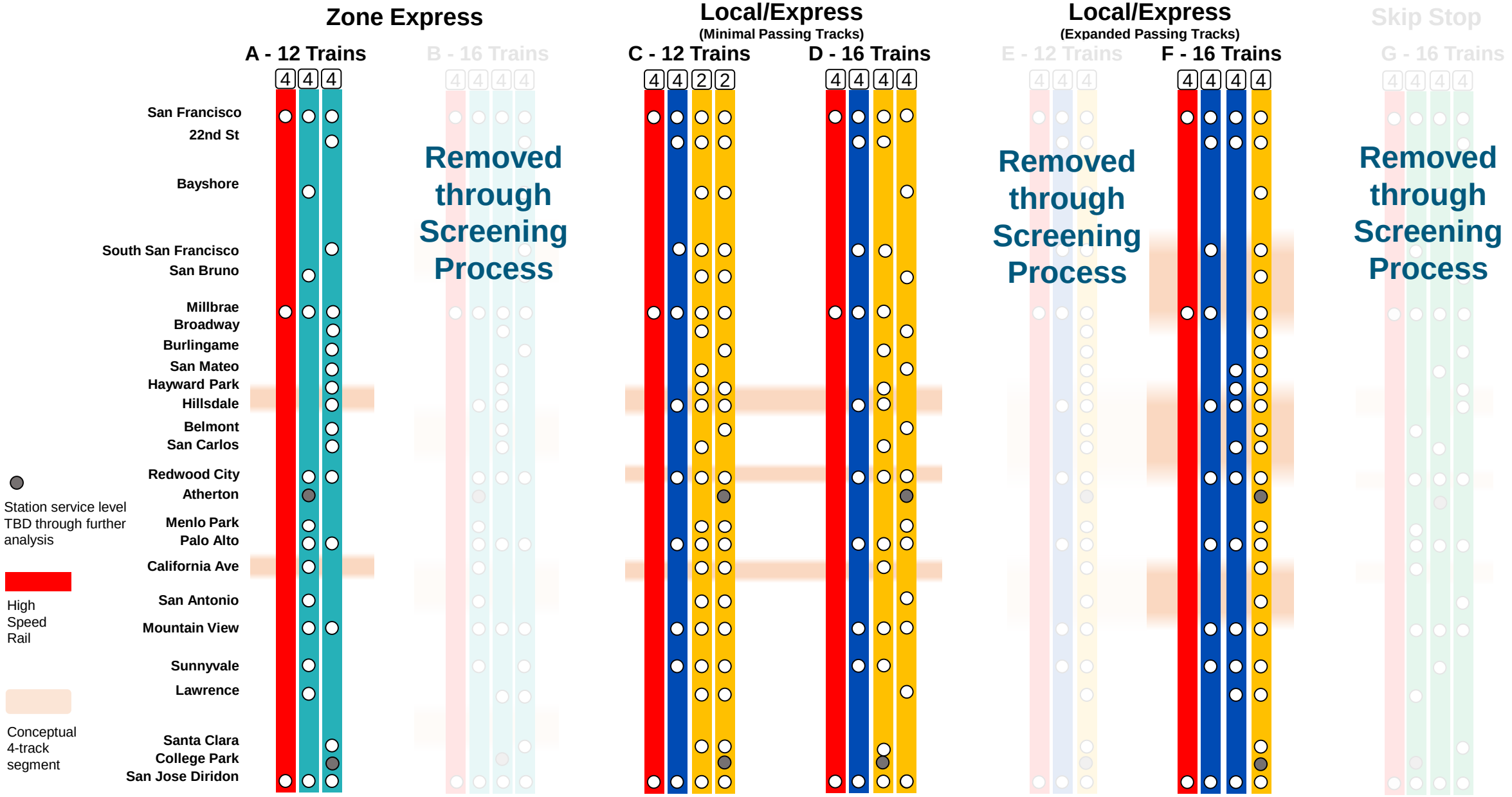
- Requires significantly more infrastructure to achieve the same throughput as other 12-train concepts
- Infrastructure is compatible with and builds toward Local/Express 16-train concept (option F). Can be considered as a variant of this option.

G - Skip Stop 16 Trains

- Challenging internal connectivity and service legibility
- Increased train throughput does not result in additional service at most stations
- Similar to and compatible with Local/Express 16 Train pattern with less passing tracks (option D)- can be considered as a variant of this option

Assumes standardized HSR service; the 2018 HSR Business Plan expects 2 trains per hour, per direction at Millbrae

Initial Screening Results



Assumes standardized HSR service; the 2018 HSR Business Plan expects 2 trains per hour, per direction at Millbrae

Service Goals

1. **Maximize Ridership -** with fast and frequent service between major markets
2. **Improve Coverage and Connectivity -** by ensuring that most stations are connected with frequent service
3. **Enhance Capacity and Convenience -** with service that is comfortable and easy to understand
4. **“Right Size” New Infrastructure -** by investing strategically to provide corridor-wide benefits

Service Concept Evaluation

1. Maximize Ridership

Goal	Metric	Existing	Minimal Passing Tracks			Expanded Passing Track
		5 TPH	A - 12 TPH Zone Express	C - 12 TPH Local/Express	D - 16 TPH Local/Express	F - 16 TPH Local/Express
Provide high frequency service	Number of stations served every 10 minutes or more	0 Stations	6 Stations	10 Stations	10 Stations	14 Stations
Improve travel times between major markets	Average travel times plus wait times between major stations[1]	55 Minutes	28 Minutes	31 Minutes	28 Minutes	24 Minutes

[1]Averaged matrix of travel times between the eight busiest stations accounting for approximately ¾ of existing ridership (4th & King, Millbrae, Hillsdale, Redwood City, Palo Alto, Mountain View, Sunnyvale, and San Jose). Includes travel time riding the train plus half of train headway.

All metrics include Broadway and Atherton stations but exclude College Park station

Service Concept Evaluation

2. Improve Coverage and Connectivity

Goal	Metric	Existing	Minimal Passing Tracks			Expanded Passing Track
		5 TPH	A - 12 TPH Zone Express	C - 12 TPH Local/Express	D - 16 TPH Local/Express	F - 16 TPH Local/Express
Achieve 15-minute frequencies at most stations during peak	Number of stations without service every 15 minutes[2]	17 Stations	4 Stations Broadway, Burlingame, Atherton, Menlo Park	7 Stations San Mateo, Belmont, San Carlos plus Broadway, Burlingame, Atherton, Menlo Park	2 Stations Atherton, Menlo Park	4 stations Broadway, Burlingame, Atherton, Menlo Park
Maintain connectivity between stations	Percentage of stations directly connected by local trains without a transfer	83%*** ***Local service every 60 minutes	66% Zone service every 15 minutes	95% Local service every 15 minutes	64% Local service every 15 minutes	99% Local service every 15 minutes

[2]Stations that do not receive 4 TPHPD are served with 2 TPHPD except Atherton (1 TPHPD) and Menlo Park (3 TPHPD)

All metrics include Broadway and Atherton stations but exclude College Park station

Service Concept Evaluation

3. Enhance Capacity and Convenience

Goal	Metric	Existing	Minimal Passing Tracks			Expanded Passing Track
		5 TPH	A - 12 TPH Zone Express	C - 12 TPH Local/Express	D - 16 TPH Local/Express	F - 16 TPH Local/Express
Provide capacity responsive to 2040 demand	Percent demand served relative to seated capacity[3]	35% 2040 demand	80% 2040 demand	80% 2040 demand	100% 2040 demand	100% 2040 demand
Provide legible service structure	Complexity of stopping pattern	High Complexity 5+ patterns per hour	Moderate Complexity 2 patterns without connected local service	Moderate Complexity 3 patterns with 2 local service variants	High Complexity 3 patterns with 2 distinct local skip stop patterns	Low Complexity 2 patterns with fully connected local service

[3]Assumes 10 car trains and 2040 peak demand of approximately 10,000 passengers per hour in the peak direction

All metrics include Broadway and Atherton stations but exclude College Park station

Service Concept Evaluation

4. “Right Size” Infrastructure

Goal	Metric	Existing	Minimal Passing Tracks		Expanded Passing Track
		5 TPH	A - 12 TPH Zone Express	C - 12 TPH Local/Express	D - 16 TPH Local/Express	F - 16 TPH Local/Express
Minimize mainline track expansions	Miles of new passing track	0 Existing passing tracks at Bayshore and Lawrence stations	2 Hayward Park-Hillsdale and a northern Santa Clara County station	3 Hayward Park-Hillsdale, a northern Santa Clara County station, and a 4-track Redwood City Station	3 Hayward Park-Hillsdale, a northern Santa Clara County station, and a 4-track Redwood City Station	15 South San Francisco-Millbrae, Hillsdale-San Carlos, a 4-track Redwood City Station and 5 miles in northern Santa Clara County

See appendix slides for additional detail on infrastructure needs and options (excerpted and repeated from November presentation)

All metrics include Broadway and Atherton stations but exclude College Park station

Evaluation Results

	Goal	Metric	Existing	Minimal Passing Tracks			Expanded Passing Track
			5 TPH	A - 12 TPH Zone Express	C - 12 TPH Local/Express	D - 16 TPH Local/Express	F - 16 TPH Local/Express
1. Maximize Ridership	Provide high frequency service	Number of stations served every 10 minutes or more	0 Stations	6 Stations	10 Stations	10 Stations	14 Stations
	Improve travel times between major markets	Average travel times plus wait times between major stations[1]	55 Minutes	37 Minutes	34 Minutes	33 Minutes	30 Minutes
2. Improve Connectivity	Achieve 15-minute frequencies at most stations	Number of stations without service every 15 minutes	17 Stations	4 Stations	7 Stations	2 Stations	4 stations
	Maintain connectivity between stations	Percentage of stations directly connected by local train without a transfer	83%*** (at 60 min headways)	66%	95%	64%	99%
3. Enhance Convenience	Provide capacity responsive to 2040 demand	% 2040 demand relative to seated capacity[2]	35%	80%	80%	100%	100%
	Provide legible service structure	Complexity of stopping pattern	High Complexity	Moderate Complexity	Moderate Complexity	High Complexity	Low Complexity
4. "Right Size" Infrastructure	Minimize mainline track expansions	Miles of new passing track	0	2	3	3	15

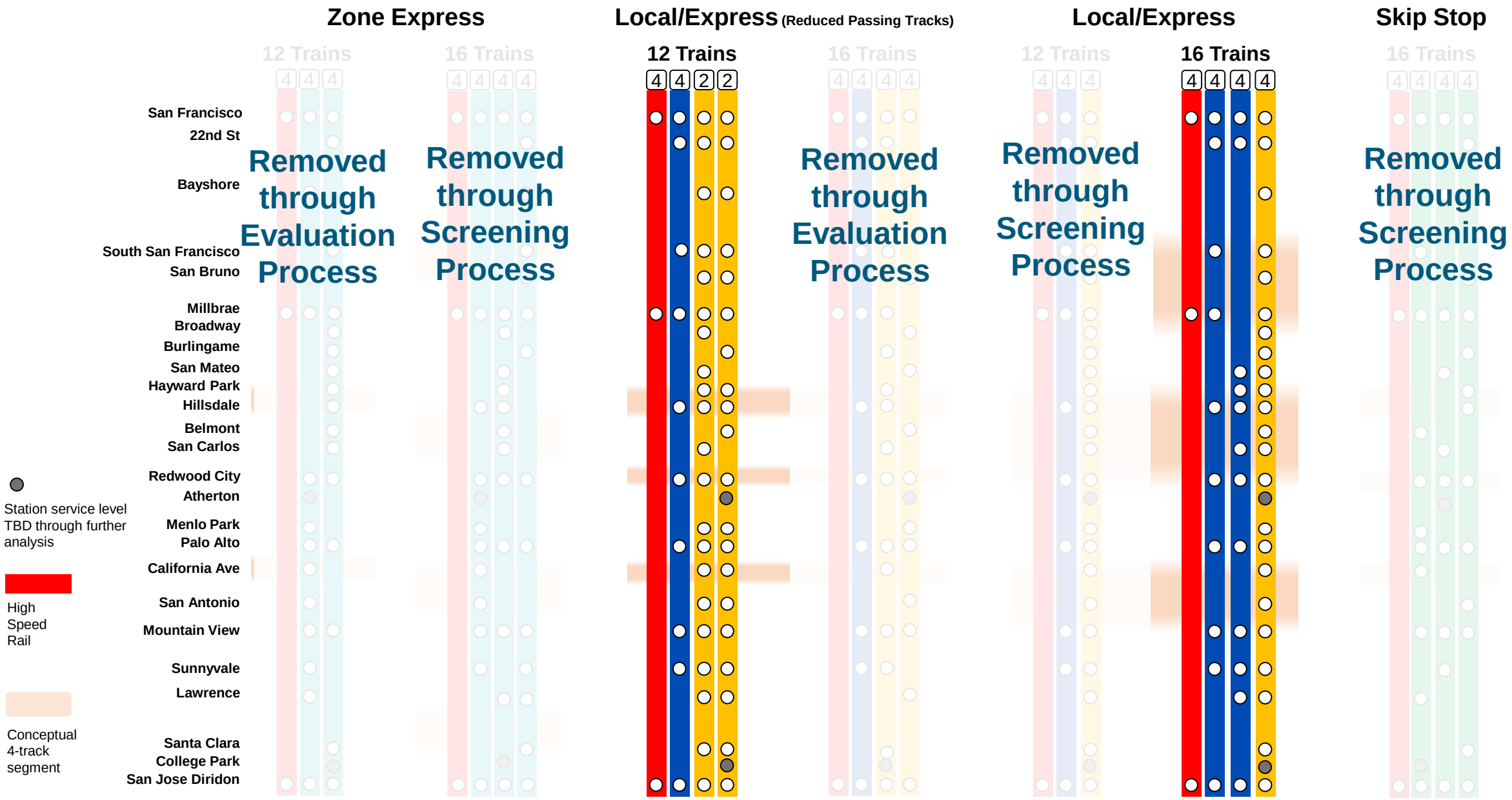
A - Zone Express 12 TPH

- Insufficient capacity to fully meet future demand
- Longest average travel times
- Least stations with high-frequency service

D – Local/Express 16 TPH

- High complexity and poor connectivity
- 15% of stations are not connected at all due to skip stop service

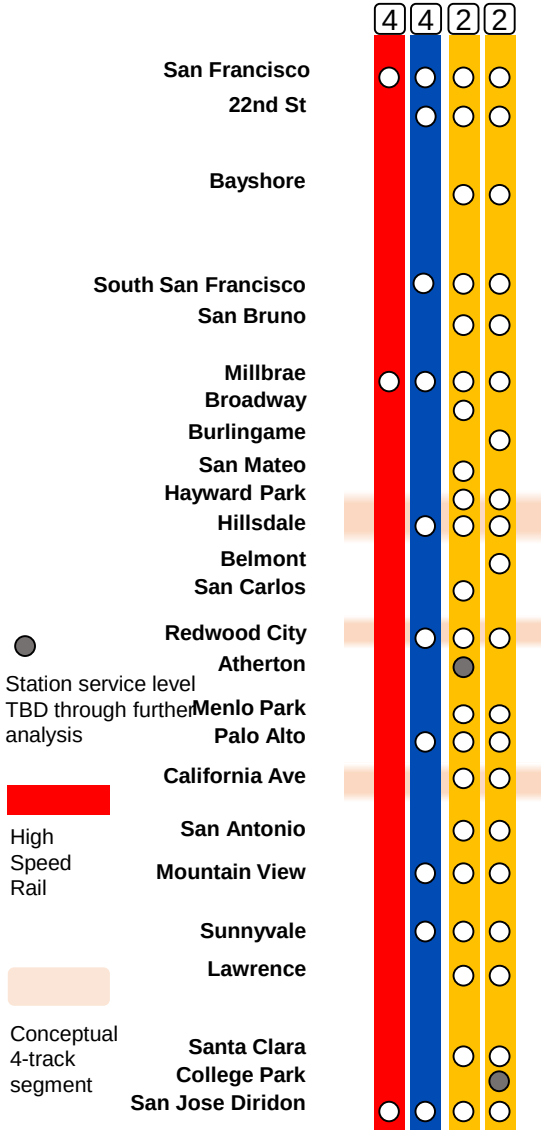
Evaluation Results



Evaluation Results

Local/Express (Reduced Passing Tracks)

12 Trains



Features

- Regional Express serves all Major Activity Centers at 15-minute headways
- Most stations served by local service at 15 minute headways
- Closely-spaced mid-Peninsula stations served at 30 minute headways (Broadway, Burlingame, San Mateo, Belmont, and San Carlos)
- Timed local-express transfer at Redwood City

Passing Track Needs

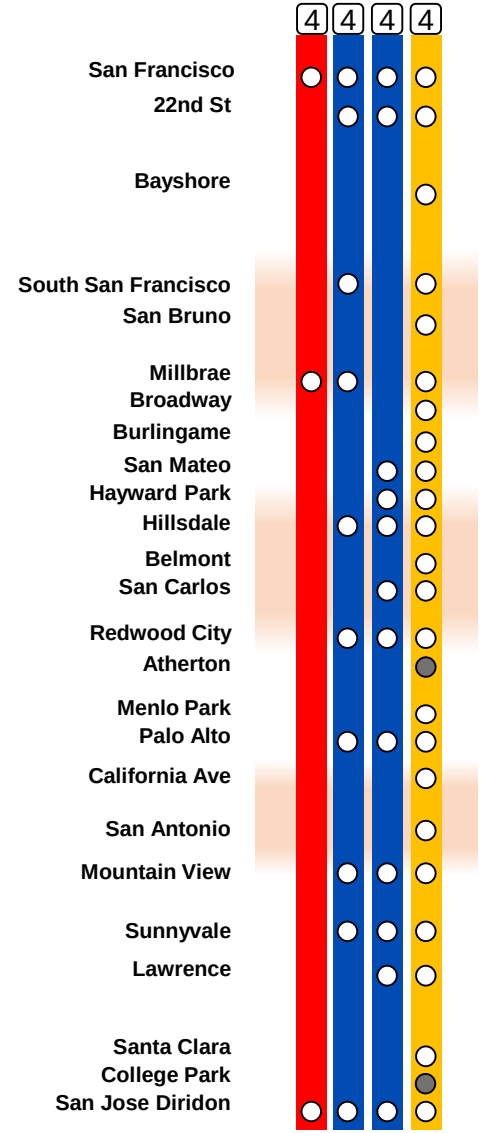
- 3 miles of new passing tracks: Hayward Park to Hillsdale, at Redwood City, and at a station in northern Santa Clara county- either Palo Alto, California Ave (shown), San Antonio or Mountain View

