



**Federal Railroad
Administration**

High Speed Rail Regulatory Update

Briefing to the State Rail Safety Managers

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Today's Presentation

1. Vision and Objectives
2. Vehicle/Track Safety Standards - Final Rule
3. System Safety Program – Final Rule Stage
4. RSAC Engineering Task Force/Tier III Passenger Equipment Safety Standards – Pre-NPRM Stage
5. Questions and Discussion

Vision and Objectives

Vision:

Create an interoperable, three-tier, passenger equipment regulatory environment incorporating “service proven” designs, advanced technology, and a systematic approach to safety.

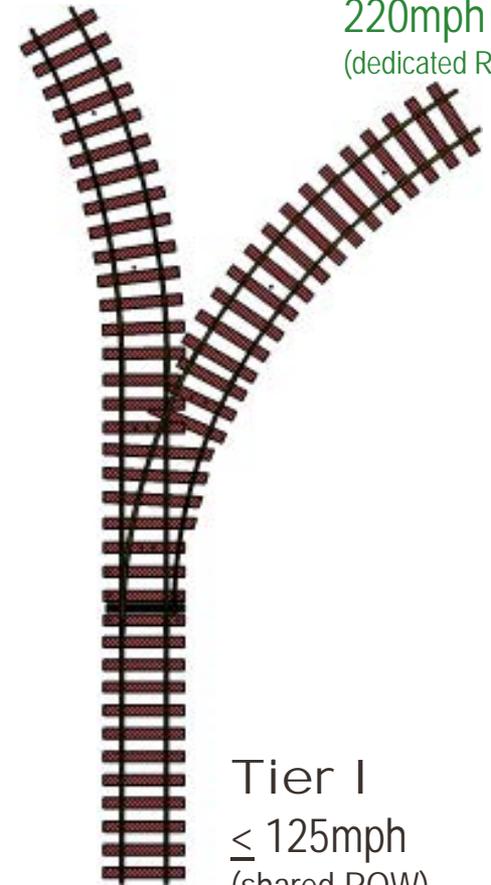
Tier I – conventional and **alternatively-compliant equipment** on shared right-of-way (ROW) up to 125 mph

Tier II – 160-mph maximum authorized speed on shared ROW (namely, NEC)

Tier III – interoperable with all tiers of equipment up to 125 mph in shared ROW – up to 220 mph in dedicated ROW with no grade crossings

Tier II
Up to 160mph
(shared ROW)

Tier III
220mph
(dedicated ROW)

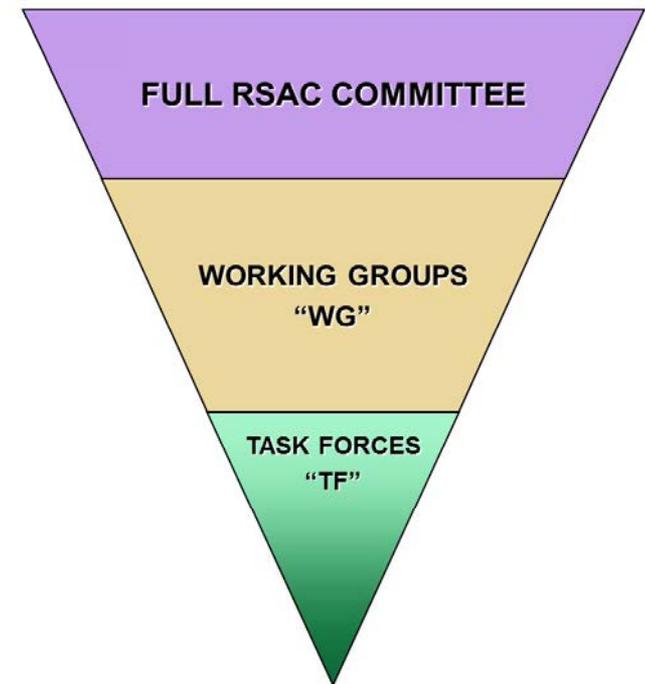


Tier I
≤ 125mph
(shared ROW)

