Caltrain Business Plan

MARCH 2019

Local Policy Maker Group

March 2019

Caltrain

Starting to Build a Business Case

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

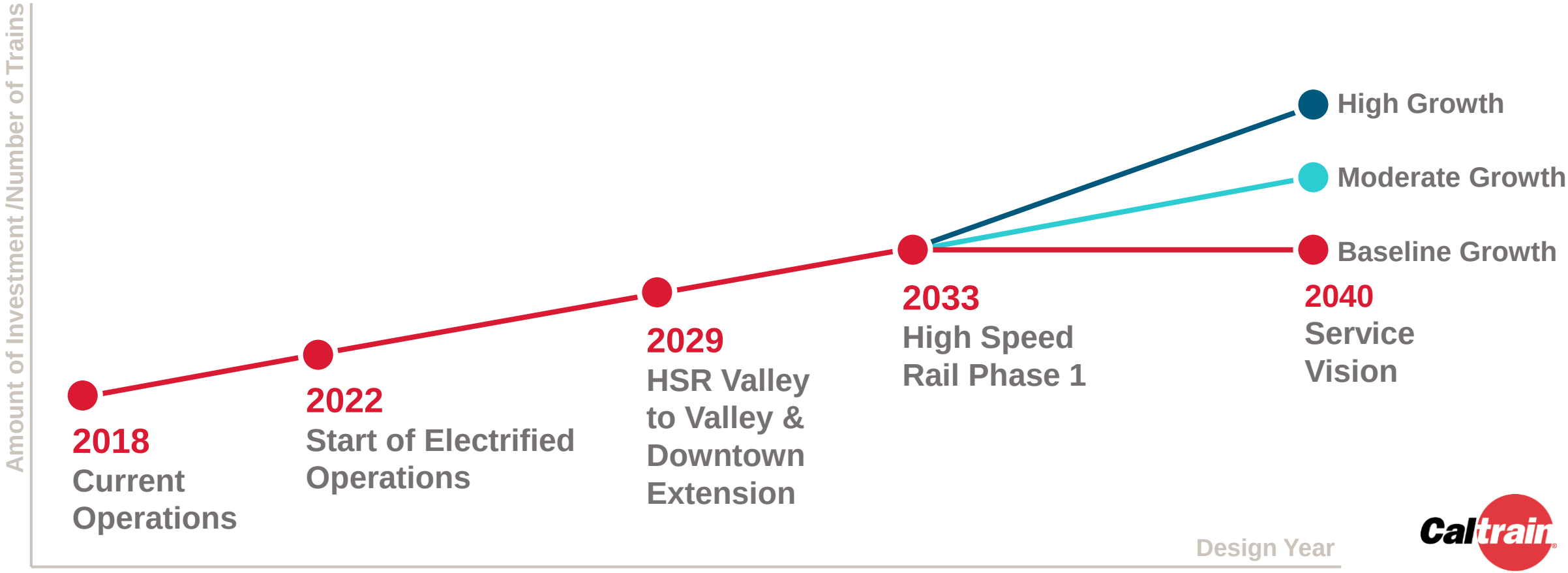
- Benefits and impacts to surrounding communities
- Corridor management strategies and consensus building
- Equity considerations

Organization

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

Where Are We in the Process?

2040 Service Scenarios: Different Ways to Grow



2040 Baseline Growth Scenario (6 Caltrain + 4 HSR)

Features

- Blended service with up to 10 TPH north of Tamien (6 Caltrain + 4 HSR) and up to 10 TPH south of Tamien (2 Caltrain + 8 HSR)
- Three skip stop patterns with 2 TPH – most stations are served by 2 or 4 TPH, with a few receiving 6 TPH
- Some origin-destination pairs are not served at all

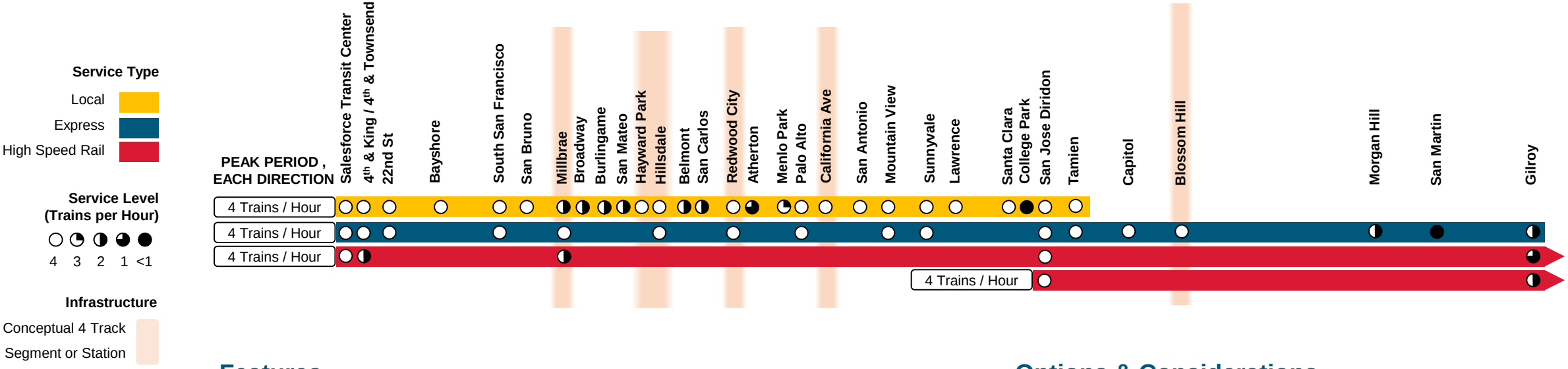
Passing Track Needs

- Less than 1 mile of new passing tracks at Millbrae associated with HSR station plus use of existing passing tracks at Bayshore and Lawrence

Options & Considerations

- Service approach is consistent with PCEP and HSR EIRs
- Opportunity to consider alternative service approaches later in Business Plan process

Moderate Growth Scenario (8 Caltrain + 4 HSR)



Features

- A majority of stations served by 4 TPH local stop line, but Mid-Peninsula stations are serviced with 2 TPH skip stop pattern
- Express line serving major markets – some stations receive 8 TPH
- Timed local/express transfer at Redwood City

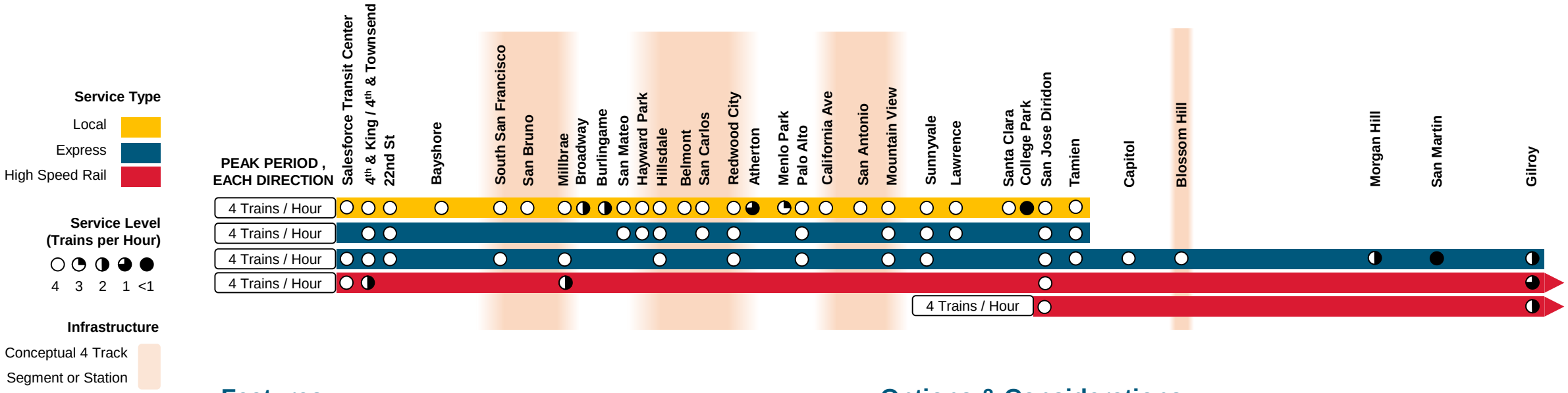
Passing Track Needs

- Up to 4 miles of new 4-track segments and stations: Hayward Park to Hillsdale, at Redwood City, and a 4-track station in northern Santa Clara county (Palo Alto, California Ave, San Antonio or Mountain View. California Ave Shown)

Options & Considerations

- To minimize passing track requirements, each local pattern can only stop twice between San Bruno and Hillsdale - in particular, San Mateo is underserved and lacks direct connection to Millbrae
- Each local pattern can only stop once between Hillsdale and Redwood City
- Atherton, College Park, and San Martin served on an hourly or exception basis

High Growth Scenarios (12 Caltrain + 4 HSR)



Features

- Nearly complete local stop service – almost all stations receiving at least 4 TPH
- Two express lines serving major markets – many stations receive 8 or 12 TPH

Passing Track Needs

- Requires up to 15 miles of new 4 track segments: South San Francisco to Millbrae, Hayward Park to Redwood City, and northern Santa Clara County between Palo Alto and Mountain View stations (shown: California Avenue to north of Mountain View)

Options & Considerations

- SSF-Millbrae passing track enables second express line; this line cannot stop north of Burlingame
- Tradeoff between infrastructure and service along Mid-Peninsula - some flexibility in length of passing tracks versus number and location of stops
- Flexible 5 mile passing track segment somewhere between Palo Alto and Mountain View
- Atherton, College Park, and San Martin served on an hourly or exception basis

Terminal Analysis

Terminal Planning Context

Terminal Planning Context

San Francisco Terminal

San Jose Terminal

Next Steps

Purpose and Process

Purpose

- Extend initial service planning analysis to identify how each growth 2040 growth scenario will function at and around terminals
- Establish initial service plans as a basis for estimating ridership, identifying areas of operational risk and clarifying needed investments

Process

- Initial staff discussions with partner agencies at each terminal regarding goals and planning parameters
- Initial planning analysis
- Follow up discussion and review with partner agencies at each terminal
- Move to detailed simulation analysis and continued coordination

Service Planning Parameters

The following rail operating parameters are used as the starting point for 2040 service planning. Some variation to these parameters may be explored as service planning progresses

Parameter	HSR	Caltrain
Minimum headway between trains*	2 minutes	2 minutes
Turnaround time at terminal	20 minutes	20 minutes
Minimum station dwell time**	2 minutes	1.0 (high-ridership stations) 0.7 (low-ridership stations)
Train equipment	High speed trainset	8-car electric multiple unit trainset
Speed limit	110 MPH	110 MPH
Recovery time	10% distributed	10% distributed

**Assumes investment in new signal system*

***Assumes investment to achieve level-boarding*

San Francisco Terminal

Terminal Planning Context

San Francisco Terminal

San Jose Terminal

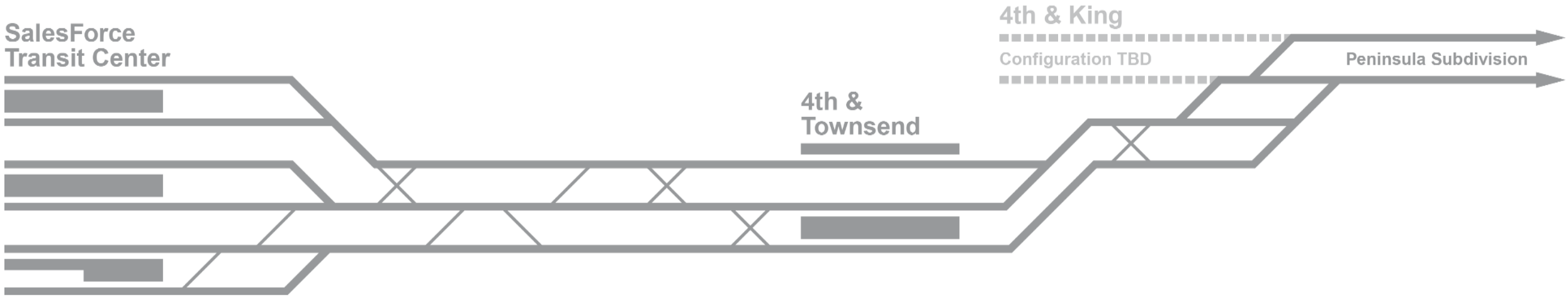
Next Steps

San Francisco Terminal

Key Points and Findings

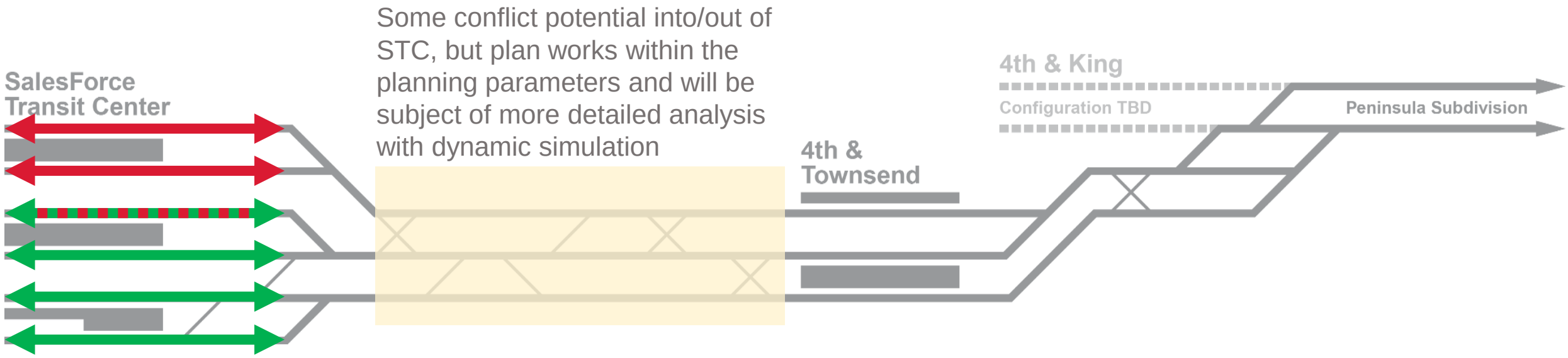
- In the Baseline and Moderate Scenarios preliminary analysis suggests that all train service can utilize Sales Force Transit Center. In the High Growth Scenario the additional 4 trains would terminate at 4th & King.
- Some platform availability preserved at 4th & King in all scenarios to account for event, disruption, and/or regular revenue service
- Direct sharing of platforms between Caltrain and HSR as part of scheduled revenue service provides no direct capacity benefits in any of the scenarios studied at either terminal. The importance of platform interoperability to system reliability is under study through ongoing analysis
- All findings will be further tested and evaluated trhough simulation analysis

San Francisco Terminal Area



Source: TJPA Draft Preliminary Engineering Track Plans for Phase 2 Downtown Rail Extension (October 25, 2018)

SF Terminal: Baseline Growth



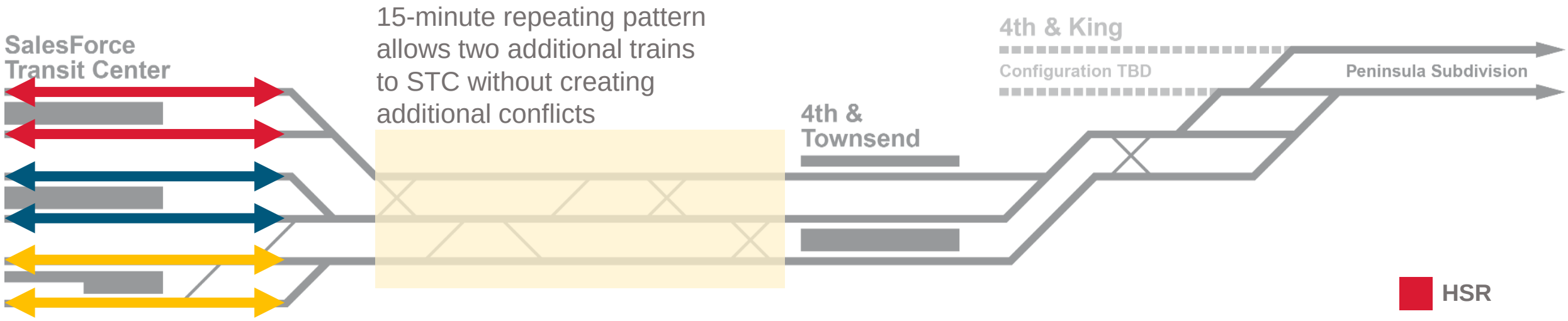
Turn times at STC above minimum requirements are achievable with HSR assigned to two tracks and Caltrain assigned to four tracks. Three and three is also achievable with tighter turns for Caltrain

