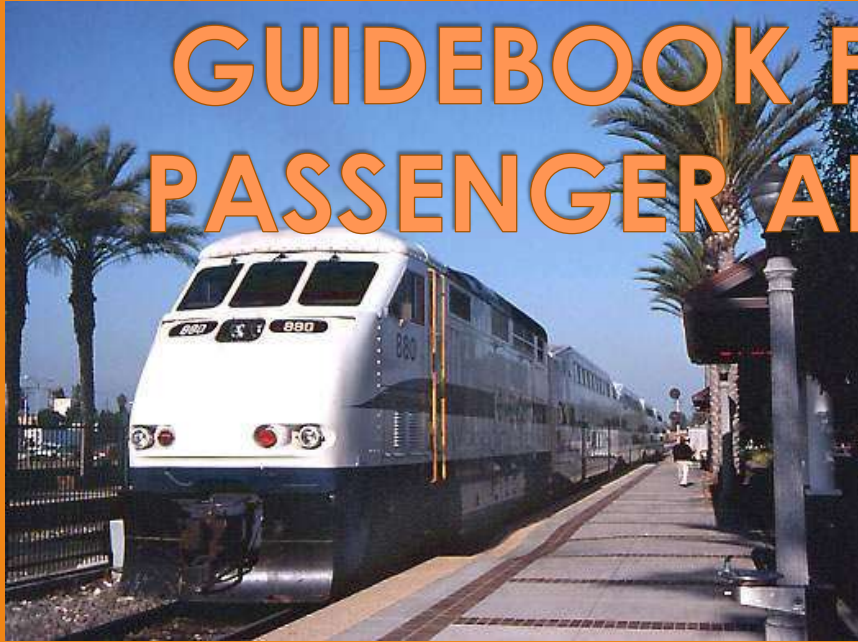


NCHRP REPORT 773 CAPACITY MODELING GUIDEBOOK FOR SHARED-USE PASSENGER AND FREIGHT RAIL OPERATIONS



A project to develop guidebook for
DOT's, Public Agencies and other
Shared Rail Corridor Stakeholders

Introductions

- ◎ Justin Fox
 - > Senior Project Manager, CDM Smith
- ◎ David Simpson
 - > Principal at David P. Simpson Consultants LLC
- ◎ Paula Hirsch
 - > Senior Admin Assistant, CDM Smith

Project Background

- NCHRP Report 657 is the general guidebook for implementing passenger service on shared corridors
- This guidebook “drills down” on the issue of service capacity assessment and modeling as these elements often comprise the biggest challenge to developing a long-term partnership

Project Sponsor

- AASHTO's Standing Committee on Rail Transportation (SCORT)



Study Team

- ◉ Justin Fox, CDM Smith
- ◉ David Simpson
- ◉ With assistance from
 - > Alan Bing
 - > Bruce Horowitz
 - > Andy Cebula
 - > Om Kanike
 - > Paula Hirsch

Shared Corridor Context

- > Public transportation agencies are increasingly considering rail service options to improve passenger mobility
- > Agencies are engaging freight railroads given that new rail corridors are very costly and difficult to build
- > Agency staff often lack knowledge of rail line capacity planning methods and issues

Project Goal

- Produce a guidebook for public sector agencies that will help them interact more effectively with freight railroads and other track owners in planning and managing line capacity for shared-use operations



Project Work Program

- Three essential activities
 - > Outreach to stakeholders
 - > Description of capacity analysis tools and methodologies
 - > Illustrative case studies

Outreach

- Stakeholder target groups
 - > Freight railroads hosting passenger services
 - > Public agency sponsors of passenger trains on freight railroads and Amtrak's Northeast Corridor (NEC)
 - > Amtrak
 - > Federal Railroad Administration (FRA)

Principal Themes from Outreach

- > Standards for transparency of modeling inputs and outputs vary widely
- > Long-term view of corridor needs is essential to ensure appropriate targeting of capital and to build confidence of all parties in the process
- > Robust analysis of service capacity needs and issues, including modeling, is essential to building a solid foundation for a corridor partnerships