Options with Service Structure

- Each local pattern can only stop once Millbrae to Hillsdale
- Each local pattern can only stop once Hillsdale to Redwood City
- Flexible station overtake location in northern Santa Clara County

Local/Express

16 Trains



Features

- Complete local stop service
- Two express lines serving major markets
- All stations receive at least 4 TPH, with many receiving 8 or 12 TPH

Passing Track Needs

- 15 miles of new passing tracks: South San Francisco to Millbrae, Hayward Park to Redwood City, and northern Santa Clara County (shown: California Avenue to north of Mountain View)

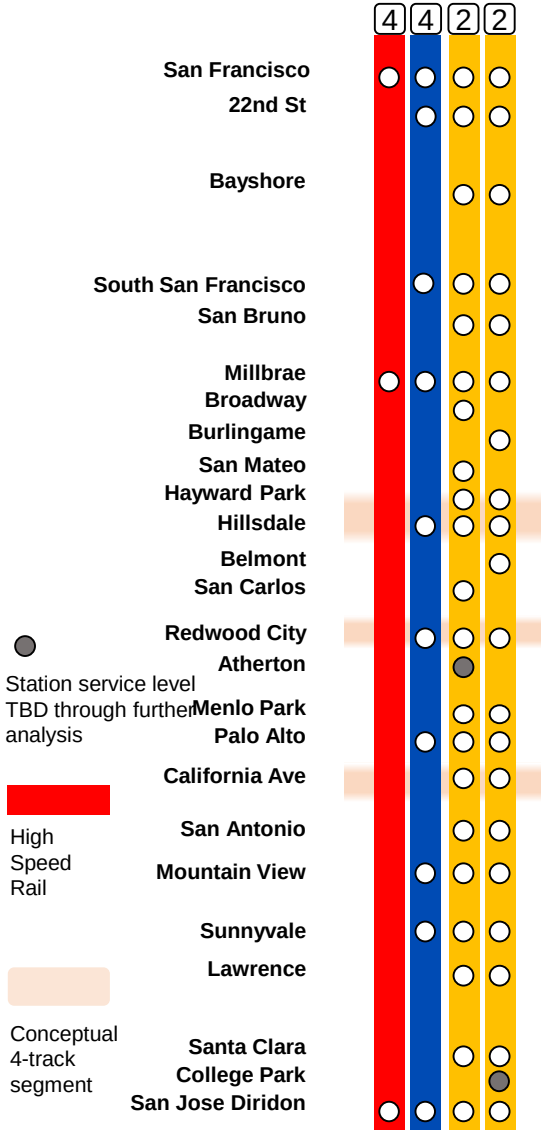
Options with Service Structure

- Second express pattern must run non-stop from 22nd St to San Mateo, but has some flexibility in number and location of stops along mid-Peninsula
- Flexible 5 mile passing track location in northern Santa Clara County

Evaluation Results

Local/Express (Reduced Passing Tracks)

12 Trains



Local/Express 12 Summary

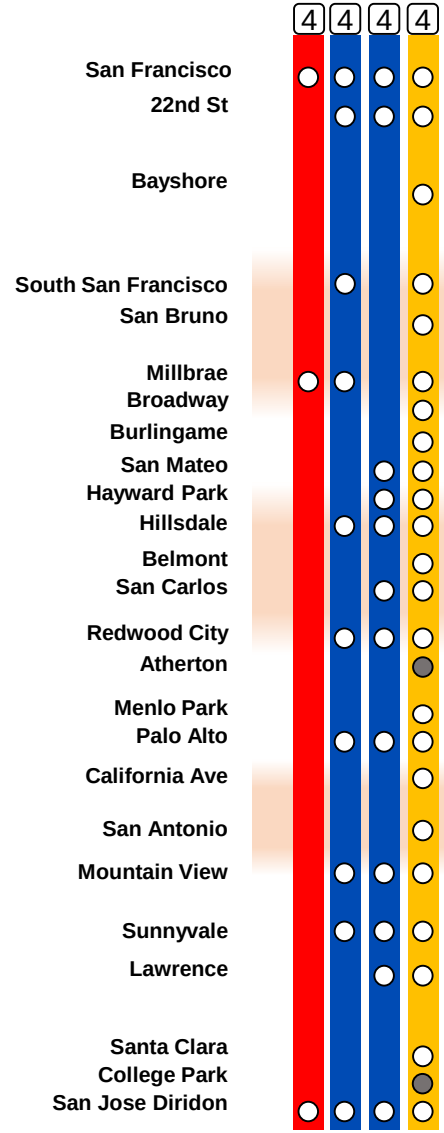
with Minimal Passing Tracks

- Provides good travel times, frequency, and connectivity for most markets, though with some shortcomings
- Insufficient capacity to fully meet projected demand
- Minimizes extent of overtakes required

- ***Recommended for further analysis***

Local/Express

16 Trains



Local/Express 16 Summary

with Expanded Passing Tracks

- Provides fastest, most frequent, most reliable service to the most people
- Strong connectivity
- Appropriate capacity to serve future demand
- However, passing tracks needs represent major infrastructure challenge

- ***Recommended for further analysis***

Recommendation

DRAFT

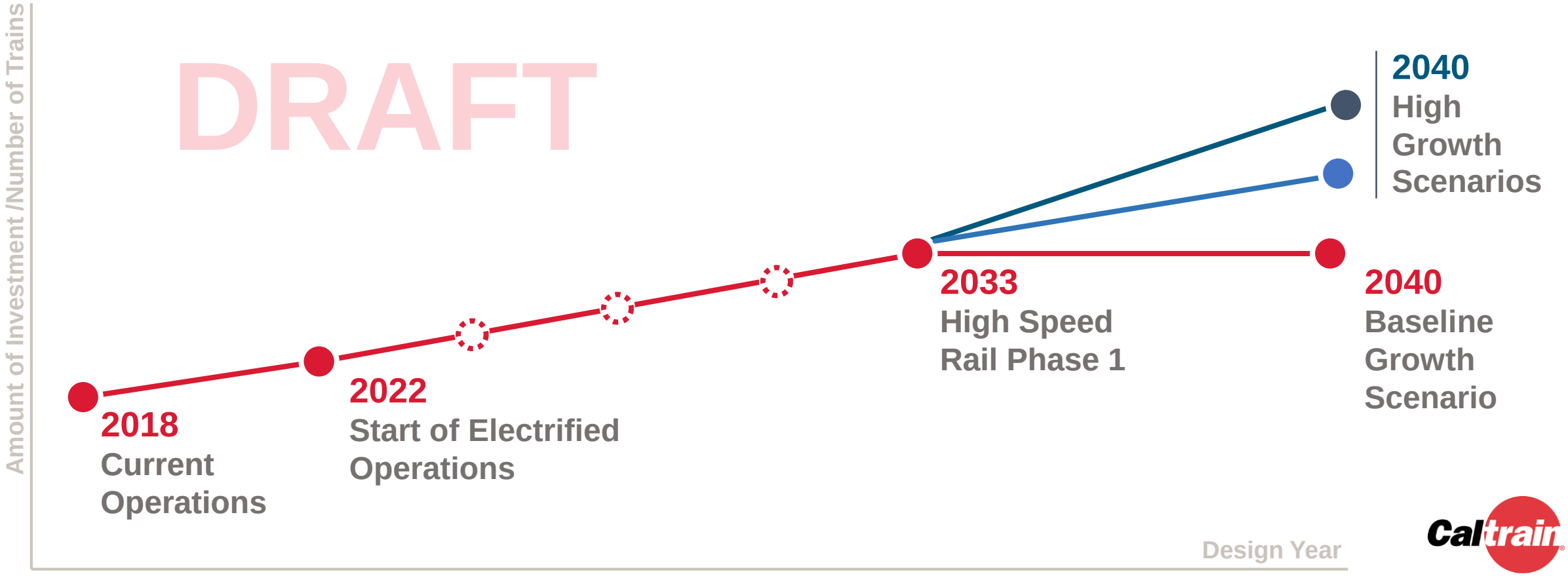
1. **Analyze a Local/Express service in the Business Plan as the “High Growth” Scenario**

2. **Carry forward and evaluate two "high growth" service scenarios**
   - **A 12-train local / express service using limited passing tracks**
   - **A 16 train local / express using full passing tracks**

3. **Continue dialogue with project partners and local jurisdictions to understand interests and concerns with each variant**

DRAFT

Context: Different Ways to Grow



SHARING SESSION

Do you have any questions about the evaluation process or scoring criteria?

How do you feel about the findings of the evaluation?

Do you agree with the recommendation to evaluate two "high growth" scenarios?

Off-Peak & Weekend Service Planning

- Review & Evaluate Concepts
- **Off-Peak Service Planning**
- Terminal Planning
- South San Jose & Gilroy Planning

Considerations

Off-peak and weekend service provides unique opportunities and challenges for Caltrain

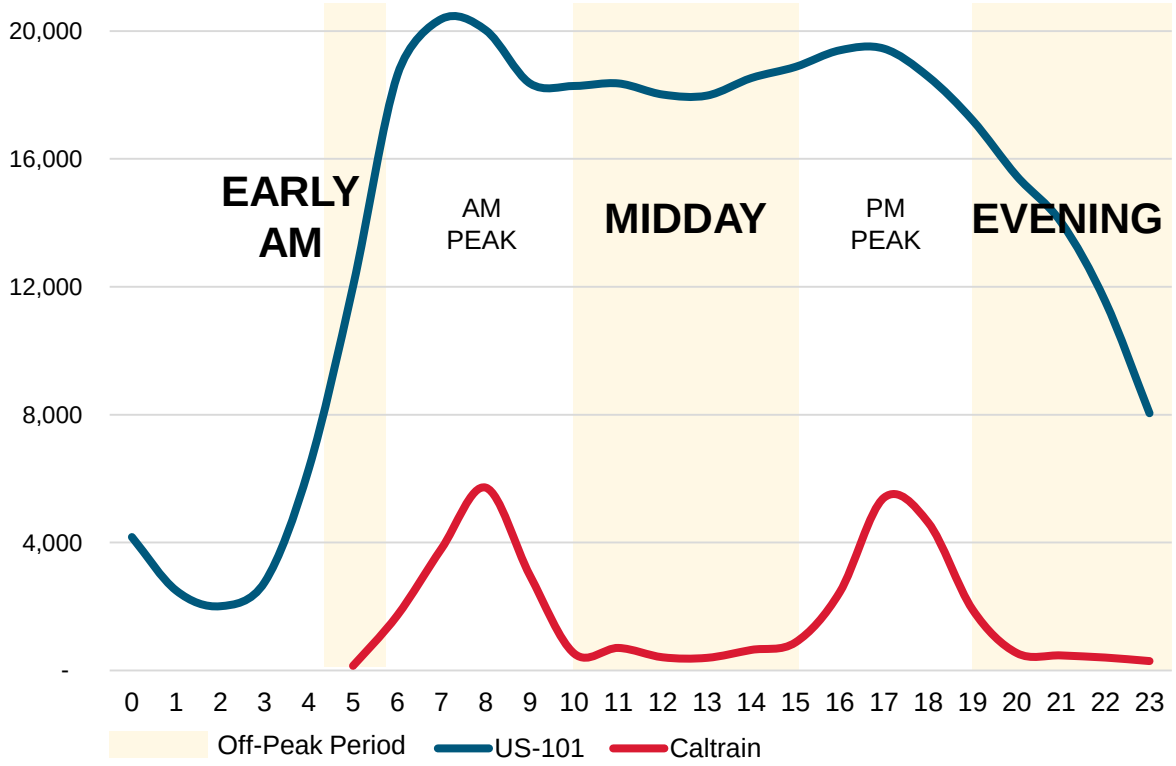
- The Caltrain corridor has very high all-day travel demand, 7 days a week
- Demand for off-peak service may increase overtime along with corridor development and densities
- Early morning, midday, evening, and weekend periods all present different challenges and opportunities related to operating costs and work windows for construction and maintenance

These slides illustrate options of how Caltrain may respond to these factors over time

Off-Peak & Weekend Demand

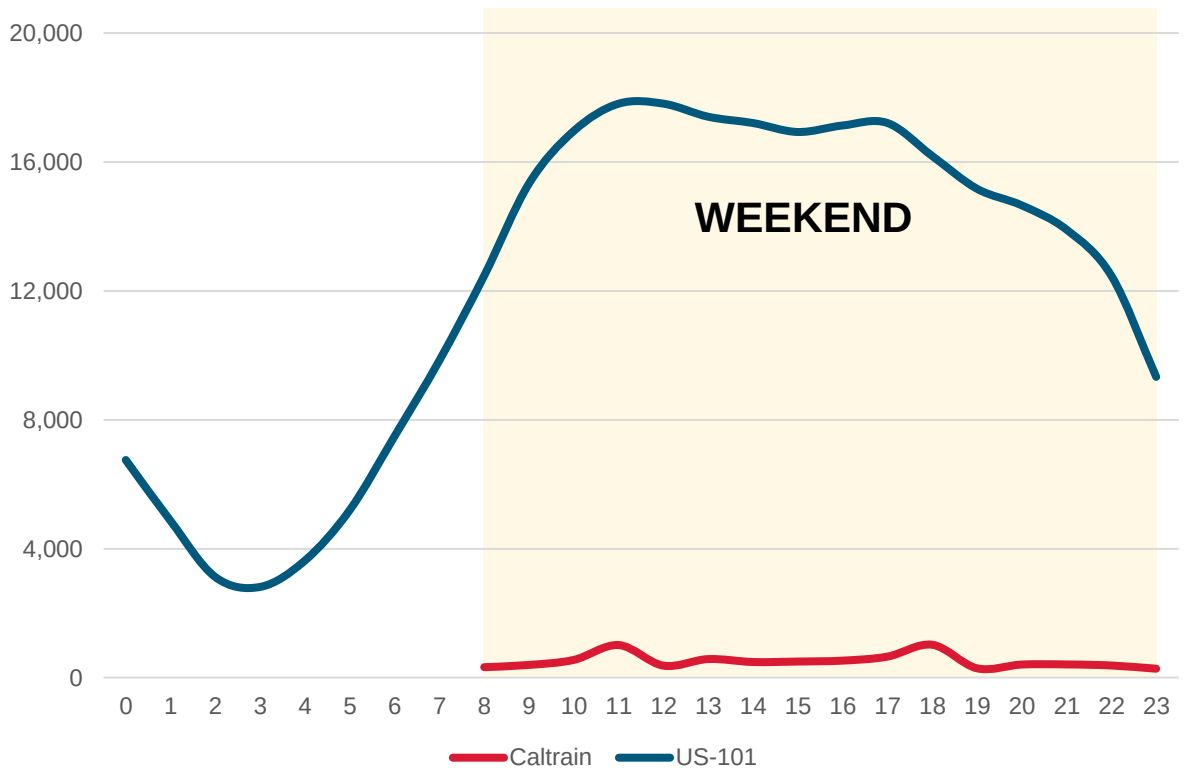
Existing Off-Peak Service

- Most Caltrain service and ridership occurs during the morning and evening periods. Hourly midday and evening service captures a very small market share
- US-101 experiences a 14-hour bidirectional peak period from 6 AM to 8 PM



Existing Weekend Service

- Hourly weekend service that primarily serves long-distance trips and captures a very small market share
- US-101 experiences a 12-hour peak period from 9 AM to 9 PM with volumes near weekday levels

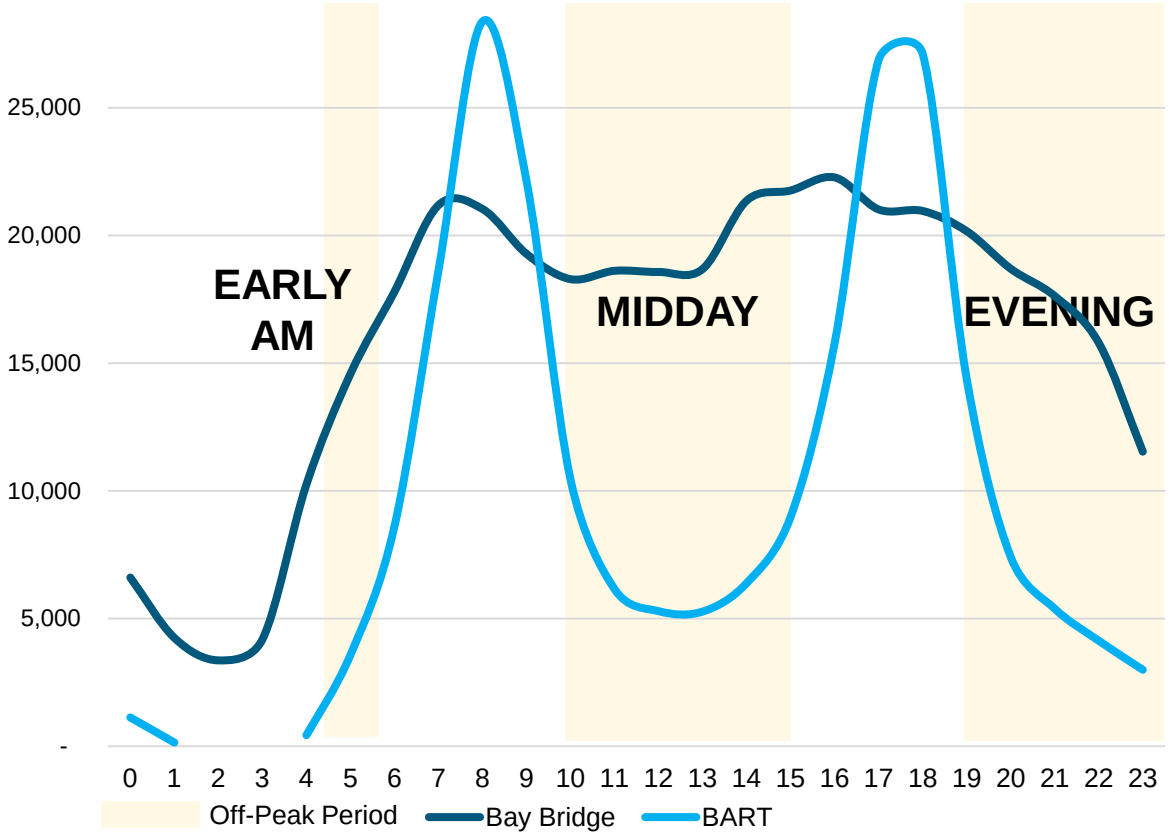


Based on US-101, BART, and Caltrain person trip volumes at San Francisco County line. Volumes are comparable along most of Caltrain corridor.

