Chapter 5
Emerging Challenges and Opportunities for U.S. High-Speed Rail Development

Francis P. Banko
WSP | Parsons Brinckerhoff, USA

Jackson H. Xue
WSP | Parsons Brinckerhoff, USA

ABSTRACT

As we witness the advancement of U.S. high-speed rail initiatives, the country can look towards its European and Asian counterparts for best practices and lessons learned from their decades of high-speed rail design and operations. These experiences gained may be applicable towards projects such as the Texas Central Railway and the California High-Speed Rail Project. This chapter will address the events of 2009 that have brought domestic high-speed rail to the forefront of U.S. rail transportation. This includes the new FRA Tier I and proposed Tier III criteria, challenges associated with each FRA tier of operation, overseas interoperability efforts, snapshots of international experiences (from policy and technological perspectives), the holistic system-based approach to safety, ongoing efforts of the FRA Engineering Task Force, and additional challenges and opportunities moving forward.

DOI: 10.4018/978-1-5225-0102-2.ch005

Copyright ©2016, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.
INTRODUCTION

Regardless of operating speed, it is essential that trains are safely and reliably operated if train travel is to be a preferred mode of transportation. With its rich rail history, the U.S. has had substantial experience in developing and enforcing safety requirements for passenger rail equipment and systems. Title 49, Parts 200-299 of the Code of Federal Regulations (CFR) identifies criteria established by the Federal Railroad Administration (FRA) to govern the design and operation of passenger and freight rail rolling stock. However, these criteria are only applicable for equipment that operate up to 125 mph (201 km/h), also known as Tier I operation, or 150 mph (241 km/h), also known as Tier II operation. To date, there are no established U.S. regulations or standards that address design of rail equipment to operate at speeds greater than 150 mph (241 km/h).

To facilitate introduction of service at speeds greater than 150 mph (241 km/h), the U.S. has looked to its overseas counterparts for best practices from their decades of experience with the design, manufacture, operation, and maintenance of high-speed rail (HSR) equipment and systems. The information gathered through interaction with HSR industry experts will aid the development and subsequent growth of HSR policies and technologies in the U.S. This chapter provides insight into the challenges faced when introducing new HSR technologies and associated design and construction techniques, along with the challenges of complying with current U.S. regulations. These issues are being overcome as the domestic rail industry looks to international high-speed railroads, and applies the lessons learned by those who have been successfully providing safe, reliable, and efficient HSR service.

This chapter addresses the following elements:

- **History of HSR Support:** In the U.S., HSR is “old, but new.” Ever since the introduction of passenger rail service in the U.S., there have been numerous examples where speed records were chased and surpassed. More recently, one can look to Amtrak’s Acela Express service, where trainsets are in daily operation on the Northeast Corridor (NEC) at speeds up to 150 mph (241 km/h). The American Recovery and Reinvestment Act of 2009 (ARRA) has since served as the catalyst for new investments in HSR in existing and new corridors throughout the U.S.

- **Challenges and Considerations from the Project and Industry Perspectives:** New HSR initiatives in the U.S. are focused largely on two different maximum operating speeds (Tier I and proposed Tier III operations up to 220 mph (354 km/h)). Each of these speed ranges introduces a unique set of challenges, including: challenges with traveling at these speeds, challenges
Laser Scanning for the Evaluation of Historic Structures

[www.igi-global.com/chapter/laser-scanning-for-the-evaluation-of-historic-structures/133368?camid=4v1a](www.igi-global.com/chapter/laser-scanning-for-the-evaluation-of-historic-structures/133368?camid=4v1a)