Recent Regulatory Efforts to Implement HSR Through Railroad Safety Advisory Committee (RSAC)

1. **Vehicle/Track Interaction (VTI)
Safety Standards (Final Rule)**
– *49 CFR Parts 213 and 238*
2. **System Safety Program (SSP)**
(Final Rule stage) – *49 CFR Part 270*
3. **Engineering Task Force/Tier III Passenger
Equipment Safety Standards**
(Pre-NPRM stage) – *49 CFR Part 238*

General RSAC Structure



Purpose of VTI Safety Standards

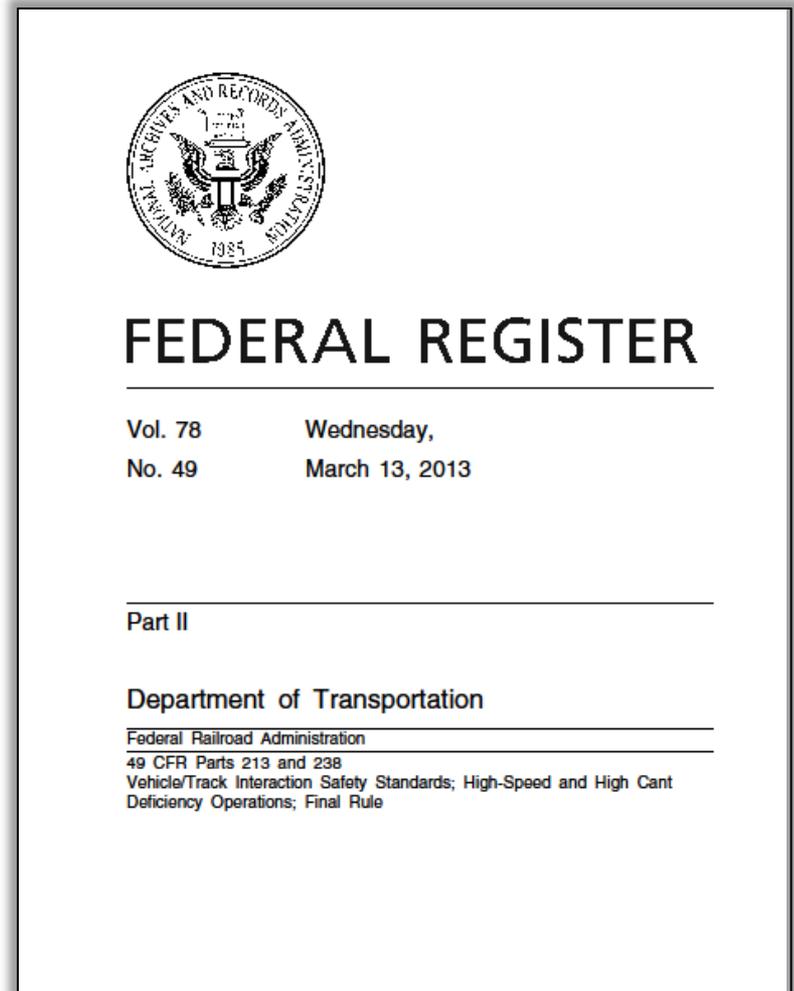


Vehicle/Track Interaction (VTI) Safety Standards reduce the risk of derailments and other accidents attributable to the dynamic interaction between moving vehicles and the track over which they operate.

VTI Safety Standards Final Rule

The final rule was published on March 13, 2013, and is intended to promote VTI safety under a variety of conditions at speeds **up to 220 mph**. The final rule—

1. Revised standards for vehicle response to track conditions.
2. Revised standards for track geometry.
3. Revised requirements for operations at high cant deficiency.
4. Enhanced qualification procedures for demonstrating vehicle trackworthiness to take advantage of computer modeling.



VTI Safety Standards Final Rule - General

Based on operational and vehicle qualification experience (data), the results of simulation studies (modeling), research, and consideration of international practices.