Off-Peak Demand: BART vs. Caltrain

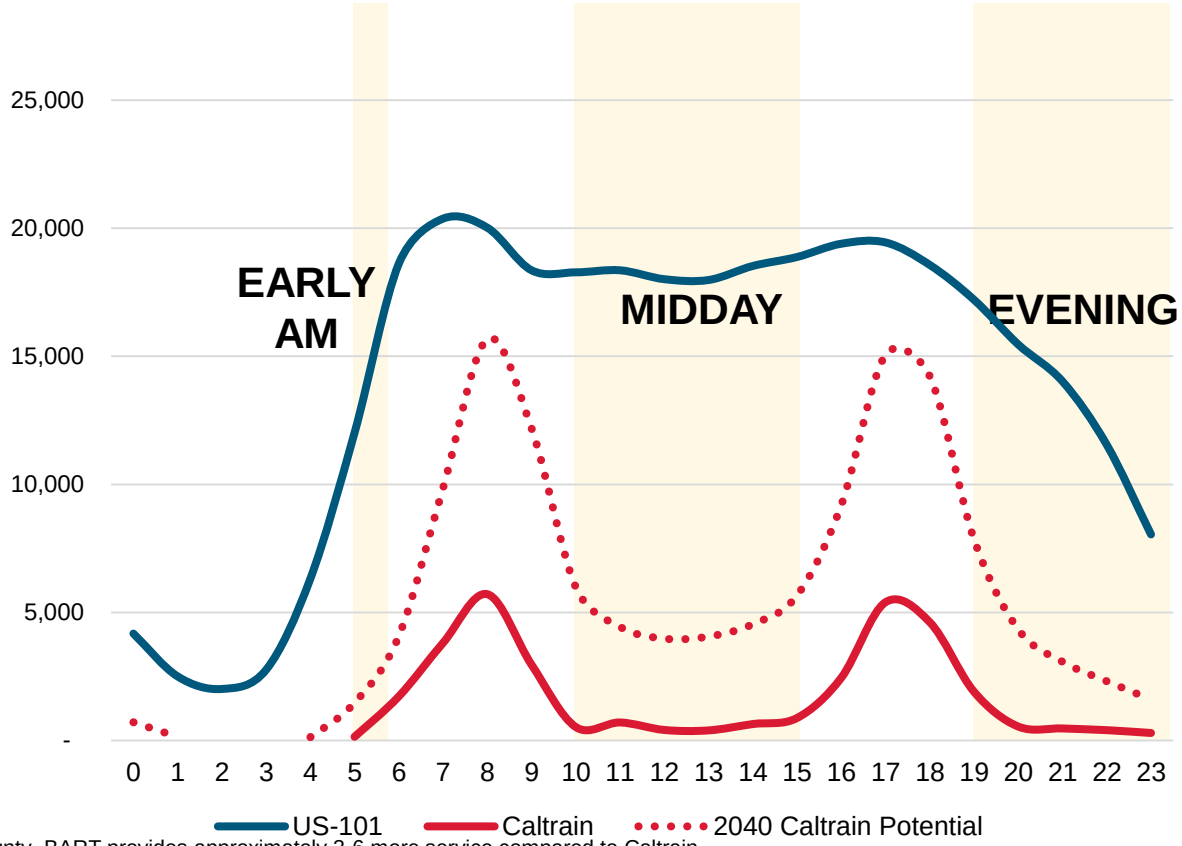
Transbay Corridor

BART serves about 20-30% of midday and weekend travel on the Transbay corridor, whereas Caltrain serves about 2-3% of travel on the Peninsula



Caltrain Corridor

Assuming similar peaking patterns to BART, Caltrain may serve approximately 4,000-5,000 passengers per hour during the midday and evening periods

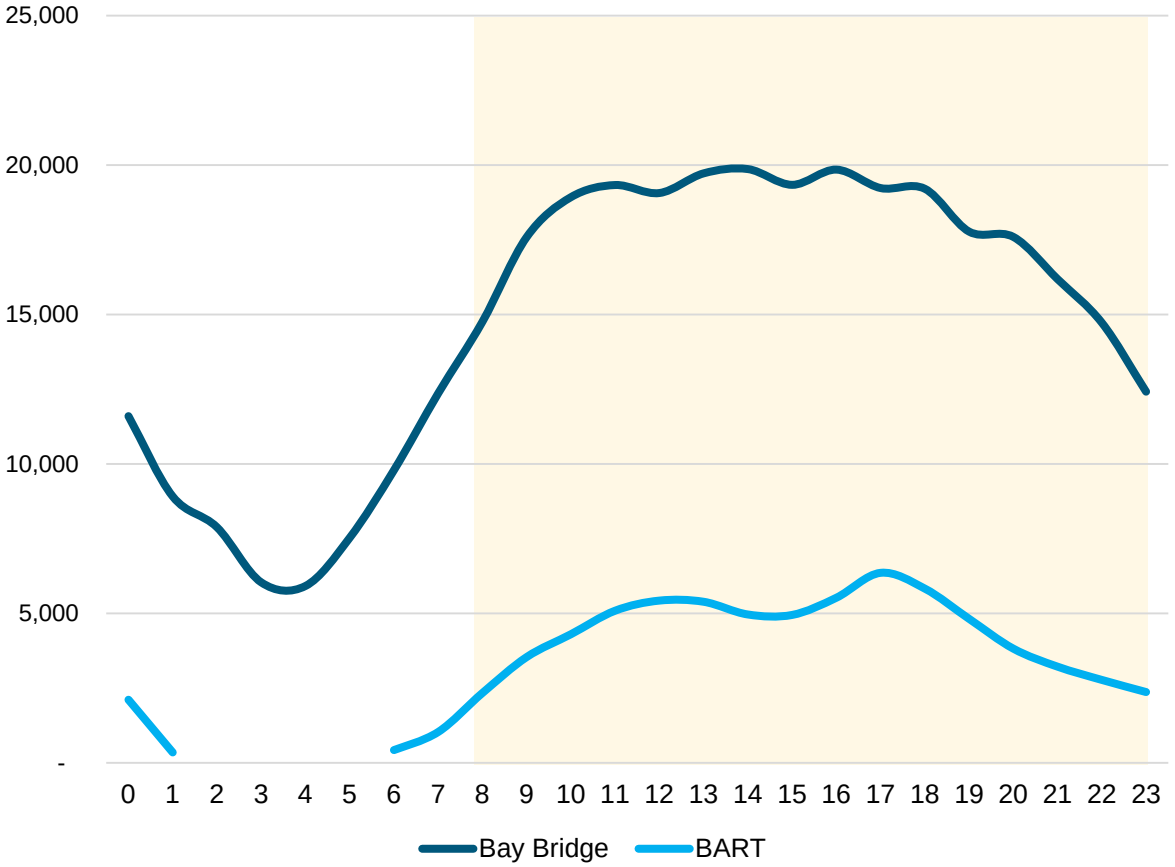


2040 potential based on unconstrained ridership forecast and assumed similar peaking patterns to BART service in San Mateo County. BART provides approximately 3-6 more service compared to Caltrain.

Weekend Demand: BART vs. Caltrain

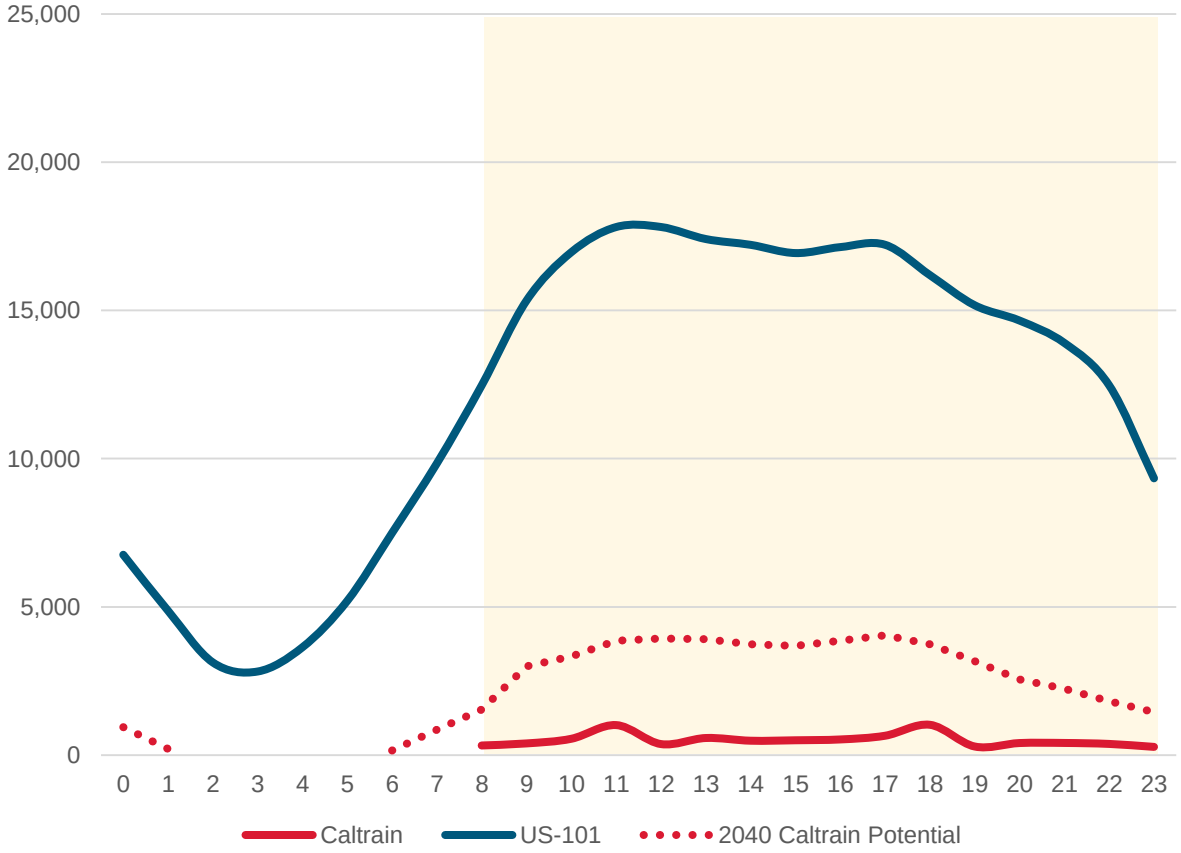
Transbay Corridor

BART serves about 20-30% of weekend travel on the Transbay corridor, whereas Caltrain serves about 3-4% of travel on the Peninsula



Caltrain Corridor

Assuming similar weekend service to BART, Caltrain may serve approximately 4,000-5,000 passengers per hour during most of the day on weekends



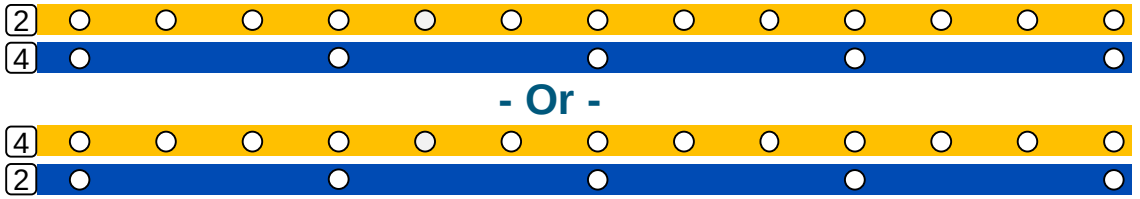
Off-Peak & Weekend Service Options

Caltrain may serve Early Morning, Midday, Evening, and Weekend periods with various potential service types depending on demand and construction/maintenance needs.

8 TPHPD with Local and Express

- Maximizes mobility by mirroring all-day corridor demand; potential to carry highest mode share
- Highest operating and maintenance cost
- Best suited for midday service

6 TPHPD with Reduced Express or Reduced Local



- Prioritizes either station coverage or maximizing ridership between major markets
- Moderate operating and maintenance cost

4 TPHPD with Local Only

- Prioritizes coverage while sacrificing ridership between major markets
- Lower operating and maintenance cost
- Best suited for evening and weekend service

SHARING SESSION

What sorts of off-peak service improvements are most important to your community?

Do you have any thoughts about the specific mix of service types and frequencies that would work at different times of day?

South San Jose & Gilroy Planning

Review & Evaluate Concepts

Off-Peak Service Planning

Terminal Planning

South San Jose & Gilroy Planning

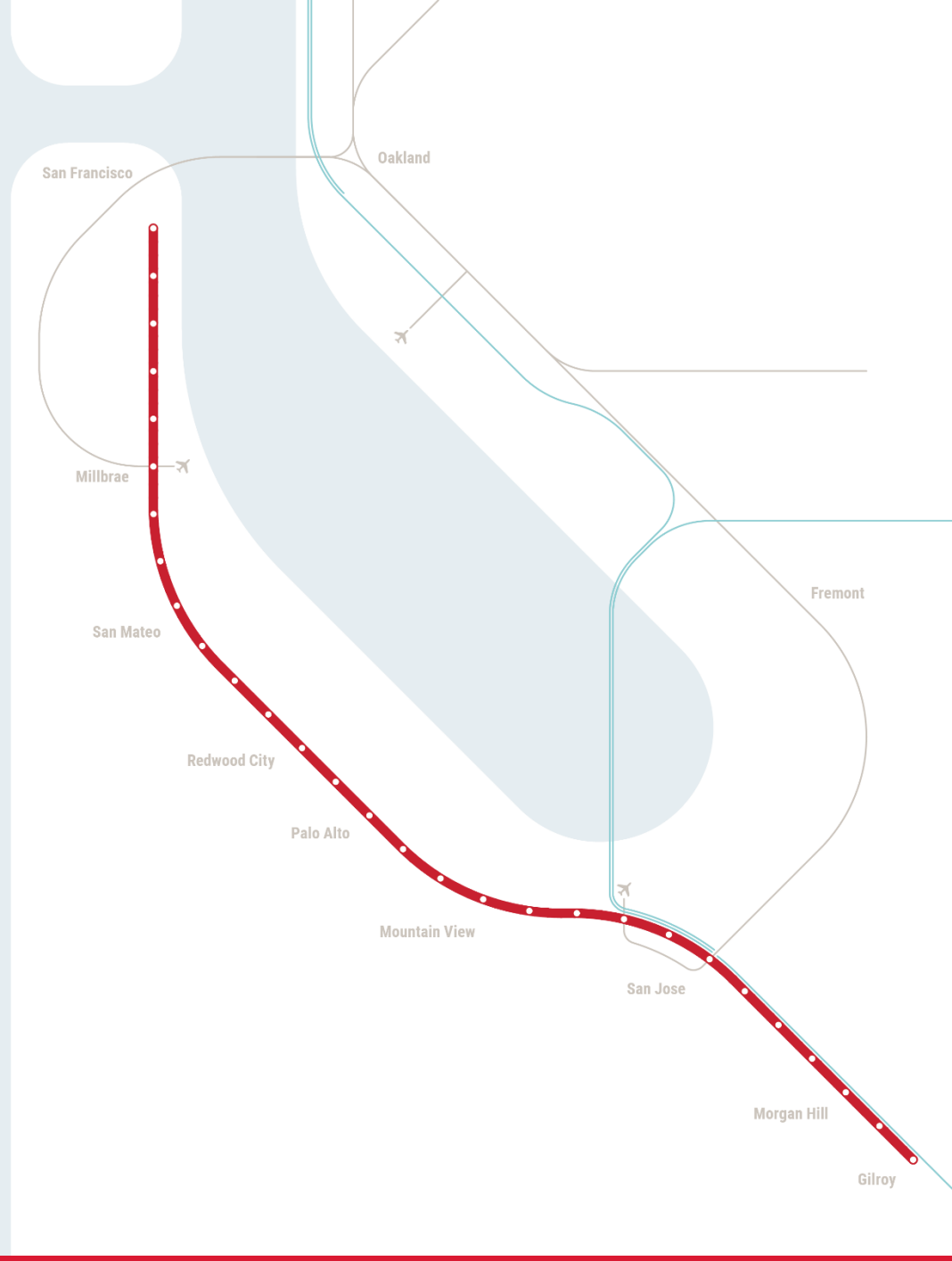
What's Different South of San Jose?