Capacity Analysis Methodologies

- ◉ Manual methods
 - > String line analysis and grid time analysis
- ◉ Operations simulation
 - > Rail Traffic Controller (RTC), RAILSIM, RAILS2000, NCFRP's Web-based Freight-Passenger Rail Corridor Project Screening Tool, aka Shared-use Tool (SU Tool)
- ◉ Other methods
 - > Manual, statistical, simulation, etc.
 - > Proprietary, details less well known

Methodology Pros and Cons

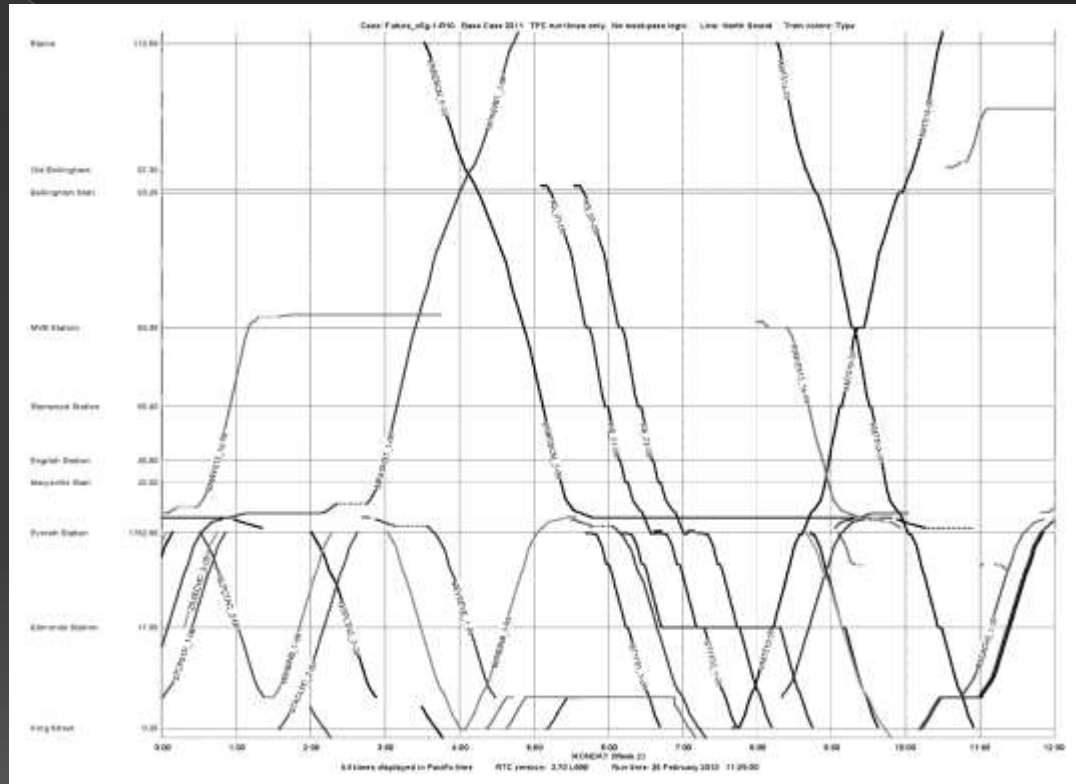
○ Manual methods

- > Pros: Easy to do, inexpensive, limited data requirements
- > Cons: Not applicable to complex rail environments

