MIT Regional Transportation Planning and High-Speed Rail Research Group

HSR/R Group 2012-2013 (MIT faculty and graduate students)
Upper row (from L to R): Iori Mori, Ryan Westrom, Prof. Joseph Sussman, and Andrés Archila
Lower Row: Naomi Stein, Soshi Kawakami, Joel Carlson, and Maite Peña
Overview of Research Activities

- NURail funding is the lynchpin of the activities of the Regional Transportation Planning and High-Speed Rail Research Group.
  
  [http://web.mit.edu/hsr-group](http://web.mit.edu/hsr-group)

- Complementary research, providing matching funds:
  - MIT Portugal Program (MPP)
  - MIT Transportation Productivity Study
  - MIT Undergraduate Research Opportunities Program (UROP)
  - Region 1 University Transportation Center (UTC)
  - Japan International Transport Institute (JITI)
  - East Japan Railway (endowed chair)
Objective and Scope

- A deeper understanding of HSR and its contributions to critical contemporary issues (CCI), including economic development, energy, and the environment
- The development of a suite of innovative tools of value in studying the above issues
  - CLIOS Process
  - Scenario Planning
  - Real Options Analysis
  - Approximate Dynamic Programming (ADP)
Project List (Ongoing and Complete)

- HSR as a Complex Sociotechnical System (CSS):
  - Transportation in the Northeast Corridor of the U.S.: A Multimodal and Intermodal Conceptual Framework
- HSR Transportation Productivity Study
- HSR in the Digital Society
- Climate Impacts of HSR and Air Transportation
- Rail Industry Strategy for Moving Energy Resources
- Urban Issues Related to HSR – England and Portugal
- Colombian Caribbean Coast Integration HSR
Some Key Results

- Flexibility and scenarios in HSR project planning reveals hidden opportunities and increases expected value, in addition to adding robustness.
- Institutions and organizational structure play a vital role.
- HSR can be a catalyst for regional development.
- HSR changes users’ behavior – e.g., supercommuting.
- Effective urban connections to HSR are vital.
- A first look at US passenger rail productivity focusing on the past decade in the NEC – HSR, overall, increases productivity.
- Air and HSR interact in interesting ways with broad environmental and institutional ramifications.
Publications – Papers I

- Stein N.E.G., Sussman J.M. (2013). Discontinuous Regions: High-Speed Rail and the Limits of Traditional Governance. TRB
Publications – Papers II

- Westrom R.J. (2013). An Examination of the Interaction between Two Prospective Transport Technologies: Questioning the Importance of High-Speed Rail in a Driverless Vehicle Society. TRB
Publications – Ph.D Theses

- Shah, N.B. (2012)
  - Influence Strategies for Systems of Systems. (Ph.D. Aero-Astro)

  - Climate Impacts of High-Speed Rail and Air Transportation: A Global Comparative Analysis. (Ph.D. ESD)

  - The Geography of Strategy: An Exploration of Alternative Frameworks for Transportation Infrastructure Strategy Development. (Ph.D. CEE)
Publications – Theses S.M.

  - Intercity Passenger Rail Productivity in the Northeast Corridor: Implications for the Future of High-Speed Rail. (S.M. in Transportation)

- Stein, N.E.G. (2013)
  - Spatial Dimensions of High-Speed Rail: Intermediate Cities, Inter-Jurisdictional Planning, and the Implications for High-Speed Rail in Portugal. (S.M. in Transportation and Master in City Planning)

- Sakamoto, R. (2012)
  - High-Speed Railway Productivity: How Does Organizational Restructuring Contribute to HSR Productivity Growth? (S.M. in Transportation)

- Huang, T. (2011)
  - Financial Impacts of and Financing Methods for High-Speed Rail in Portugal. (S.M. in Transportation)

  - Development Impacts of High-Speed Rail: Megalopolis Formation and Implications for Portugal's Lisbon-Porto High-Speed Rail Link. (S.M. in Transportation)
Future Work

- Comparative Studies of HSR – Portugal and the US
- Market Design Analysis for Capacity Pricing and Allocation in Shared Railway Systems
- HSR Safety in the Northeast Corridor
- Cross-Border HSR Effect: Economic and Social Structure – Southeast Asia
- Continued Focus on Innovative Methods for Analysis
Questions?

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These projects are supported in full or in part by the National University Rail (NURail) Center, a USDOT-RITA Tier 1 University Transportation Center.