High Speed Rail Operations on Private Freight Lines

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Outline

• Background
  • US Freight Rail
  • US Passenger Rail

• Challenges

• Past Study Results

• Summary
US Freight Rail – Foundation for US Economy

- Privately owned and operated
- 140K route miles
- Spent $575B total to upgrade and maintain assets (1980-2014)
- Spending $29B in 2015
- Employing 185K jobs and supporting 1.2M jobs
US Freight Rail – America’s workhorse

• ~ 40% of intercity freight moves on rail

• ~ 1/3 of US Export moves on rail

• ~ 70 million truck loads equivalent annually
US Freight Rail - Benefits

- Safest, most efficient, most affordable and most reliable freight rail system in the world
- Large, heavy vehicles and trains - economies of scale
- Privately owned and no cost to tax payers

- Fuel efficiency since 1980 improved by 103%
- Four times more fuel efficient than trucks
- A single freight train can replace several hundred trucks
US Freight Rail – Impact of Staggers Act

Less regulations, more competition, more productivity and more benefits to customers
US Freight Rail – Privately funded and is a great relief to highway congestions
U.S. DOT/FHWA forecasts 61% growth in freight rail transportation by 2040

It is very important to ensure US Freight Rail industry is poised to handle projected future growth
US Passenger Rail

- Passenger ridership declined as automobiles became more affordable, and highways improved.
- Air travel further cut into the railroads’ market share during 1960’s and 70’s.
- Highway travel has been more affordable for US intercity passengers compared to other countries.

Source: Congressional Budget Office based on data from the Association of American Railroads, the Eno Transportation Foundation, Amtrak, and National Association of Railroad Passengers.
Government spending in intercity passenger rails

- U.S. investments in passenger rail have been minimal compared to other countries
- In other countries, passenger rail is more of a public service vs. free-market, profit-making enterprise in the U.S.

![Bar chart showing per capita government investment in intercity passenger rail in 2009.](Source: Worldwatch Institute)
FRA Shared-Use Definitions

- **Shared Track**: tracks shared between passenger and freight or other service
- **Shared Right of Way (ROW)**: dedicated high-speed passenger tracks separated from freight or other service tracks up to 25’
- **Shared Corridor**: dedicated high-speed passenger tracks separated from freight or other service tracks by 25-200’

Source: Rapik Saat, Shared Rail Corridor Challenges – Future Issues in U.S. Rail Transportation, Presented at St. Louis University, 23 October 2012
Shared Use Implementation Challenges

• **Safety**
  - Risk mitigation
  - Operating practices
  - Safety technology
  - Highway/rail grade crossings

• **Infrastructure and Rolling Stock**
  - Wheel-load characteristics
  - Track structure and components
  - Special trackwork
  - Track geometry
  - Vehicle-track interaction (VTI)
  - Stations
  - Signaling systems and train control technology

• **Planning and Operation**
  - Planning process
  - Host railroad negotiation
  - Train scheduling
  - Capacity planning
  - Train control and operations

• **Economic**
  - Capital cost sharing
  - Passenger operation sustainability
  - Freight level of service preservation

• **Institutional**
  - Regulatory compliance
  - Performance incentives/penalties
  - Grant agreement structure
  - Liability

Source: Rapik Saat, Shared Rail Corridor Challenges – Future Issues in U.S. Rail Transportation, Presented at St. Louis University, 23 October 2012
Shared operations creates loss of efficiency and capacity

Train slot utilization

Distance

Time

300 mile corridor

50 mph

110 mph

1 Higher Speed Train = 6 Trains

Source: Marco Turra, 2014 APTA Rail Conference, Transatlantic Passenger Freight Panel
Variation in Freight Train Delay due to Additional Trains

Speed Heterogeneity

- Original speed of train types: Max. speed of (Passenger trains, Intermodal, Unit) = (75 mph, 55 mph, 35 mph)
- Scenario with more homogeneous speed: Max. speed of (Passenger trains, Intermodal, Unit) = (60 mph, 55 mph, 50 mph)

Source: Mei-Cheng Shih et. al, Capacity and Level of Service Impact of Passenger Trains on Shared Rail Corridors with Multiple Types of Freight Trains, Presented at the TRB Conference, 9 Jan. 2015
Freight Rail Industry position on sharing

**SAFETY**
- Separated (min. 30ft), dedicated corridor for passenger trains >90 MPH (CSX)

**CAPACITY**
- Provide capacity for existing and future freight demand

**LIABILITY**
- No fault liability

**COMPENSATION**
- Appropriate compensation for the use/acquisition of property

Passenger rail solutions *can* create mutual gains

Source: Charles E. Gullakson, Shared-Use Rail Routes Technical Challenges: Freight Railroad Perspective, Presented at the University of Illinois, Urbana Champaign lecture series CEE 498 – High-Speed Rail Planning, April 30, 2014
Summary

• Critical to ensure that the freight rail network is able to safely and efficiently transport current and future freight demand
• Separate corridor or separated tracks would be necessary for running high and/or higher speed passenger trains to avoid negative impact to freight rail
• Sharing freight rail track or right of way by lower speed passenger rail may be feasible on a low density line as long as there is capacity available and any additional cost is compensated by passenger agency