Local Policy Maker Group (LPMG) Meeting

Thursday, January 23, 2020
5:30 p.m. – 7:30 p.m.
SamTrans Offices – Bacciocco Auditorium 2nd Floor
1250 San Carlos Ave., San Carlos

Agenda

1. Call to Order
2. Staff Report
3. California High-Speed Rail: Update (Presented by California High-Speed Rail Authority Staff)
4. Caltrain Electrification Project
5. Caltrain Business Plan
6. Public Comments
7. LPMG Member Comments/Requests
   a. Grade Separation Toolkit
8. Next Meeting
   a. Thursday February 27, 2019 at 5:30pm
9. Adjourn

All items on this agenda are subject to action
Local Policy Maker Group 2020 Meeting Schedule

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<th>Date</th>
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<tr>
<td>January 23, 2020</td>
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<td>February 27, 2020</td>
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<td>March 26, 2020</td>
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<td>October 22, 2020</td>
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<td>November 19, 2020*</td>
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<td>December 17, 2020*</td>
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Note: *Changed to avoid conflicts on Thanksgiving and Christmas

**Location:** Caltrain Administrative Offices, 2nd Floor, 1250 San Carlos Ave., San Carlos, CA 94070

**Time:** 5:30-7:30pm
### Local Policy Maker Group Members

<table>
<thead>
<tr>
<th>City / County</th>
<th>Representative</th>
<th>Alternate</th>
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<tbody>
<tr>
<td>Atherton</td>
<td>Councilmember Cary Wiest</td>
<td>Mayor Rick DeGolia</td>
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<td>Belmont</td>
<td>Councilmember Tom McCune</td>
<td>Councilmember Davina Hurt</td>
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<td>Brisbane</td>
<td>Mayor Terry O'Connell</td>
<td>Councilmember Cliff Lentz</td>
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<td>Burlingame</td>
<td>Mayor Emily Beach</td>
<td>Vice Mayor Ann Keighran</td>
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<td>Gilroy</td>
<td>Mayor Pro Tempore Cat Tucker</td>
<td>Councilmember Peter Leroe-Muñoz</td>
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<td>Menlo Park</td>
<td>Councilmember Betsy Nash</td>
<td>Councilmember Ray Mueller</td>
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<td>Millbrae</td>
<td>Mayor Reuben Holober</td>
<td>Councilmember Gina Papan</td>
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<td>Mountain View</td>
<td>Councilmember John McAlister</td>
<td>Mayor Margaret Abe-Koga</td>
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<td>Morgan Hill</td>
<td>Mayor Rich Constantine</td>
<td>Councilmember Larry Carr</td>
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<td>Palo Alto</td>
<td>Mayor Adrian Fine</td>
<td>Councilmember Lydia Kou</td>
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<td>Redwood City</td>
<td>Vice Mayor Shelly Masur</td>
<td>Councilmember Janet Borgens</td>
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<td>San Bruno</td>
<td>Mayor Rico Medina</td>
<td>Vice Mayor Michael Salazar</td>
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<td>San Carlos</td>
<td>Mayor Ron Collins</td>
<td>Councilmember Mark Obert</td>
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<td>San Francisco</td>
<td>Mr. Paul Supawanich</td>
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<td>San Jose</td>
<td>Councilmember Sergio Jimenez</td>
<td>Councilmember Devora &quot;Dev&quot; Davis</td>
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<td>Mayor Joe Goethals</td>
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<td>Santa Clara</td>
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<td>Councilmember Patricia Mahan</td>
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<td>Councilmember Gustav Larsson</td>
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**CHAIR (JPB Member)**

**VICE CHAIR (LPMG Member)** Emily Beach

*Updated January 2020*
Date: January 23, 2020
To: Local Policy Maker Group (LPMG)
From: Boris Lipkin, Northern California Regional Director
Re: California High-Speed Rail Program Update

STATEWIDE UPDATE
Track and Systems Industry Forum
On January 22, 2020 the Authority hosted an Industry Forum for businesses interested in working on the Track and Systems Design-Build-Maintain contract. The forum provided an opportunity for interested small businesses to meet directly with the three pre-qualified prime contractors and learn more about the procurement. The scope of work will include design and construction of trackwork, railway systems, electrification, as well as testing and commissioning starting in the Central Valley but also extending to Northern California. Additional information about the Track and Systems Request for Proposals (RFP) can be found on the Authority’s Track and Systems webpage: www.hsr.ca.gov/business/contractors/track_and_systems.aspx

NORTHERN CALIFORNIA UPDATE
Northern California Draft EIR/EIS
The Authority has completed the Administrative Draft Environmental Impact Reports/Statements (EIR/S) for the two Northern California project sections and has sent the documents for review by cooperating and responsible agencies (see below). This is the final step in the development process before the release of each Draft EIR/S, which will occur in spring/summer 2020 and will be followed by a 45-day public comment period. The Authority is currently preparing for the next round of outreach in support of the release of each Draft EIR/S. This will include presentations to the LPMG, CSCG, Technical and Community Working Groups, as well as Open Houses and Hearings during the respective 45-day comment periods.

San Carlos Transportation Museum
Andrew Mancini, a student at Sequoia High School in Redwood City and creator of the San Carlos Transportation Museum, was featured in the Authority’s Faces of High-Speed Rail series. Mancini started his museum as a boy by setting up exhibits in his house, but it has grown into an annual event held at Brittan Acres Elementary School. This year the museum had an estimated 300 visitors and featured tables from the Authority and the Metropolitan Transportation Commission. The full Faces of High-Speed Rail article can be found here: https://www.buildhsr.com/facesofhsr/#high_school_senior_with_a_passion_for_trains
Local Policy Maker Group
January 23, 2020
San Carlos, CA

NORTHERN CALIFORNIA REGION

2020 STATUS

350 miles of electrified high-speed rail under development
2022 PROGRESS

- 350 miles under construction
- Full 520-mile system environmentally cleared

STATEWIDE PROGRAM UPDATES

- Virgin Trains MOU
- Sustainability Report
- Link Union Station
- Bakersfield LGA ROD
- Track & Systems RFP
The Authority Board approved the Term Sheet and issuance of a Request for Proposals for the Track and Systems design-build-maintain contract to three pre-qualified teams.

