Caltrain Modernization EMU Procurement

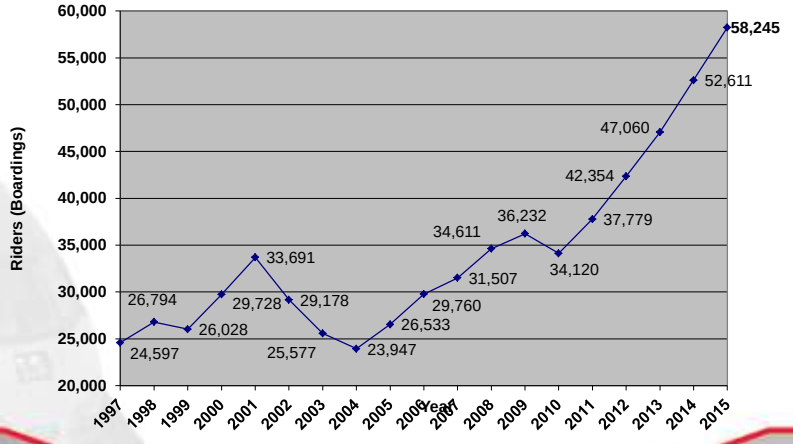
Boarding Height

CAC Meeting
May 20, 2015

Context

Average Weekday Ridership

Since 2004 143% increase



Standees: 2015 Maximum Loads

Northbound		
Depart SJ	Percent of Seated Capacity (low season)	Percent of Seated Capacity (high season)
7:03 AM	135%	158%
7:45 AM	128%	150%
8:03 AM	127%	149%
5:23 PM	122%	143%
6:57 AM	122%	142%
7:50 AM	117%	137%
6:45 AM	108%	126%
6:50 AM	106%	124%
4:39 PM	106%	124%
7:55 AM	103%	121%
8:40 AM	102%	119%
4:23 PM	96%	113%

Exceeding Capacity Today

Rider Average Trip

- Caltrain
  - Average trip length 20-28 miles
  - Average trip time 30-50 minutes
- Other Bay Area Transit Systems
  - BART 14 miles / 24 minutes
  - MUNI 2.8 miles / variable
  - VTA light rail 5.7 miles / 23 minutes
  - ACE 48 miles / 60+ minutes

Regional Transportation Needs

- US 101 and Interstate 280 Congested
- Corridor supports growing economy
  - 14% CA GDP; 52% CA patents; 25% CA tax revenue
- Caltrain Commuter Coalition (formed 2014)
  - 75% caltrain rider's commute to work; 60% choice riders

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Need to Maximize Capacity

- Add Cars to Diesel Trains Now
- Caltrain Electrification (2020)
  - More trains / serve more riders
  - Increase station stops and/or reduced travel times
- Level Boarding and Longer Trains


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Key Regional Benefits

Note: 2013 BAC Report, generates $2.5B economic activity and 9,600 jobs

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PCEP Service Benefits

Metric	Today	PCEP
Trains / peak hour / direction	5	6
Passengers / peak hour / direction	5,100	6,300
Example Baby Bullet Train		
Retain 5-6 stops	*60 minutes*	*45 minutes*
Retain SF to SJ 60 minutes	*6 stops*	*13 stops*
Example RWC Station		
Train stops / peak hour	*3*	*5*

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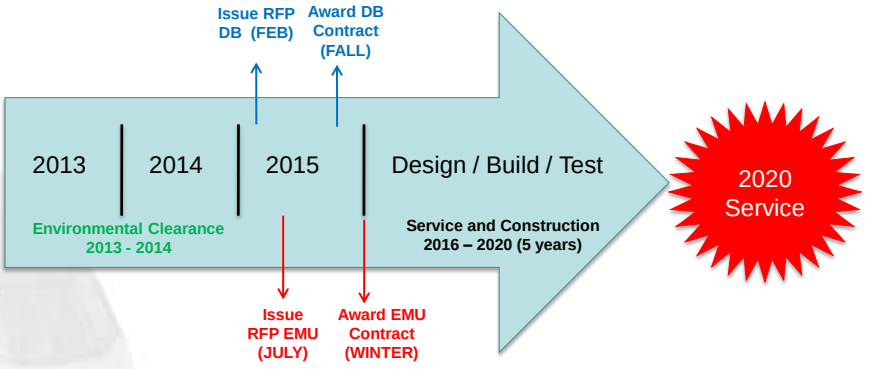
Electrification Project