HSR

Skip Stop

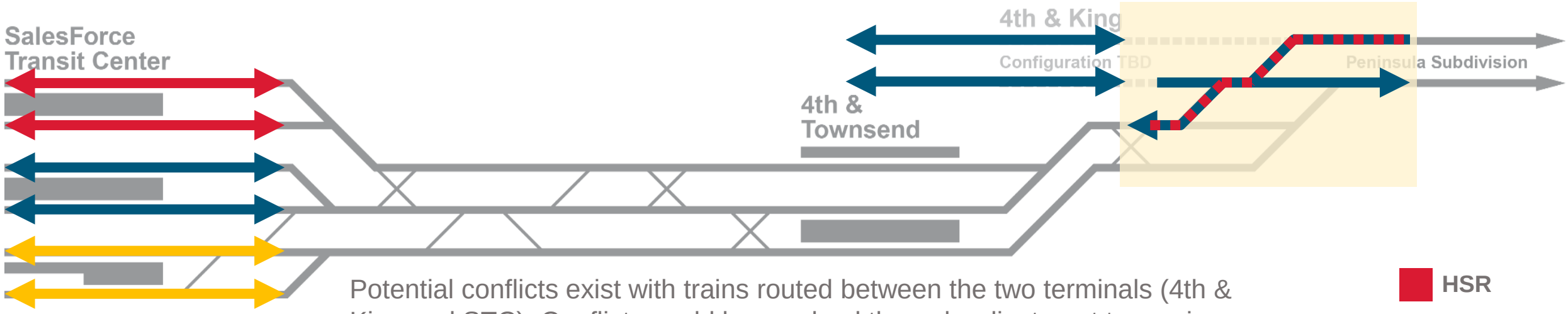
Caltrain

SF Terminal: Moderate Growth



Turns at STC are tighter for both HSR and Caltrain compared to the Baseline, but are still within minimum parameters w/ two HSR and four Caltrain platforms faces for normal operations. Three and three in normal operation would result in unacceptably short turns for Caltrain

SF Terminal: High Growth



Potential conflicts exist with trains routed between the two terminals (4th & King and STC). Conflicts could be resolved through adjustment to service patterns and/or construction of additional infrastructure including:

- Sending locals to 4th & King and Express to STC
- Other adjustments to 16 tph operating plan
- Construction of significant, vertically separated junction

16 trains to STC is not possible due to unrealistic turn times for all operators

HSR

Express

Local

Caltrain

San Jose Terminal

Terminal Planning Context

San Francisco Terminal

San Jose Terminal

Next Steps

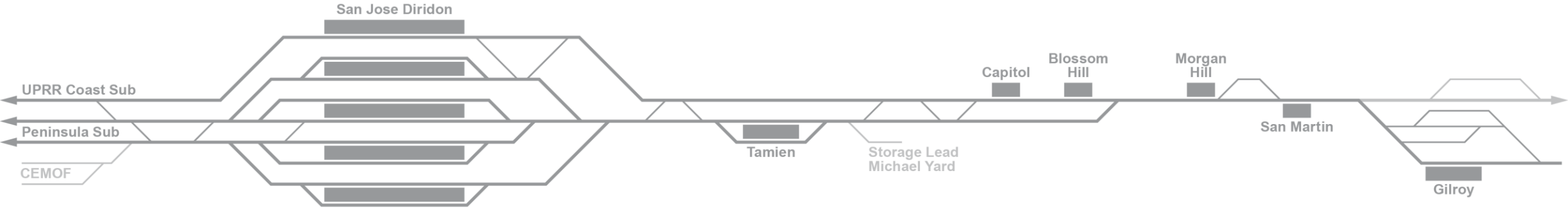
San Jose Terminal

Key Points and Findings

- Work developed in conjunction with Diridon Integrated Station Concept Plan and some analysis is ongoing
- Solutions were found for all three Growth Scenarios that are consistent with ongoing Diridon planning efforts
- For Caltrain, the ability to “turn” trains south of Diridon is important and will require investments
- Analysis of “diesel” system including freight and intercity operators (Amtrak, ACE, and CCJPA) IS ongoing
- All findings will be further tested and evaluated trhough simulation analysis

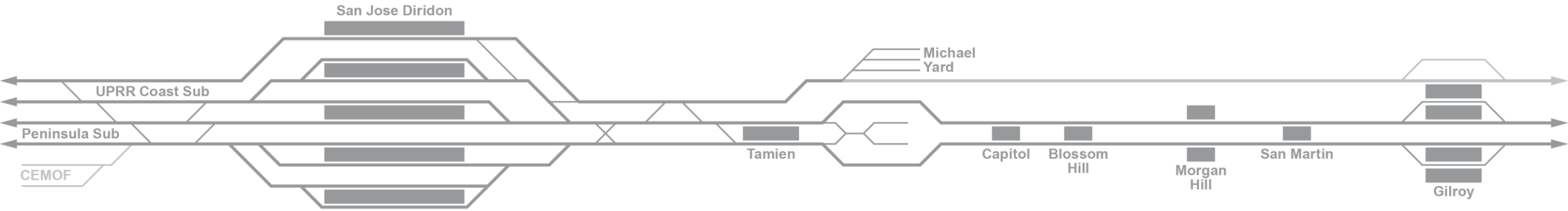
San Jose Terminal Area

1. Existing



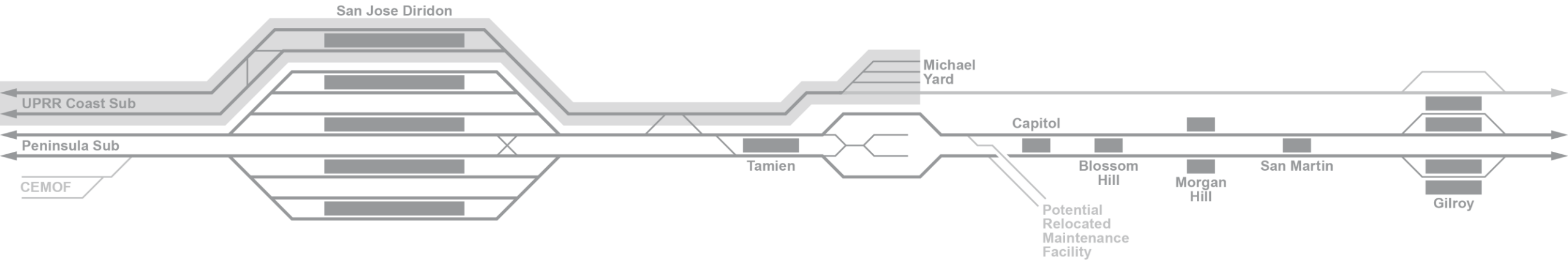
San Jose Terminal Area

2. HSR-PEPD



San Jose Terminal Area

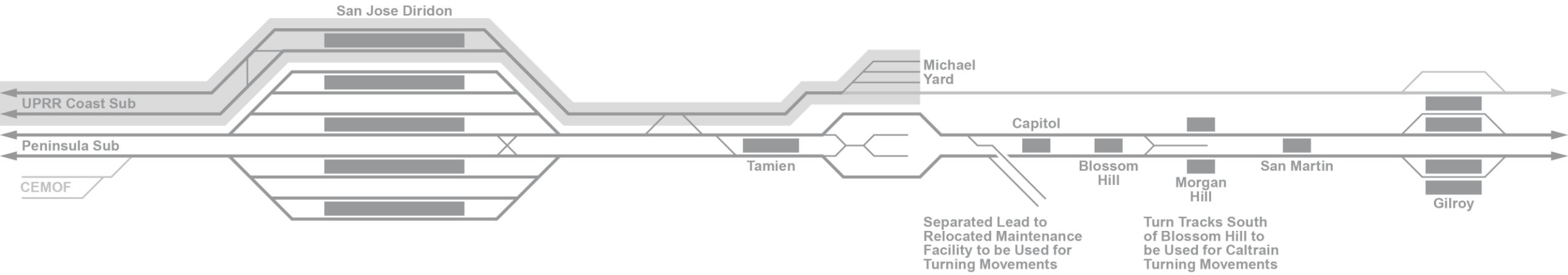
3. HSR-PEPD + Generalized Initial Diridon Integrated Station Concept Plan (DISC) Concepts



UPRR and Diesel Passenger Service Tracks (Analysis Ongoing through DISC Process)

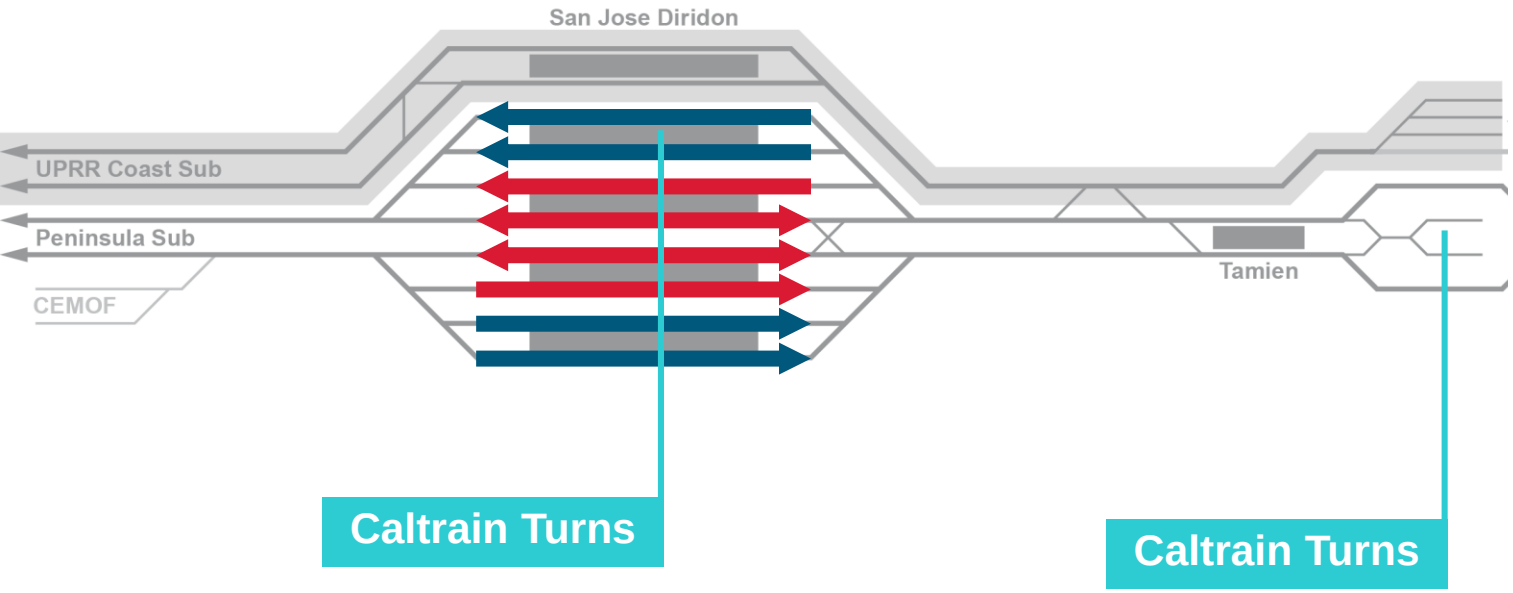
San Jose Terminal Area

4. HSR-PEPD + DISC Concepts + Potential Additional Infrastructure



UPRR and Diesel Passenger Service Tracks (Analysis Ongoing through DISC Process)

SJ Terminal: Baseline Growth



Caltrain

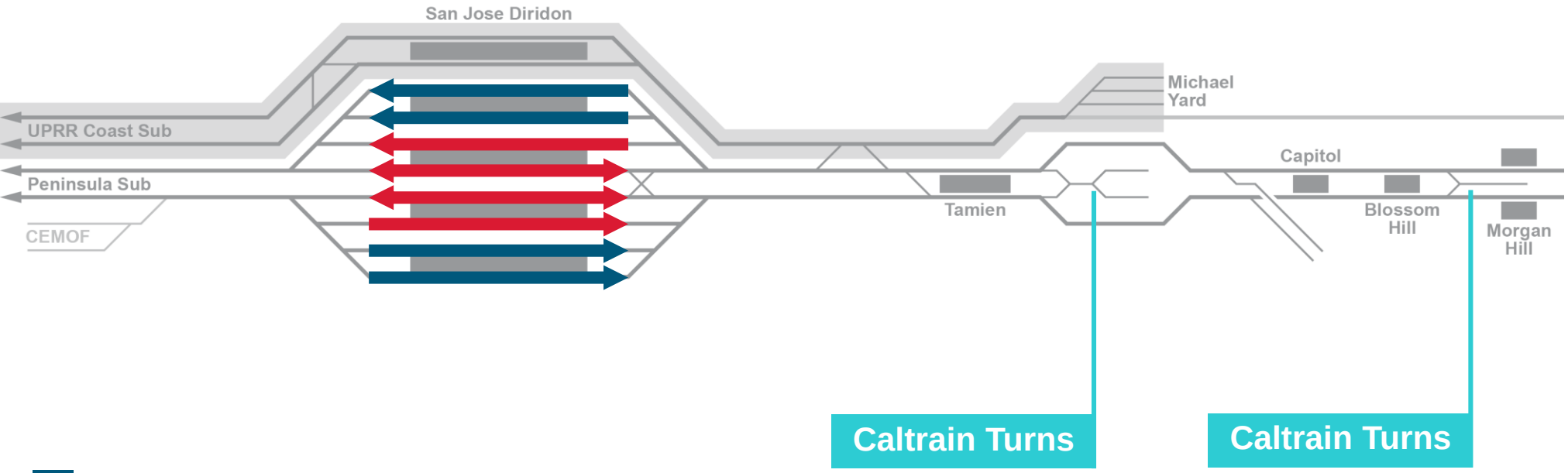
HSR

UPRR and Diesel Passenger Service Tracks

Scenario generally works within infrastructure currently contemplated with some level of operational risk that will be tested with simulation in next round of Business Plan

Operational challenges result from turning six Caltrain and three HSR trains in the Diridon/Tamien area. Possible mitigations for operational risk in the Baseline include additional interlocking infrastructure and/or adjustment to turn locations for HSR in San Jose.

SJ Terminal: Moderate Growth



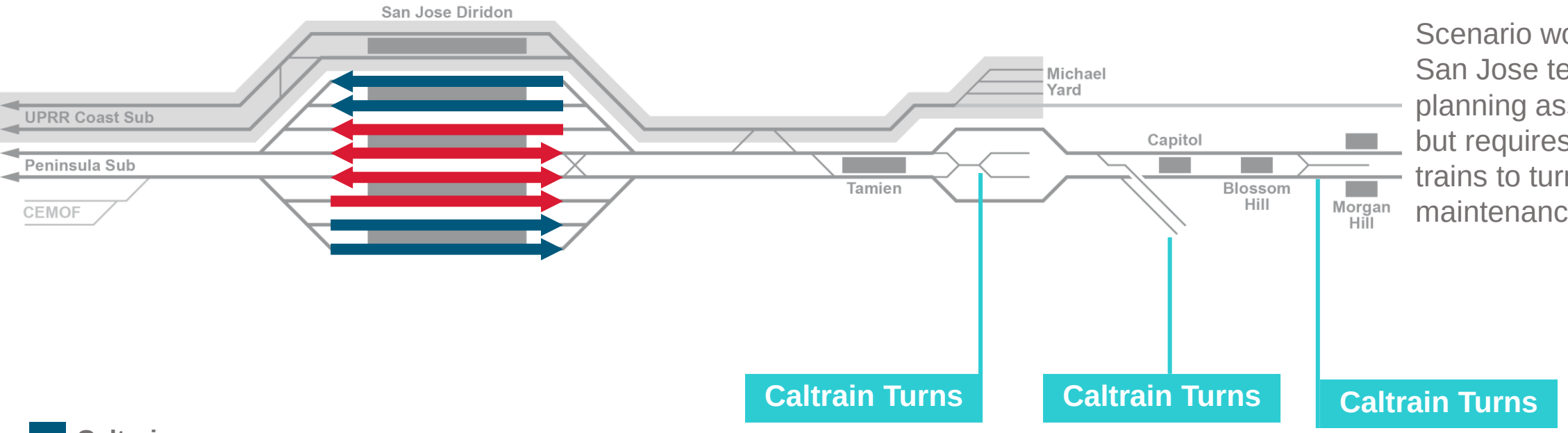
Operating all Caltrain through Diridon and turning a maximum of four trains at Tamien broadly works in currently contemplated infrastructure in PEPD and assumed changes at Diridon contemplated in DISC analysis

Caltrain

HSR

UPRR and Diesel Passenger Service Tracks

SJ Terminal: High Growth



Scenario works with San Jose terminal planning assumptions, but requires some trains to turn at new maintenance facility