North of San Jose

- Corridor between San Francisco and Tamien owned by Caltrain
- Electrification under construction
- Caltrain will share corridor with HSR

South of San Jose

- Union Pacific owns existing corridor between Tamien and Gilroy
- HSR and State of California negotiating with UP
- 2018 HSR Business Plan contemplates building two electrified tracks alongside non-electrified freight track
- Creates an opportunity to extend electrified Caltrain service south to Gilroy



Opportunities & Constraints

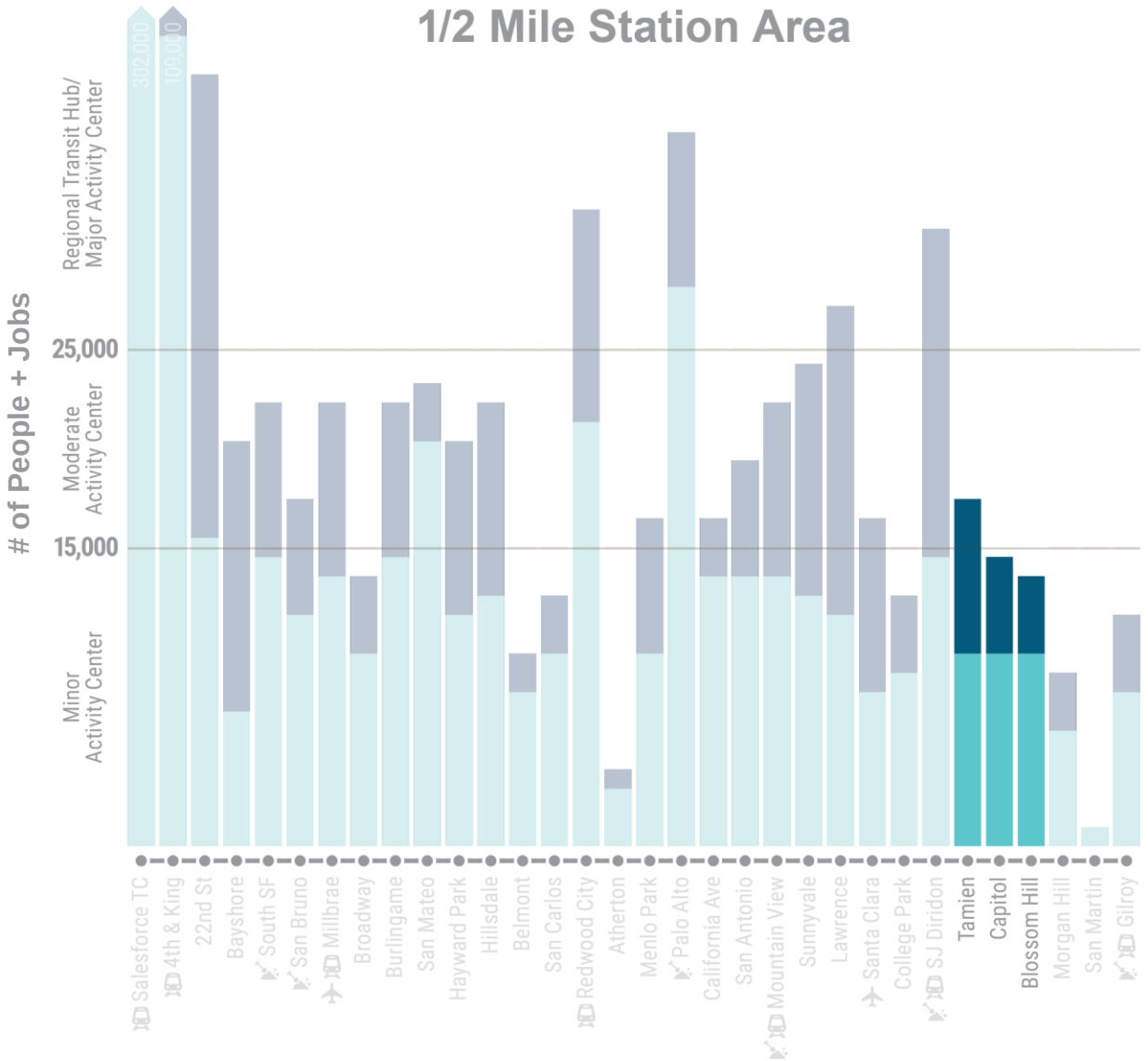
Track Capacity is Constrained

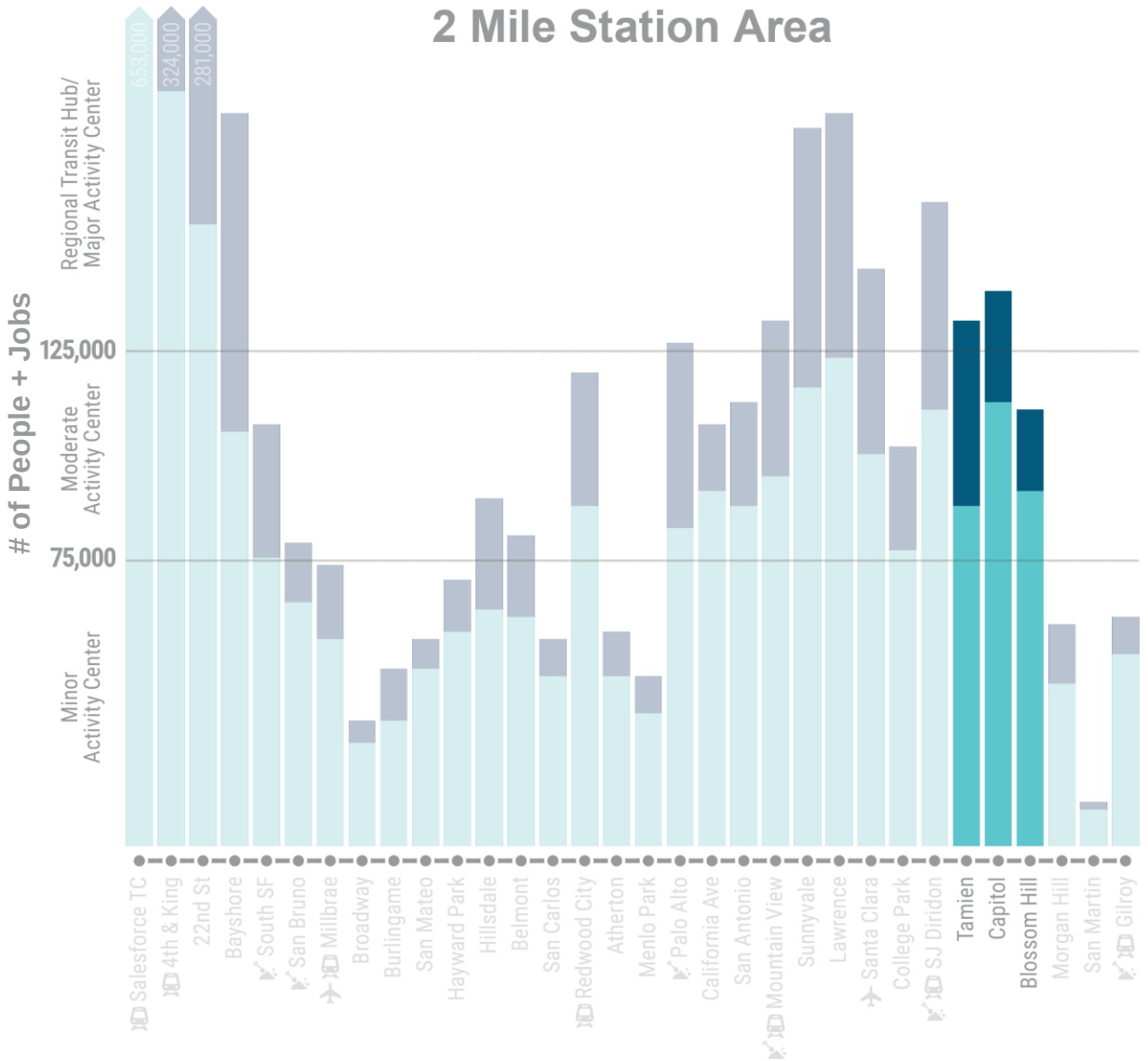
- Caltrain service is limited by operational constraints of a two track corridor
- HSR plans to operate up to 8 trains per hour, per direction south of San Jose

Demand is Unevenly Distributed

- Southern San Jose stations serve densely populated area with bidirectional demand
- Morgan Hill, San Martin, and Gilroy serve fewer people with directionally peaked demand
- HSR provides more competitive travel times between Gilroy and San Francisco/ Millbrae

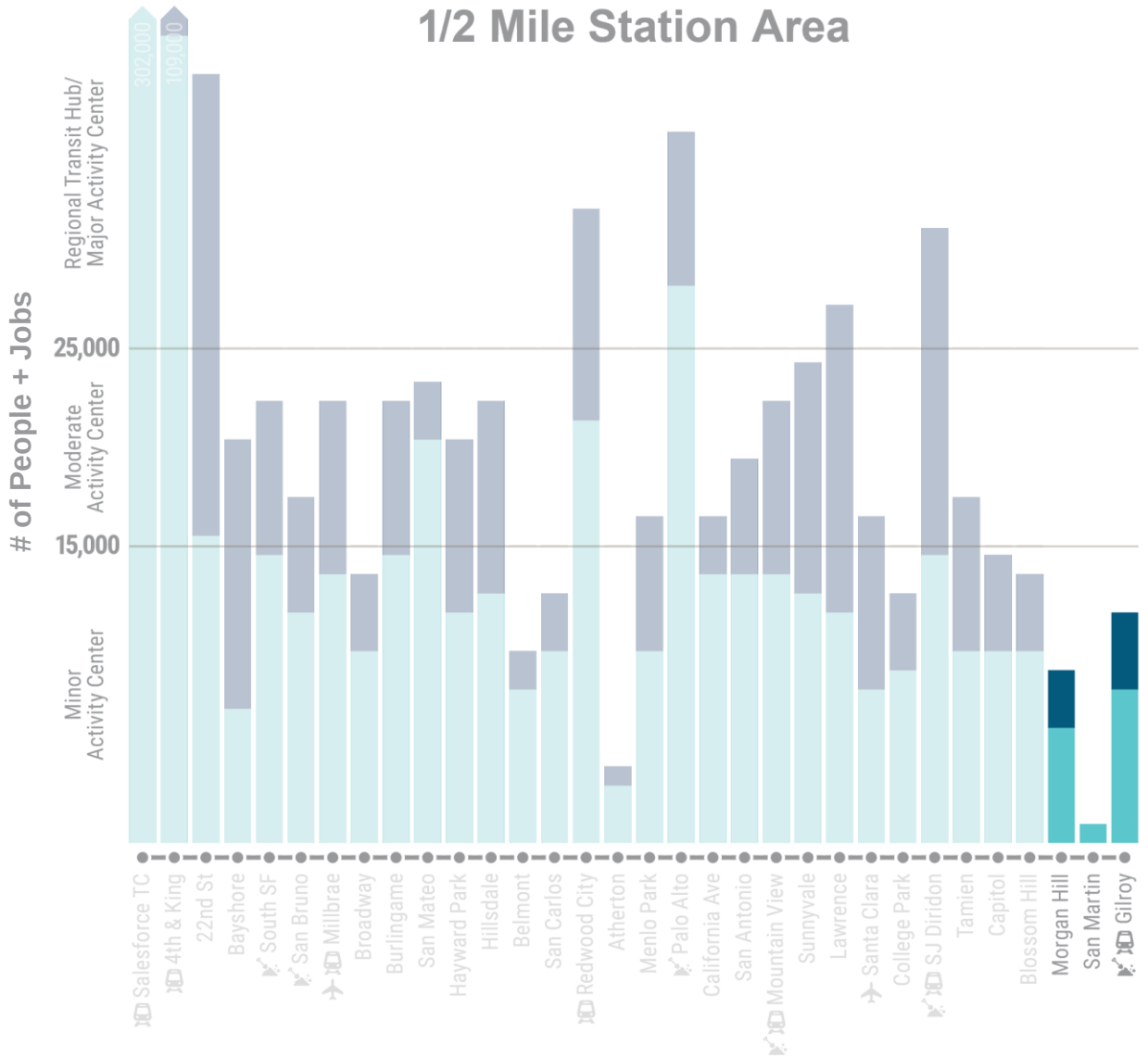
2040 Land Use & Transportation Context

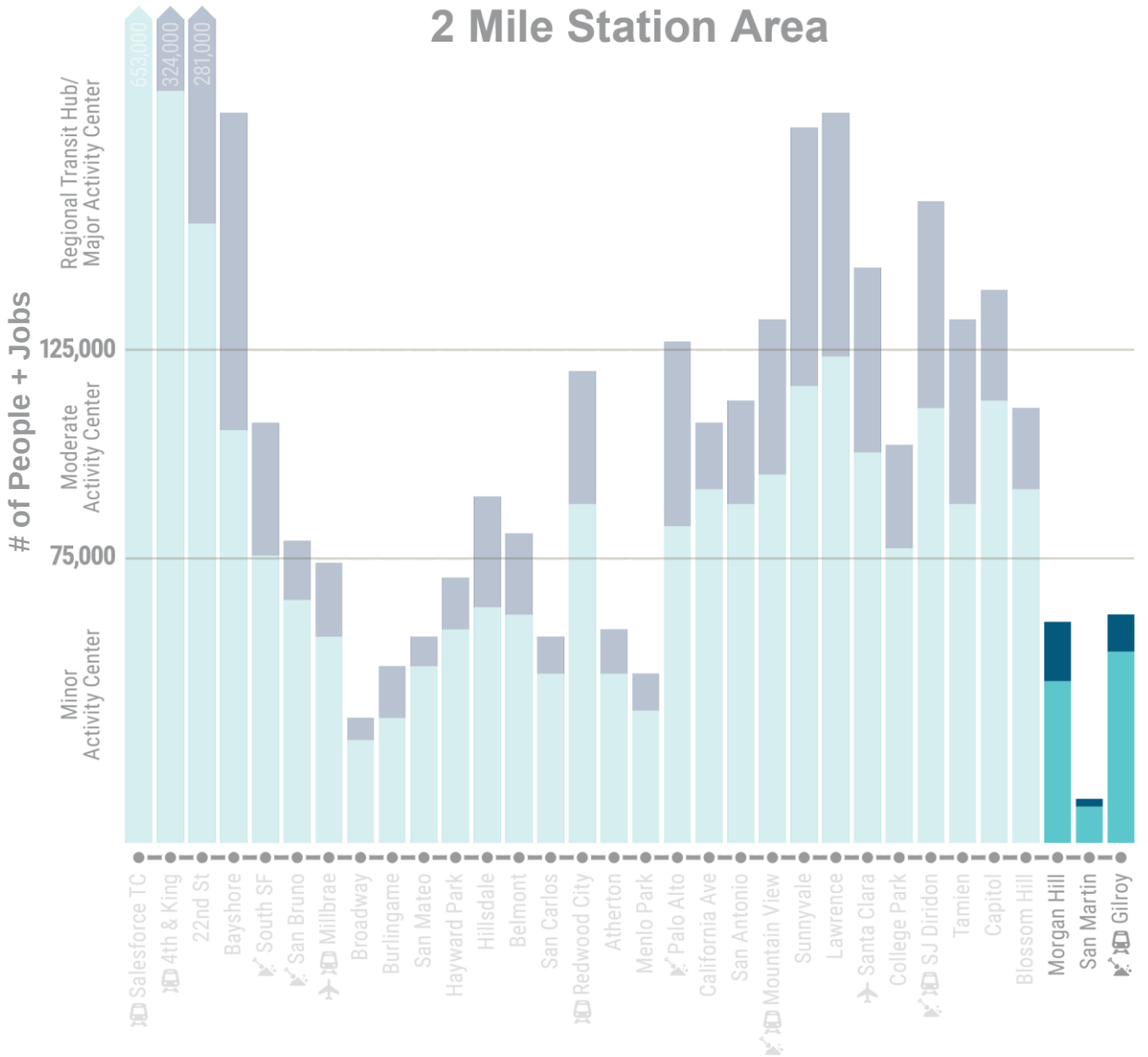




Indicates a station where substantial growth beyond Plan Bay Area forecasts is anticipated, but not yet approved

2040 Land Use & Transportation Context



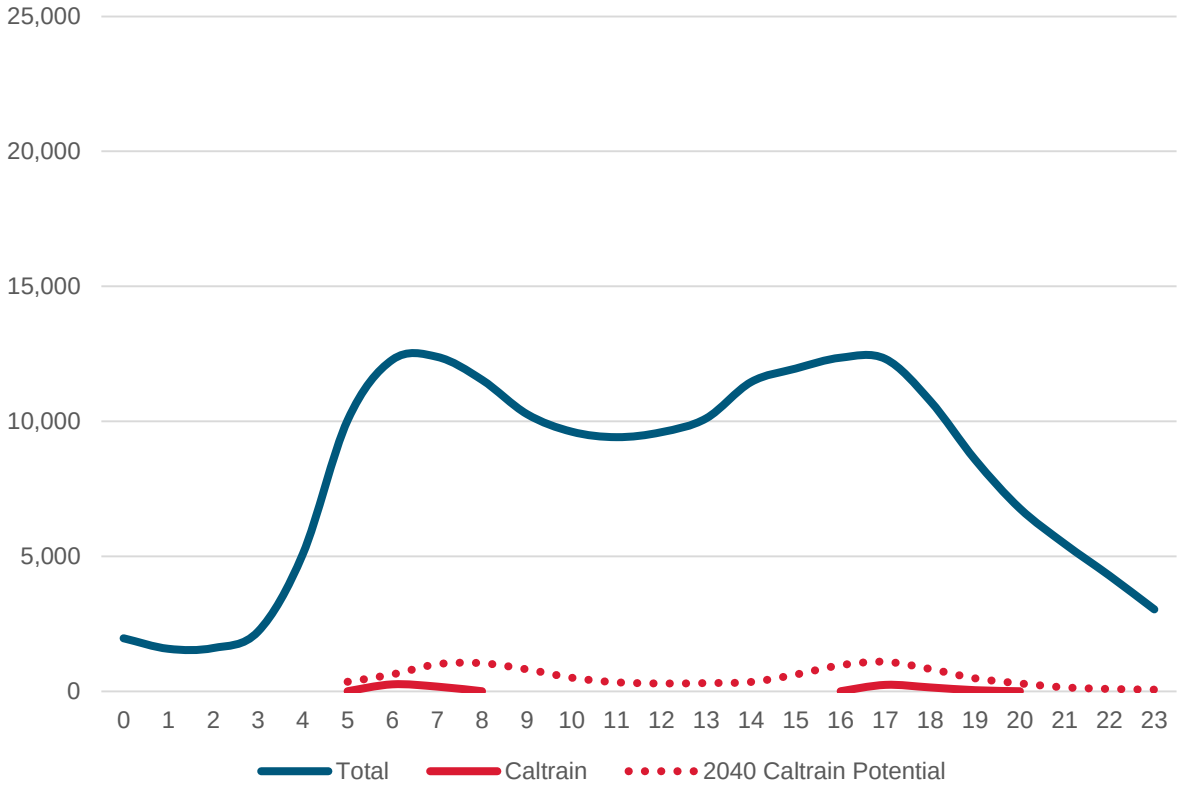


Indicates a station where substantial growth beyond Plan Bay Area forecasts is anticipated, but not yet approved