2020 Revenue Service



Important milestones to meet 2020 service date

2 Key Contracts / Milestones

- Design Build Electrification Infrastructure
  - RFQ Issued / 6 Teams Pre Qualified
  - DB RFP Issued
  - Contract Award (Fall 2015)
- Electric Multiple Units (96 cars)
  - RFI Issued (2 – 4 builders interested)
  - **RFP to be issued July 2015**
  - Contract Award (Winter 2015/2016)

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EMU Original Plan /
Modification Consideration

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Information to Car Builders

Summer 2014

- Growing Demand
  - Weekday ridership today: 60,000+
  - Weekday ridership future: 110,000+
- Today
  - 20+ mile trips
  - 96%-135% peak weekday (over capacity in low season)
  - 11% bikes on board
- Future
  - Share train slots (6 Caltrain / 4 HSR) per hour / direction

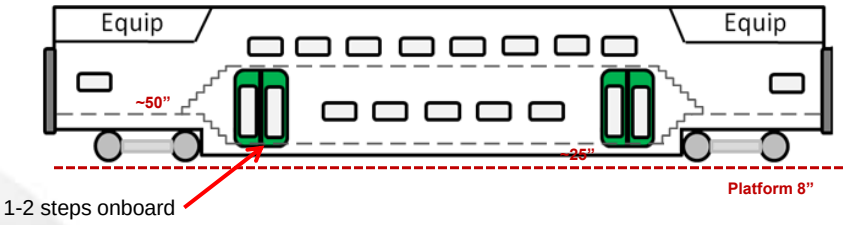
Request for Information

Summer 2014

Attributes	Industry Confirmation
Maximize Capacity	• Bi-level (versus single level)
Previously Made	• Service proven options • Saves costs / time
US Regulation Compliance	• ADA • Buy America • FRA Waiver / Alternative Compliant Vehicles Criteria • Meet Caltrain Technical / Quality Standards
Floor Threshold	• 2 double doors per car (low level boarding) • ~22" to ~25" most common

Note: Anticipate adequate competition for the RFP

Recommended EMU



- Bi-level car
- 2 double doors (located: ~25” floor)
- Passengers step (1-2) from platform
- ADA passengers and bikes located ~25” level
- ADA use mini highs and wayside lifts

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Similar to Today’s Bombardier

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Future Level Boarding

(Beyond Electrification)

- Important to Caltrain
- Safety enhancements
- Operating efficiencies
- Passenger convenience
- ADA

Future Level Boarding, continued

(Beyond Electrification)

- Caltrain ~25” Dedicated Level Boarding all stations
- HSR ~50” Dedicated Level Boarding 2 – 3 stations
  - Transbay Terminal Center
  - Millbrae
  - Diridon

Dedicated Platforms

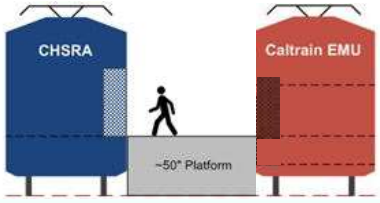
Level Boarding Challenges

- Lengthy construction period with revenue service
- CPUC waiver needed for freight corridor
- Tenants with different boarding heights
  - Altamont Corridor Express
  - Capitol Corridor
  - Amtrak
- Station area impacts (e.g. ramps, circulation, etc.)

Request for EMU Modification

Request for EMU Modifications

- Stakeholder request for car modification
- Caltrain bi-level EMU ~25” boarding height
- HSR single level cars ~50” boarding height (different needs than Caltrain)
- **Can Caltrain modify EMUs to not preclude ~50” boarding in the future?**



Explore Modification Options

- 6 month effort (Dec 2014 to May 2015)
- Car builder interviews w/ HSR
- Technical analysis w/ HSR
- Caltrain operational assessment

Car Builder Interviews

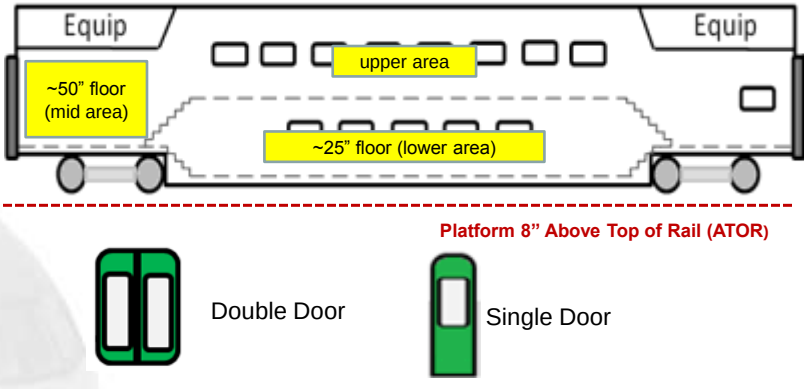
- 7 Participated
- Proposed Modification Solutions
  - Option A Cars with more doors
    (Seat loss 60 - 100 per 6 car train)
  - Option B Cars with traps
    (No seat loss, operational challenge)
- Redesign existing vehicles (not starting from scratch)
- Vehicle delivery (2020 revenue service)
- Competition adequate