- After consideration of proposals, Authority staff will return to the Board in Fall 2020 for approval to award the Track and Systems contract.
- This is an important next step as construction in the Central Valley advances and infrastructure will soon be ready for tracks to be laid.

**TRACK AND SYSTEMS PROCUREMENT**

**SCHEDULE**

- **2019**
  - July 17: RFQ Released
  - August 23: Offeror Questions Due
  - October 3: SOQs Due
  - December 10: Board Approves Release of RFP
  - December 19: RFP Released

- **2020**
  - June 30: Proposals Due
  - Fall: Presentation to the Board (Approval for Contract Award and NTP 1)
  - Fall: NTP 1 Issued
The Authority held an Industry Forum for businesses interested in working on the Track and Systems Design-Build-Maintain contract to meet with prime contractors and learn about the procurement.

The pre-qualified prime contractors hosted informational tables to meet with potential team members, including small, disadvantaged, and disabled veteran-owned firms.

**DEVELOPMENT & REVIEW OF ENVIRONMENTAL DOCUMENT**

- Preparation of EIR/EIS document sections
- Review of chapters and technical reports
- Assemble Administrative Draft
- Finishing Team Final Review for Cooperating and Responsible Agency review
- WE ARE HERE Cooperating and Responsible Agency review
- Publish Draft EIR/EIS
### 2020/2021 PROJECT SCHEDULE

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<tr>
<th>Year</th>
<th>Event</th>
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<td>2019</td>
<td>Draft 2020 Business Plan</td>
<td>(60-day Public Comment Period)</td>
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<td>Board Meeting</td>
<td>Identification of Preferred Alternative</td>
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<td>Draft EIR/EIS</td>
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<td>- Public Hearings</td>
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<td>Close of 45-day Public Comment Period</td>
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<td><strong>Spring/Summer</strong></td>
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<td>2021</td>
<td>Final EIR/EIS</td>
<td>- San Francisco to San Jose Project Section</td>
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<td>- Complete and Certify</td>
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<td><strong>Spring/Summer</strong></td>
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### PROGRAM UPDATE

**February**

- Draft 2020 Business Plan (60-day Public Comment Period)

**Spring/Summer**

- Final 2020 Business Plan
  - April – Adoption of Final by Authority Board
  - May – Submission to CA Legislature
Memorandum

Date: January 23, 2020
To: CalMod Local Policy Maker Group (LPMG)
From: John Funghi, CalMod Chief Officer; Casey Fromson, Gov. Affairs Director
Re: Caltrain Electrification Project E-Update

ELECTRIC TRAIN AND CONSTRUCTION UPDATE

The new high-performance electric trains continue to progress as they undergo extensive testing. Earlier in the manufacturing process, the car shells underwent the “Squeeze Test” (shown below) which verified the designed strength of the car shell under various stressors, including twisting, bending, and external pressure. More recently the truck (bogie) which holds the propulsion motors, wheels, and axles passed the structural and fatigue endurance tests. The electric trains will continue to undergo a range of tests to ensure safety and functionality.
Construction to make Caltrain a modern, electric commuter rail system continues. This month, crews installed foundations from Menlo Park to San Jose. Work was also performed on six traction power facilities in San Jose, Redwood City, Sunnyvale and San Mateo.

To view more photos visit CalMod.org/Gallery. To sign up for weekly construction updates or for more construction information, visit CalMod.org/construction.

2019 RECAP:

Caltrain Modernization made big strides towards electrification over the last year. To date, we installed 1,400 foundations and 750 poles along the corridor, began assembly of 28 train cars, and created hundreds of jobs in the process.

Check out our 2019 Year in Review web page for more about the progress we made!
PUBLIC MEETINGS

Mountain View Community Meeting – January 23 at 6:00 p.m  
Palo Alto Community Meeting – January 28 at 6:00 p.m  
JPB Board Meeting – February 6 at 9:00 a.m  
LPMG Meeting – February 21 at 5:30 p.m  

For more details, and a full list of upcoming meetings, please visit CalMod.org/Events.

DETAILED PROGRESS REPORT

- November 2019 Monthly Progress Report presented to Caltrain Board on December 5, 2019
Memorandum

Date: January 23, 2019
To: CalMod Local Policy Maker Group (LPMG)
From: Sebastian Petty, Director of Policy Development
Re: Caltrain Business Plan

PROJECT UPDATE

Following the Peninsula Corridor Joint Powers Board’s adoption of the Caltrain Long Range Service Vision in October, the Business Plan team spent November through January focused on completing remaining technical work on the plan to both round out the 2040 Service Vision and develop key actions for the next 10 years.

Ongoing Technical Work

The Business Plan team is concurrently developing a number of additional technical analyses and documentation elements needed to complete the Business Plan in early-mid 2020. The following technical areas will be highlighted in the January presentation:

- Travel Market: Near-term travel markets analysis
- Service: 6-train and 8-train service plan options for 2022-2029
- Ridership: Near-term ridership forecasts
- Equity: Opportunities and challenges and market analysis
- Funding: Review of universe of funding and revenue sources and a preview of the 10-year funding plan

A substantial presentation to the LPMG on many of these elements in January.

Background

In 2017, the JPB secured full funding for the Peninsula Corridor Electrification Project and issued notices to proceed to its contractors for corridor electrification and purchase of Electric Multiple Unit railcars. Now that construction on this long-awaited project is underway, the
agency has the opportunity to articulate a long-term business strategy for the future of the system.