Amended both the Track Safety Standards (49 CFR Part 213) and the Passenger Equipment Safety Standards (49 CFR Part 238).

Helps promote the safe implementation of nationwide, high-speed passenger rail service at speeds **up to 220 mph**.

Recent Regulatory Efforts to Implement HSR

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Safety Standards (Final Rule)
– 49 CFR *Parts 213 and 238*
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(Pre-NPRM stage) – 49 CFR *Part 238*

System Safety Program Rulemaking

- Notice of Proposed Rulemaking (NPRM) issued on September 7, 2012, as proposed 49 CFR Part 270.
- Would require each commuter and intercity passenger railroad to develop and implement a system safety program (SSP) to improve the safety of its operations, as required by the Rail Safety Improvement Act of 2008.
- The SSP would be a structured program with proactive processes and procedures to identify and mitigate or eliminate hazards and the resulting risks on each railroad's system.
- Each railroad would in turn prepare a written plan to implement the SSP and submit the plan to FRA for review and approval.

System Safety Program Rulemaking

Proposed Plan Elements



Recent Regulatory Efforts to Implement HSR

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Engineering Task Force (ETF)/Tier III Rulemaking

Engineering Task Force Established by Passenger Safety Working Group (PSWG), August 12, 2009

- Developed Technical Criteria and Procedures for the Crashworthiness of Alternatively-Designed Tier I Passenger Equipment

ETF Re-Tasked by PSWG, July 28, 2010

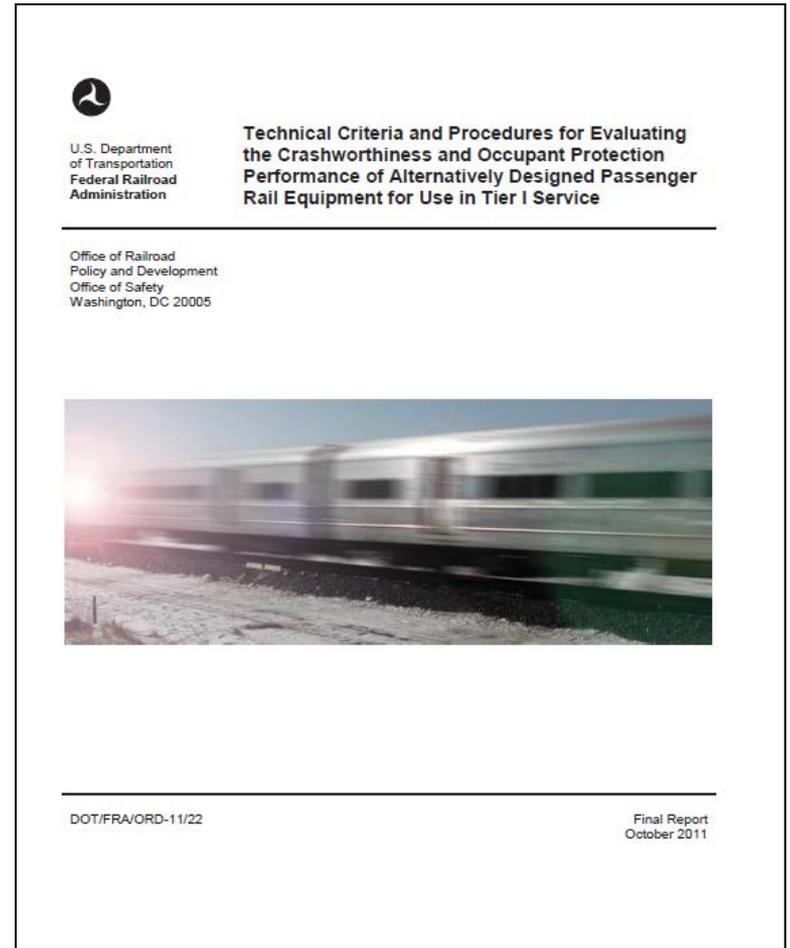
- May Address Any Type of Equipment
- May Address Any Safety Features of the Equipment

