



Caltrain Modernization EMU Procurement

Boarding Height

JPB Workshop
May 20, 2015



Workshop Purpose (Jim)



Workshop Purpose

- Technical Topic: EMU Boarding Height
- Informational / Discussion
- July JPB EMU RFP Action

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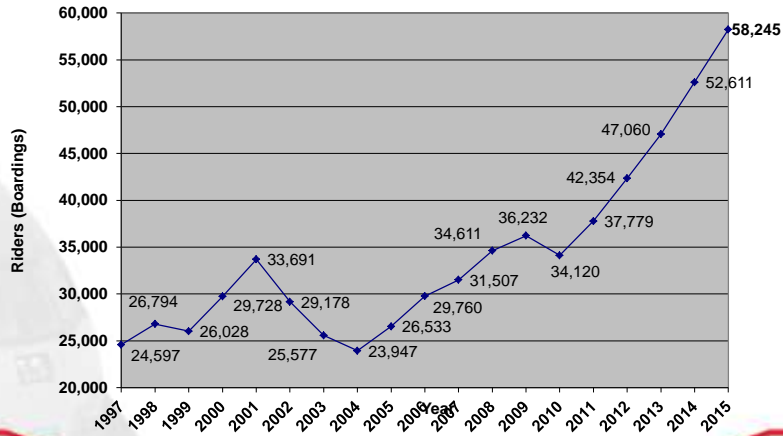
Context (Mare)

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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



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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

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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

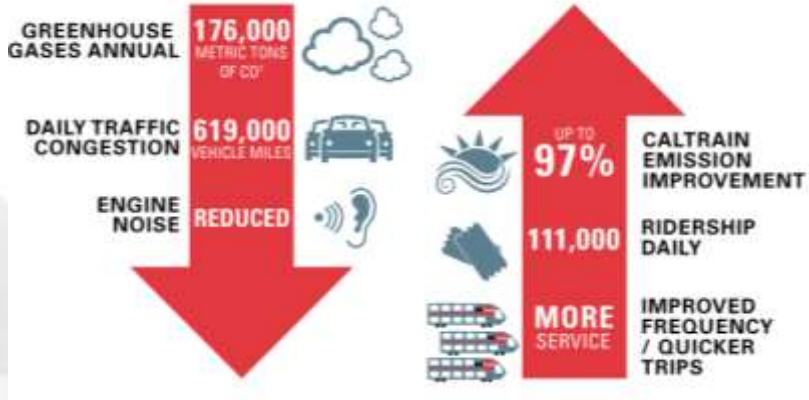


Need to Maximize Capacity

- 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



Key Regional Benefits



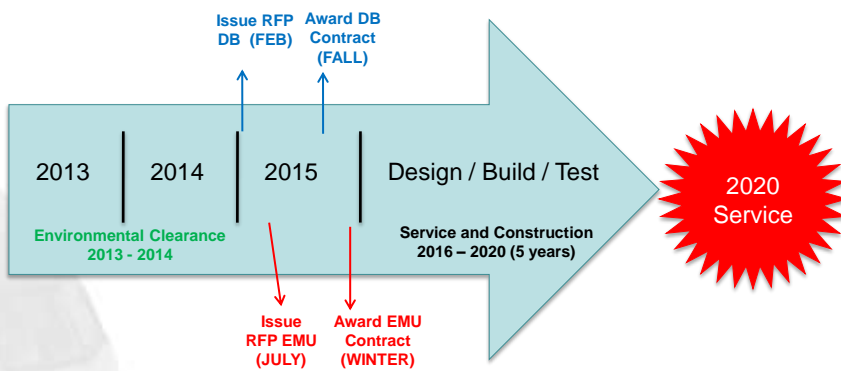
Note: 2013 BAC Report, generates \$2.5B economic activity and 9,600 jobs

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 |

Electrification Project (Dave)

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)