Caltrain Operational Assessment

Analysis

- 2 Modification Options
- 2 Timeframes
  - 2020 electrified service without HSR
  - Future blended service with HSR
- Focus Areas
  - Boarding for passengers with and without bikes, ADA
  - Passenger circulation within the cars
  - Operational changes

Terminology



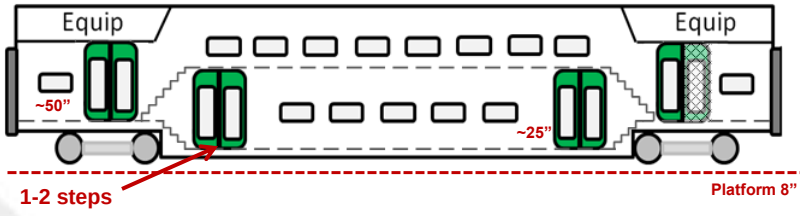
Notes: Caltrain EMU Floor ATOR: 22"- 25" (for this presentation ~25")'; HSR Train Floor ATOR: 48"- 51" (for this presentation ~50")

2020 Evaluation
Mixed EMU and Diesel Service

(Using Existing Stations)

Modification A (2020)

Cars with More Doors



- 4 double doors (located: ~25" & ~50")
- ~50" double doors may not be feasible
- Passengers / bikes use ~25" doors (1-2 steps)
- ADA location TBD
  - Located at ~50" (use high doors: need high blocks / wayside lift)
  - Located at ~25" (use low doors: need mini high / wayside lift)

Modification A (2020), continued

Cars with More Doors

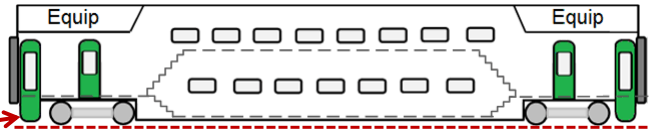
High Block

Wayside lift

Mini-High

Modification B (2020)

Cars with Traps



Open Trap

Close Trap

Single Door w/ Trap

Modification B (2020), continued

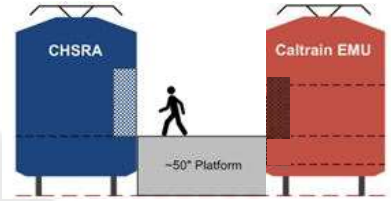
Cars with Traps

- 2 single doors w/ traps, 2 single doors no trap
  - All doors to ~50” floor
- Single door access (longer dwell)
- Passengers/bikes use doors w/ traps (3-5 steps)
  - Taller first step or step stool needed
  - Bikes located ~25” level (additional internal steps down)
- ADA location ~50” level
  - At stations high blocks / wayside lifts
- Automatic / manual traps

Future Blended System Evaluation
Full Fleet EMU Service

(HSR and Modified Level Boarding Stations)

Scenario 1: Shared Platform at HSR Stations Only

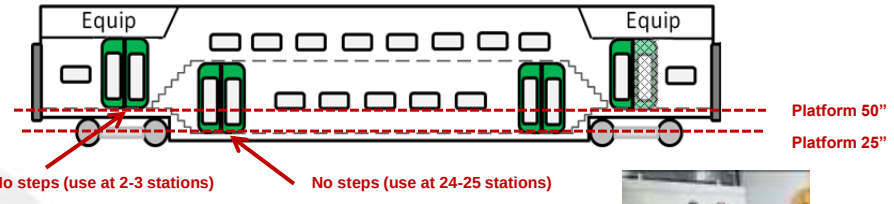


2-3 Stations: Caltrain / HSR Stations Common Platforms ~50”

25 Stations: Caltrain Level Boarding ~25”

Modification A (Future)