Morgan Hill & Gilroy Demand

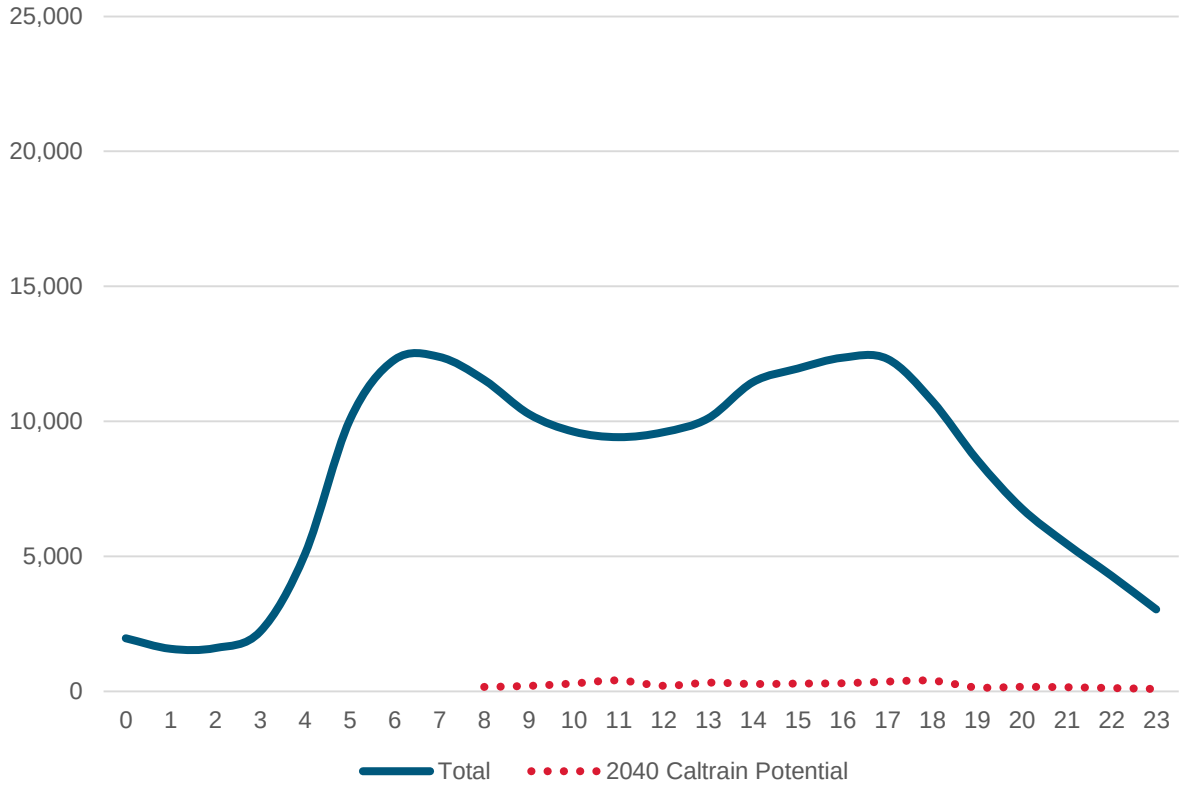
Weekday Demand

- Caltrain's serves about 2% of existing peak period travel
- US-101 experiences a morning and evening peak periods, with lower reverse-peak travel
- Potential 2040 demand of about 1,000 passengers per hour in the peak direction and 500 passengers per hour in the reverse-peak direction

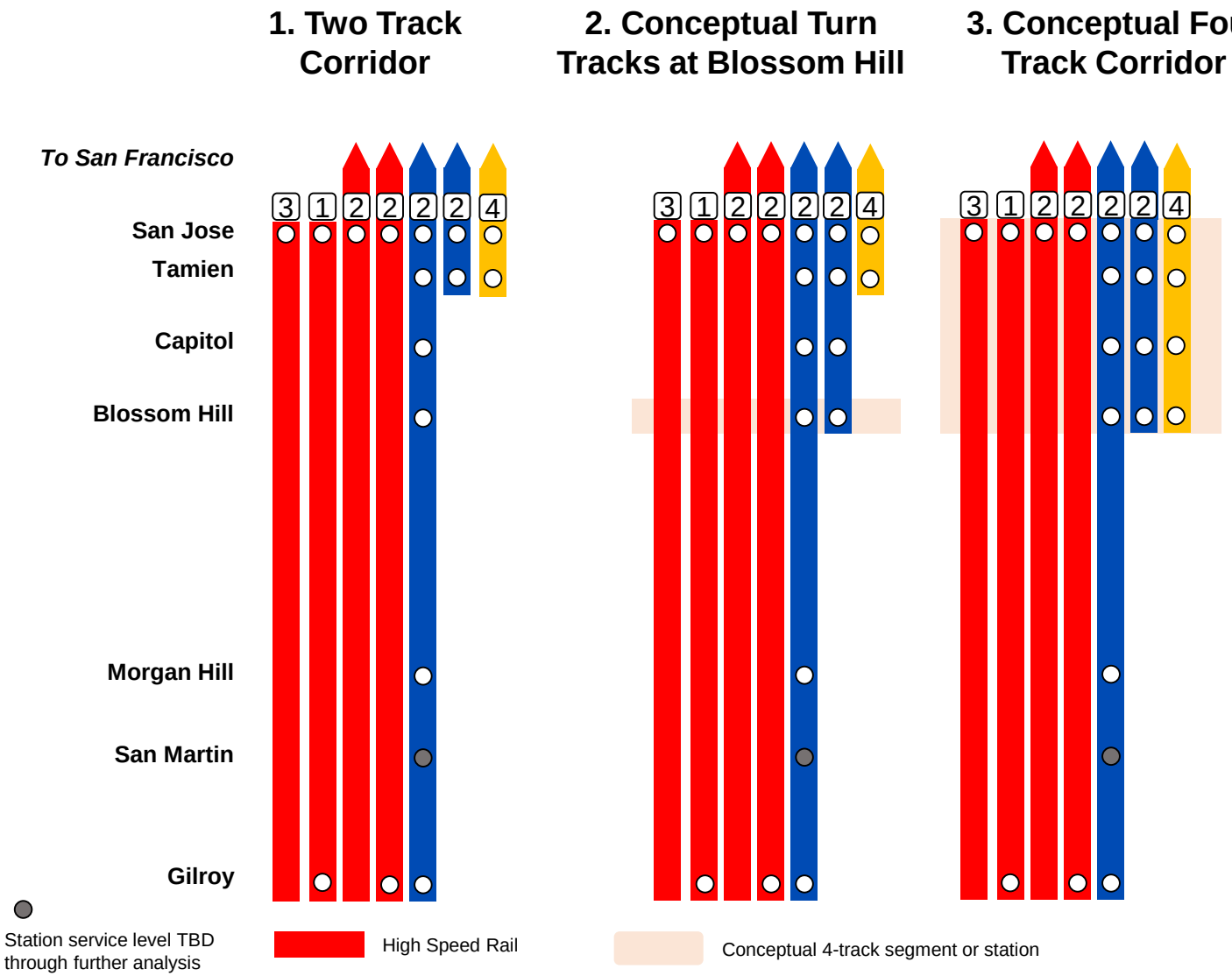


Weekend Demand

- Volumes on US-101 are comparable to weekday periods, with the highest demand between 9 AM and 7 PM
- Potential 2040 demand of about <500 passengers per hour, per direction



Peak Period Service Concepts



1. Two Track Corridor

- 8-12 TPH at Tamien, depending on mainline service levels
- 2 TPH south of Tamien except San Martin

2. Conceptual Turn Tracks at Blossom Hill

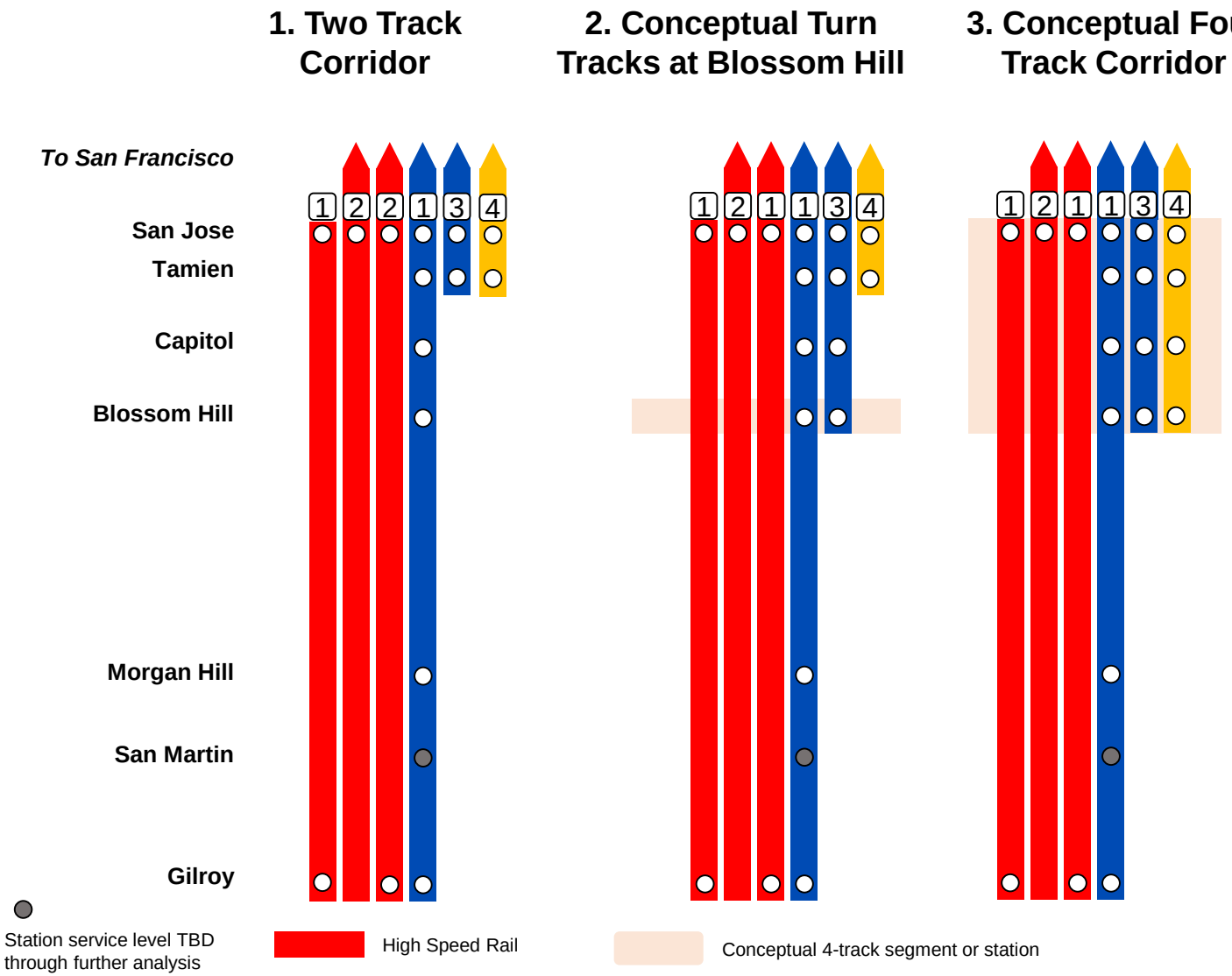
- 8-12 TPH at Tamien, depending on mainline service levels
- 4 TPH at Capitol and Blossom Hill
- 2 TPH at Morgan Hill and Gilroy

3. Conceptual Four Track Corridor

- 8-12 TPH at Tamien, depending on mainline service levels
- 8 TPH at Capitol and Blossom Hill
- 2 TPH at Morgan Hill and Gilroy

All scenarios subject to further analysis to confirm compatibility with planned HSR service

Off-Peak & Weekend Concepts



1. Two Track Corridor

- 4-8 TPH at Tamien, depending on mainline service levels
- 1 TPH at each station except San Martin
- Subject to further analysis to assess compatibility with HSR service

2. Conceptual Turn Tracks at Blossom Hill

- 4-8 TPH at Tamien, depending on mainline service levels
- 4 TPH at Capitol and Blossom Hill
- 1 TPH at Morgan Hill and Gilroy

3. Conceptual Four Track Corridor

- 4-8 TPH at Tamien, depending on mainline service levels
- 4-8 TPH at Capitol and Blossom Hill, depending on mainline service levels
- 1 TPH at Morgan Hill and Gilroy

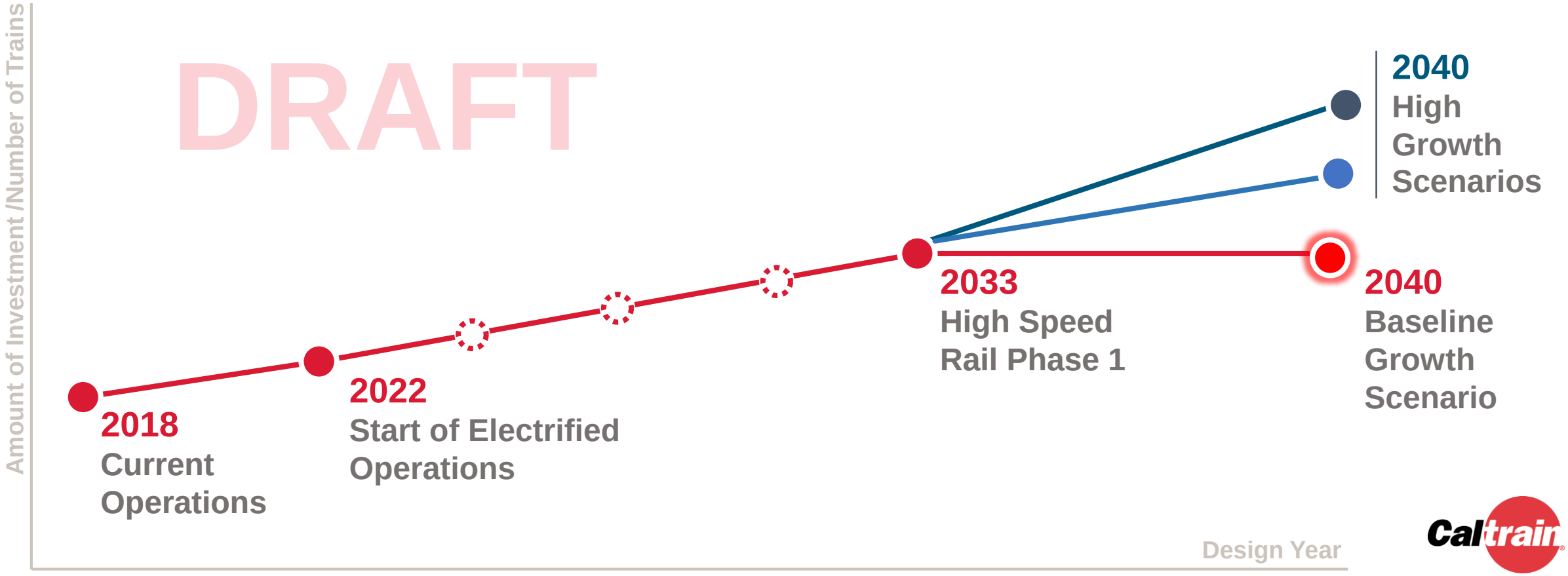
SHARING SESSION

Do you understand the service options shown south of San Jose?

Are there particular options that seem better or worse to you? Why?

Service Planning: 2040 Baseline

Context: Different Ways to Grow



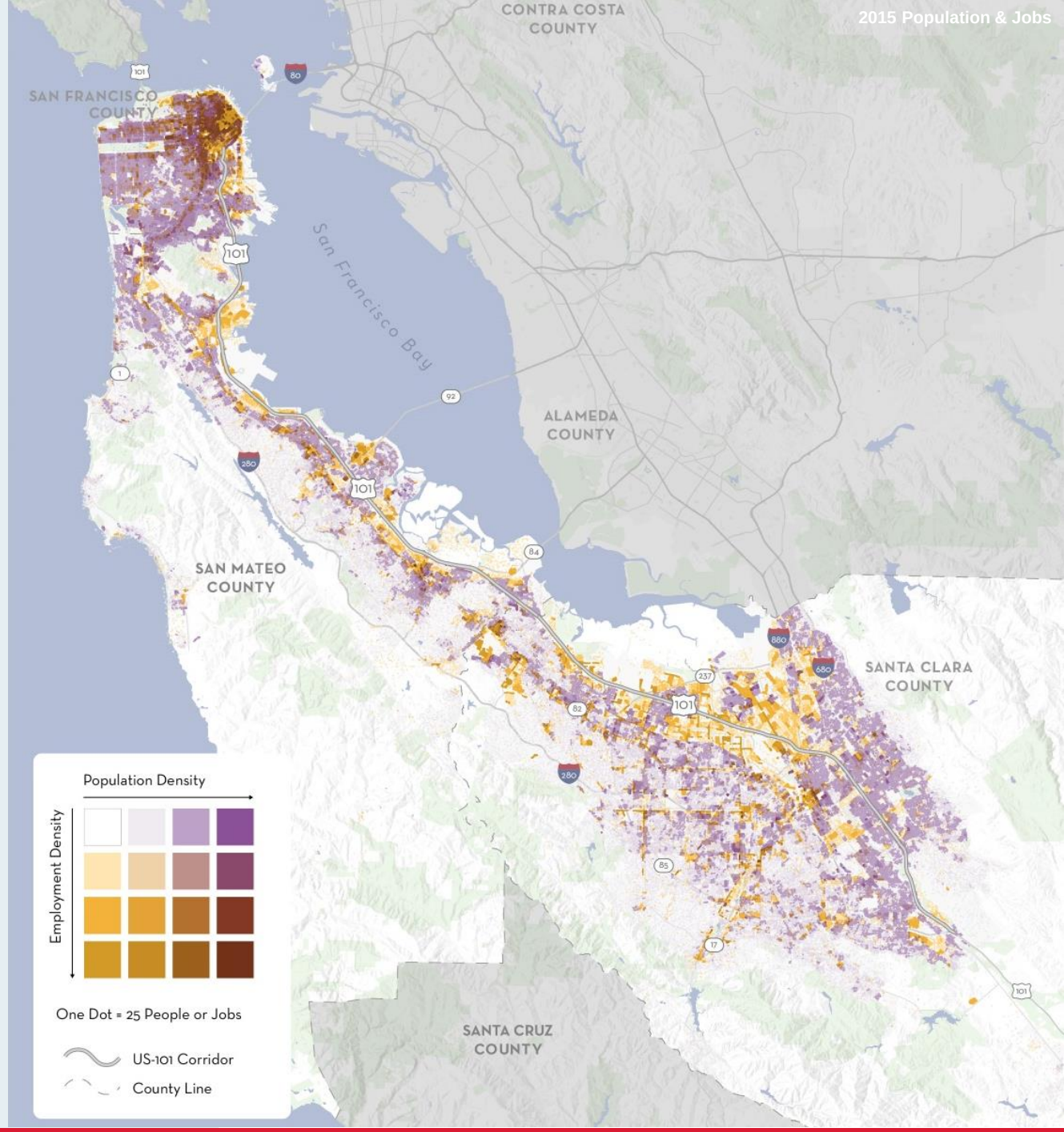
2040 Baseline

Operational Parameters

- Blended service with 10 trains per hour, per direction north of San Jose (6 Caltrain, 4 HSR)
- Blended operations with existing/committed levels of Caltrain service assumed south of San Jose (equivalent of 4 round trip Caltrain trains per day)