Caltrain

HSR

UPRR and Diesel Passenger Service Tracks

Next Steps

Terminal Planning Context

San Francisco Terminal

San Jose Terminal

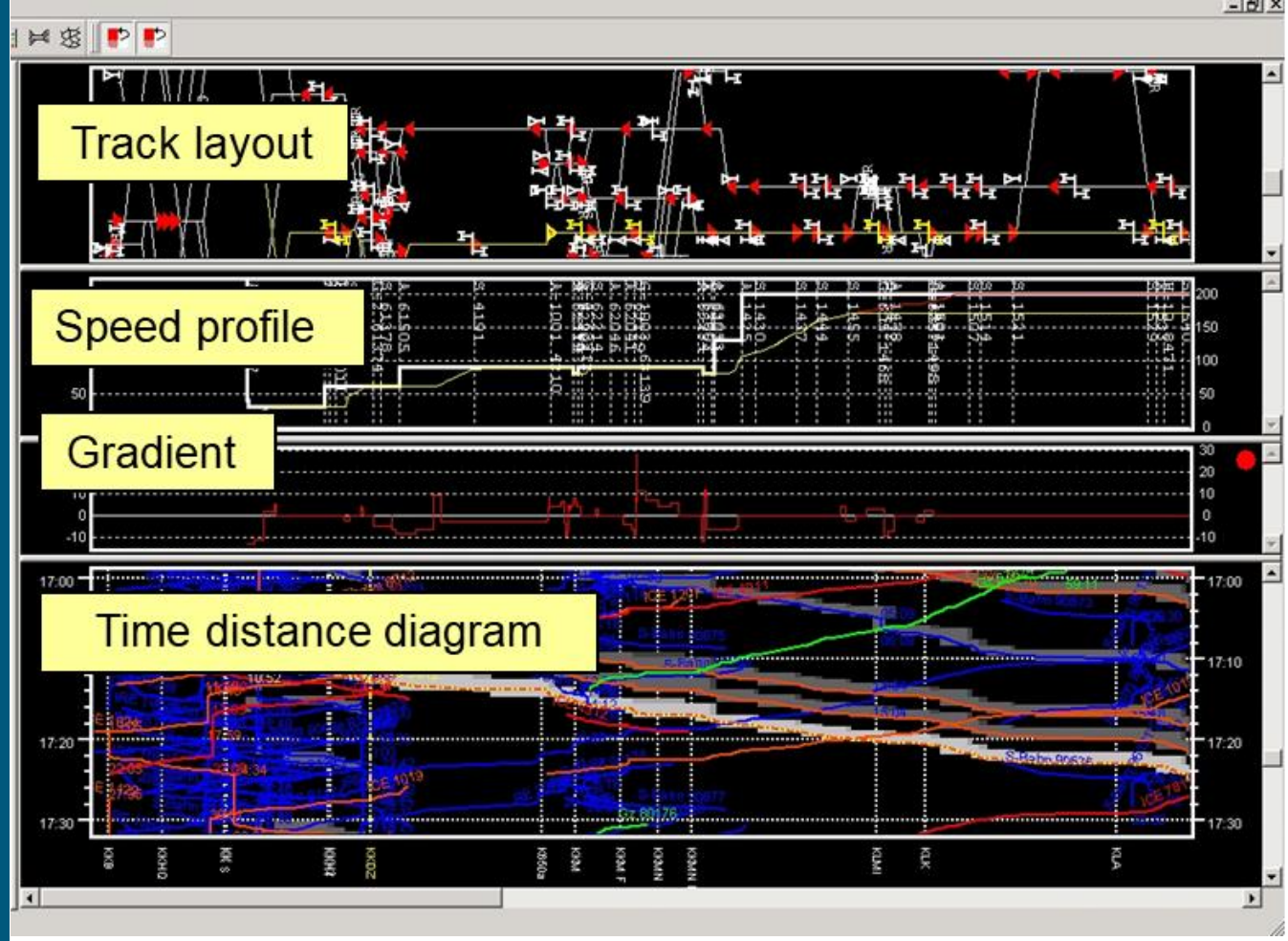
Next Steps

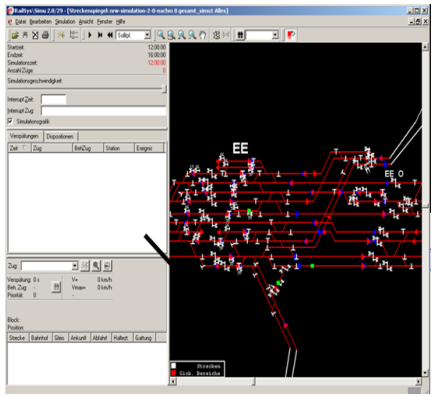
DRAFT

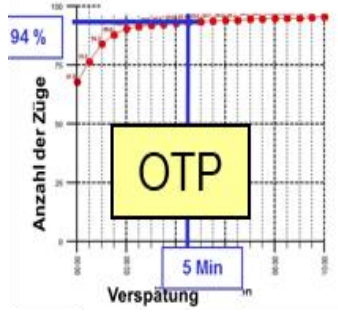
Next Steps: Simulation

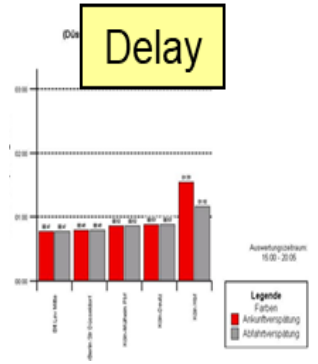
Process

- The primary objective for the simulation analysis is to determine whether the simulation model indicates a stable rush-hour operation absent any major disruptions (e.g. track outages or disabled trains) for the three growth scenarios subject to analysis
- Of particular concern is the extent to which the variability of dwells at intermediate stations will affect the ability to deliver the proposed timetables within reasonable on-time performance parameters









Next Steps: Storage & Maintenance Analysis

Process

- Analyze fleet, storage and maintenance needs associated with the fleet requirements for each of the growth scenarios considered
- Understand when and where new investments in storage and maintenance facilities may be required and analyze how these may impact or benefit overall system operations

Next Steps: Explorations

Examples;

- High Growth stopping pattern tradeoffs
- Dumbarton service connection in Redwood City
- East Bay run-through service via second Transbay Tube
- 22nd St Station relocation

Ridership Forecasts

Ridership Context

Ridership Context

Ridership Forecasts

Capacity & Crowding

Existing Ridership

Today, Caltrain serves bidirectional and polycentric ridership demand

- 62,000 daily boardings[1]
- 64%-36% NB-SB split during AM peak period
- Half of trips occur outside of San Francisco

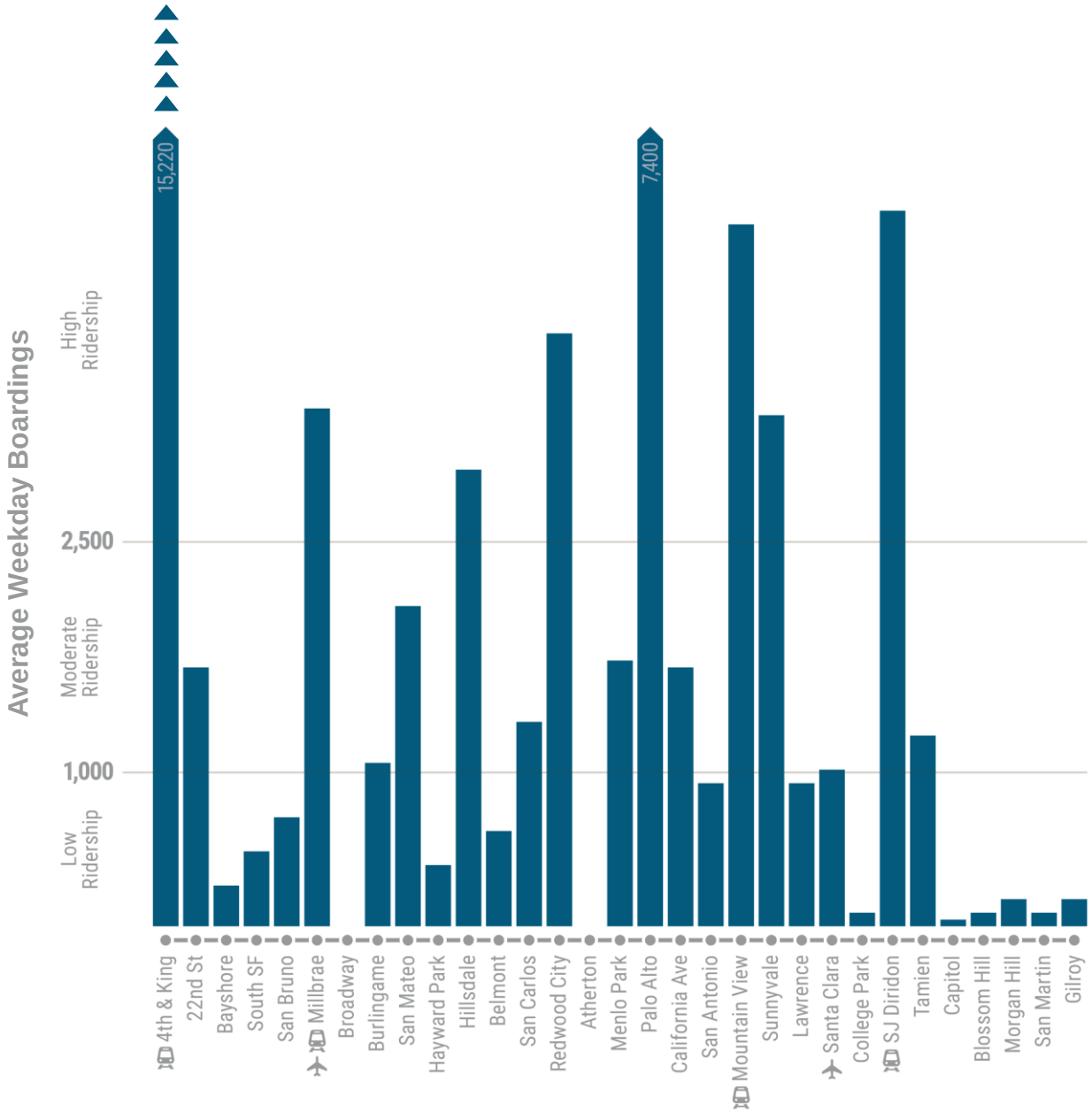
Ridership is highly concentrated around stations with fastest & most frequent Service

- 73% of ridership at 8 Baby Bullet stations served by 4 or more trains per hour, per direction
- There is substantial latent demand, particularly at stations with low service

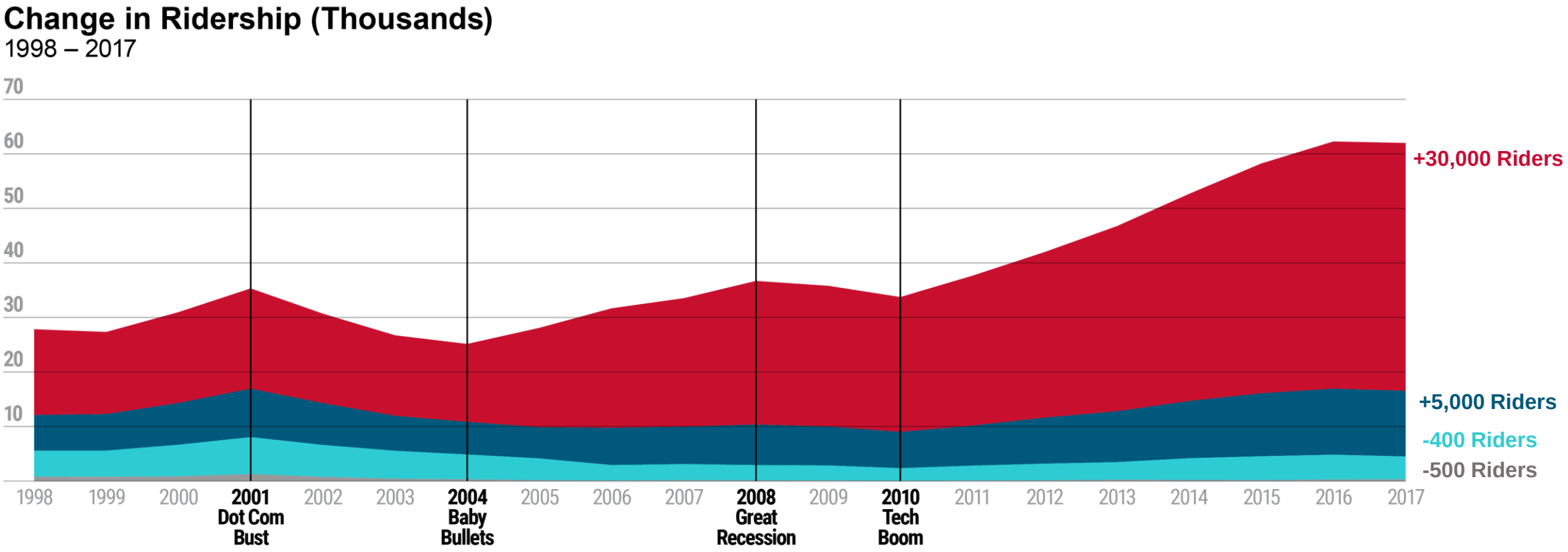
Train occupancy varies by service type

- Many Baby Bullet trains carry 100%-140% of their seated capacity during peak periods, while limited trains vary from about 50% to 120% of seated capacity

[1]Based on 2017 ridership data



Ridership Growth Over Time



Top 8 Stations
4th & King, Millbrae, Hillsdale, Redwood City, Palo Alto, Mountain View, Sunnyvale, San Jose Diridon

Middle 8 Stations
22nd Street, Burlingame, San Mateo, San Carlos, Menlo Park, California Ave, Santa Clara, Tamien

Bottom 8 Stations
Bayshore, South San Francisco, San Bruno, Hayward Park, Belmont, San Antonio, Lawrence, College Park

Gilroy Service
Capitol, Blossom Hill, Morgan Hill, San Martin, Gilroy

Source: 1998-2017 Passenger Counts

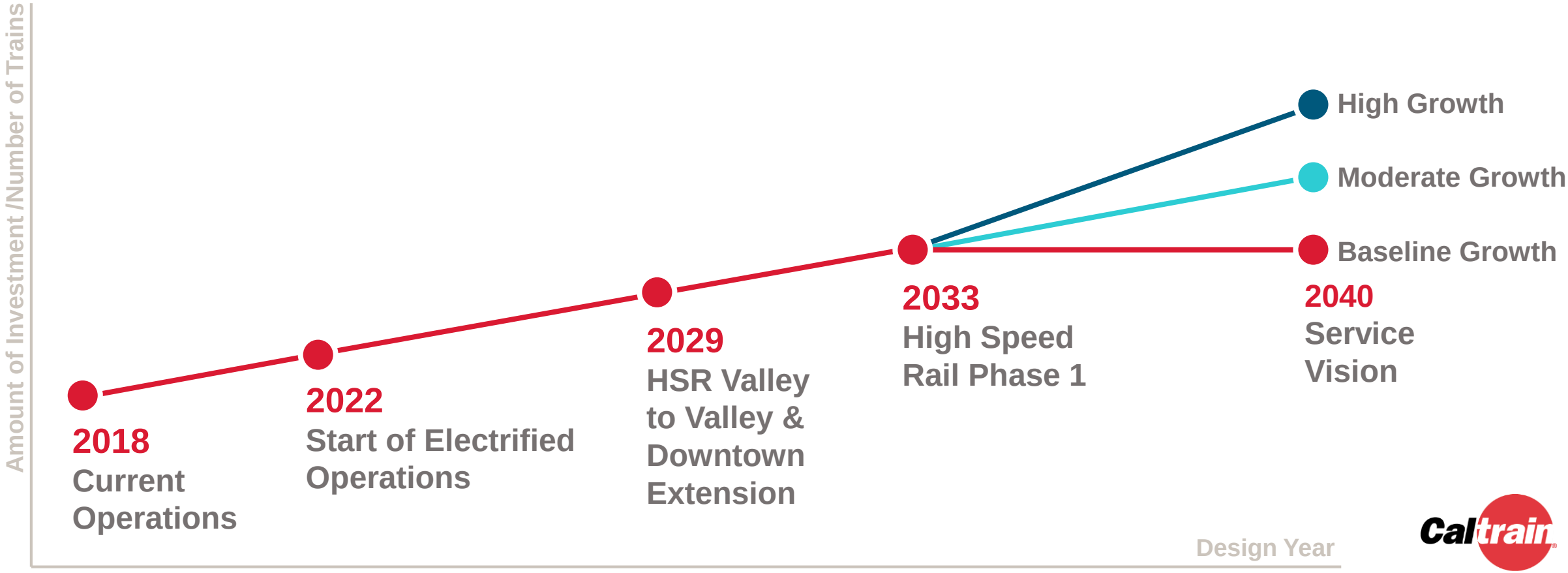
Ridership Forecasts

Ridership Context

Ridership Forecasts

Capacity & Crowding

2040 Service Scenarios



Objectives

Update the Caltrain Ridership Model to forecast changes associated with Growth Scenarios