ETF/Tier III Rulemaking Background and Brief History

In 2009 FRA began developing alternative criteria for Tier I crashworthiness requirements

This effort eventually led to development of “waiver guidance” in October 2011 and a draft rule

The alternative criteria would also serve as the backbone for the proposed Tier III standards



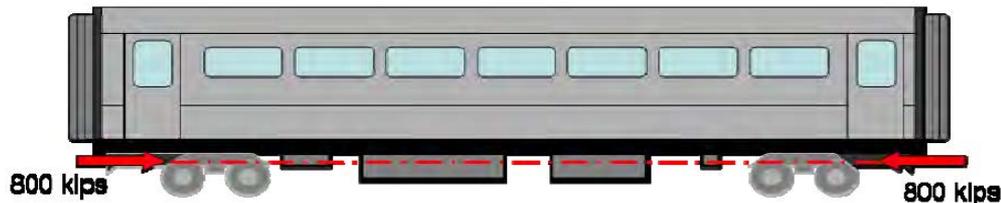
ETF/Tier III Rulemaking

Background - Alternative Compliance

Traditional rolling stock designs rely on structural strength for crashworthiness

This approach was common because:

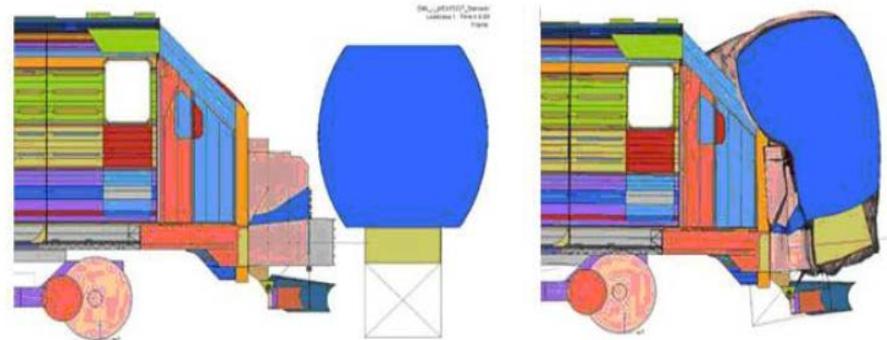
- Analysis/calculations could be done by hand;
- Performance was well understood; and
- Non-destructive tests were essential.



Modern designs focus on crash energy management and occupant protection

Prevalence of this approach is due to:

- Increased computing power, modeling, and simulations;
- Improved industry experience; and
- Drive to improve performance & efficiency.



ETF/Tier III Rulemaking

Tier III Safety Standards

Tier III is the proposed regulatory classification for the next-generation of HSR equipment at speeds **up to 220 mph in a dedicated ROW**

Enables the use of modern, advanced, and **service proven** technology within the US

Core requirements are **derived from the Tier I alternative compliance criteria**

California High-Speed Rail Project **intended to take full advantage** of Tier III safety framework



ETF/Tier III Rulemaking Plan For Initial NPRM

Overall approach:

1. Alternative crashworthiness criteria for Tier I equipment (speeds up to 125 mph)
2. Raise Tier II maximum operating speed (from 150 mph) to 160 mph
3. Baseline requirements for Tier III - next generation HSR equipment (speeds up to 220 mph in dedicated ROW)



ETF/Tier III Rulemaking

Two-stage process intended to adopt Tier III

Baseline Elements Included In NRPM #1

- Definition of Tier III equipment
- Trainset structure (crashworthiness)
- Glazing
- Brake Systems
- Interior Fittings and Surfaces (seats, fixtures, etc.)
- Emergency egress/access and lighting

Elements Slated for NPRM #2

- Applicable sections of 49 CFR Part 229 (Locomotive Safety Standards)
- Safety Appliances
- Inspection, Testing, & Maintenance (ITM) Requirements
- Miscellaneous Items Necessary for Qualification, Review, and Approval of Operations