*EMU Original Plan /
Modification Consideration*



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

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Request for Information

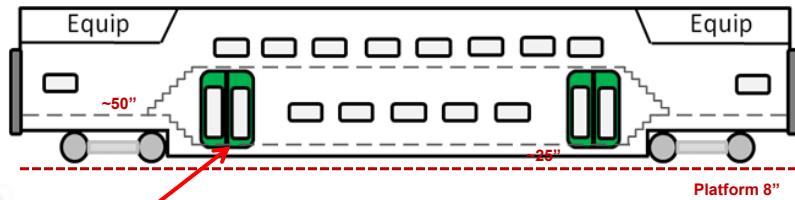
Summer 2014

| Attributes | Industry Confirmation |
|--------------------------|--|
| Maximize Capacity | <ul style="list-style-type: none">• Bi-level (versus single level) |
| Previously Made | <ul style="list-style-type: none">• Service proven options• Saves costs / time |
| US Regulation Compliance | <ul style="list-style-type: none">• ADA• Buy America• FRA Waiver / Alternative Compliant Vehicles Criteria• Meet Caltrain Technical / Quality Standards |
| Floor Threshold | <ul style="list-style-type: none">• 2 double doors per car (low level boarding)• ~22" to ~25" most common |

Note: Anticipate adequate competition for the RFP

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Recommended EMU



1-2 steps onboard

- 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

Similar to Today's Bombardier



Future Level Boarding

(Beyond Electrification)

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

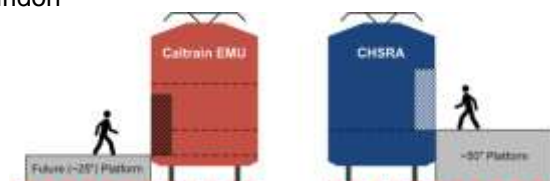


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Future Level Boarding, continued

(Beyond Electrification)

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



Dedicated Platforms

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Level Boarding Challenges

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

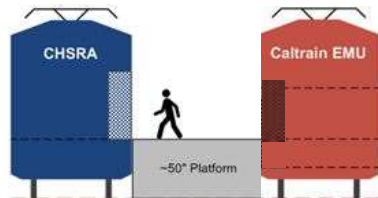
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Request for EMU Modification

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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?**



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Explore Modification Options

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

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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

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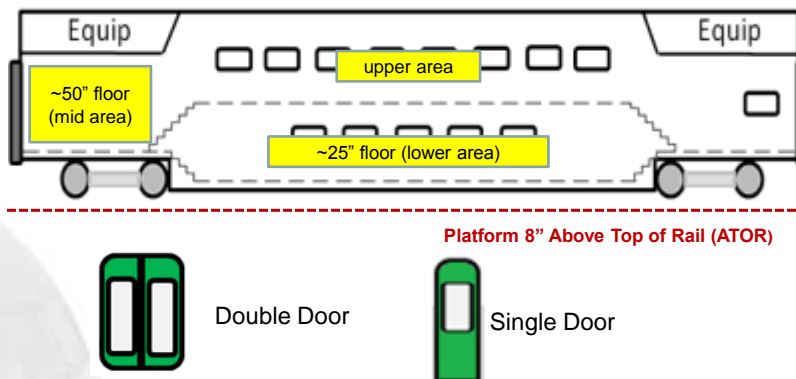
Caltrain Operational Assessment (Chuck)

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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")

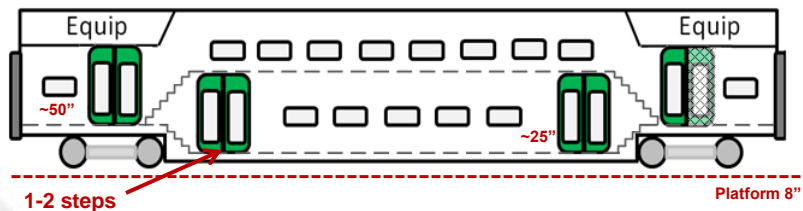
2020 Evaluation Mixed EMU and Diesel Service

(Using Existing Stations)

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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)

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Modification A (2020) continued

Cars with More Doors



High Block



Wayside lift

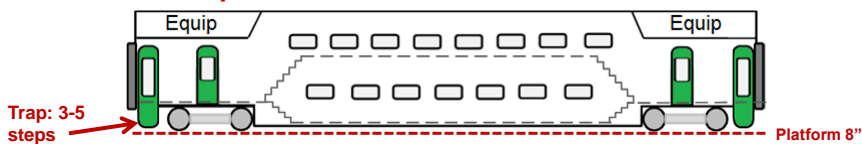


Mini-High

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Modification B (2020)

Cars with Traps



Open Trap



Close Trap



Single Door w/ Trap

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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