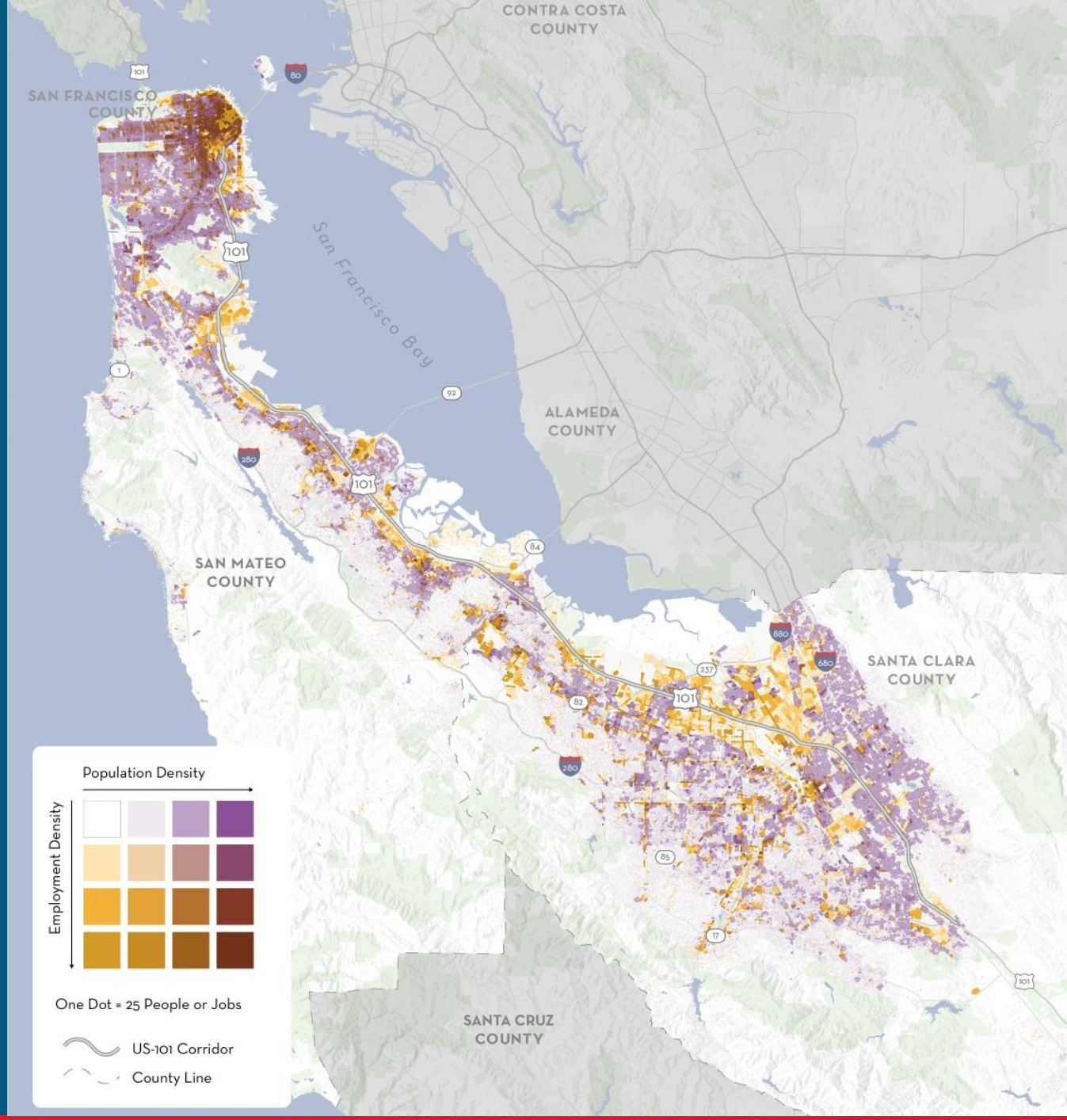
- System, station, and origin-destination forecasts
- Weekday and weekend forecasts
- Breakdown by time period for weekdays (AM peak, midday, PM peak, and evening)

Incorporate sensitivity to regional and local factors influencing ridership

- Regional transportation changes
- Station area land use
- Differentiated service patterns
- Socioeconomic characteristics

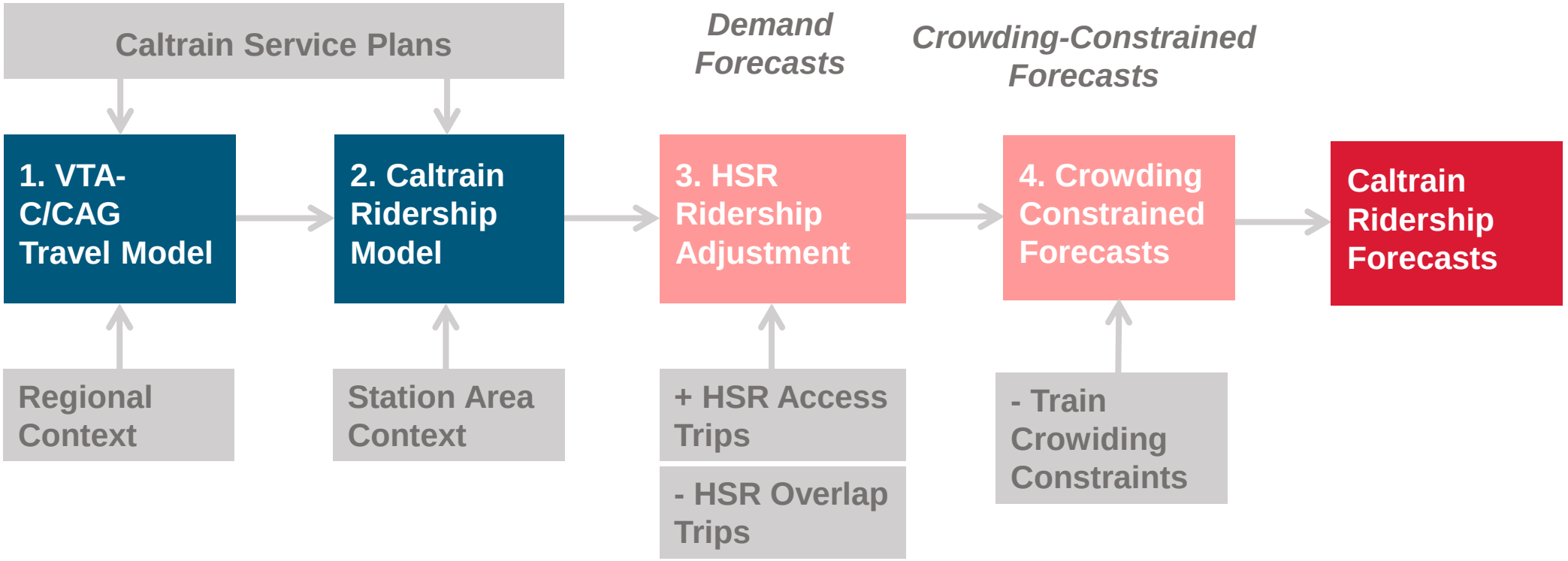
Understand implications of train crowding

- Align ridership against capacity provided
- Consider extent to which service will be able to fully "capture" market given potential train crowding



Ridership Model Structure

Modeling Process



Modeling Objectives

1. Forecast for changes in regional travel behavior over time

2. Refine Caltrain regional distribution & account for micro travel behavior related to Caltrain

- Net Effect: adjusts ridership by station and reduces overall ridership forecast

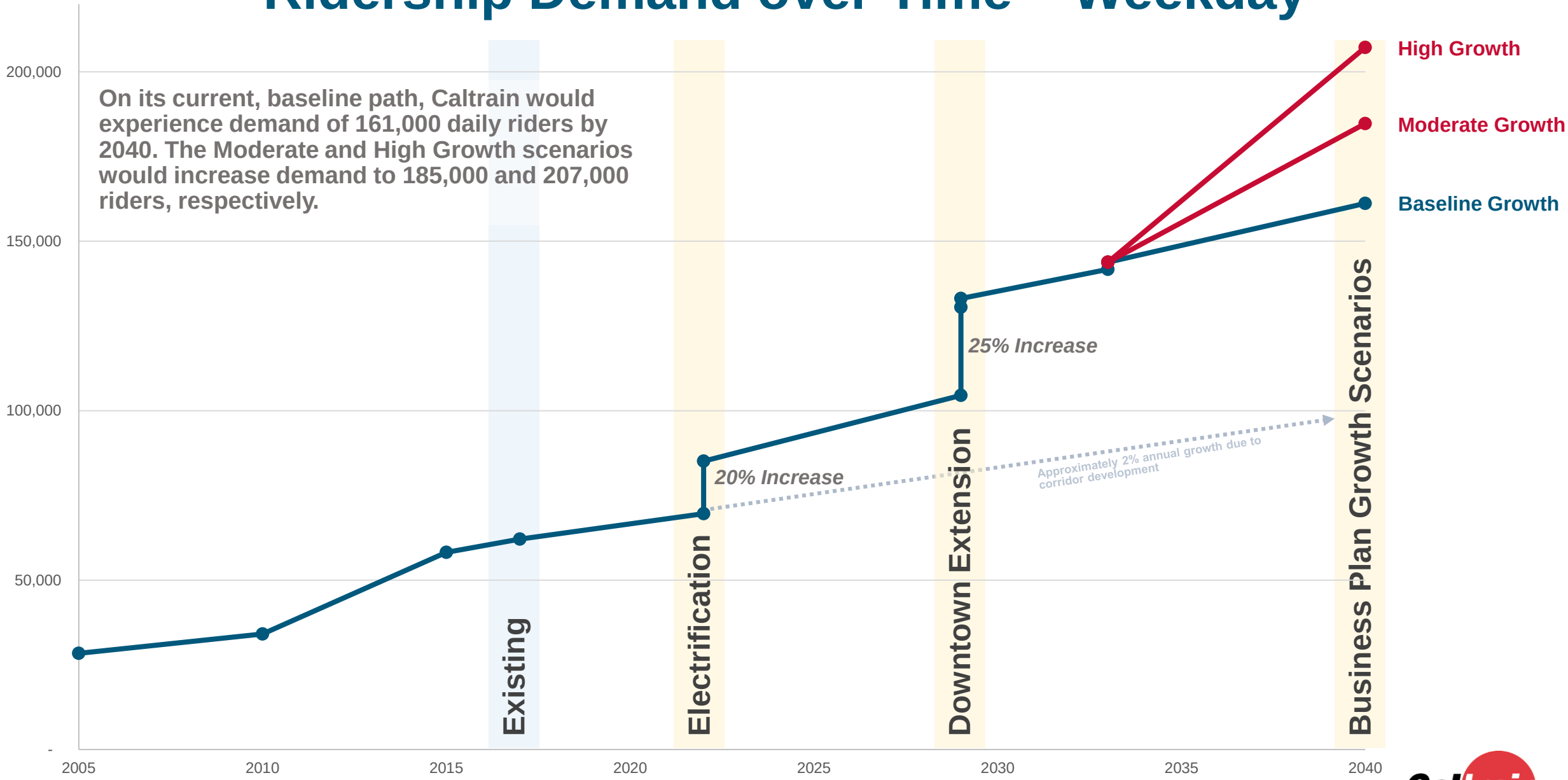
3. Account for HSR influence on Caltrain ridership

+ Net Effect: Subtracts riders on HSR ODs; adds riders as HSR access mode

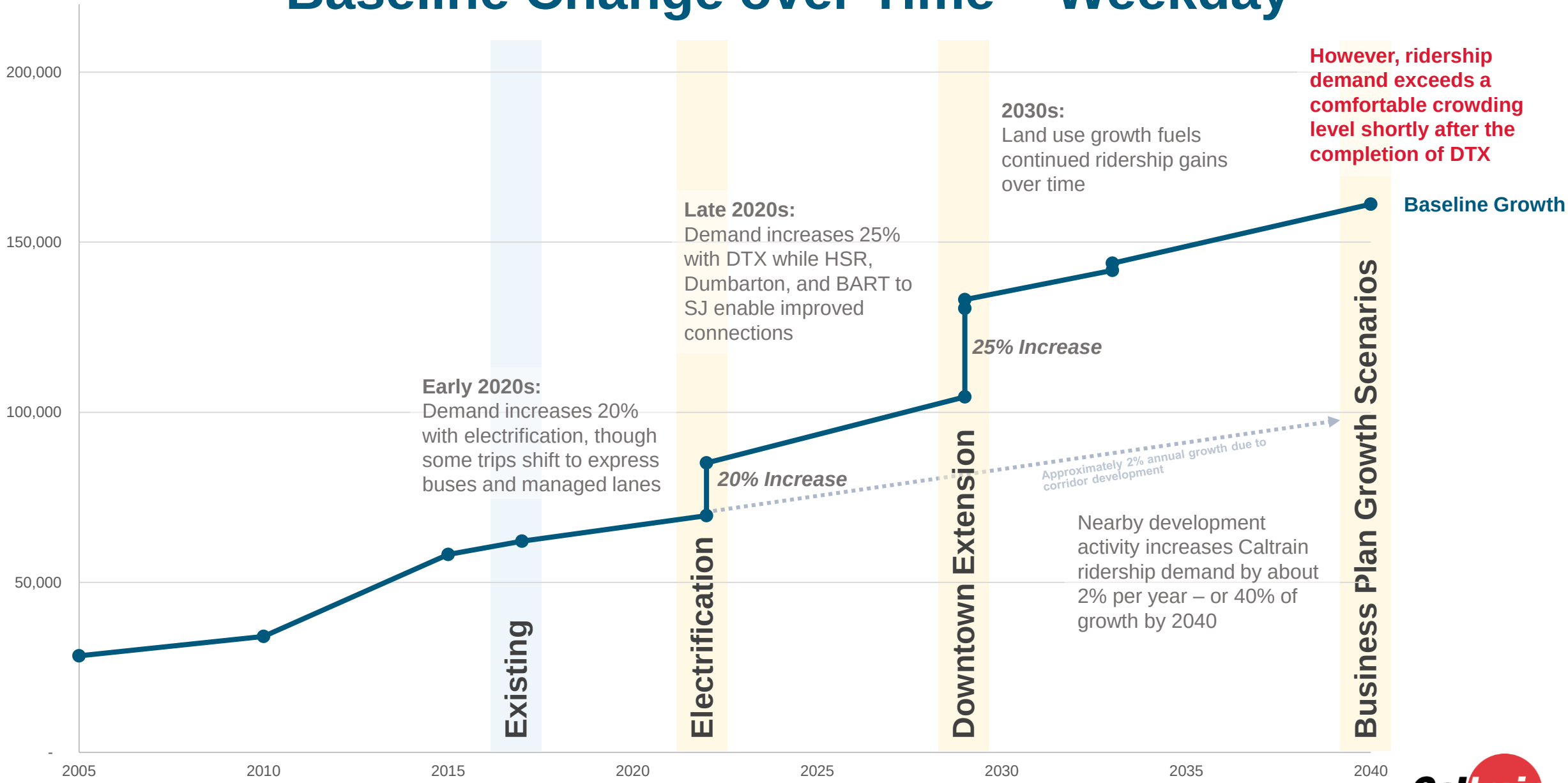
4. Constrain capacity to a comfortable crowding load of 1.35 at each segment

- Net Effect: Decrease overall Caltrain ridership for baseline and moderate growth scenarios