Tier III Safety Standards

Application to Proposed California High-Speed Passenger Rail Project

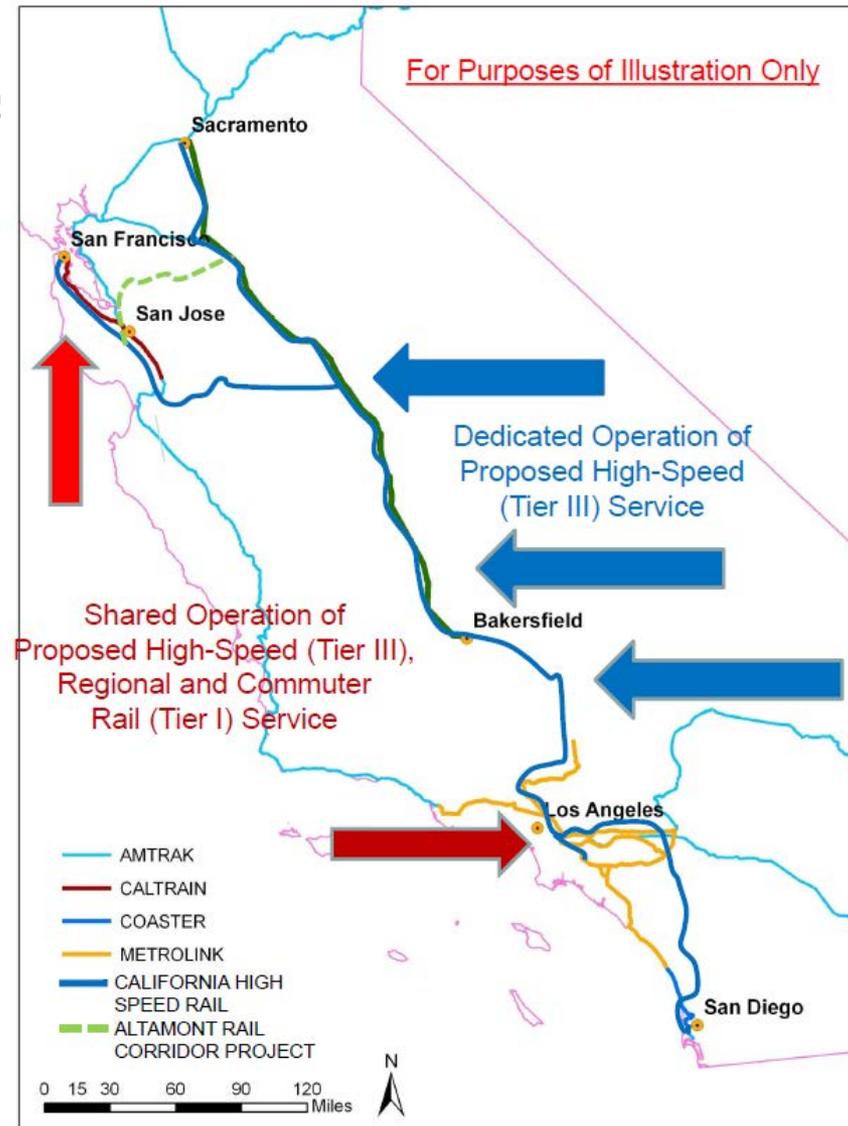
Tier III Standards would be particularly useful for addressing the safety of high-speed rail service proposed for California, providing flexibility in both the design and operation of the service.

- For instance, it is anticipated that the service will need operational compatibility to share infrastructure with regional and commuter rail service in the Los Angeles and San Francisco metropolitan areas, minimizing costs and other impacts.
- Yet, for most of the service, the equipment is intended to operate in a dedicated environment, maximizing its potential.

The following is intended to **illustrate** how the proposed California high-speed rail service may operate in both a shared and dedicated rail environment.

Tier III Safety Standards

Application to Proposed California High-Speed Passenger Rail Project



Questions & Discussion