The initial concept for a Caltrain “Business Plan” was brought to the Board in April of 2017. The Board reviewed a draft scope of work for the Business Plan in December of 2017 and adopted a final Business Strategy and Scope of Work in February of 2018. Technical work on the Plan commenced in the summer of 2018. The Business Plan has been scoped to include long-range demand modeling, and service and infrastructure planning, as well as organizational analysis and an assessment of Caltrain’s interface with the communities it traverses. In October of 2019, the JPB marked a major milestone in the Business Plan process with its adoption of a “2040 Service Vision” for the Caltrain system. This action sets long-range policy guidance for the future of the Caltrain service and allows staff to move forward with completion of the overall plan by early 2020.
Agenda for Today

Process Overview

Making it Happen: Options for Caltrain Service Over the Next Decade

CalMod: Improved Service in the 2020s
Going beyond CalMod
Ridership Forecasts (2020-2030)

Work in Progress & Next Steps
**Process Overview**

**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

Timeline

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<td>Development and Evaluation of Growth Scenarios</td>
<td>Adoption of Long-Range Service Vision</td>
<td>Rounding Out the Vision and Implementation Planning</td>
<td>Completion of Business Plan</td>
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Remaining Technical Analysis

Making it Happen

With a 2040 Service Vision adopted, what will the next 10 years look like for Caltrain? What are the key actions and steps we need to focus on next?

Additional technical and policy analysis is underway to focus on what Caltrain can achieve over the next decade and the key near-term steps and work that will be needed to make it happen.

- Building towards the Vision with service concepts for initial electrification and options for growth and investment through 2020s
- Accompanying financial projections and funding plan
- Identification of a program of key planning, policy and organizational next steps

Remaining Technical Analysis

Rounding Out the Vision

With a 2040 Service Vision adopted, how can Caltrain “Round Out” its vision for the future?

Additional technical and policy analysis are underway with a focus on areas that were highlighted as important through stakeholder outreach and help complete the picture of the railroad Caltrain hopes to become.

- Analysis of connections to other systems & station access options
- Equity analysis & focus on making Caltrain accessible to all
- Review of funding options and revenue generation opportunities to support the Vision
### Caltrain’s 2040 Service Vision

#### Illustrative Service Details

| Trains per Hour, per Direction | Peak: 8 Caltrain + 4 HSR  
|                                | Off-Peak: Up to 6 Caltrain + 3 HSR |
| Stopping Pattern               | Local / Express with timed transfer in Mid Peninsula |
| Travel Time, STC-Diridon        | 61 Min (Express)  
|                                | 85 Min (Local) |
| New Passing Tracks             | Millbrae, Hayward Park-Hillsdale, Redwood City area, Northern Santa Clara County, Blossom Hill |
| Service Plan Description       | • Local and Express trains each operating at 15-minute frequencies with timed cross-platform transfer at Redwood City  
|                                | • All trains serve Sales For Transit Center  
|                                | • Trains serve Capitol and Blossom Hill every 15 minutes and Morgan Hill and Gilroy every 30 minutes  
|                                | • Skip stop pattern for some mid-Peninsula stations |

![Conceptual 4 Track Segment or Station to be defined through further analysis and community engagement](image)
Caltrain’s 2040 Service Vision - Investments

**CAPITAL COSTS**

- **$23 BILLION** TOTAL CAPITAL COSTS
- **$9.4B** GRADE SEPARATIONS
- **$7.8B** TERMINAL IMPROVEMENTS
- **$3.3B** RAIL INFRASTRUCTURE AND SYSTEMS
- **$1.4B** STATION IMPROVEMENTS
- **$1.1B** FLEET UPGRADES

Capital costs include all projects from SF to Gilroy, knitting together a connected corridor with greatly improved service.

**OPERATING COSTS**

- **$370 MILLION** 2040 ANNUAL OPERATING COSTS
- **$266M** ANNUAL OPERATING COSTS COVERED BY FAREBOX (28%)
- **$104M** ANNUAL OPERATING INVESTMENT NEEDED (28%)

Caltrain is one of the leanest, most efficient transit services in the country. Today’s annual operating and maintenance costs are $135 million, and 73% is covered by fares. The vision would benefit from a similarly high farebox recovery ratio.

Getting to the 2040 Vision

The “path” of milestone service improvements and investments used in initial Business Plan work was based on a simplified version of the existing plans of Caltrain and its partner agencies.
Getting to the 2040 Vision

With a long-range Service Vision established, we can optimize our approach. We can explore different “paths” or incremental steps that allow us to deliver improved service sooner.

The path Caltrain ultimately takes will be based on our ability, and the ability of our partners, to fund and implement key investments.

Key Questions for the Next Decade

What is the potential market demand for Caltrain service over the next 10 years – how can we grow to satisfy it?

Which benefits of the 2040 Service Vision could Caltrain deliver before 2030?
  • How can we use the initial electrified system (CalMod) to deliver near-term service benefits and best meet market demand?
  • How could we improve service further through subsequent incremental investments?
CalMod: Improved Service in the 2020s

Market Analysis

Additional Slides Included In Appendix
Understanding Demand

Daily ridership demand for Caltrain service will likely exceed 90,000 passengers in the next decade. This growth is driven by several factors:

**Latent Demand**
Improving Caltrain service and increasing capacity will make Caltrain more appealing for a wider range of trips.

**Population and Employment Growth**
Station areas will add over 100,000 new residents and employees within ½ mile of Caltrain stations, a ~30% increase over existing Caltrain Corridor.

**Improved Connectivity**
New connections like the Central Subway will extend Caltrain’s reach.

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Caltrain Corridor – Approved Growth

**Population Growth**

**Job Growth**
2020s Outlook

Capitol and Blossom Hill have large populations that are underserved by Caltrain, while Morgan Hill, San Martin, and Gilroy have comparatively lower demand.

Operational Constraints

Under the current agreement with Union Pacific, Caltrain can add up to two additional roundtrips to Gilroy to reach five trips per day. There is limited flexibility in when these trips can be added without affecting mainline service.