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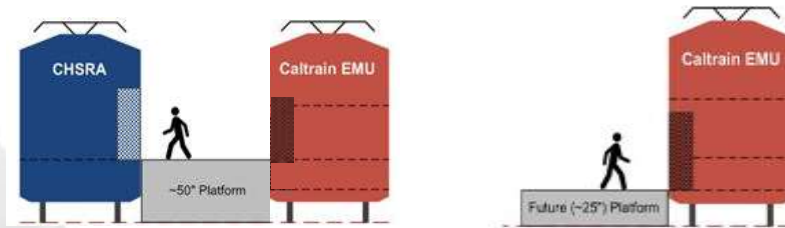
Future Blended System Evaluation Full Fleet EMU Service

(HSR and Modified Level Boarding Stations)

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Scenario 1: Shared Platform at HSR Stations Only



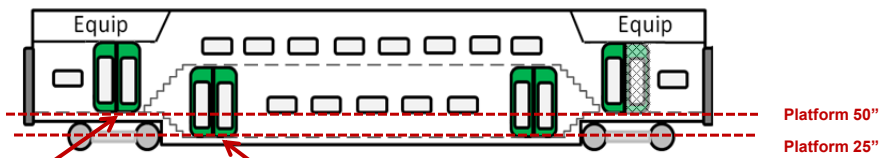
2-3 Stations: Caltrain / HSR
Stations Common Platforms ~50"

25 Stations: Caltrain Level
Boarding ~25"



Modification A (Future)

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



No steps (use at 2-3 stations)

No steps (use at 24-25 stations)

Platform 50"

Platform 25"

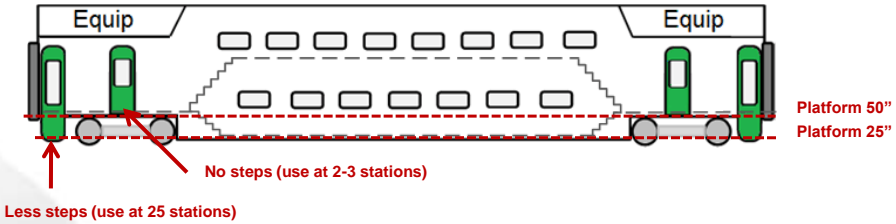
- Continue using both doors
- Seats cannot be restored
- Interior lift needed if ADA ~25" level
- Interior circulation challenges



Interior lift

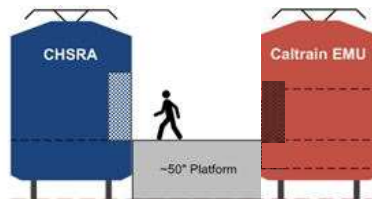
Modification B (Future)

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



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

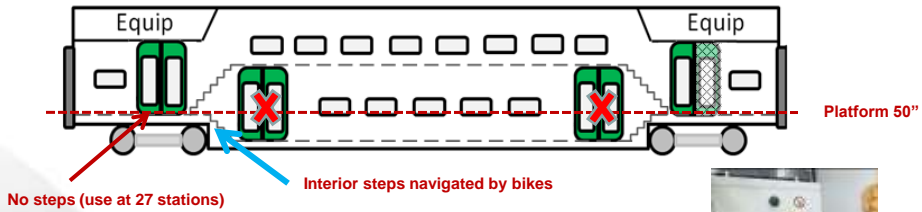
Scenario 2: Share Platforms at All Stations



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

Modification A (Future)

Cars with More Doors; Shared 50" Platforms All Stations



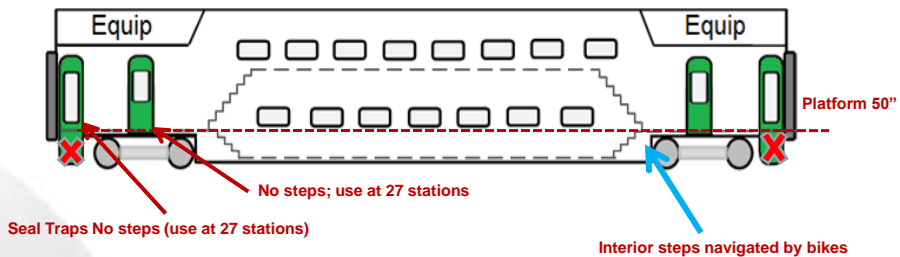
- Seal low doors and use high doors only
- Interior reconfiguration / restore seats
- Bike circulation and storage challenge
- Interior lift needed if ADA ~25" level



Interior lift

Modification B (Future)

Cars with Traps; Shared 50" Platforms All Stations



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

Potential Path Forward (Mare)

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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

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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

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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

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Next Steps

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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

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HSR Presentation (Ben)

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Public Comments / Adjourn

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