Cars with More Doors; Shared 50” Platforms 2 – 3 Stations

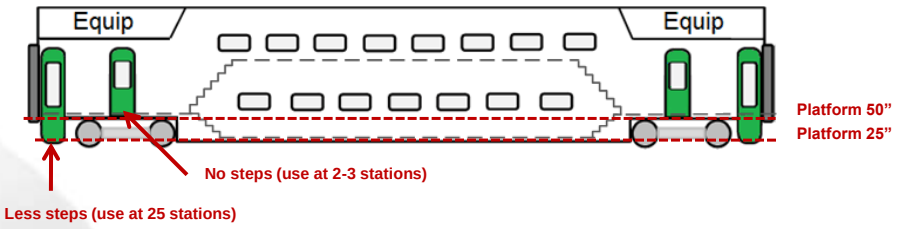


- Continue using both doors
- Seats cannot be restored
- Interior lift needed if ADA ~25” level
- Interior circulation challenges

Interior lift

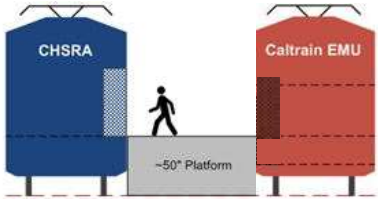
Modification B (Future)

Cars with Traps; Shared 50" Platforms 2 – 3 Stations



- Continue using traps (longer dwell)
- Interior circulation challenges

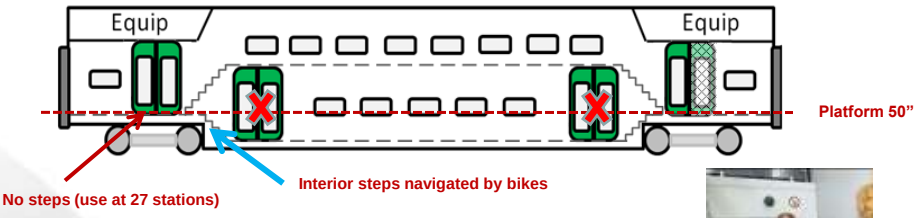
Scenario 2: Share Platforms at All Stations



28 Stations: Caltrain / HSR Stations
Common Platforms ~50"

Modification A (Future)

Cars with More Doors; Shared 50" Platforms All Stations



- Seal low doors and use high doors only
- Interior reconfiguration / restore seats
- Bike circulation and storage challenge
- Interior lift needed if ADA ~25" level

Interior lift

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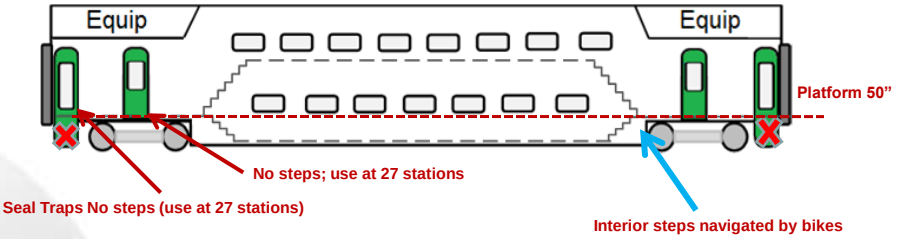
Modification B (Future)

Cars with Traps; Shared 50" Platforms All Stations



- Seal traps
- Single door (dwell impacts)
- Bike circulation and storage challenge

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Potential Path Forward

Framework

- HSR / Caltrain blended system partnership
- Blended system not yet defined
  - Community planning
  - Environmental evaluation
- Early investment program (defined / environmentally cleared)
  - CBOSS PTC (2015)
  - Electrification Project (2020)
- Need to make EMU design decision now to not preclude common platforms w/ HSR in future

Cars with More Doors Option

- Challenges Associated with More Doors
  - Seat loss / Passenger circulation inside car
- Short-Term Solution (2020)
  - Design car with 2 sets of doors
  - Keep high doors sealed / use low doors
  - Car configured similar to original EMUs (mitigate challenges)
  - Request HSR to fund modification costs
- Future Blended System (TBD)
  - Evaluate use of high doors (~50")
  - Associated car interior reconfiguration

Future Blended Service

- Additional Work Needed
- Community Planning / Environmental Review
- Blended System Definition
  - Service Plan
  - System Upgrades
  - Infrastructure (passing tracks, maintenance facility)
  - HSR Stations / Caltrain Station Modifications

Next Steps

May – July Activities

- Public Meetings
- Release Draft RFP to Car Builders
- June JPB
  - Update on proposed path forward
  - Seats/Standees/Bikes/Bathroom balance
- July JPB
  - Release EMU RFP
  - Regional funding plan update

Questions

website: www.caltrain.com/emu
email: calmod@caltrain.com

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