Two of these roundtrips could be extended south to Salinas subject to further planning and agreement by both the Caltrain Board and Union Pacific.
### Existing Ridership by Station

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<tr>
<th>Highest Ridership</th>
<th>Moderate Ridership</th>
<th>Lower Ridership</th>
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<td>&gt;4,000 Daily Riders</td>
<td>2,000 – 4,000 Daily Riders</td>
<td>&lt;2,000 Daily Riders</td>
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- 4th & King
- Redwood City
- Palo Alto
- Mountain View
- San Jose Diridon
- Millbrae
- San Mateo
- Hillsdale
- Sunnyvale
- 22nd Street
- Bayshore
- South San Francisco
- San Bruno
- Broadway
- Burlingame
- Hayward Park
- Belmont
- San Carlos
- Atherton
- Menlo Park
- California Ave
- San Antonio
- Lawrence
- Santa Clara
- Tamien
- Capitol
- Blossom Hill
- Morgan Hill
- San Martin
- Gilroy

### Potential 2020s Demand by Station

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<th>Highest Ridership Potential</th>
<th>Moderate Ridership Potential</th>
<th>Lower Ridership Potential</th>
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<td>&gt;4,000 Daily Riders</td>
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- San Antonio
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- Santa Clara
- Capitol
- Blossom Hill
- Morgan Hill
- San Martin
- Gilroy

- San Bruno
- Broadway
- Burlingame
- Hayward Park
- Belmont
- San Carlos
- Atherton
- Tamien
- Capitol
- Blossom Hill
- Morgan Hill
- San Martin
- Gilroy
### Potential 2020s Demand by Station

**Highest Ridership Potential**
- >4,000 Daily Riders

**Moderate Ridership Potential**
- 2,000 – 4,000 Daily Riders

**Lower Ridership Potential**
- <2,000 Daily Riders

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### Train Capacity and Crowding

Even with increased service, crowding will continue to be an issue for Caltrain over the next decade as demand for service increases.

- Caltrain provides approximately 3,800 seats per direction per peak hour today, which will increase to 4,144 with electrification.
- With standing room, Caltrain’s hourly capacity peak hour capacity will increase from about 4,500 passengers per direction today to 5,400 with electrification, assuming even distribution of passengers between trains.
Planning Priorities

Market Analysis
Planning Priorities
Service Concepts & Evaluation
Service Levels at Stations
Illustrative Service Plans

How Can we Improve Service and Meet Market Demand Using CalMod?

The electrification of the Caltrain service between San Francisco and San Jose provides a transformative, near-term opportunity to improve service.

With this investment, Caltrain can begin delivering many, but not all, of the service improvements described 2040 Service Vision while also attempting to keep pace with growing market demand.

While CalMod provides an overwhelming improvement to the system as a whole we will still need to make choices about which service benefits and improvements we prioritize – there are tradeoffs.
**Mainline Stopping Patterns**

- **Local** 80 Minutes  
  Connects all stations regardless of demand

- **Skip Stop or Zone** 70-75 Minutes  
  Varied patterns connect some stations with higher demand

- **Express** 60-67 Minutes  
  Connects a few stations with highest demand

*Mainline times shown for San Francisco (4th & King) to San Jose (Diridon)*

**Analytical Approach:** Combinations of Skip Stop, Zone, and Express patterns were evaluated for peak service. While local service is part of the 2040 Service Vision, it is not yet viable during peak hours due to infrastructure and fleet limitations.

---

**Travel Time vs. Frequency**

- **Reduce Travel Times between Major Stations**  
  - Minimize stops to save a few minutes in travel times for many passengers  
  - Demand in growing markets continues to be underserved

- **Increase Frequency at More Stations**  
  - Add stops and keep travel times about the same  
  - Serve more demand in growing markets

*Analytical Approach:* Service concepts tend to prioritize improving frequency over travel time given recent and projected growth patterns along the Caltrain corridor.
Building Blocks of Service Planning: Standardization vs. Customization

**Standardized Schedule**
- Repeating clockface patterns
- Symmetrical in both directions
- Typically communicated as “lines” (eg the “A Line”)

**Customized Schedule**
- Complex patterns that may vary by time of day
- May not be symmetrical in both directions
- Typically communicated as individual train numbers

Analytical Approach: Concepts developed focus on standardized, bi-directional schedules to create a more user-friendly experience and facilitate coordination with the region’s larger transit network.

---

Building Blocks of Service Planning: Combining Service Patterns

**Mixing Different Service Patterns**
- Passengers choose between different train types
- Demand can be concentrated on some very crowded trains, while other trains may be half empty

**Similar Service Patterns**
- Train types are broadly similar in terms of overall stopping structure and time between major stations
- Demand is more evenly distributed between trains – helping maximize overall throughput

Analytical Approach: Both parallel and differentiated service patterns have been considered.
Introducing Four Service Concepts

<table>
<thead>
<tr>
<th>Service Concept</th>
<th>Zone 1</th>
<th>Zone 2</th>
<th>Zone 3</th>
<th>Express</th>
<th>2 trains/hour</th>
<th>3 trains/hour</th>
<th>4 trains/hour</th>
<th>5 trains/hour</th>
<th>6 trains/hour</th>
<th>7 trains/hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Zones with Express</td>
<td>74 min</td>
<td>70 min</td>
<td>67 min</td>
<td>74 min</td>
<td>70 min</td>
<td>67 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three Zones</td>
<td>71 min</td>
<td>71 min</td>
<td>70 min</td>
<td>71 min</td>
<td>71 min</td>
<td>70 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skip Stop with Express</td>
<td>75 min</td>
<td>75 min</td>
<td>60 min</td>
<td>75 min</td>
<td>75 min</td>
<td>60 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distributed Skip Stop</td>
<td>71 min</td>
<td>71 min</td>
<td>71 min</td>
<td>71 min</td>
<td>71 min</td>
<td>71 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Trains per hour: 6 2 4 2 6 2 6 2 6 (for all service patterns)
Service Concept Evaluation Metrics

