



California High-Speed Rail Common Level Boarding and Tier III Trainsets

Peninsula Corridor Joint Powers Board
Level Boarding Workshop
May 2015

1



Advantages of Common Level Boarding

- Improved operations at common stations (TTC, Millbrae, Diridon)
- Improved passenger circulation
- Improved safety
- Improved Reliability and Recovery Capabilities
- Significantly reduced infrastructure costs
- Improved system operations
- Accelerated schedule for Level Boarding at all stations

2



Goals for Commuter Trainset RFP

- Ensure that Caltrain Vehicle Procurement does not preclude future Common Level Boarding Options
- Ensure that capacity of an electrified Caltrain system is maximized
- Identify strategies that maintain or enhance Caltrain capacity during transition to high level boarding
- Develop transitional strategies for future integrated service

3



Request for Expressions of Interest

- In January 2015 a REOI was released to identify and receive feedback from firms interested in competing to design, build, and maintain the high-speed rail trainsets for use on the California High-Speed Rail System.
- The Authority's order will include a base order and options up to 95 trainsets.

4



Technical Requirements - Trainsets

- **Single level EMU:**
 - Capable of operating in revenue service at speeds up to 354 km/h (220 mph), and
 - Based on a service-proven trainset in use in commercial high speed passenger service at least 300 km/h (186 mph) for a minimum of five years.

5



Technical Requirements - Trainsets

- Width between 3.2 m (10.5 feet) to 3.4 m (11.17 feet)
- Maximum Length of 205 m (672.6 feet).
- Minimum of 450 passenger seats
- Provide level boarding with a platform height above top of rail of 1219 mm – 1295 mm (48 inches – 51 inches)

6



Submittal Information

- Nine Expressions of Interest (EOI) have been received thus far.
- EOIs will continue to be accepted through the RFP process.
- Submitting an EOI is not a requirement. Firms that do not submit an EOI may still submit a Proposal in response to the RFP.

7



The Procurement Process

- The REOI did not begin the procurement process.
- A Draft RFP was released for Industry Input and Comment
- The Authority will issue an RFP to begin the procurement process in the Fall of 2015.
- Firms that submitted EOIs were given credentials to ask questions and participate in one-on-ones during the RFP process.

8



Trainset Boarding Scenarios In Europe and Asia

Frank Banko, PMT Rolling Stock Manager
May 20, 2015



9

CHSRA – TRAINSET PERFORMANCE CHARACTERISTICS

1. Maximize competition
2. Service-proven design
3. FRA Tier III compliant (crashworthiness, crew/passenger safety)
4. ADA compliant (high-platform level boarding, all coaches accessible)
5. Operating speed (354 km/h (220 mph), subjected to large gradients)
6. Single-level, wide body coach configuration
7. Minimize axle loads



10

EXISTING STANDARDS – ADA

• United States

- » Americans with Disabilities Act
 - 49CFR Parts 37 and 38
 - “all cars for high-speed rail systems ...shall be designed for **high-platform, level boarding...**”
 - Vertical gap between trainset floor and platform: ± 15.9 mm (± 0.625 ”)
 - » Applicable to high-speed trainset stopping at both new and existing stations
 - Horizontal gap: ≤ 76.2 mm (≤ 3 ”)
- » **CHSRA trainset will be ADA-compliant and have level boarding.**



11

EXISTING STANDARDS – EUROPEAN PLATFORM HEIGHTS

• Europe

- » High-Speed Infrastructure Technical Specifications for Interoperability (TSI)
 - Section 4.2.20.4: Nominal platform height above the running plane shall be either **550 mm (21.7”) or 760 mm (29.9”)**
 - Section 7.3: Exceptions to Great Britain, Ireland, Northern Ireland, Netherlands, and Sweden
 - » GB (Cat. II and III): 865 mm (34.1”) to 915 mm (36.0”)
 - » Ireland/Northern Ireland: 915 mm (36.0”)
 - » Netherlands (Cat. II and III): 840 mm (33.1”)
 - » Sweden (Cat. II and III): nominal 580 mm (22.8”) or 730 mm (28.7”)



12

EXISTING STANDARDS – ASIAN PLATFORM HEIGHTS

- **Japan**

- » MLIT's Technical Standard for Japanese Railway
 - Article 36: "The surface of the platform and the surface of the floor part of the rolling stock where passengers board and alight shall be as flat as possible."
- » Shinkansen platform height: 1250 mm (49.2") above top of rail.