Service Pattern

- Historically, Caltrain has planned to operate a skip stop service after electrification
  - Emphasizes increasing service for high ridership origin-destination pairs
  - No service differentiation within Caltrain service
- Blended service planning with HSR has carried forward this concept
- There is some flexibility in service levels and stopping patterns at individual stations



2040 Baseline Service Plan

Features

- Six skip stop patterns with 60-65 minute run times
- Most stations receive 2 or 4 TPHPD, with a few stations receiving 6 TPHPD in both directions
- Schedule varies by direction with 10 minute frequencies at San Francisco and San Jose

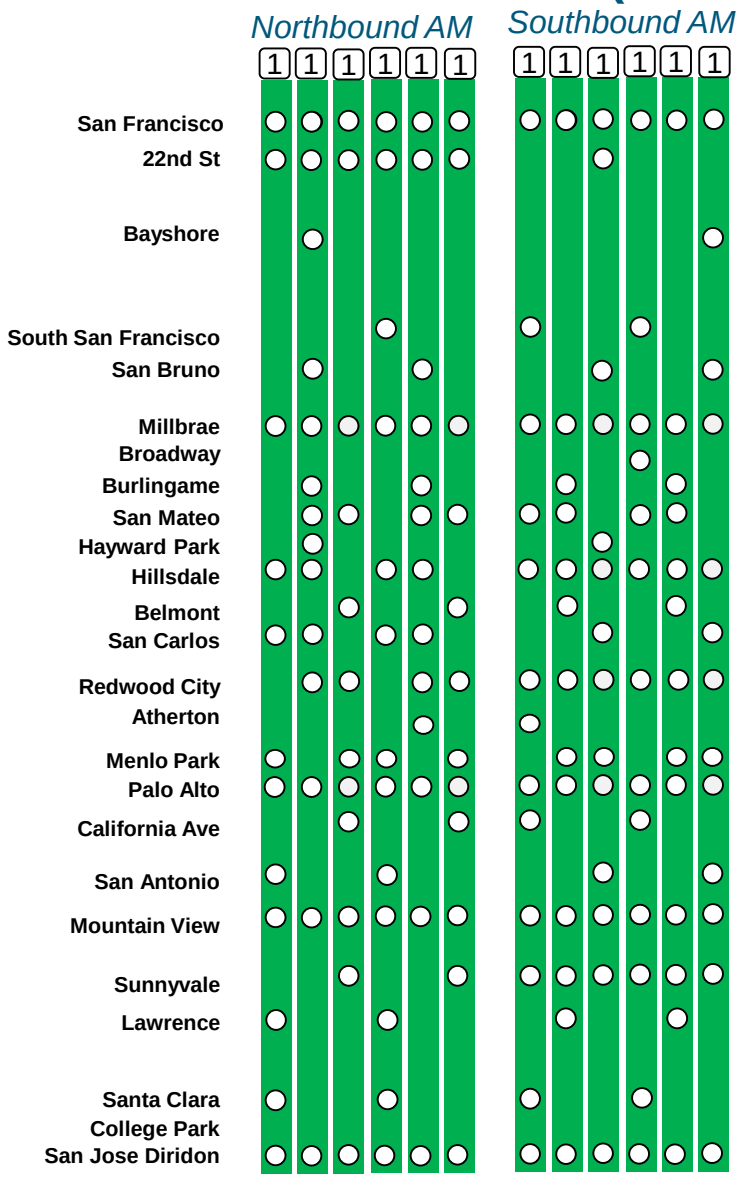
Passing Tracks

- Uses existing locations at Bayshore and Lawrence stations

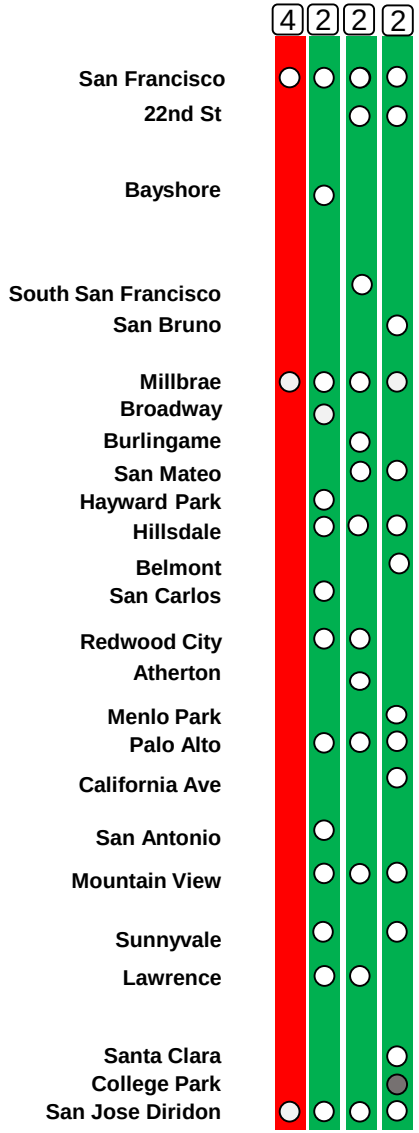
Options with Service Structure

- Flexibility in service levels at individual stations

Caltrain Electrification EIR (6 TPHPD)



HSR EIR (10 TPHPD)[1]



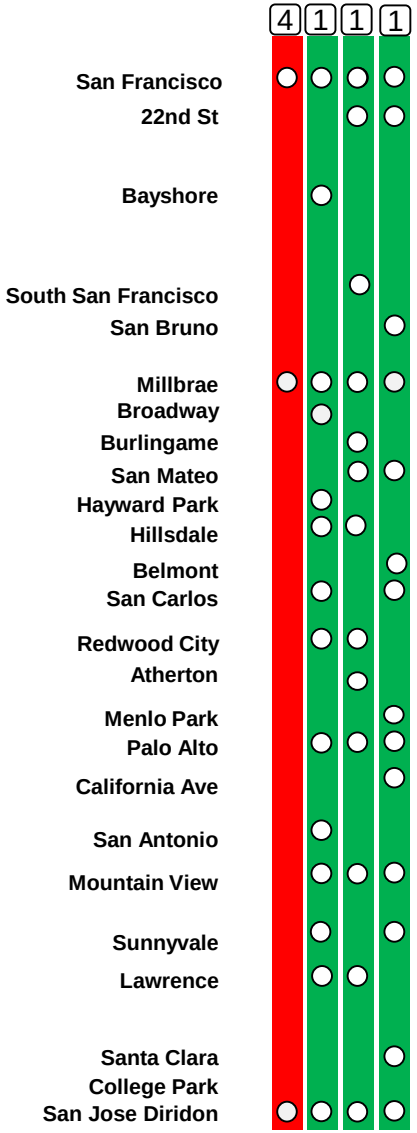
[2]Includes minor modifications to standardize Caltrain and HSR service patterns

Off-Peak & Weekend

Southern SJ/Gilroy

Features

- Same skip stop patterns at hourly headways
- Most stations receive service every 30 or 60 minutes



Features

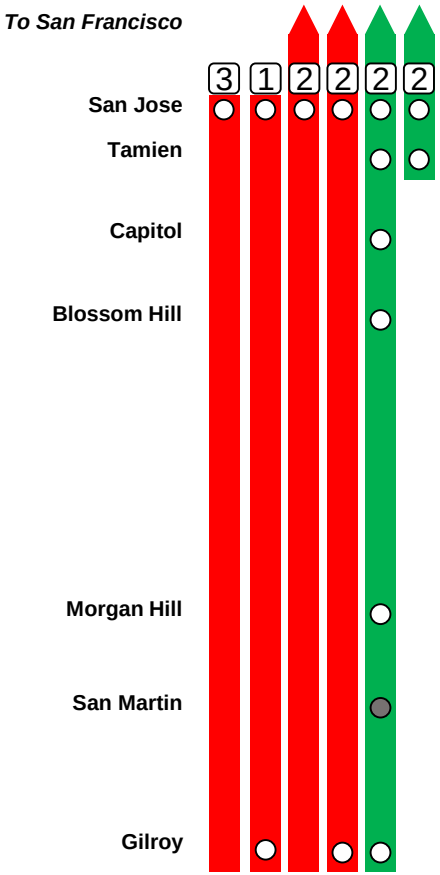
- Skip stop pattern equivalent to 4 northbound AM trains and 4 southbound PM trains
- Replicates committed service levels within parameters of new, Blended infrastructure
- Gilroy Station served by 2 Caltrain trains per hour and 2 HSR trains per hour
- Connection to Central Coast rail service at Gilroy
- No off-peak or weekend service south of Tamien

Passing Tracks

- None

Options with Service Structure

- Service levels between Morgan Hill and San Martin could be varied based on further demand analysis



SHARING SESSION

Do you understand the 2040 “Baseline” service pattern shown and how it relates to prior planning work and policy commitments?

Terminal Planning

Review & Evaluate Concepts

Off-Peak Service Planning

Terminal Planning

South San Jose & Gilroy Planning

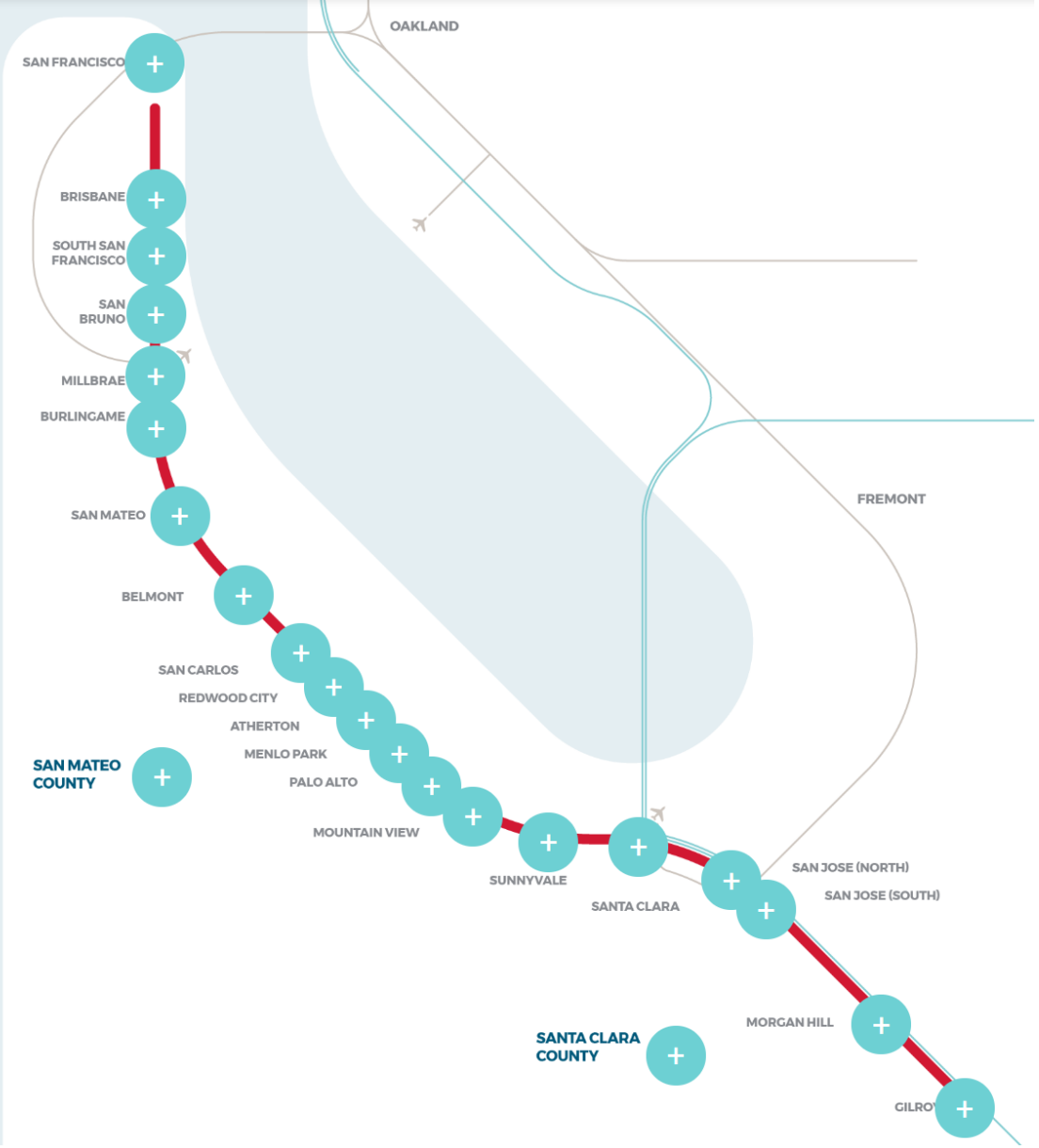
Proposed Process

- North and South Terminal working sessions with relevant partner and city staff
- Define key outcomes and constraints
- Identify range of acceptable planning-level analysis and assumptions that can serve as basis for continued Business Plan development including completion of service plans, ridership modeling and costing
- Define operations simulation parameters, methodology and process. Simulation completion required to confirm terminal assumptions

Community Interface Assessment Update

Business Plan Website is Up!

- Project timeline
- Project summary
- Corridor-wide factsheet
- Jurisdiction-specific factsheets
- Monthly presentations
- Glossary of key terms
- FAQs



www.caltrain2040.org

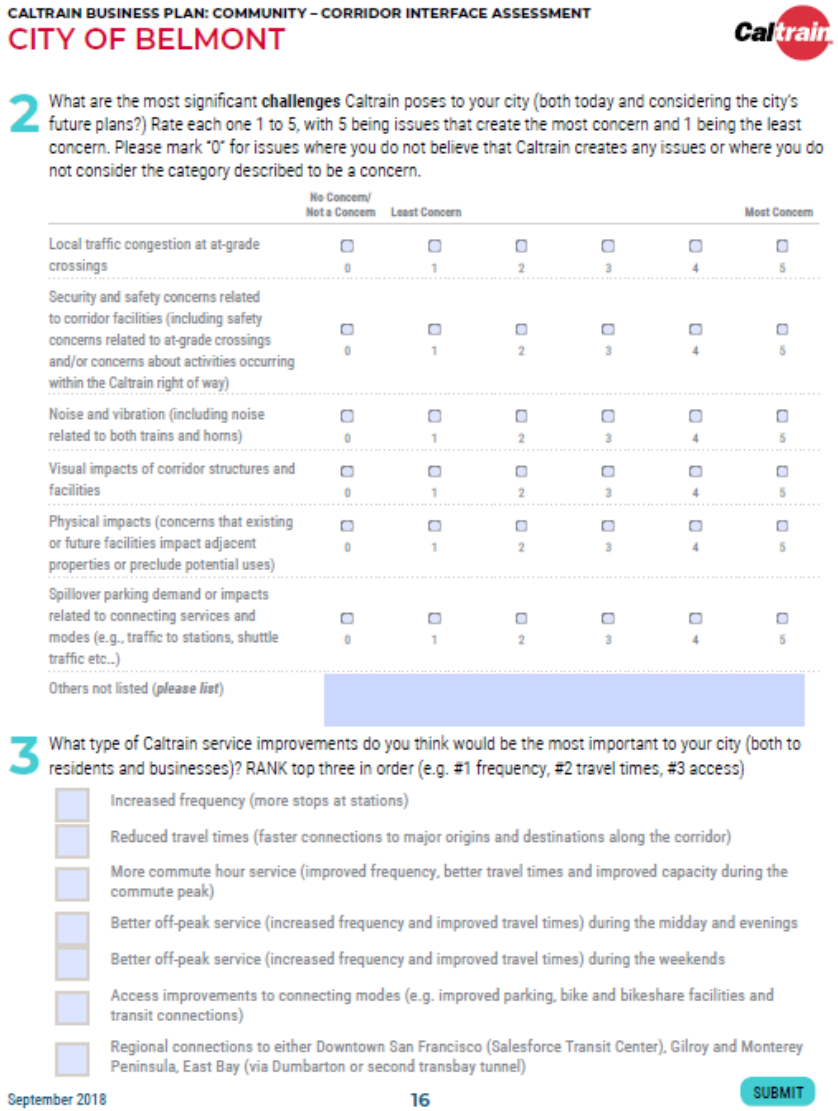
Caltrain

Round 1 Community Interface Meetings

Purpose
Introduce Business Plan and understand breadth of community interface concerns

Attendees
City and county staff representing public works, planning, economic development, and city managers offices + Caltrain Community Interface team

When
September – October 2018



CALTRAIN BUSINESS PLAN: COMMUNITY – CORRIDOR INTERFACE ASSESSMENT

CITY OF BELMONT

2 What are the most significant **challenges** Caltrain poses to your city (both today and considering the city's future plans?) Rate each one 1 to 5, with 5 being issues that create the most concern and 1 being the least concern. Please mark "0" for issues where you do not believe that Caltrain creates any issues or where you do not consider the category described to be a concern.