1 - Service Metrics
I. Travel Time
II. Maximum Wait Time

2 - Capacity Metrics
I. Crowding
II. Ability to Support Ridership Growth

3 - User Experience
I. Internal Connectivity
II. External Connectivity

Summary – Comparison to Existing Service

<table>
<thead>
<tr>
<th>Metric</th>
<th>Two Zone with Express</th>
<th>Three Zone</th>
<th>Skip Stop with Express</th>
<th>Distributed Skip Stop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel Time</td>
<td>Similar</td>
<td>Similar</td>
<td>Similar</td>
<td>Similar</td>
</tr>
<tr>
<td>Maximum Wait Time</td>
<td>Slightly Better</td>
<td>Slightly Better</td>
<td>Slightly Better</td>
<td>Better</td>
</tr>
<tr>
<td>Throughput Capacity &amp; Crowding</td>
<td>Slightly Better</td>
<td>Slightly Better</td>
<td>Similar</td>
<td>Better</td>
</tr>
<tr>
<td>Able to Support Significant Ridership Growth</td>
<td>Partially</td>
<td>Partially</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Internal Connectivity</td>
<td>Similar</td>
<td>Similar</td>
<td>Similar</td>
<td>Similar</td>
</tr>
<tr>
<td>External Connectivity</td>
<td>Slightly Better</td>
<td>Slightly Better</td>
<td>Slightly Better</td>
<td>Better</td>
</tr>
</tbody>
</table>
## Summary – Comparison to Existing Service

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<tr>
<th>Metric</th>
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<td>Slightly Better</td>
<td>Better</td>
</tr>
</tbody>
</table>

## Service Levels at Stations

- Market Analysis
- Planning Priorities
- Service Concepts & Evaluation
- **Service Levels at Stations**
- Illustrative Service Plans
Service Frequency Improvements

To aid in comparison, all of the service concepts have been developed using a uniform set of illustrative frequency assumptions (e.g., there is no difference between concepts in the number of stops a specific station receives).

All service concepts double the number of stations that receive at least four trains per hour, per direction.

All service concepts provide at least two trains per hour, per direction to all mainline, regularly served stations.

Illustrative Service Levels

Service levels shown are illustrative. Final service planning and schedule development for CalMod will involve consideration of additional data and public input and may include considerations related to:

- Current Market Demand and Ridership Patterns
- Approved Station Area Growth
- Station Access and Connectivity Opportunities
- Social Equity and Geographic Equality
- Transportation Demand Management Policies
Illustrative Peak Period Service Levels by Station (Mainline)

Change in Peak Period Service Levels
- Service Increases (17 Stations)
- No Change (4 Stations)
- Service Reduction (3 Stations)
- Existing NB AM/SB PM
- Existing SB AM/NB PM

Hourly Service levels are the same for all service concepts

Trains per Hour per Direction by Station

Illustrative Service Plans

Market Analysis
Planning Priorities
Service Concepts & Evaluation
Service Levels at Stations
Illustrative Service Plans
Illustrative Service Plans

Caltrain has prepared two sets of illustrative service plans to carry forward for further analysis.

**Two Zone with Express** – two zone patterns (north and south of Redwood City) with a regional express pattern offering different travel times and wait times.

**Distributed Skip Stop** – three skip stop patterns offering similar travel times and regular wait times at major stations.

---

Service South of Tamien

Caltrain will increase service to Gilroy to four roundtrips per day. Passengers from south of Tamien would have a one-seat ride to major stations and a transfer at Diridon Station to reach minor stations.

Arrival and departure times would be similar to today, with one later AM train and one later PM train. Service may be extended to Salinas, pending key agreements and funding, adding about one hour to travel times.
Off-Peak and Weekend Service

With electrification, Caltrain has the opportunity to increase off-peak and weekend service levels to better meet corridor demand. However, operational and financial constraints may affect what kind of service Caltrain is able to provide and when.

Goals

- Increase Caltrain’s market share during off-peak and weekend periods
- Offer competitive travel times between major stations
- Provide a legible schedule transition between peak and off-peak (Two Zone with Express concept has some advantages in this regard)
- Maintain flexibility to accommodate construction and maintenance windows

Example Off-Peak Pattern

**Local** 2 trains/hour

**Express** 2 trains/hour

Developing a Final Service Plan for CalMod

- Preferred Service Concepts shown are illustrative and are intended to help advance analysis and planning
- As the PCEP approaches completion, Caltrain will undertake a supplemental planning process to determine the final 6tp/h schedule that the railroad will operate – this will include:
  - Selecting the ultimate concept or “style” of service to be operated
  - Determining individual station service levels
  - Confirming off-peak and weekend service levels
- This process will include additional public and stakeholder input as well as analysis of updated ridership and survey data

Implementation Process and Next Steps

This analysis has been developed to provide updated concepts for how the investments currently being made as part of CalMod can be used to serve market demand and begin delivering some of the key benefits of the 2040 Service Vision

Preferred concepts shown will be used to continue planning for various aspects of CalMod implementation and launch of electrified service in 2022.
Going Beyond CalMod

Paths to Incrementally Improving and Increasing Service

CalMod will provide tremendous service benefits to the corridor. However, regional growth projections suggest that there is medium-term demand for even more service and capacity.

The following analysis considers options for how Caltrain could accelerate the delivery of key elements of the 2040 Service Vision to better meet demand by the late 2020s.
Adding Capacity and Increasing Service to Grow Ridership

Toward the end of the 2020s, Caltrain is expected to reach capacity during peak hours.

Caltrain will not be able to accommodate additional ridership growth in the 2030s without adding capacity. This poses a challenge for accommodating land use growth, DTX, Dumbarton rail, and other potential changes on the corridor.

While smaller, interim improvements may ease capacity, the most significant improvement to service and capacity involves expanding service to eight trains per hour, per direction.

An Interim Step- Not the Full 2040 Service Vision

Increasing mainline service in the mid- to late 2020’s would be an interim step- not the full implementation of the 2040 Service Vision.

Major investments at terminals and in passing tracks infrastructure are not assumed.

Making near-term, tactical investments to increase service to 8 trains per hour per direction would precede the full buildout of the 2040 Service Vision. As such, many important aspects of the 2040 Service Vision would not yet be fully achieved, including:

- Ability to operate a peak-hour express / local service pattern with timed transfers
- Ability to lengthen trains to 8- or 10-cars
- Direct service to downtown San Francisco
- Greatly expanded and electrified service south of Tamien Station to Gilroy

Fully achieving the 2040 Service Vision would require the overall buildout discussed and documented in the Business Plan process to date.
An 8-train Caltrain service would likely look like a hybrid of the zone express and skip stop patterns with 8 trains per hour, per direction. There is limited flexibility in the service structure due to lack of new passing tracks and the constraints of Caltrain’s existing signal system. Diesel service to/from Gilroy would terminate at San Jose with a timed transfer mainline service. This service could be increased to 5 round trips per day and would have more flexibility to customize departure and arrival times based on public input.