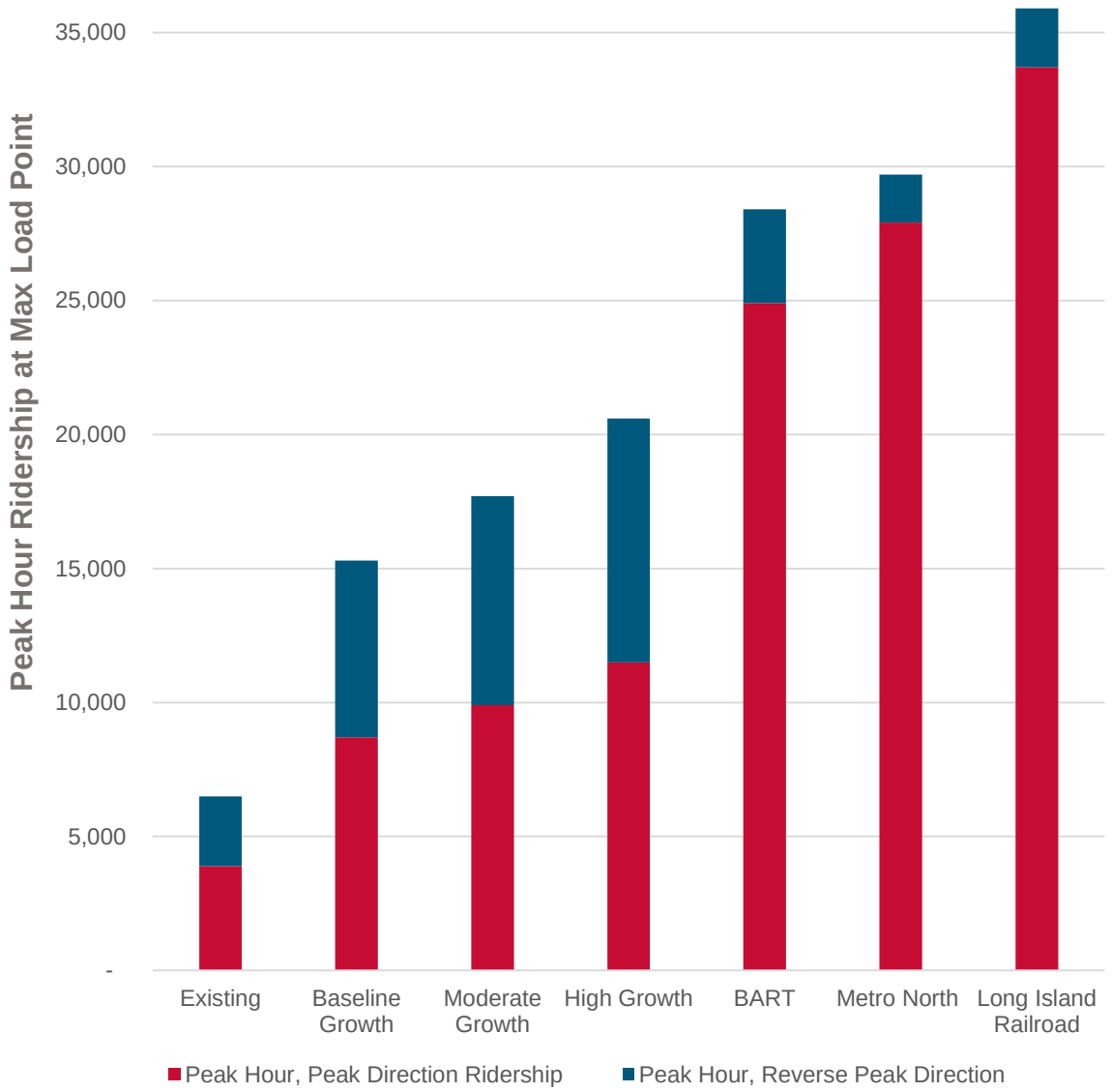
Ridership Demand over Time – Weekday



Baseline Change over Time – Weekday



Peer Comparison: Ridership Demand

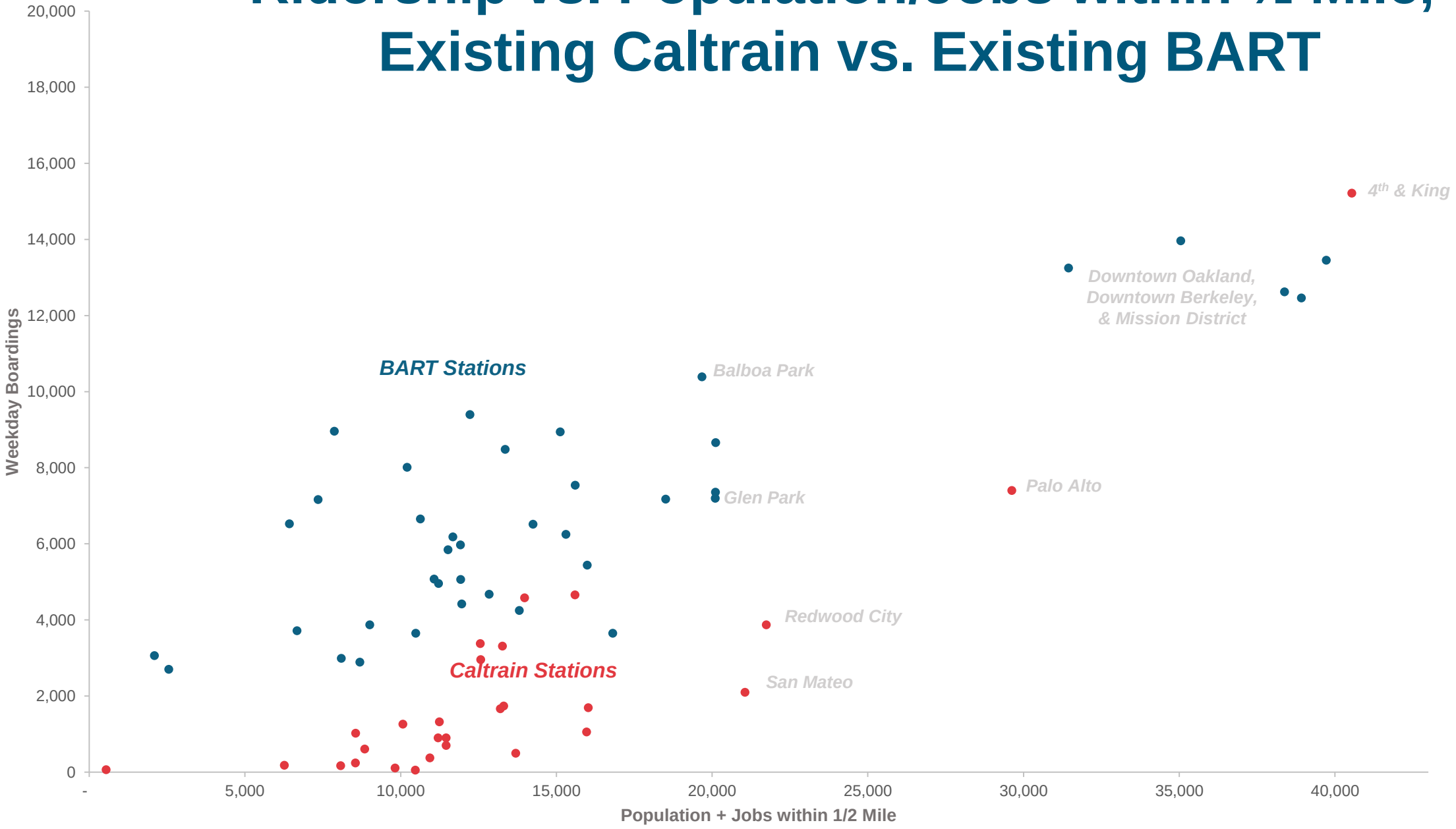


Caltrain's 2040 ridership demand is more balanced (directionally and geographically) than peer corridors

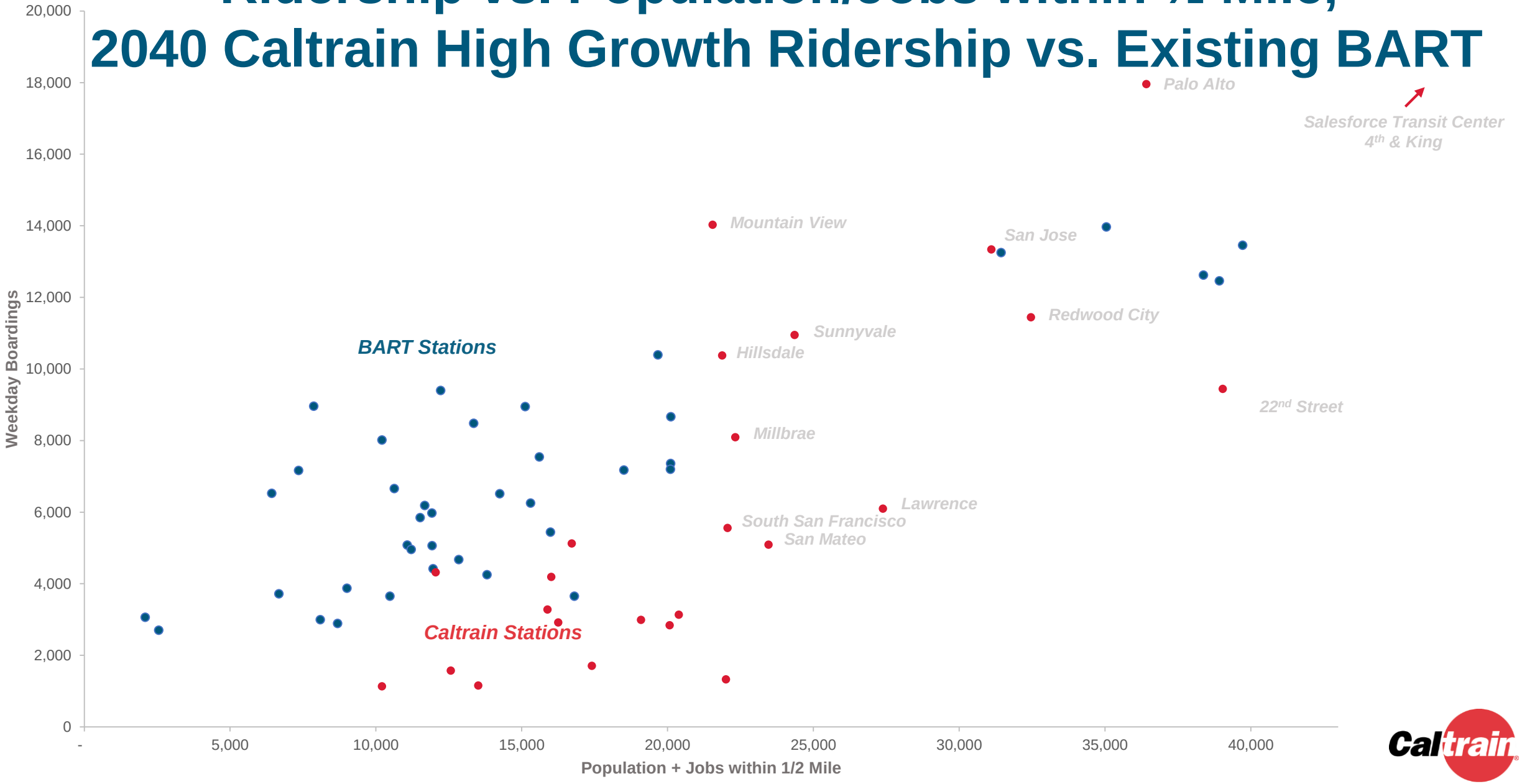
System		Daily	Peak Hour, Max Load Point	Peak % - Reverse Peak %	Peak Hour, Peak Direction Max Load Point
Caltrain	Existing	62,000	6,500	60% - 40%	3,900
	2040 Baseline	161,000*	15,300*	57% - 43%*	8,700
	2040 Moderate	185,000*	17,700*	56% - 44%*	9,900
	2040 High	207,000	20,600	56% - 44%	11,500
BART (All Lines)		414,000	28,400	88% - 12%	24,900
Metro North (Harlem & New Haven Lines)		176,000	27,900	94% - 6%	26,200
Long Island Railroad (All Lines)		350,000	35,900	94% - 6%	33,700

**Excludes capacity constraining for Baseline and Moderate*

Ridership vs. Population/Jobs within ½ Mile, Existing Caltrain vs. Existing BART



Ridership vs. Population/Jobs within ½ Mile, 2040 Caltrain High Growth Ridership vs. Existing BART



Key Findings

1. **Ridership demand could exceed 200,000 riders by 2040**
   i. Under the Baseline Growth condition, Caltrain would attract 161,000 riders by 2040
   ii. Increasing to 8 TPH would increase ridership to 185,000 for the Moderate Growth scenario
   iii. Increasing to 12 TPH would increase ridership to 207,000 for the High Growth scenario

2. **PCEP will provide near-term crowding relief, but growing demand will lead to overcrowded conditions during peak hours upon completion of DTX around 2029**
   i. Caltrain could reach 100,000 riders over the next decade with electrification and land use growth alone
   ii. The Completion of DTX increases Caltrain ridership demand by about 25 percent (27,000 riders)
   iii. While new trains will enable better standing conditions for passengers, the level of crowding expected will be uncomfortable and may not be a competitive option for choice riders

3. **By 2040 the Baseline and Moderate Growth scenarios face crowding challenges, while the High Growth does not.**
   i. By 2040 the Baseline and Moderate Growth scenarios exceed a comfortable crowding condition by about 30 to 40 percent for peak hour, peak direction travel.

DTX & Intra-San Francisco Ridership

1. **STC Surcharge**
   i. Assumed average surcharge of $2.50 (or $3 in 2029 dollars) per trip, roughly equivalent to a separate fare zone
   ii. STC would serve about 25,000 daily boardings, but some potential riders may shift to other modes
   iii. Ultimate surcharge amount and mechanism will influence ridership outcomes at STC
2. **Location of 22nd Street Station**
   i. Ridership forecasts suggest 6,000-10,000 daily station boardings by 2040, but may be higher or lower depending on potential station relocation
3. **Intra-SF Ridership**
   i. With opening of DTX Caltrain could offer substantial time savings for intra-SF trips and as connection to BART, Transbay buses, and ferries
   ii. Ridership forecasts suggest 4,000-7,000 trips, but could be 20,000-30,000 if similar to BART

Origin-Destination Pair	Estimated Travel Time (& Frequency by Growth Scenario)	
	Muni	*Caltrain*
4th & King – STC/Montgomery Station	15 minutes (6 trains per hour)	4 minutes (6-8 trains per hour)
22nd Street – STC/Montgomery Station	25 minutes (6 trains per hour)	8 minutes (4-8 trains per hour)
Bayshore – STC/Montgomery Station	37 minutes (8 buses per hour)	13 minutes (2-4 trains per hour)

South of Tamien Ridership

Daily Boardings				
Topic	*Existing*	*2040 Baseline*	*2040 Moderate*	*2040 High*
Capitol & Blossom Hill	300	700	3,500	4,300
Morgan Hill & Gilroy	400	600	1,300	1,600

**Excludes capacity constraining for Baseline and Moderate*

Findings

- There is reasonably strong demand for service in southern San Jose, where Capitol and Blossom Hill would serve 3,000-4,000 new boardings per day with service every 15 minutes
- There is lower demand in Morgan Hill and Gilroy with half-hourly peak period service and hourly off-peak service
  - Smaller markets with less housing growth
  - HSR is attractive option at Gilroy due to higher frequency service to San Jose and faster travel times to San Francisco and Millbrae

Off-Peak & Weekend Ridership

Daily Boardings				
Topic	*Existing*	*2040 Baseline*	*2040 Moderate*	*2040 High*
Off-Peak Boardings (Early AM, Midday, and Evening)	7,300	23,000	34,700	35,900
Weekend Boardings	12,400	43,300	58,800	61,200

Findings

- There is strong potential for growth during off-peak and weekend periods, although there is particularly high uncertainty given data and model limitations
- However, station demand is highly sensitive to service frequency. Demand is highest at stations receiving service every 15 minutes or greater, and lower at stations receiving service every 30 or 60 minutes

2040 Capacity & Crowding

Ridership Context

Ridership Forecasts

Capacity & Crowding

Crowding

How crowded will trains be? Will they still be a competitive choice? Will they be able to serve their full potential market demand?