	No Concern/ Not a Concern	Least Concern				Most Concern
Local traffic congestion at at-grade crossings	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Security and safety concerns related to corridor facilities (including safety concerns related to at-grade crossings and/or concerns about activities occurring within the Caltrain right of way)	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Noise and vibration (including noise related to both trains and horns)	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Visual impacts of corridor structures and facilities	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Physical impacts (concerns that existing or future facilities impact adjacent properties or preclude potential uses)	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Spillover parking demand or impacts related to connecting services and modes (e.g., traffic to stations, shuttle traffic etc..)	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Others not listed (*please list*)						

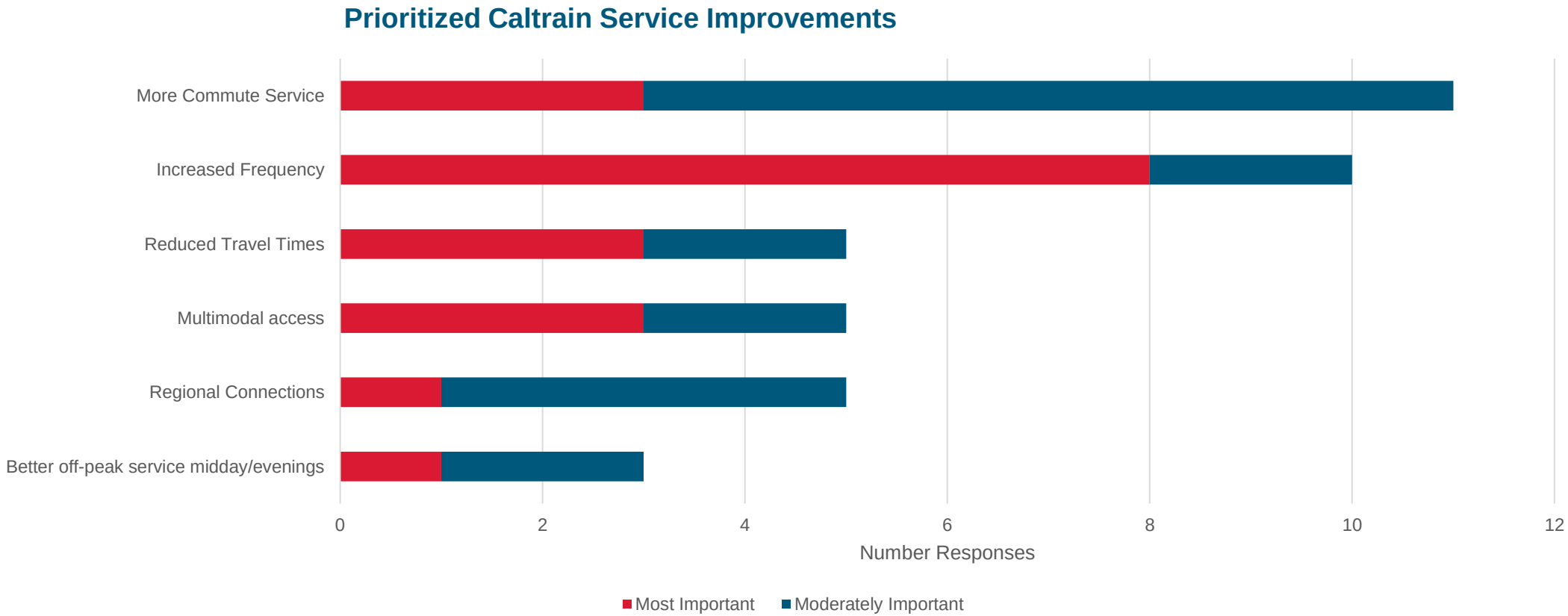
3 What type of Caltrain service improvements do you think would be the most important to your city (both to residents and businesses)? RANK top three in order (e.g. #1 frequency, #2 travel times, #3 access)

- ☐ Increased frequency (more stops at stations)
- ☐ Reduced travel times (faster connections to major origins and destinations along the corridor)
- ☐ More commute hour service (improved frequency, better travel times and improved capacity during the commute peak)
- ☐ Better off-peak service (increased frequency and improved travel times) during the midday and evenings
- ☐ Better off-peak service (increased frequency and improved travel times) during the weekends
- ☐ Access improvements to connecting modes (e.g. improved parking, bike and bikeshare facilities and transit connections)
- ☐ Regional connections to either Downtown San Francisco (Salesforce Transit Center), Gilroy and Monterey Peninsula, East Bay (via Dumbarton or second transbay tunnel)

September 2018 16 SUBMIT

Community Interface Meeting Results

Service Priorities



Community Interface Meeting Results

Key Themes

Service Levels & Schedules

Travel demand and mode split goals in relation to existing and anticipated roadway congestion

Physical Corridor

Grade crossings, grade separations, and the stretches of fencing, walls, and vegetation in between

Land Development

Placemaking, jobs-housing balance, transit-oriented development, and zoning changes

Station Connectivity & Access

Local first/last mile solutions, multi-modal access, and equitable incentive programs

Next Steps

Next Steps

Upcoming Work

- Finalize recommendations for high growth and baseline growth service plans to be studied further
- Terminal planning working sessions with Caltrain partners
- Capital costing, ridership projections and business model integration
- Ongoing organizational assessment and community interface work

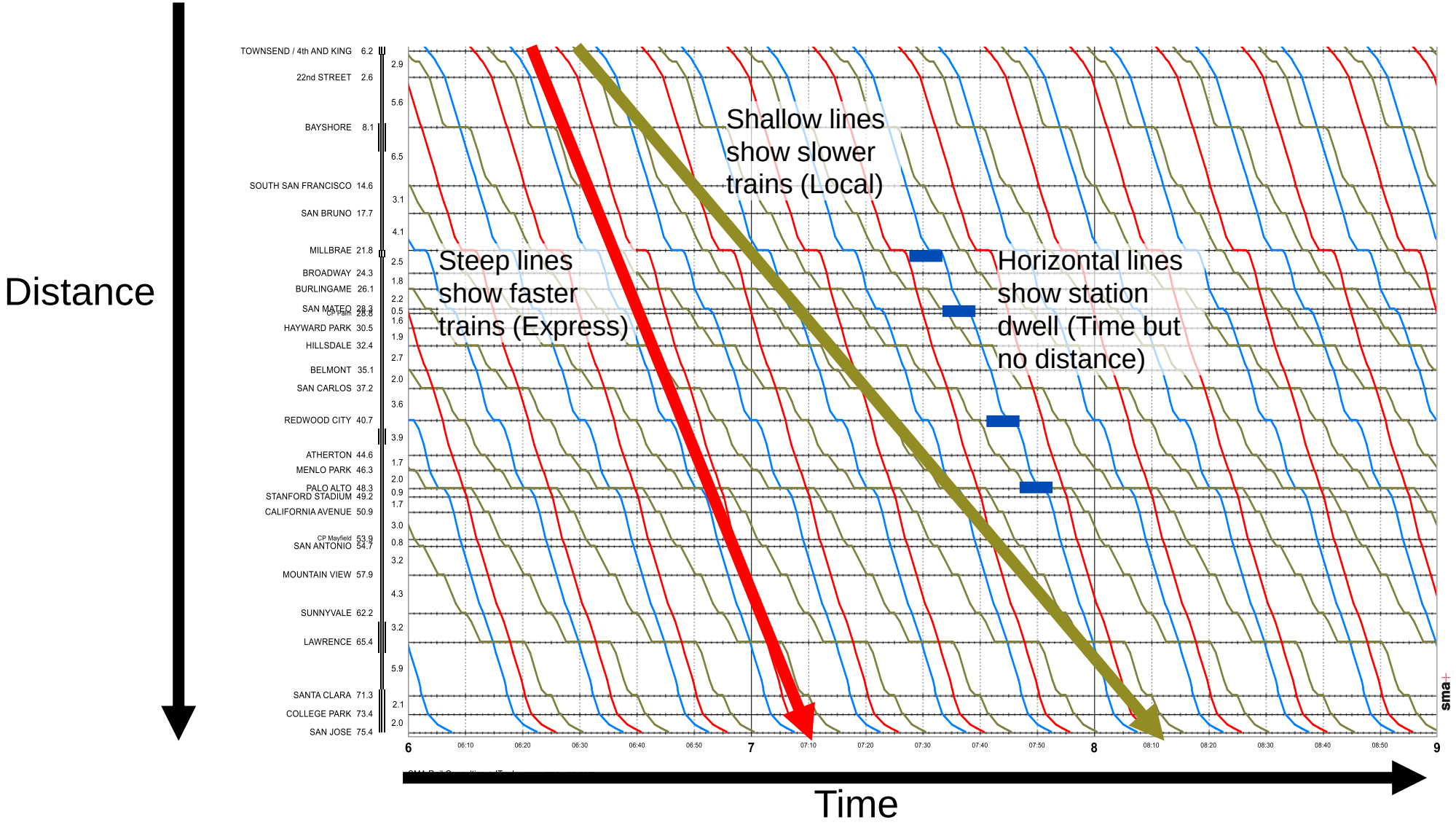
Appendix:

Land Use Details & Service Concept Stringlines

Land Use Planning Along Caltrain Corridor

Station	Major Projects Included in Forecasts (Approved or consistent with Plan Bay Area projections)	Major Projects Noted but Not Quantified in Forecasts (Not yet approved and potentially inconsistent with Plan Bay Area)
4th & King	Central SoMa Plan, Mission Bay & Mission Rock	The Hub Plan
22nd St	Pier 70, Potrero Power Plant, India Basin	
Bayshore	Hunters Point, Candlestick Point, Schlage Lock, Sierra Point buildout, Brisbane Baylands	
South SF	6 MSF of approved East of 101 developments and the Downtown Station Area Specific Plan	Other employment projects in pipeline such as Genentech Master Plan
San Bruno	Transit Corridors Plan	Bayhill Specific Plan (Youtube)
Millbrae	Station Plan	
Burlingame	Burlingame Point (Facebook)	
San Mateo	Downtown Area Plan	General Plan/Downtown Plan Update
Hayward Park	Nearby TOD projects under construction	
Hillsdale	Bay Meadows, Hillsdale Station Plan	
Belmont	General Plan Update, Belmont Village Specific Plan	
San Carlos	Meridian 25, Downtown TOD projects	
Redwood City	Downtown Precise Plan, Stanford Redwood City Campus	Facebook campus expansion in Menlo Park (Caltrain connection via Dumbarton Rail)
Menlo Park	El Camino Real Downtown Specific Plan	
Palo Alto	Stanford Hospital Expansion	Stanford General Use Permit
California Ave	Stanford Research Park redevelopment	
San Antonio	San Antonio Precise Plan	
Mountain View	El Camino Real Precise Plan, North Bayshore Precise Plan, Moffett Field redevelopment	East Whistman Specific Plan, additional Moffett Field redevelopment
Lawrence	Lawrence Station Plan, City Place	
San Jose Diridon		Google Campus, Downtown Strategy 2040
Morgan Hill	Downtown Specific Plan	
Gilroy		Station Plan

How to Read a Stringline



Zone Express: 12 Trains

Features

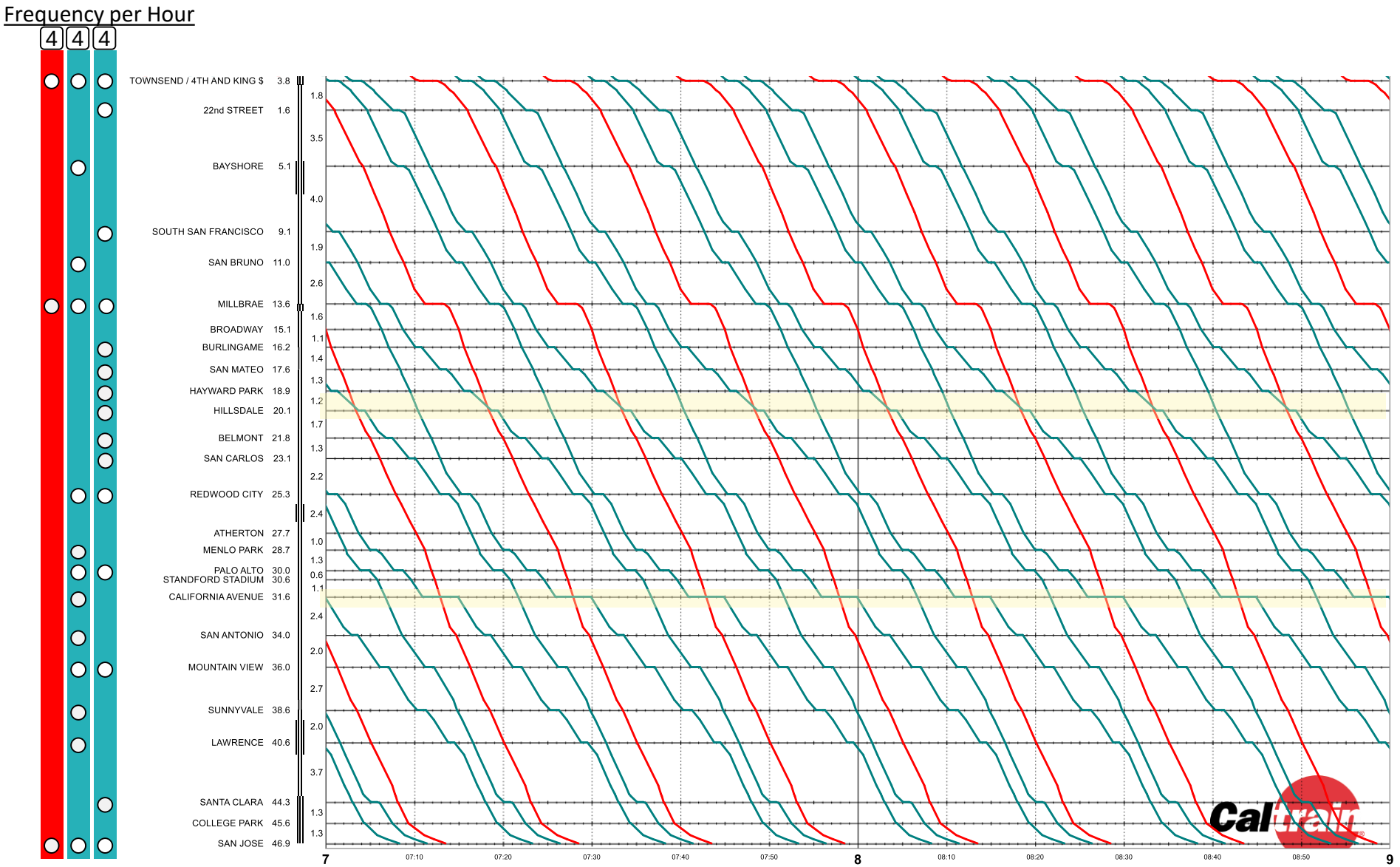
- Provides 15-minute service to all stations except Broadway/Burlingame with two semi express zone patterns
- Major activity centers receive 8 TPH
- Direct service from all markets to major activity centers, but transfer required between minor stations in different zones

Passing Track Needs

- 2 new miles of passing track between Hayward Park to Hillsdale and at a station in northern Santa Clara county (shown: California Ave)

Options with Service Structure

- Each pattern can at only stop at 2 of the 4 stations north of Millbrae
- Middle-zone train needs to stop at two stations south of California Ave
- Flexible station overtake location in northern Santa Clara County



Zone Express: 16 Trains

Features

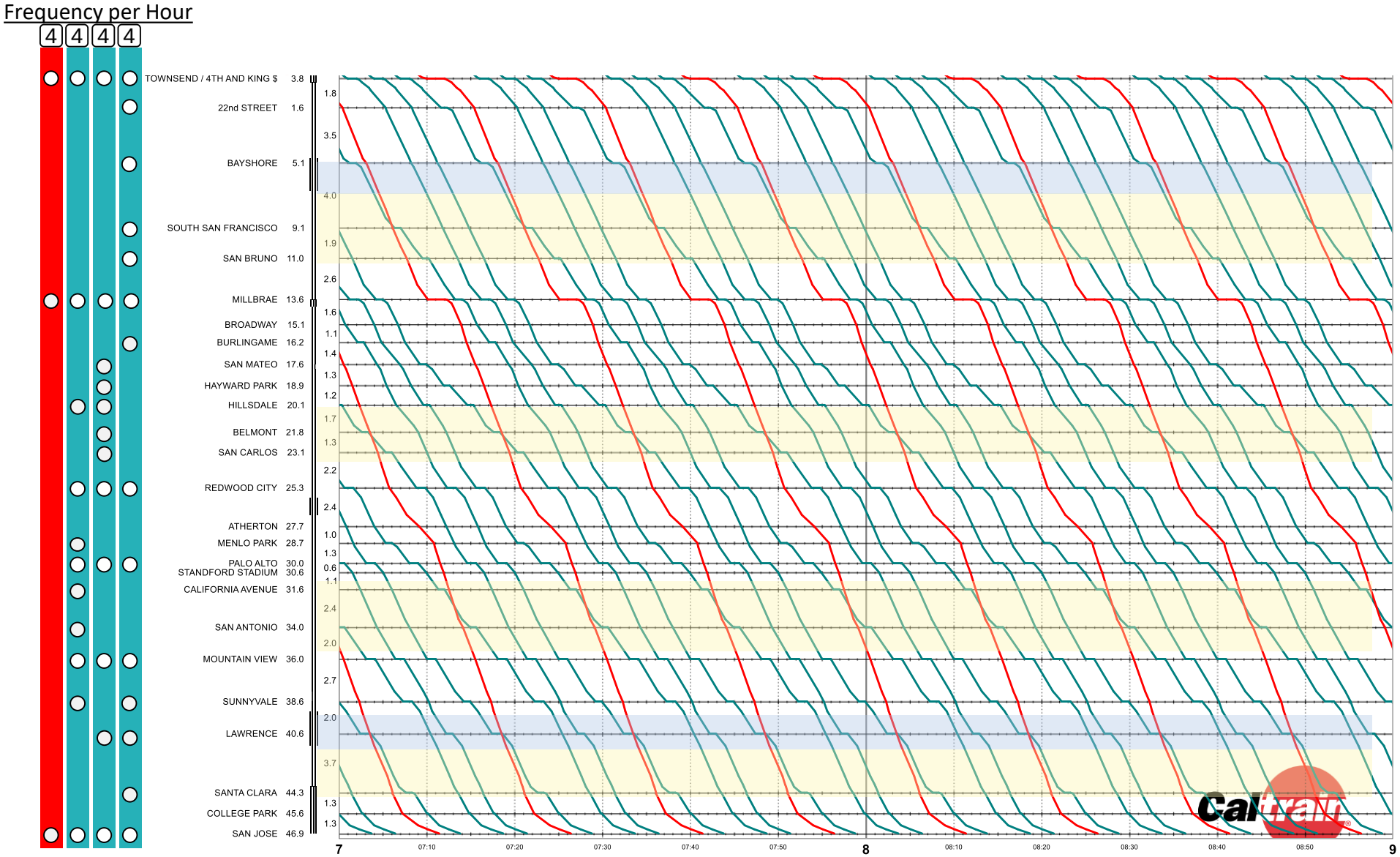
- Provides 15-minute service to all stations except Broadway/Burlingame with three semi express zone patterns (with major activity centers receiving 12 TPH)
- Direct service from all markets to major activity centers, but transfer required between minor stations in different zones