Increasing service from six to eight trains per hour, per direction enables more frequent service to more stations. With an interim 8 tphpd service, 20 of 24 mainline stations would receive at least four trains per hour, per direction, and nearly half of stations would receive eight trains per hour, per direction.
Increasing Service to Stations

20 stations could receive at least four trains per hour, per direction.

**Illustrative Change in Peak Period Service Levels**
- Illustrative service at expanded "8tph plan"
- Illustrative service at initial CallMod level
- Existing NB AM/SB PM
- Existing SB AM/NB PM

**Trains per Hour per Direction by Station**

Overall Investments

The following parallel and programmatic investments are assumed to be occurring throughout the 2020's - they are needed to support the overall success of the system and the full implementation of the 2040 Service Vision

**Grade Separations**
Planning and construction of grade separations and grade crossing improvements

**Station Improvements**
Programmatic improvements to Caltrain stations and investments in station access and connectivity

**Major Investments**
Work on major terminal projects (including Diridon and DTX), major station investments, and partner projects including HSR
What Specific Incremental Investments and Changes Would be Needed?

The following key investments would specifically be needed to implement an interim 8-tph service. These investments are consistent with the overall program assumed in the 2040 Service Vision.

**Expanded EMU Fleet**
To provide 8 tphpd direction mainline service, Caltrain will need to expand its EMU fleet.

**Holdout Rule Elimination**
Once 8 trains per hour per direction are operating on the corridor, remaining “holdout” rule stations will need to be rebuilt or closed.

**More Train Storage**
The railroad will need to add storage capacity to accommodate additional trainsets.

What Specific Incremental Investments and Changes Would be Needed?

The following key investments would specifically be needed to implement an interim 8-tph service. These investments are consistent with the overall program assumed in the 2040 Service Vision.

**Level Boarding**
Level boarding is needed to ensure reliability and to keep dwell times as short as possible.

**Gilroy-SJ Shuttle Service**
Remaining diesel service south of Tamien would be converted to a shuttle service until the UP corridor is rebuilt and electrified. Service levels could be increased to 5 round trips per day under existing agreements with UP.

**Minor Track Work**
Minor track work would be needed to accommodate increased train volumes around Diridon Station.
Ridership Forecasts
2020-2030

Change in Weekday Ridership Over Time

- Service improvements from electrification adds 21,000 riders over three years.
- Increasing service to 8 trains adds 20,000 riders over three years.
- Caltrain is near-capacity today, which limits ridership growth.

Electrification Service Plans (6 TPH Peak in 2022)  Expanded Service (8 TPH in 2027)
Ridership Forecasts, 2019-2030

<table>
<thead>
<tr>
<th>Ridership Unit</th>
<th>2019</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 TPH</td>
<td>6 TPH</td>
<td>6 TPH</td>
</tr>
<tr>
<td>Average Weekday</td>
<td>63,400</td>
<td>86,500</td>
<td>92,900</td>
</tr>
<tr>
<td>Average Weekend Day</td>
<td>11,800</td>
<td>23,600</td>
<td>25,200</td>
</tr>
<tr>
<td>Annual</td>
<td>18.4M</td>
<td>26.1M</td>
<td>28.1M</td>
</tr>
</tbody>
</table>

Note: Ridership forecasts are relatively comparable between zone express and skip stop patterns in 2025. 2030 Forecasts assume no DTX, which may add another 30,000 weekday riders (~9M annually) after opening.

Over the next decade, Caltrain could nearly double ridership by increasing service from five to eight trains and doubling to quadrupling service at many stations.

By 2025, Caltrain could serve about 35% more passengers than today with either zone express or skip stop service.
Station Access
Work Plan

The Business Plan presents an opportunity to evaluate Caltrain’s current role in station access and how this role may need to change over time to support the service vision.

The Business Plan will provide a high-level assessment of potential paths forward at a system-level, but will not address investment needs at individual stations.

What role does Caltrain play in station access?
- Review existing programs and investments

What is Caltrain’s station access vision?
- Consider several paths forward:
  a. A hands-off approach
  b. A proactive investment in parking
  c. A proactive investment in multimodal access

How do we get there?
- Identify most pressing access needs and priorities

Equity Assessment
Work Plan

The equity assessment is intended to help us understand how the Service Vision could improve equitable access to Caltrain and develop a series of policy interventions that would improve equitable access further.

Opportunities & Challenges
- Review of existing plans
- Stakeholder interviews
- Market assessment

Analysis of the Service Vision
- Qualitative & quantitative evaluation of the Service Vision

Recommendations
- Context-specific recommendations as outcomes from the analysis of the Service Vision and opportunities and challenges.
Funding Work Plan

Service Vision includes $25.3 Billion in corridor investments by Caltrain, cities and partner agencies and operating costs of $370 M/year by 2040

This phase of work will identify new funding and revenue sources to support the increase in capital and operating costs.

The funding work plan will develop:

- 10-year Funding Plans to support incremental increases in service from 2019-2029
- A Funding and Revenue Strategy to support the full implementation of the Service Vision by 2040

FOR MORE INFORMATION
WWW.CALTRAIN2040.ORG
BUSINESSPLAN@CALTRAIN.COM
650-508-6499
Appendix

Market Analysis

- Market Analysis
- Planning Priorities
- Service Concepts & Evaluation
- Service Levels at Stations
- Illustrative Service Plans

Additional Slides Included In Appendix
## Near-Term Growth: County-Level Findings