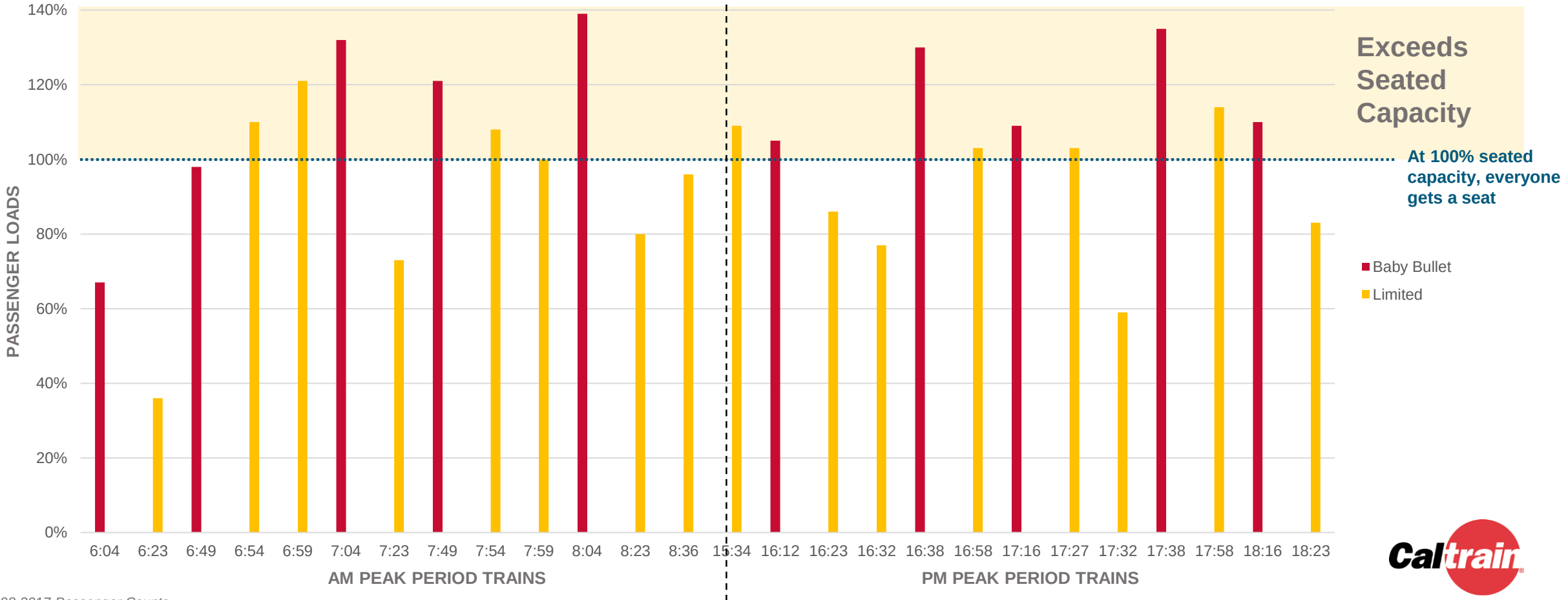
- The underlying ridership model projects demand based on land use and service levels- it does not take comfort and crowding into account

- If Caltrain is highly crowded and uncomfortable will it still be a competitive mode? Is there a portion of future demand that we may not capture if the trains are uncomfortably full?

For the purposes of Business Planning, Caltrain is assuming that it can competitively serve passenger loads of up to 135% of seated capacity during regular service. At higher levels of crowding the service may not be competitive for choice riders and Caltrain may not be able to fully capture potential demand

Context - Crowding

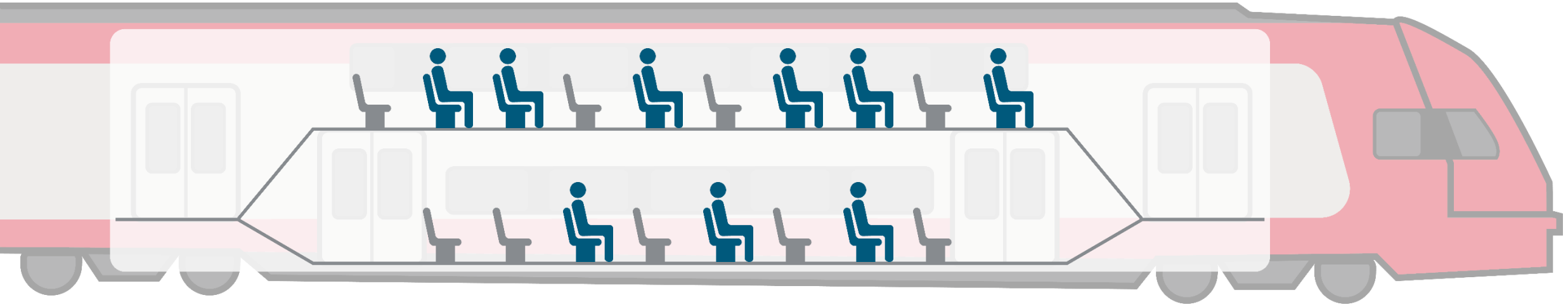
Today, 15 of 28 peak commute direction trains exceed seated capacity during peak periods. Baby Bullet trains are usually beyond their seated capacities (averaging 115%), while Limited trains are typically near capacity (averaging 92%). Max train loads vary from 40% to 140%.



Source: 1998-2017 Passenger Counts

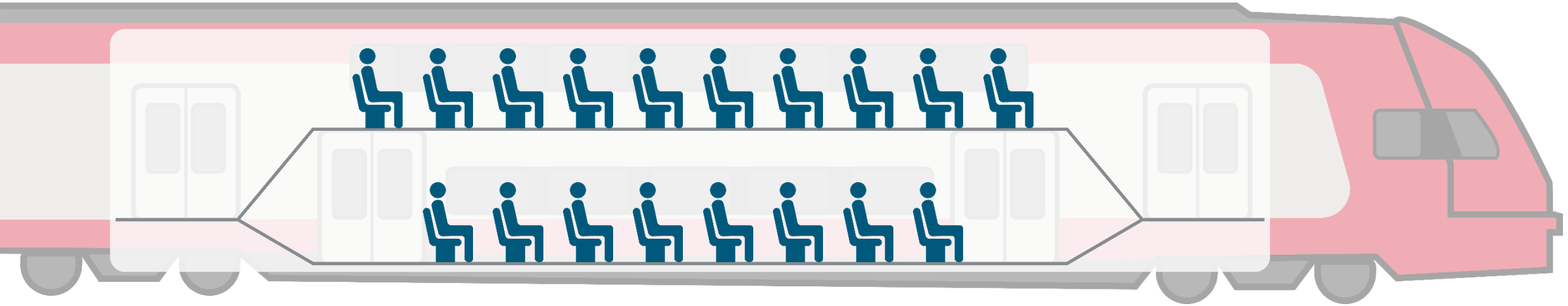
Train Capacity and Crowding

50% Occupancy – Many seats available



Train Capacity and Crowding

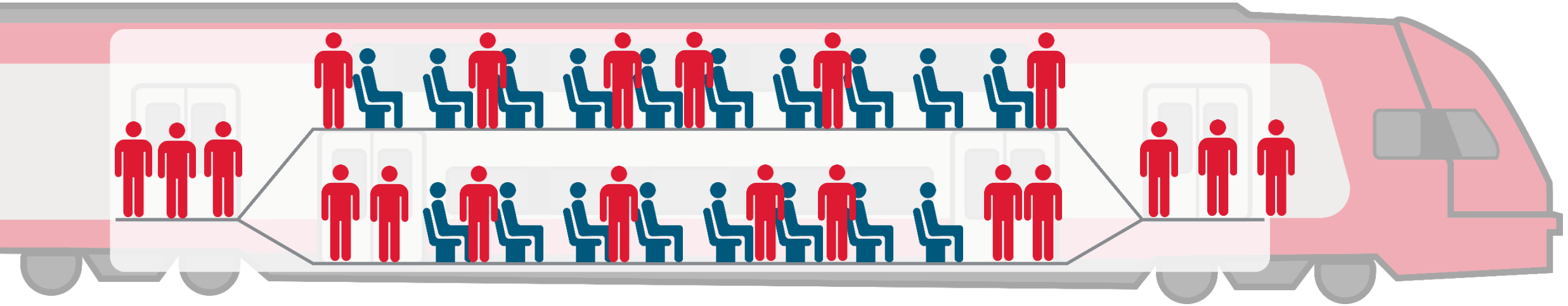
100% Occupancy – Everyone gets a seat



This level of occupancy is the planning standard used for commuter rail by FTA

Train Capacity and Crowding

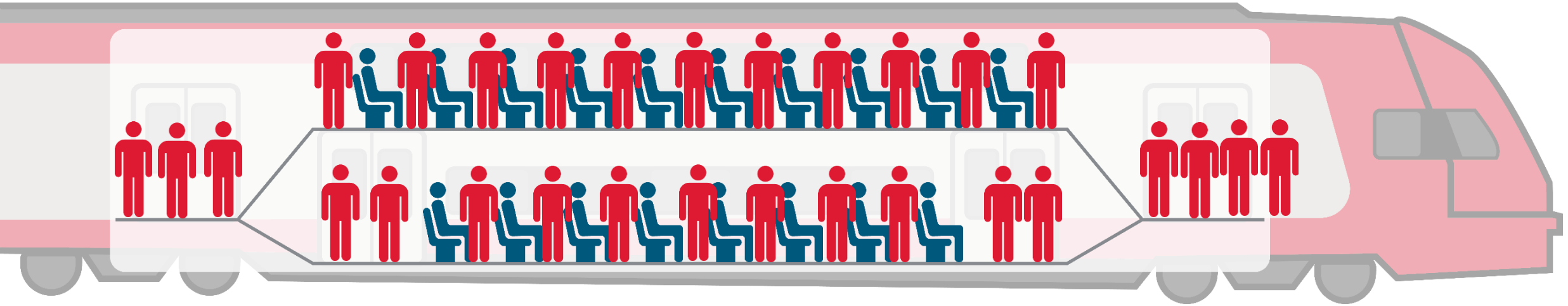
135% Occupancy – Most are seated and everyone else can stand comfortably



This level of occupancy roughly equates to the planning standard used for commuter rail lines into London and on S-Bahn (commuter) trains in Germany. Depending on the specific train design this level of occupancy generally equates to less than two standees per square meter of space

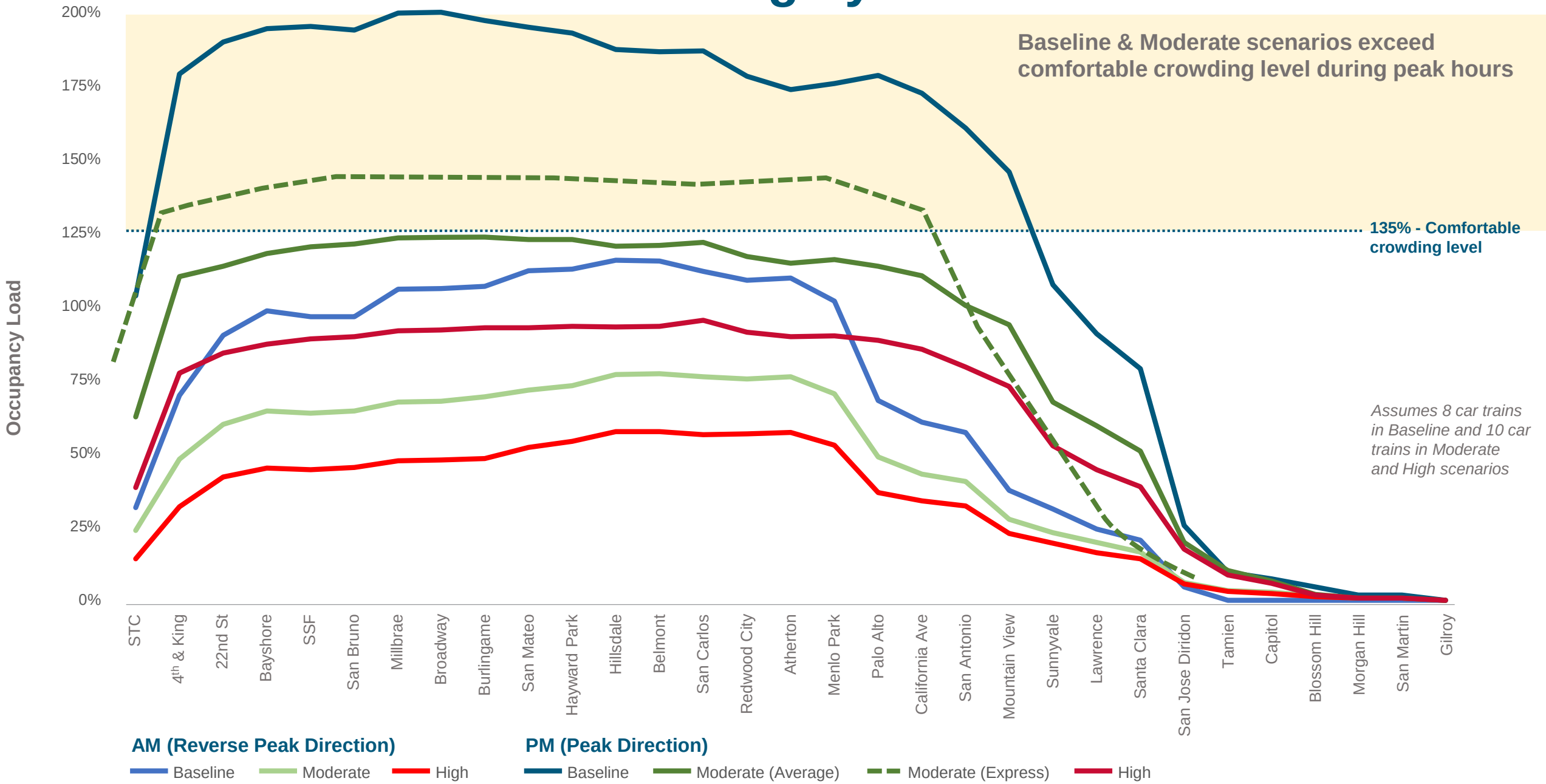
Train Capacity and Crowding

More than 135% Occupancy – Many are standing and may be uncomfortable

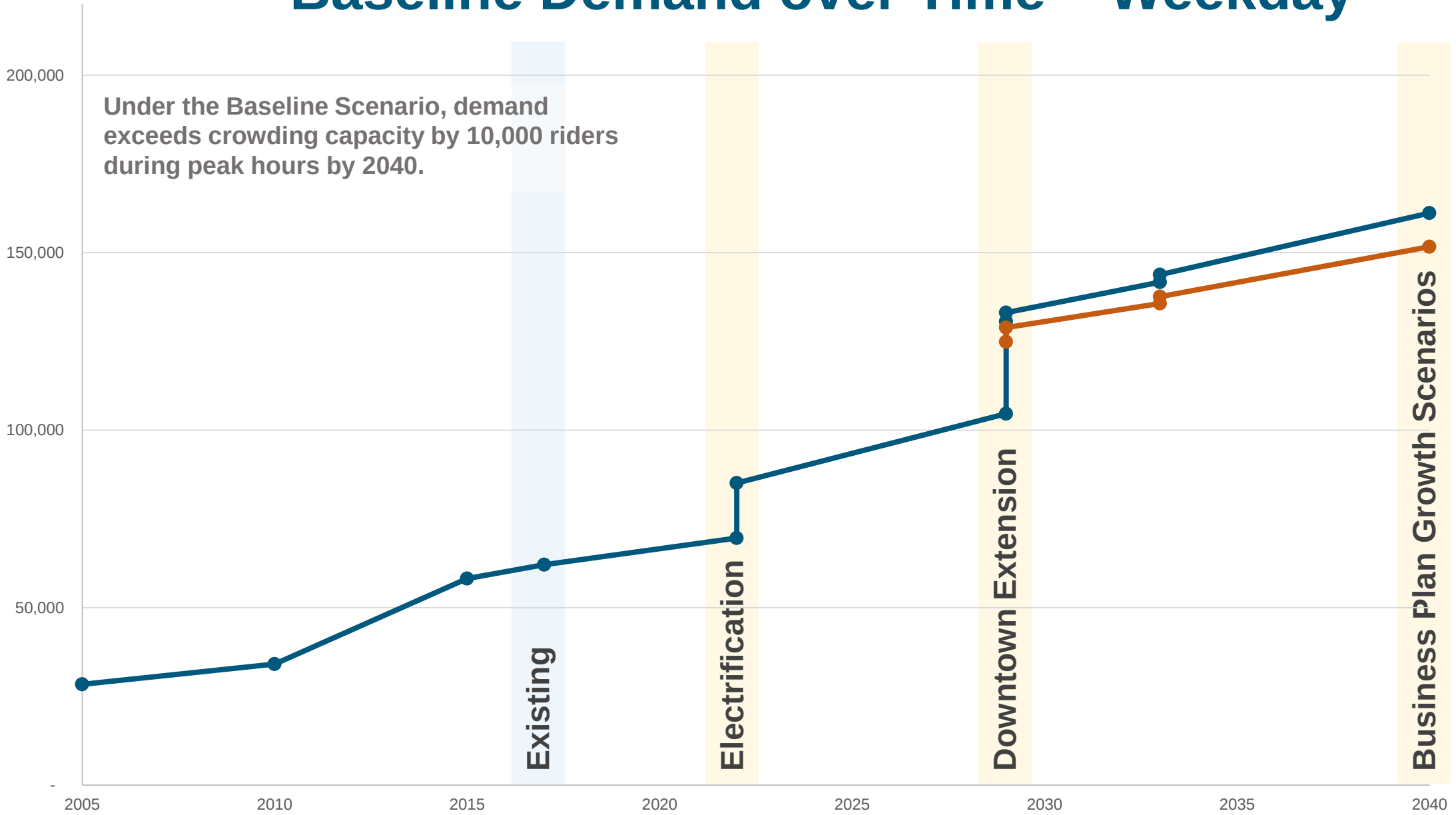


While occupancy loads well over 150% can be safely accommodated, passengers will feel crowded and uncomfortable and the service may not be attractive to choice riders