- **China**

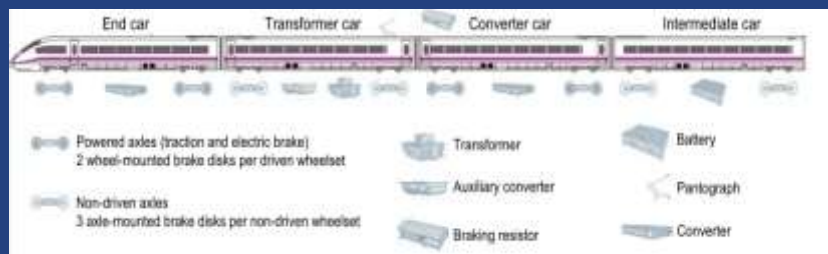
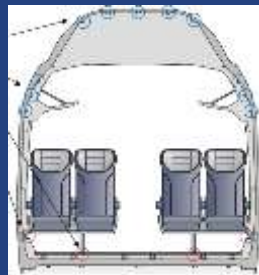
- » MOR's Code for Design of High-Speed Railway
 - Section 10.4.1: Platform height: 1250 mm (49.2") above top of rail.



13

HSR TRAINSET FLOOR HEIGHTS

- There are no service-proven HS trainsets capable of operating at 354 km/h (220 mph) that can provide ADA-compliant level boarding at platforms built 635 or 762 mm (25 or 30") above top of rail.



15

LIFECYCLE FOR TRAINSET PROCUREMENT

- RFP issued - 2015
- Contract awarded to manufacturer - 2016
- Design completed - 2018
- Trainsets manufactured - 2021
- Testing, commissioning, training - 2022
- In-service - 2022

16

HIGH-SPEED TRAINSET FLOOR HEIGHTS

Manufacturer	Vehicle	Floor Height in mm (inches)	Continent/Country
Alstom	AGV	1160 (45.7)	Europe (Italy)
Alstom	Duplex	306 (12.1) ¹	Europe (France)
Bombardier	Zefiro 380	1250 (49.2)	China
Bombardier	V300 Zefiro	1250 (49.2)	Europe (Italy)
Siemens	Velaro CN	1260 (49.6)	China
Siemens	Velaro D	1240 (48.8)	Europe (Germany)
Sumitomo	N700	1300 (51.2) ²	Japan
Talgo	350	760 (29.9)	Europe (Spain)
TBD	TBD	1219 to 1295 (48 to 51) - TBD	US - CHSRA

¹ The lower floor of the Duplex can be elevated to provide level boarding at a 550 mm (21.7") platform height

² Same floor height for CRH380A

17

ALSTOM AGV

- Operated in Italy
- Vehicle floor height: 1160 mm (45.7")
 - » Platform height: 550 or 760 mm (21.7 or 29.9")
- Half width of trainset: 1500 mm (59.0")
 - » Platform offset from track centerline: 1661.5 mm (65.4")



18

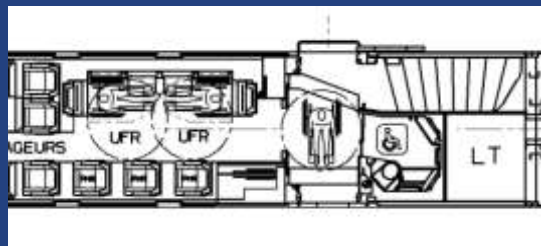
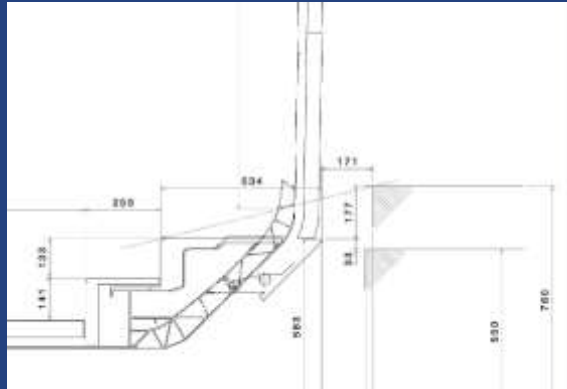
ALSTOM EURODUPLIX (TGV 2N2)