<table>
<thead>
<tr>
<th>County</th>
<th>Population Growth Pipeline</th>
<th>Job Growth Pipeline</th>
<th>Total Population + Job Growth</th>
<th>% Growth over Existing</th>
<th>% of Growth within ½ mile of Caltrain</th>
<th>% of Growth within 2 miles of Caltrain</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco</td>
<td>99,600</td>
<td>78,000</td>
<td>177,600</td>
<td>11%</td>
<td>23%</td>
<td>82%</td>
</tr>
<tr>
<td>San Mateo</td>
<td>30,400</td>
<td>56,700</td>
<td>87,100</td>
<td>7%</td>
<td>37%</td>
<td>87%</td>
</tr>
<tr>
<td>Santa Clara</td>
<td>82,700</td>
<td>122,600</td>
<td>205,300</td>
<td>7%</td>
<td>17%</td>
<td>64%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>212,700</strong></td>
<td><strong>257,300</strong></td>
<td><strong>470,000</strong></td>
<td><strong>8%</strong></td>
<td><strong>23%</strong></td>
<td><strong>75%</strong></td>
</tr>
</tbody>
</table>

Inventory of all development projects that are approved or under construction in cities along the Caltrain Corridor to assess mid-2020s demand:
- Based on review of City planning websites
- Excludes developments proposed/under review and growth allowed under specific plans that has not resulted in individual project entitlements
- Prorates major SF developments like Candlestick Point based on latest information on phasing

## Near-Term Growth: Corridor-Level Findings

<table>
<thead>
<tr>
<th>Distance</th>
<th>Category</th>
<th>Existing</th>
<th>Under Construction</th>
<th>Approved</th>
<th>Total Growth</th>
<th>Mid-2020s Estimate</th>
<th>% Growth over Existing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Within ½ Mile of Stations</strong></td>
<td>Population</td>
<td>195,000</td>
<td>24,600</td>
<td>32,100</td>
<td>56,800</td>
<td>251,800</td>
<td>+29%</td>
</tr>
<tr>
<td></td>
<td>Jobs</td>
<td>196,300</td>
<td>28,200</td>
<td>28,500</td>
<td>56,700</td>
<td>253,000</td>
<td>+29%</td>
</tr>
<tr>
<td></td>
<td>Population + Jobs</td>
<td>391,300</td>
<td>52,800</td>
<td>60,600</td>
<td>113,400</td>
<td>504,800</td>
<td>+29%</td>
</tr>
<tr>
<td><strong>Within 2 Miles of Stations</strong></td>
<td>Population</td>
<td>1,599,700</td>
<td>85,000</td>
<td>98,500</td>
<td>183,500</td>
<td>1,783,100</td>
<td>+11%</td>
</tr>
<tr>
<td></td>
<td>Jobs</td>
<td>1,423,100</td>
<td>132,800</td>
<td>68,600</td>
<td>201,400</td>
<td>1,624,500</td>
<td>+14%</td>
</tr>
<tr>
<td></td>
<td>Population + Jobs</td>
<td>3,022,700</td>
<td>217,900</td>
<td>167,100</td>
<td>384,900</td>
<td>3,407,600</td>
<td>+13%</td>
</tr>
</tbody>
</table>
Today, Caltrain carries up to 3,900 passengers per hour at its peak load points. 7 trains exceed a comfortable crowding level of 900 passengers during peak periods.

Caltrain would need to accommodate 4,500-5,000 passengers per peak hour at 80,000-90,000 daily riders, which approaches the throughput capacity of a six-train mixed fleet (5,400).

The effective capacity of the system may be lower depending on the degree to which trains are differentiated:

- Differentiating faster and slower trains reduces Caltrain’s effective capacity by concentrating demand on a few trains.
- Similar service patterns across all trains maximizes the effective capacity by spreading demand evenly across all trains.

There is substantial unmet demand for midday and weekend Caltrain service, although this demand is difficult to measure.
Off-Peak & Weekend Service

Measured Against US-101 Trips
Traffic volumes on US-101 no longer experience peak periods; there is all-day bidirectional travel and intermittent congestion.

Yet, Caltrain’s share of US-101 in/out of San Francisco is 10 times higher during peak periods than off-peak and weekend periods.

Off-Peak & Weekend Service

Measured Against BART Ridership
Caltrain serves more peak period passengers than BART traveling between the Peninsula and San Francisco, but BART serves three times more passengers during off-peak times.

BART provides six times more service than Caltrain during off-peak times, but connects fewer people and jobs on the Peninsula than Caltrain.
Introducing Four Service Concepts

<table>
<thead>
<tr>
<th>Service Concept</th>
<th>Zone 1</th>
<th>Zone 2</th>
<th>Zone 3</th>
<th>Pattern A</th>
<th>Pattern B</th>
<th>Express</th>
<th>Pattern C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Zones with Express</td>
<td>2 trains/hour</td>
<td>2 trains/hour</td>
<td>2 trains/hour</td>
<td>7 trains/h</td>
<td>7 trains/h</td>
<td>8 trains/h</td>
<td>7 trains/h</td>
</tr>
<tr>
<td>Three Zones</td>
<td>2 trains/hour</td>
<td>2 trains/hour</td>
<td>2 trains/hour</td>
<td>7 trains/h</td>
<td>7 trains/h</td>
<td>8 trains/h</td>
<td>7 trains/h</td>
</tr>
<tr>
<td>Skip Stop with Express</td>
<td>2 trains/hour</td>
<td>2 trains/hour</td>
<td>2 trains/hour</td>
<td>7 trains/h</td>
<td>7 trains/h</td>
<td>8 trains/h</td>
<td>7 trains/h</td>
</tr>
<tr>
<td>Distributed Skip Stop</td>
<td>2 trains/hour</td>
<td>2 trains/hour</td>
<td>2 trains/hour</td>
<td>7 trains/h</td>
<td>7 trains/h</td>
<td>8 trains/h</td>
<td>7 trains/h</td>
</tr>
</tbody>
</table>

Time Table:

- Two Zones with Express: 74 min, 70 min, 67 min
- Three Zones: 71 min, 71 min, 70 min
- Skip Stop with Express: 75 min, 75 min, 60 min
- Distributed Skip Stop: 71 min, 71 min, 71 min