Passing Track Needs

- 15 miles of new passing track: south of Bayshore to San Bruno, mid-Peninsula (shown: Hillsdale to San Carlos), northern Santa Clara County (shown: California Avenue to north of Mountain View), and south of Lawrence to Santa Clara

Options with Service Structure

- Flexible location for 3 mile passing track in mid-Peninsula and 5 mile passing track in northern Santa Clara County



Local/Express: 12 Trains

Features

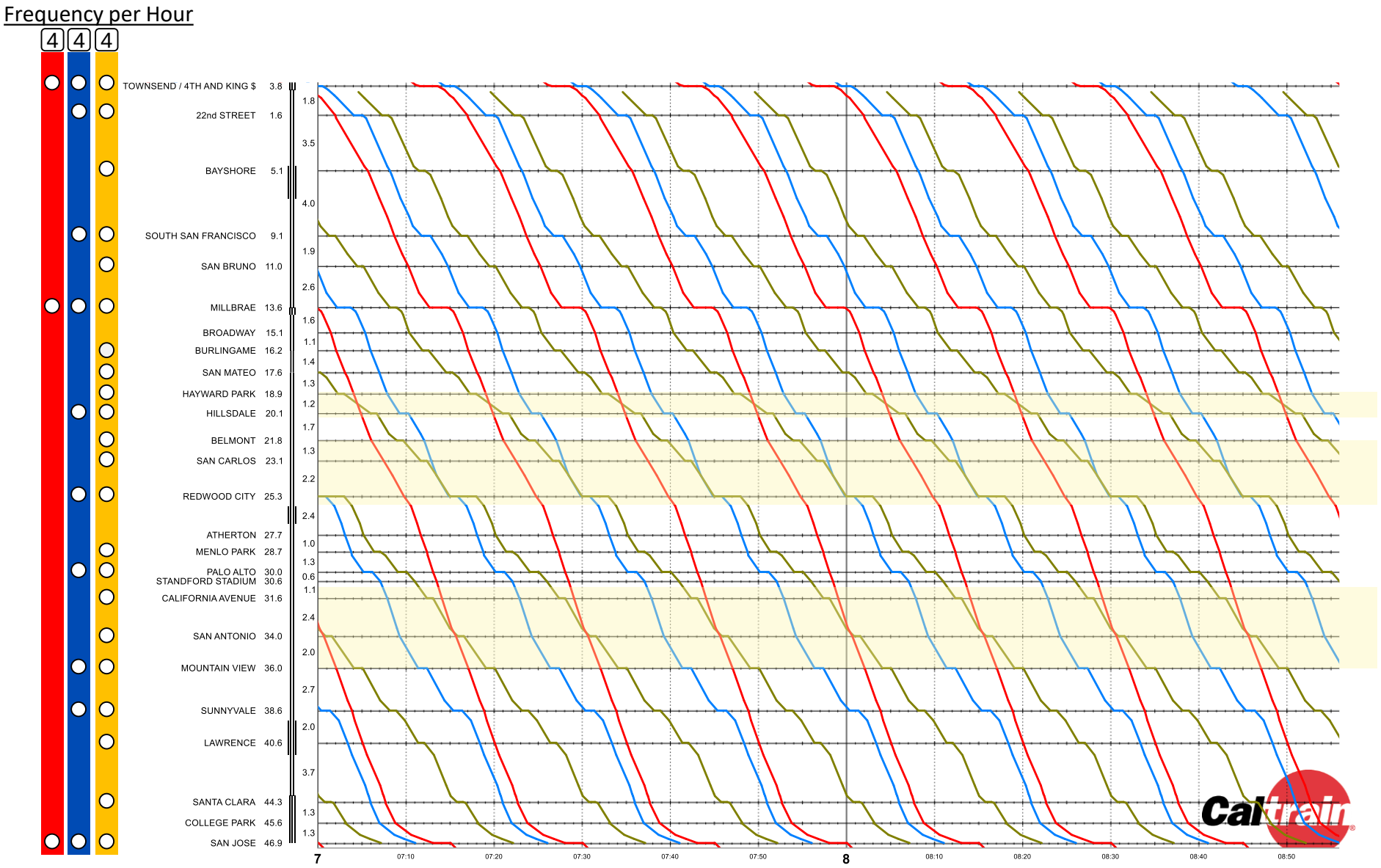
- Regional Express serves all Major Activity Centers at 15-minute headways
- All stations receive local service at 15-minute headways except Broadway and Burlingame
- Timed local-express transfer at Redwood City

Passing Track Needs

- 10 miles of new passing tracks: Hayward Park to Redwood City and northern Santa Clara County (shown: California Avenue to north of Mountain View)

Options with Service Structure

- One stop on Express Train between Millbrae and Redwood City
- One or two stops on express south of Palo Alto
- Flexible 5 mile passing track location in northern Santa Clara County



Local/Express: 12 Trains, Less Passing Tracks

Features

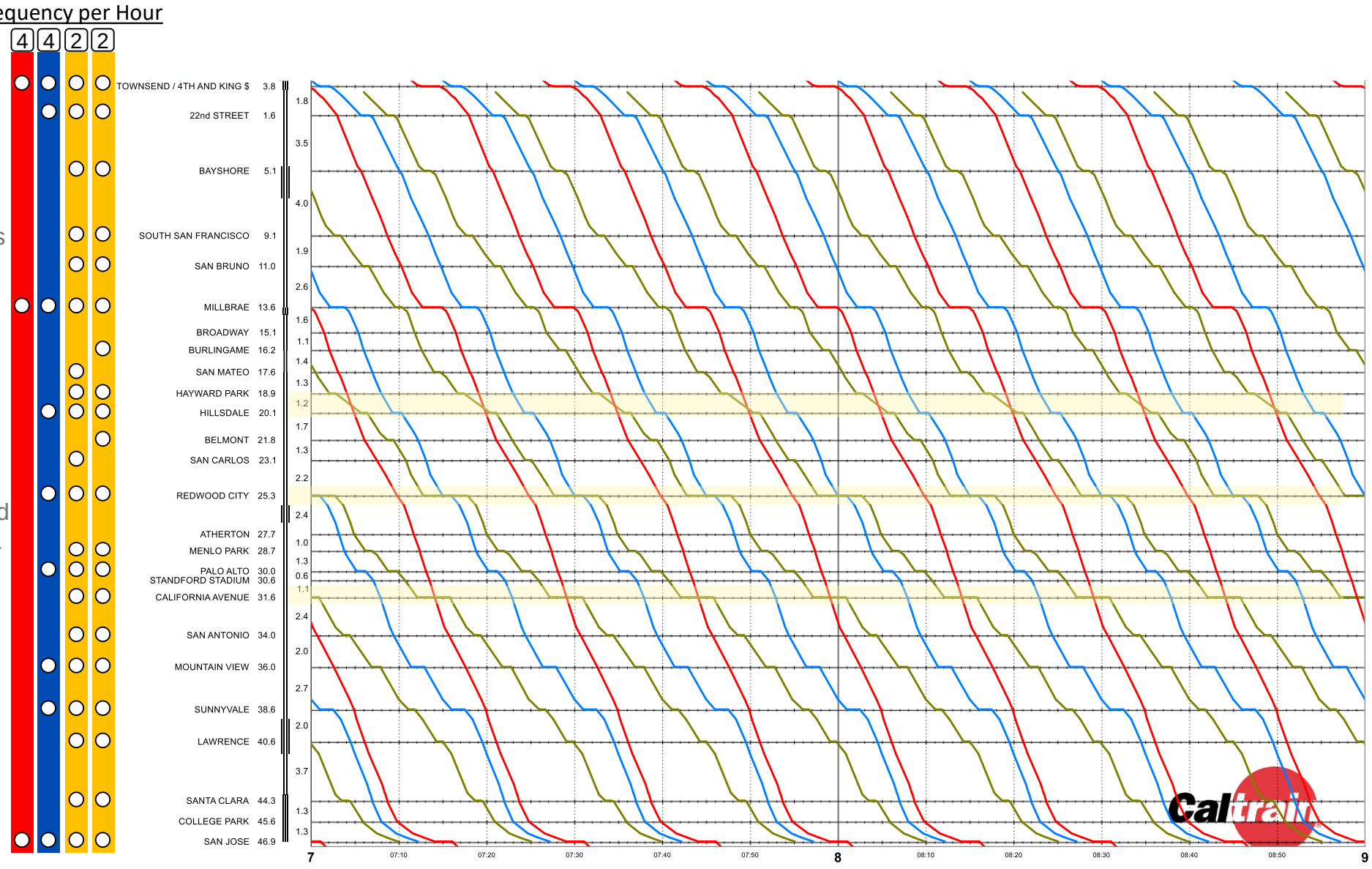
- Regional Express serves all Major Activity Centers at 15-minute headways
- Most stations served by local service at 15 minute headways
- Closely-spaced mid-Peninsula stations served at 30 minute headways (Broadway, Burlingame, San Mateo, Belmont, and San Carlos)
- Timed local-express transfer at Redwood City

Passing Track Needs

- 3 miles of new passing tracks: Hayward Park to Hillsdale, at Redwood City, and at a station in northern Santa Clara county (shown: California Ave)

Options with Service Structure

- Each local pattern can only stop once Millbrae to Hillsdale
- Each local pattern can only stop once Hillsdale to Redwood City
- Flexible station overtake location in northern Santa Clara County



Local/Express: 16 Trains, Less Passing Tracks

Features

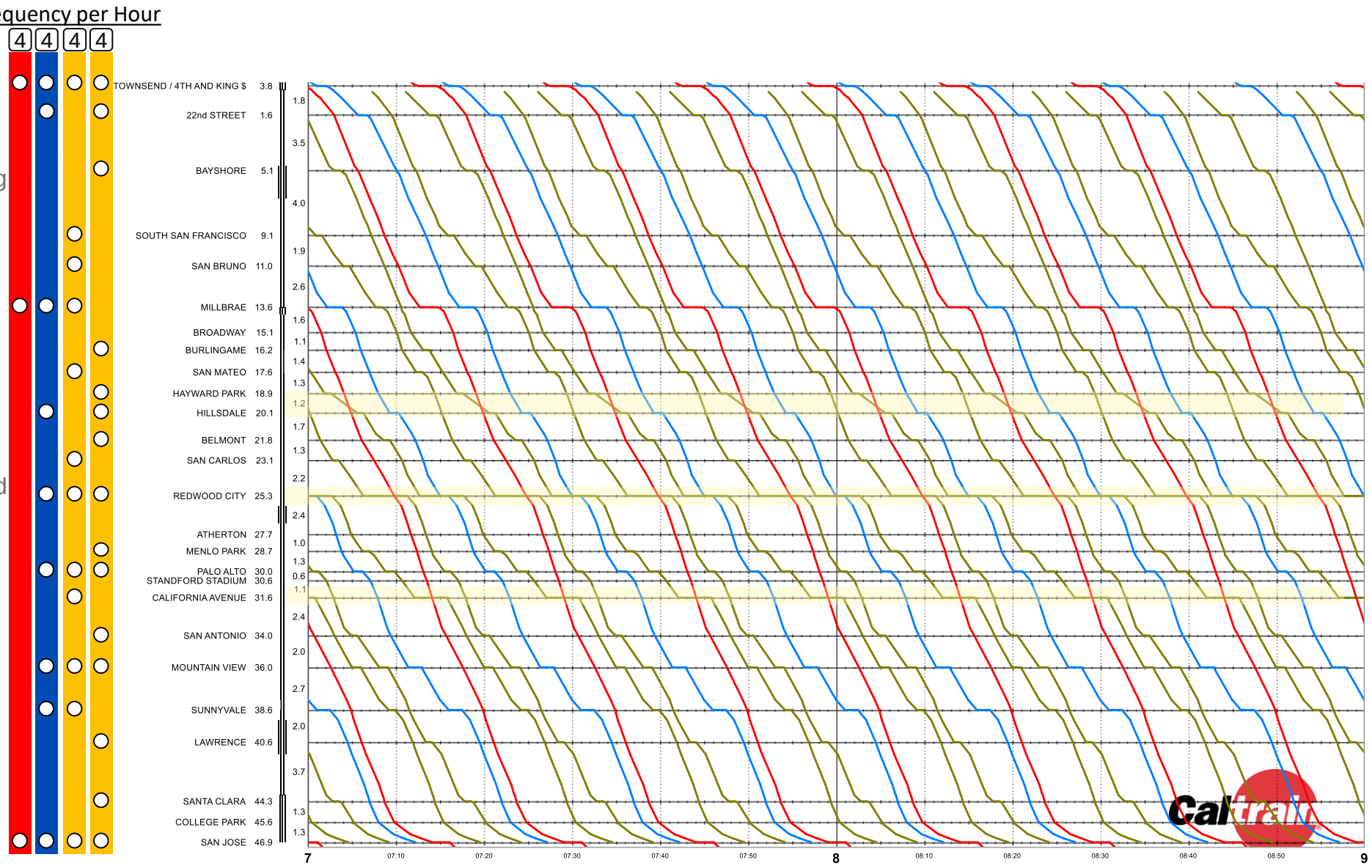
- Local service becomes skip-stop service
- All stations receive 15 minute headways with major stations receiving 8 or 12 trans per hour
- Many station pairs require transfer at regional hubs
- Half of station OD pairs between 22nd Street and Redwood City are not served at all

Passing Track Needs

- 3 miles of new passing tracks: Hayward Park to Hillsdale, at Redwood City, and at a station in northern Santa Clara county (shown: California Ave)

Options with Service Structure

- Generally need each pattern to stop at every other station
- Pattern overtaken by express must stop at Hayward Park & Hillsdale; other pattern cannot stop at these stations
- Flexible station overtake location in northern Santa Clara County



Local/Express: 16 Trains

Features

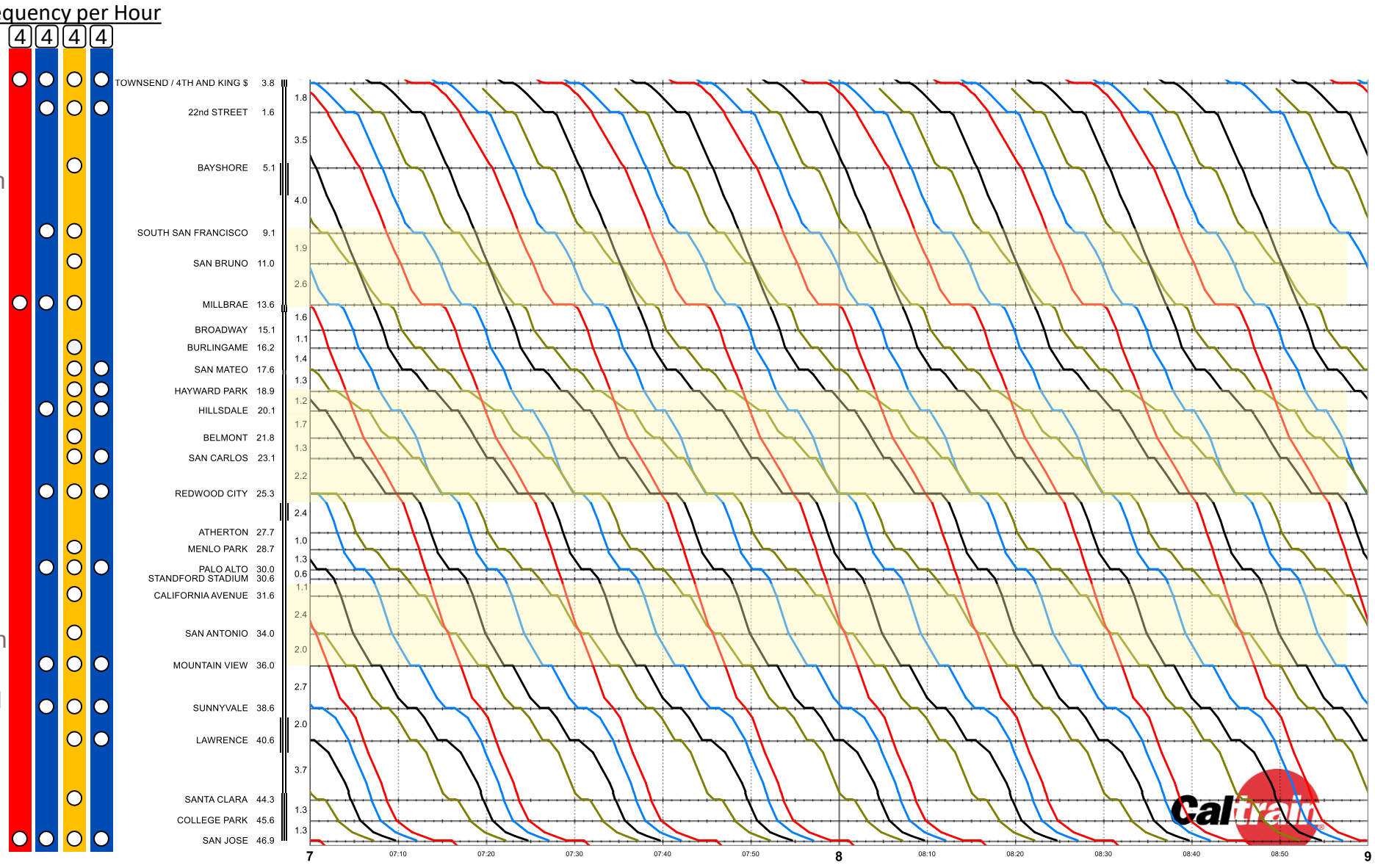
- Complete local stop service
- Two express lines serving major markets
- All stations receive at least 4 TPH, with many receiving 8 or 12 TPH

Passing Track Needs

- 15 miles of new passing tracks: South San Francisco to Millbrae, Hayward Park to Redwood City, and northern Santa Clara County (shown: California Avenue to north of Mountain View)

Options with Service Structure

- Express B pattern must run non-stop from 22nd St to San Mateo, but has some flexibility in number and location of stops along mid-Peninsula
- Flexible 5 mile passing track location in northern Santa Clara County
- Passing tracks between Lawrence and San Jose may enhance reliability and save 1-2 min of travel time for HSR and Caltrain (for passengers traveling south of Diridon)



FOR MORE INFORMATION

WWW.CALTRAIN.COM