- Operated in France
- Vehicle floor height: 306 mm (12.1")
 - » Platform height: 550 or 760 mm (21.7 or 29.9")
- Half width of trainset: 1450 mm (57.1")
 - » Platform offset from track centerline: 1650 to 1700 mm (65.0 to 66.9")



19

ALSTOM EURODUPLEX (TGV 2N2)



20

BOMBARDIER ZEFIRO 380

- Operated in China
- Vehicle floor height: 1250 mm (49.2")
 - » Platform height: 1250 mm (49.2")
- Half width of trainset: 1680 mm (66.1")
 - » Platform offset from track centerline: 1750 mm (68.9")



21

BOMBARDIER V300 ZEFIRO

- To be operated in Italy in June 2015
- Vehicle floor height: 1250 mm (49.2")
 - » Platform height: 550 or 760 mm (21.7 or 29.9")
- Half width of trainset: 1450 mm (57.1")
 - » Platform offset from track centerline: 1661.5 mm (65.4")



22

SIEMENS VELARO CN

- Operated in China
- Vehicle floor height: 1260 mm (49.6")
 - » Platform height: 1250 mm (49.2")
- Half width of trainset: 1640 mm (64.6")
 - » Platform offset from track centerline: 1750 mm (68.9")



23

SIEMENS VELARO D

- Operated in Germany
- Vehicle floor height: 1240 mm (48.8")
 - » Platform height: 760 mm (29.9")
- Half width of trainset: 1460 mm (57.5")
 - » Platform offset from track centerline: 1650 to 1700 mm (65.0 to 66.9")



24

SUMITOMO N700 SERIES SHINKANSEN

- Operated in Japan
- Vehicle floor height: 1300 mm (51.2")
 - » Platform height: 1250 mm (49.2")
- Half width of trainset: 1680 mm (66.1")



25

TALGO 350

- Operated in Spain
- Vehicle floor height: 760 mm (29.9")
 - » Platform height: 550 or 760 mm (21.7 or 29.9")
- Half width of trainset: 1470 mm (57.9")
 - » Platform offset from track centerline: 1650 to 1700 mm (65.0 to 66.9")



26

TALGO 350

- The Talgo 350 trainset can provide level boarding at platforms built 762 mm (30") above top of rail.
 - » Maximum design speed of 354 km/h (220 mph)
 - » Certified at 330 km/h (205 mph)
 - » Operating speed is 300 km/h (186 mph)
 - Does not meet the required operating speed of 354 km/h (220 mph)
 - CHSR Trainset to be tested at 390 km/h (242 mph)

27

RSSB PLATFORM TRAIN INTERFACE STRATEGY

- In 2013, the Railroad Safety and Standards Board (RSSB) investigated PTI risk and develop a strategy that would:
 - » Reduce safety risk
 - » Optimize operational performance
 - » Optimize availability of access
- RSSB Platform Train Interface (PTI) Strategy Report issued January 2015
- Identified areas of design and operation that are not always compatible:
 - » Platform clearances for passenger, freight, and other vehicles
 - » Platform and passenger vehicle floor heights
 - » **Step and gap configurations** for passengers with and without mobility issues and those using wheelchairs
 - » Passenger train designs, including door configurations, train capacity, provision for luggage; and how these might affect overall performance

28

IMPORTANCE OF PASSENGER TRAIN INTERFACE (PTI)

- Optimizing the step and gap will:
 - » Reduce dwell times
 - » Optimize capacity
 - » Improve passenger experience
 - » Reduce anxiety
 - » Increase accessibility
 - » Overall encourage the use of the railway

29

QUESTIONS AND ANSWERS



30