Trains per hour:

| 6 | 2 | 4 | 2 | 6 | 2 | 2 | 6 | 2 | 6 |

Caltrain
Service Concept Evaluation Metrics

1 - Service Metrics
   I. Travel Time
   II. Maximum Wait Time

2 - Capacity Metrics
   I. Crowding
   II. Ability to Support Ridership Growth

3 - User Experience
   I. Internal Connectivity
   II. External Connectivity

Detailed Slides Included In Appendix

Internal Connectivity

Trip Pairs with Direct Service

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Two Zone with Express</th>
<th>Three Zone with Express</th>
<th>Skip-Stop with Express</th>
<th>Distributed Skip Stop</th>
<th>Existing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Service</td>
<td>83%</td>
<td>82%</td>
<td>89%</td>
<td>81%</td>
<td>93%</td>
</tr>
<tr>
<td>No Direct Service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Riders with Direct Service

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Two Zone with Express</th>
<th>Three Zone with Express</th>
<th>Skip-Stop with Express</th>
<th>Distributed Skip Stop</th>
<th>Existing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Service</td>
<td>97%</td>
<td>98%</td>
<td>99%</td>
<td>98%</td>
<td>99%</td>
</tr>
<tr>
<td>No Direct Service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1 - Travel Time to/from San Francisco

All four concepts offer mostly similar travel times to San Francisco compared to the 'typical best' existing travel time.

<table>
<thead>
<tr>
<th>Change in Travel Time by Station</th>
<th>Two Zone with Express</th>
<th>Three Zone</th>
<th>Skip Stop with Express</th>
<th>Distributed Skip Stop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Better (≥4 mins faster)</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>About the Same (+- 3 mins)</td>
<td>15</td>
<td>16</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>Worse (≥4 mins slower)</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

Typical best defined as the median fastest time in the current timetable. For example, 4th & King to Diridon Baby Bullet travel times vary from 62 to 69 minutes, with a median time of 66 minutes.

1 - Change in Travel Time and Wait Time by Existing Ridership
1- Travel Time & Wait Time Systemwide

Average Travel Time (Weighted by Ridership)

Average Maximum Headway (Weighted by Ridership)

1 – Service Comparison to Existing

<table>
<thead>
<tr>
<th>Metric</th>
<th>Two Zone with Express</th>
<th>Three Zone</th>
<th>Skip Stop with Express</th>
<th>Distributed Skip Stop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel Time</td>
<td>Similar</td>
<td>Similar</td>
<td>Similar</td>
<td>Similar</td>
</tr>
<tr>
<td>Maximum Wait Time</td>
<td>Slightly Better</td>
<td>Slightly Better</td>
<td>Slightly Better</td>
<td>Better</td>
</tr>
</tbody>
</table>

**Travel Times**
All concepts provide similar travel times to existing, although each pattern preferences different station pairs.

**Maximum Wait Times**
All concepts provide a similar reduction in maximum wait times, although the Distributed Skip Stop is the only concept to provide regular intervals at major stations.
1 – Service Comparison to Existing

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**Travel Times**
All concepts provide similar travel times to existing, although each pattern preferences different station pairs

**Maximum Wait Times**
All concepts provide a similar reduction in maximum wait times, although the Distributed Skip Stop is the only concept to provide regular intervals at major stations

2 – Capacity Metrics

**Internal Connectivity**

**External Connectivity**
Crowding Effects of Irregular Wait Times and Differentiated Service

Passenger Loads: PM Peak

Crowding Effects – Skip Stop with Express

Skip Stop with Express has the lowest effective capacity and least room for ridership growth.
Crowding Effects – Distributed Skip Stop

Distributed Skip Stop has the highest effective capacity and most room for ridership growth.

Wait Times at Major Stations

Depending on the service concept, Caltrain may still experience irregular wait times at major stations served by all trains. This has ramifications for Caltrain’s ability to manage crowding for trains and stations, coordinate transfers, and provide a user-friendly experience.

Only the Distributed Skip Stop concept would maintain regular 10 minute intervals serving all major stations.
2 – Crowding Comparison to Existing

<table>
<thead>
<tr>
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<th>Three Zone</th>
<th>Skip Stop with Express</th>
<th>Distributed Skip Stop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughput Capacity &amp; Crowding</td>
<td>Slightly Better</td>
<td>Slightly Better</td>
<td>Similar</td>
<td>Better</td>
</tr>
<tr>
<td>Ability to Support Significant Ridership Growth</td>
<td>Partially</td>
<td>Partially</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

- The Two Zone with Express and Three Zone concepts would spread riders somewhat evenly across trains, but would still experience some capacity issues due to bunching.
- The Skip Stop with Express would concentrate riders on express trains, which will not alleviate current crowding conditions or provide room for growth.
- The Distributed Skip Stop would spread riders across trains relatively evenly and maximize effective capacity.

3 - Rider Experience Metrics

Internal Connectivity
External Connectivity
3 - User Experience Comparison to Existing Service

<table>
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<tr>
<td>Internal Connectivity</td>
<td>Similar</td>
<td>Similar</td>
<td>Similar</td>
<td>Similar</td>
</tr>
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<td>External Connectivity</td>
<td>Slightly Better</td>
<td>Similar</td>
<td>Similar</td>
<td>Better</td>
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**Existing Riders**
All concepts serve nearly all existing riders with more frequent direct service, although none serve all existing riders.

**Intermodal Transfers**
The Distributed Skip Stop provides efficient transfers at key intermodal stations, while the Two Zone Express provides a good transfer to BART at Millbrae.

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Two Zone with Express

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**PEAK PERIOD**

- **2 Trains / Hour**
- **2 Trains / Hour**
- **2 Trains / Hour**
- **2 Trains / Hour**

**Runtime Tam - 486K**

---

**Express**

- Diesel
- EMU

**Local**

- Hourly stop
- Half-hourly stop

**Zone Express**

- XX min

**Skip - Stop**

- 87 min
Distributed Skip Stop

Express
Local
Zone Express
Skip - Stop

DIESEL EMU

Express
Local
Zone Express
Skip - Stop

Hourly stop
O Half-hourly stop

Runtime Tam – 4th&K

Express
Local
Zone Express
Skip - Stop

PEAK PERIOD

SF to SJ

71 min

71 min

71 min