○ Simulation

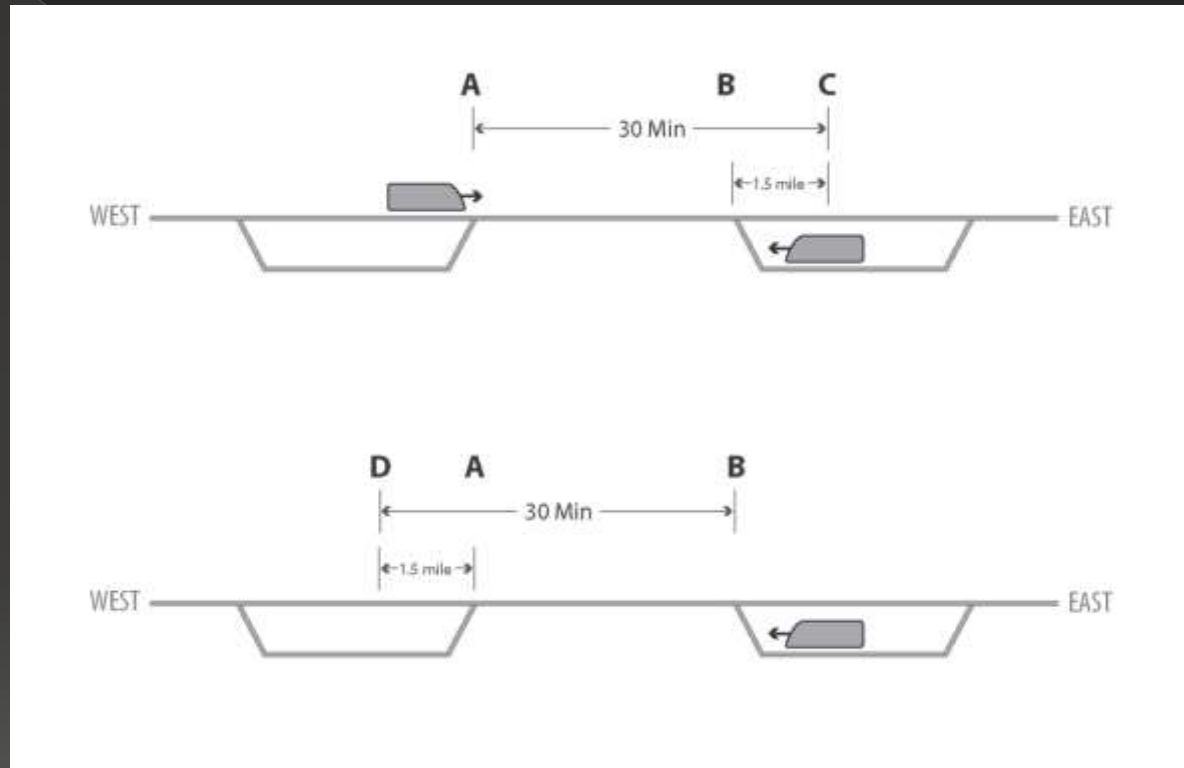
- > Pros: Robust, comprehensive analysis capability
- > Cons: Intensive data and resource requirements; potentially very expensive; getting freight railroad data may require confidentiality guarantees