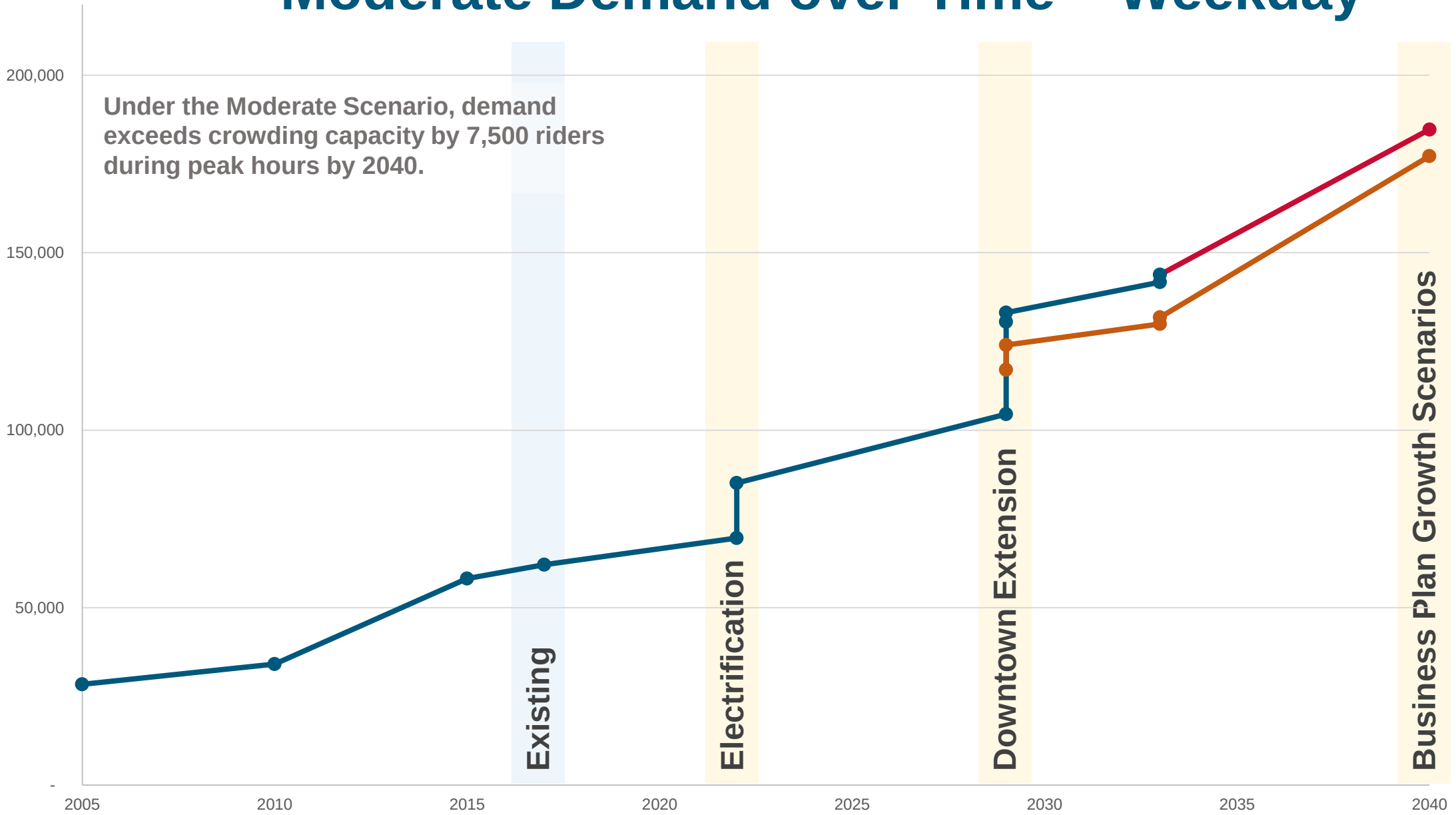
2040 Crowding by Scenario



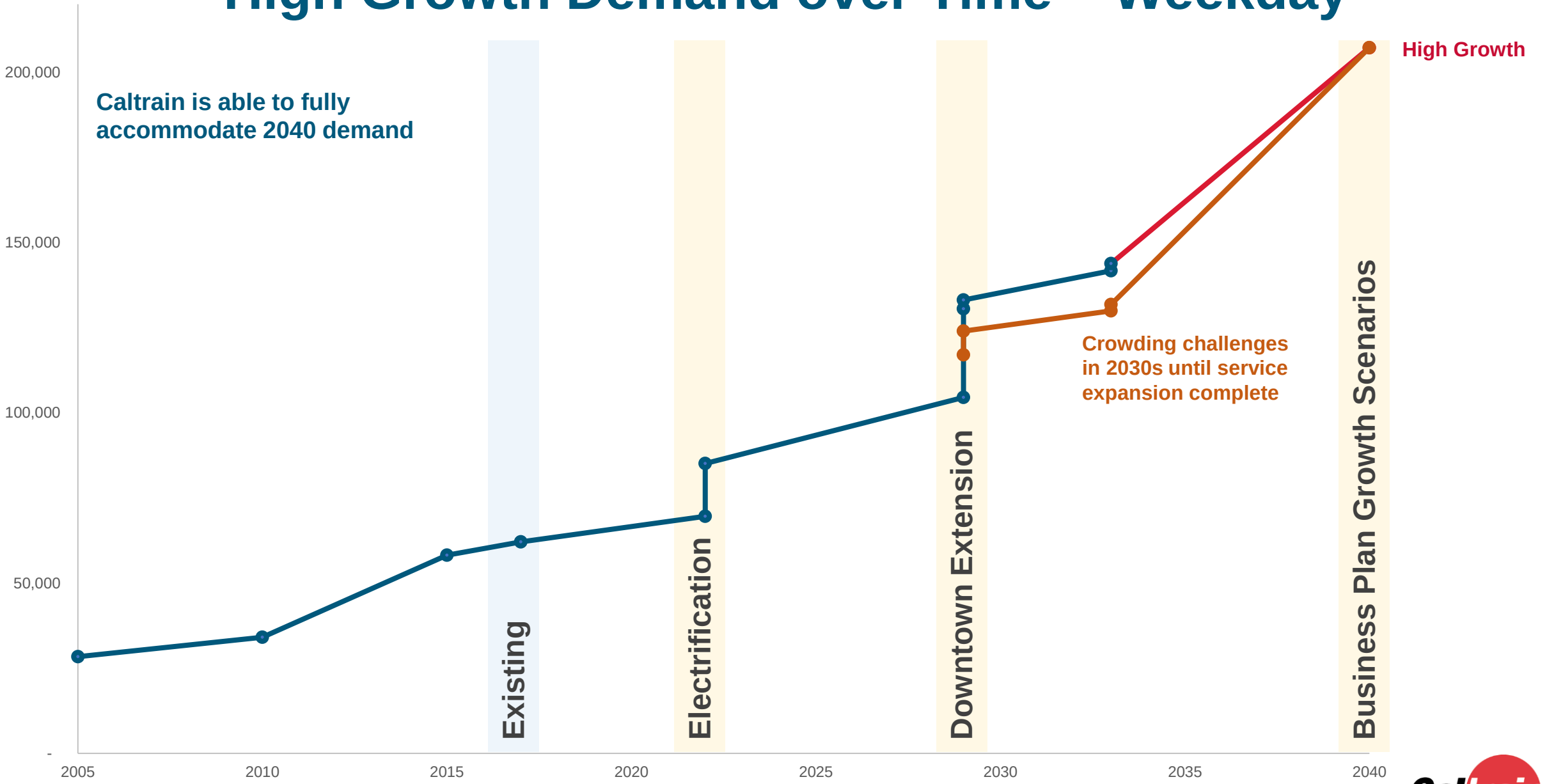
Baseline Demand over Time – Weekday



Moderate Demand over Time – Weekday



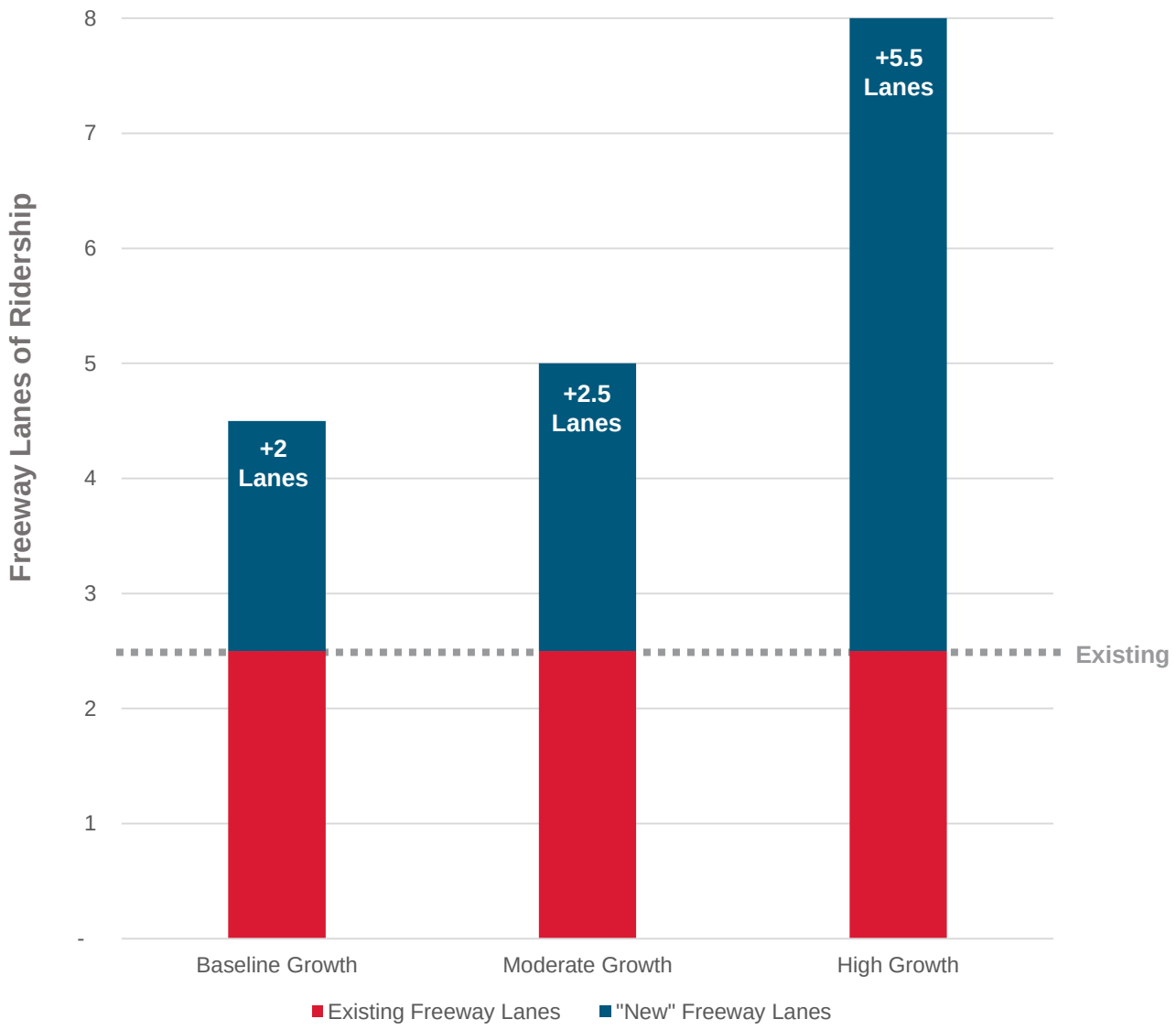
High Growth Demand over Time – Weekday



System Forecasts- Constrained for Crowding

Systemwide Boardings: Weekday Ridership				
Model Year	*Service Plan*	*Demand*	*Capacity Constrained*	*Notes*
2017	5 TPH	62,100	62,100	Electrification increases service and capacity. Combined with the Central Subway, significant latent demand is unlocked within the system. After the completion of DTX, peak Caltrain ridership demand would exceed capacity. Ridership continues to grow during shoulder peak and off-peak periods.
2022	5 TPH	69,700	69,700	
	6 TPH	85,000	85,000	
2029	6 TPH	103,100	103,100	
	6 TPH (+ DTX)	130,600	124,900	
	6 TPH (+ DTX and 2 HSR)	132,900	128,900	
2033	6 TPH (+ 2 HSR)	141,700	135,700	
	6 TPH (+ 4 HSR)	143,800	137,600	
2040	Baseline 6 TPH (+ 4 HSR)	161,200	151,700	
2040	Moderate 8 TPH (+ 4 HSR)	184,800	177,200	Demand for express trains would exceed a comfortable crowding level. While local trains could serve some excess capacity, some riders would choose other modes in lieu of a longer local travel time.
2040	High 12 TPH (+ 4 HSR)	207,300	207,300	Sufficient peak capacity and more connected local service serving off-peak and weekend demand.

Rider Throughput as Freeway Lanes



Caltrain's peak load point occurs around the mid-Peninsula. Today, Caltrain serves about 3,900 riders per direction during its busiest hour at this peak load point. This is equivalent to 2.5 lanes of freeway traffic.

The **Baseline Growth Scenario** increases peak hour ridership to about 6,400 riders at the peak load point – equivalent to widening US-101 by 2 lanes. Peak hour demand exceeds capacity by about 40%.

The **Moderate Growth Scenario** increases peak hour ridership to about 7,500 riders at the peak load point – equivalent to widening US-101 by 2.5 lanes. Peak hour demand exceeds effective capacity by about 35% due to higher demand for express trains.

The **High Growth Scenario** increases peak hour ridership to over 11,000 at the peak load point – equivalent to widening US-101 by 5.5 lanes. All ridership demand is served.

Assumes 135% max occupancy load

Next Steps

Next Steps

Upcoming Work & Updates

- Service Planning
  - Explorations and Variations
  - Simulation analysis
- Business Case Development
  - Corridor Investments and Capital Costs
  - Operating Costs and Revenues
  - Mobility and Environmental Benefits
- Community Interface Assessment
  - Grade Separation Update

FOR MORE INFORMATION

WWW.CALTRAIN.COM

2040 Station Demand: Top 12

Weekday Boardings				
Station	**Existing**	**Baseline Growth**	**Moderate Growth**	**High Growth**
4th & King	15,200	20,600	23,800	27,300
Salesforce Transit Center	0	21,600	26,800	25,000
Palo Alto	7,400	14,900	15,700	18,000
Mountain View	4,500	11,700	12,700	14,100
San Jose	4,700	11,100	12,000	13,400
Sunnyvale	3,300	7,700	10,000	11,700
Redwood City	3,900	8,300	9,400	11,500
Hillsdale	3,000	8,400	9,000	10,400
22nd Street	1,700	5,800	7,100	9,500
Millbrae	3,400	8,900	7,900	8,100
Lawrence	900	5,400	4,700	6,100
South San Francisco	500	2,100	5,500	5,600

Notes:

- *Excludes capacity constraining.*
- *San Francisco ridership may vary depending on location of 22nd Street station and Salesforce Transit Center surcharge. Future SFCHAMP modeling may better inform intra-SF ridership demand.*

2040 Station Demand: Largest Gains

Weekday Boardings – 2040 High Growth vs. Existing				
Station	**Existing**	**2040 High Growth**	**Change**	**% Change**
Capitol	55	1,700	1,600	2,909%
Blossom Hill	107	2,600	2,500	2,336%
Bayshore	240	3,200	3,000	1,250%
South San Francisco	496	5,600	5,100	1,028%
Hayward Park	376	2,900	2,500	665%
Lawrence	907	6,100	5,200	573%
22nd St	1,687	9,500	7,800	462%
Morgan Hill	181	900	700	387%
Gilroy	173	700	600	347%
Tamien	1,264	5,100	3,900	309%
Hillsdale	2,963	10,400	7,500	253%
San Antonio	904	3,000	2,100	232%

Notes:

- *Excludes Salesforce Transit Center.*
- *22nd Street Station ridership may vary depending on station location and Salesforce Transit Center surcharge.*

2040 County to County Demand

Daily County to County Ridership Demand				
County OD Pair	**Existing**	**Baseline Growth**	**Moderate Growth**	**High Growth**
San Francisco-San Mateo	11,500	36,500	37,200	37,700
San Francisco-Santa Clara	22,600	57,400	71,200	74,800
San Mateo-Santa Clara	15,800	29,700	35,500	46,400
Within San Francisco	100	4,400	7,000	7,100
Within San Mateo	4,900	13,300	11,900	16,000
Within Santa Clara	7,200	19,900	21,900	24,500

Notes:

- *Excludes capacity constraining.*
- *Future SFCHAMP modeling may better inform intra-SF ridership demand and implications of STC fare surcharge.*
- *Southern Santa Clara County stations account for 1,300 riders in Baseline Scenario, 4,800 in Moderate Scenario, and 5,900 in High Scenario*
- *HSR, Dumbarton Rail, and BART to San Jose each account for an increase of about 1,000-2,000 daily trips over existing.*

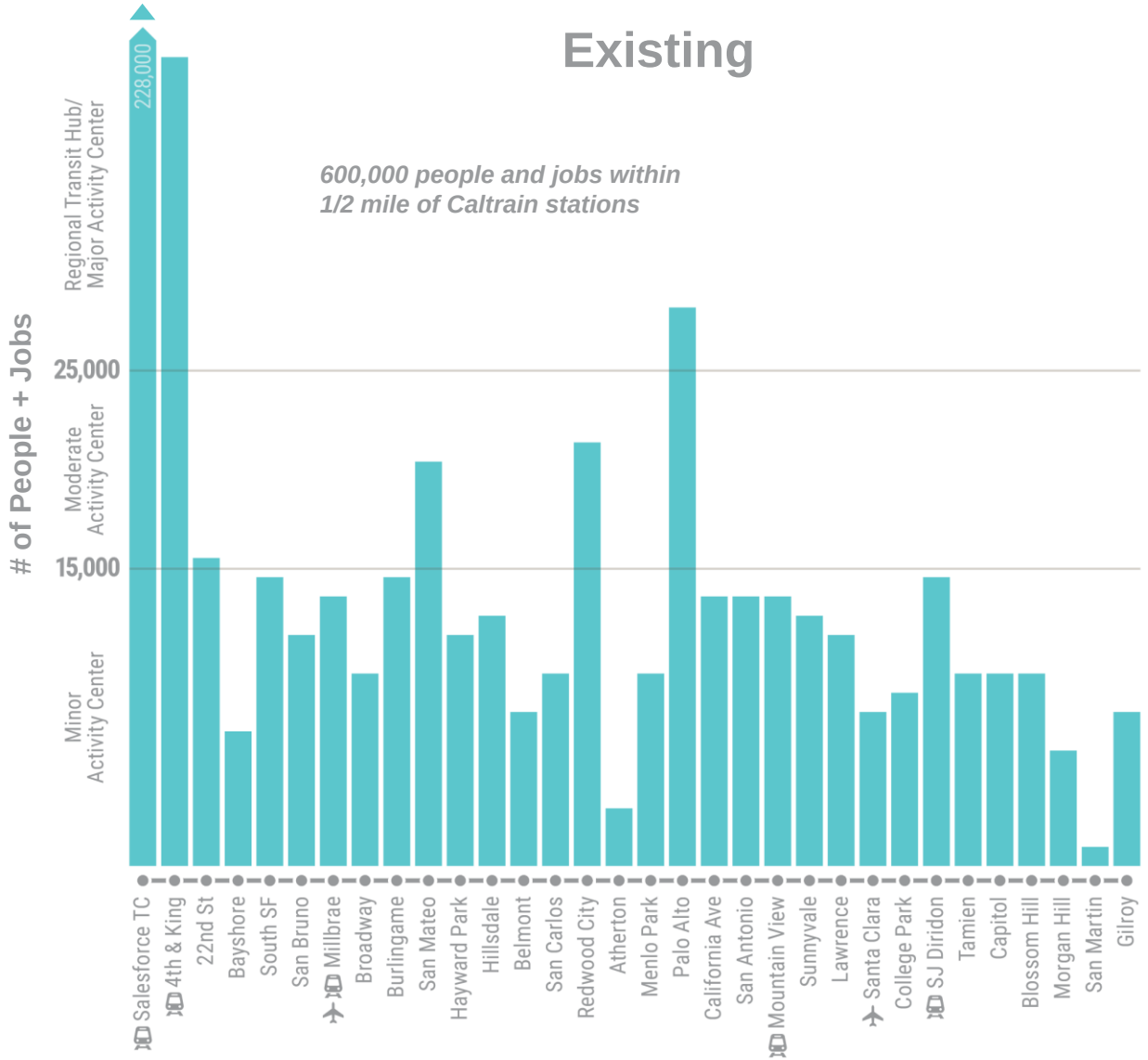
2040 Station OD Demand

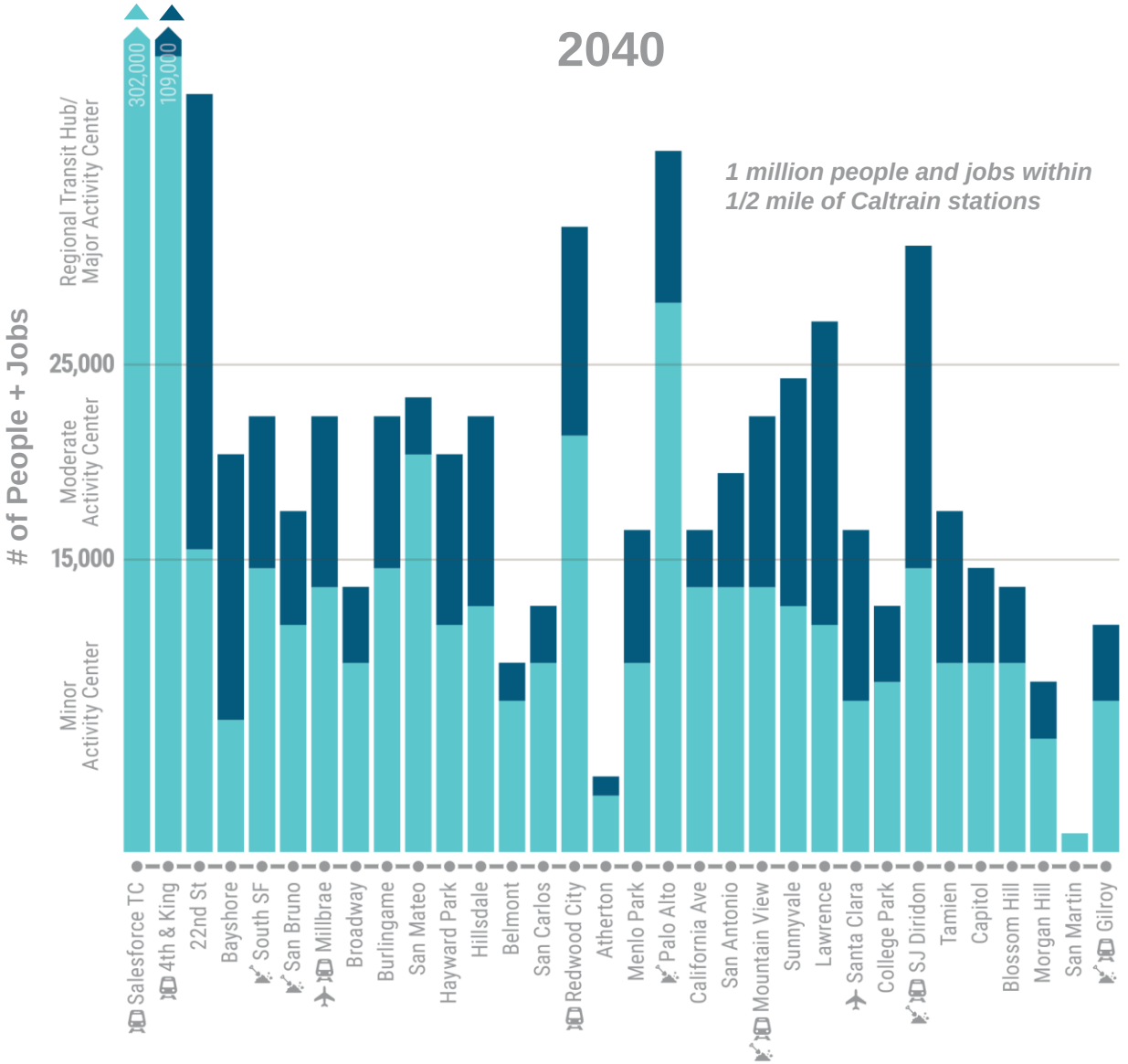
Top 5 Station OD Pairs, Including Downtown San Francisco				
Station-Station OD Pair	Existing	Baseline Growth	Moderate	High Growth
STC/4th & King-Palo Alto	4,300	9,100	12,300	12,300
STC/4th & King-Mountain View	4,100	8,100	9,300	9,200
STC/4th & King-Sunnyvale	3,700	6,900	8,400	8,600
STC/4th & King-San Jose	3,700	5,000	5,900	6,500
STC/4th & King-Lawrence	500	4,600	4,700	5,200

Top 5 Station OD Pairs, Excluding Downtown San Francisco				
Station-Station OD Pair	Existing	Baseline Growth	Moderate	High Growth
San Jose-Palo Alto	1,500	4,200	3,600	3,500
San Jose-Mountain View	400	2,900	3,600	3,300
Redwood City-Palo Alto	600	2,200	2,000	3,100
22nd Street-Palo Alto	1,400	1,700	2,000	2,600
Redwood City-Hillsdale	300	1,500	2,100	2,400

Excludes capacity constraining

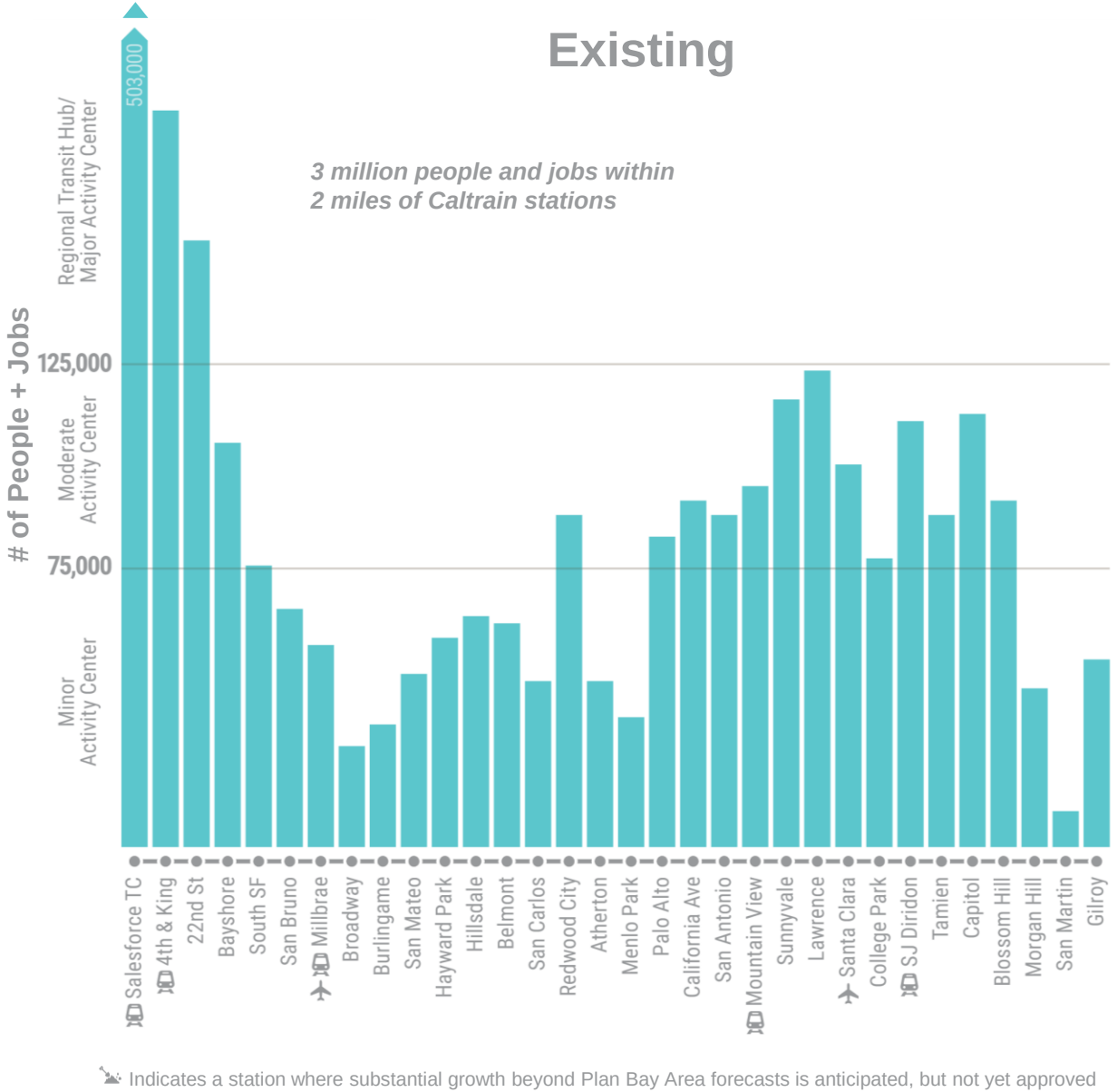
Land Use/Transportation Context: ½-Mile Area

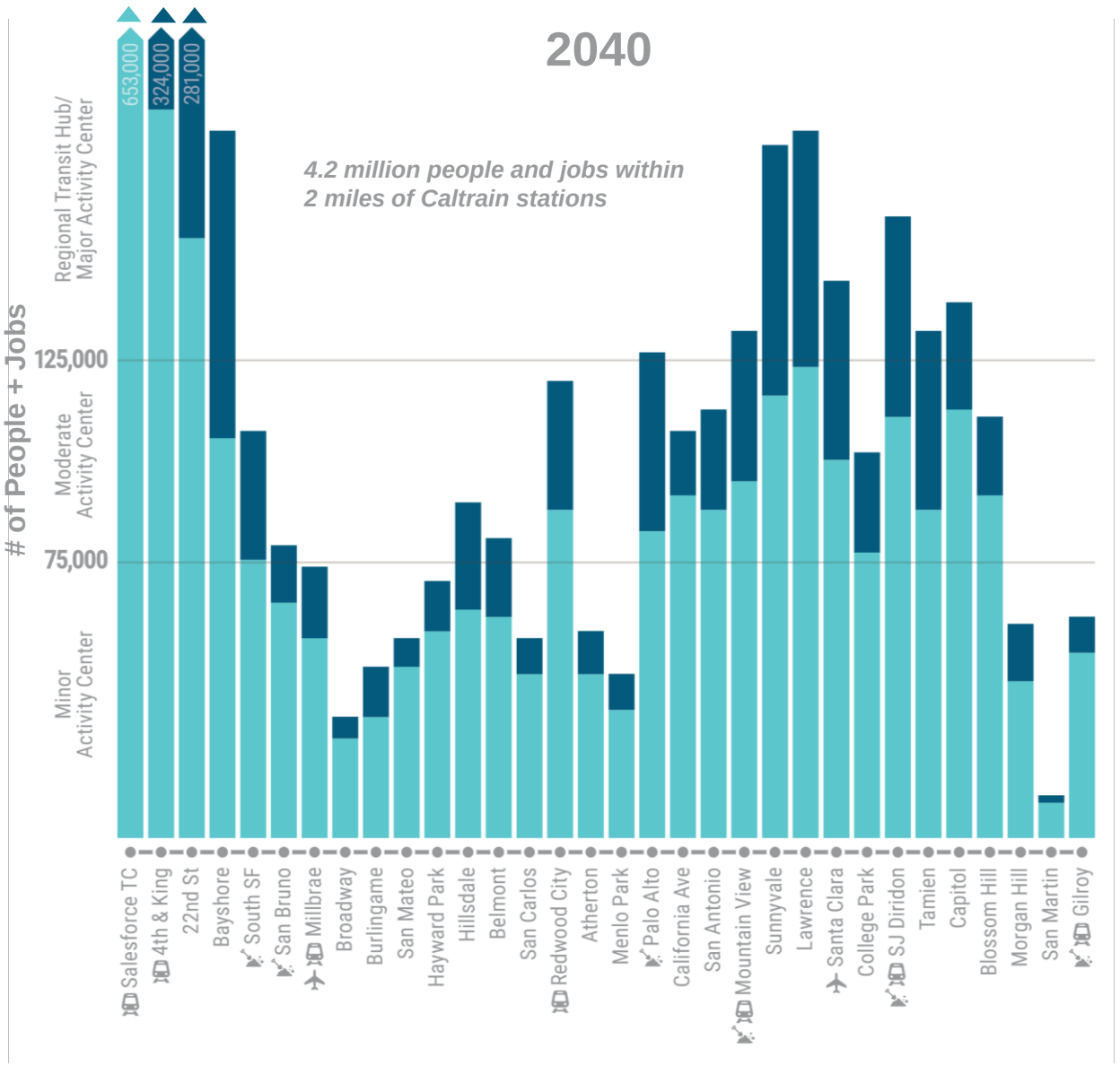




Indicates a station where substantial growth beyond Plan Bay Area forecasts is anticipated, but not yet approved

Land Use/Transportation Context: 2-Mile Area





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