String Lines



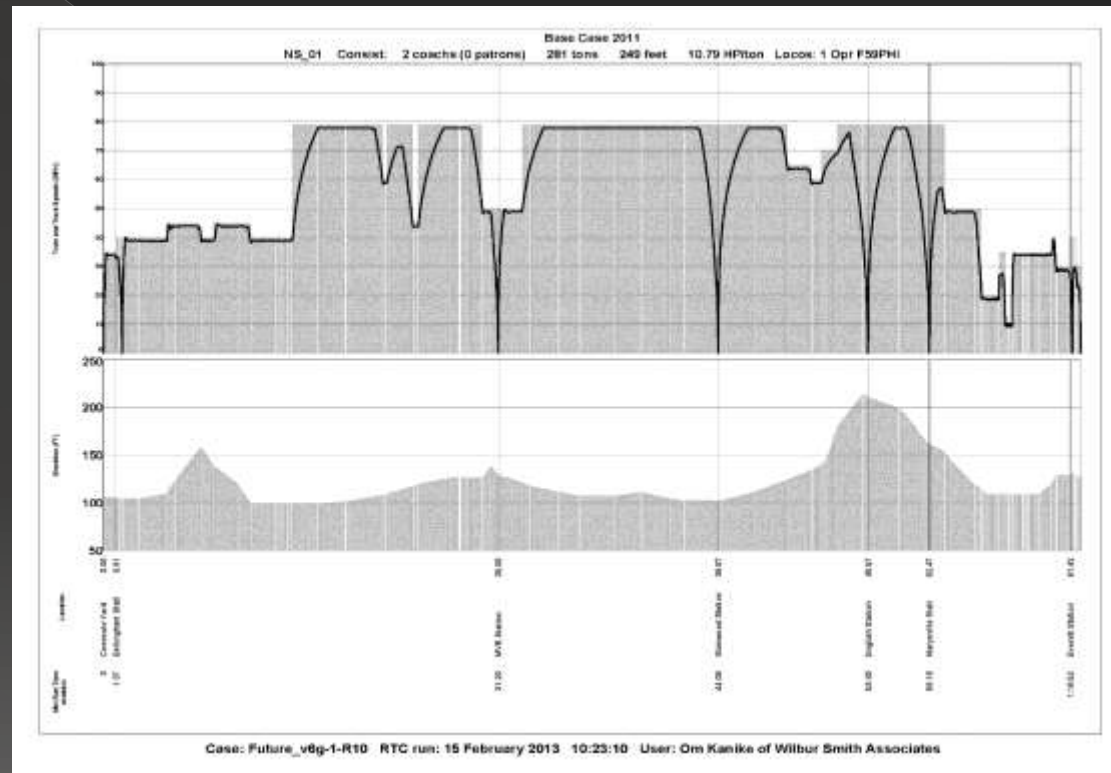
Also known as a time-distance diagram, a string line shows movements of trains over a track segment

Grid Time Analysis



One-way grid time: Time required for train to exit eastern siding at Point B and enter western siding and stop at Point D (30 minutes)

Simulation Output: Speed Chart



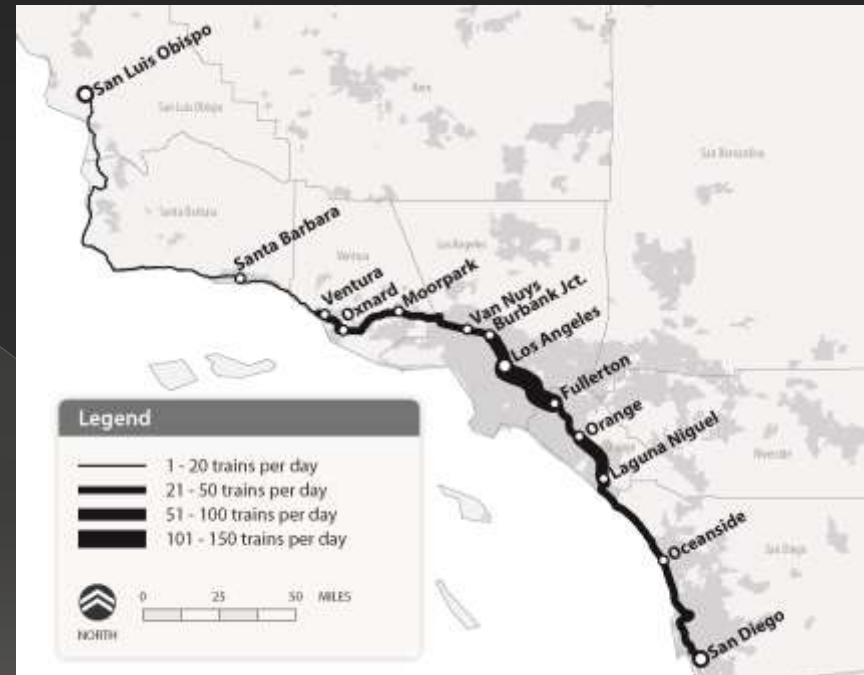
At top: Maximum allowable speeds in grey; train progress in black

Methodology Applications

- ◎ Manual methods
 - > Feasibility studies
 - > Conceptual planning studies
 - > Alternatives screening
- ◎ Operations simulation
 - > Highly detailed operations analyses
 - > Planning for detailed improvements to enhance line capacity over time
 - > Reaching agreement between host railroad and public agency service sponsor on shared-use contract terms

Case Study: LOSSAN

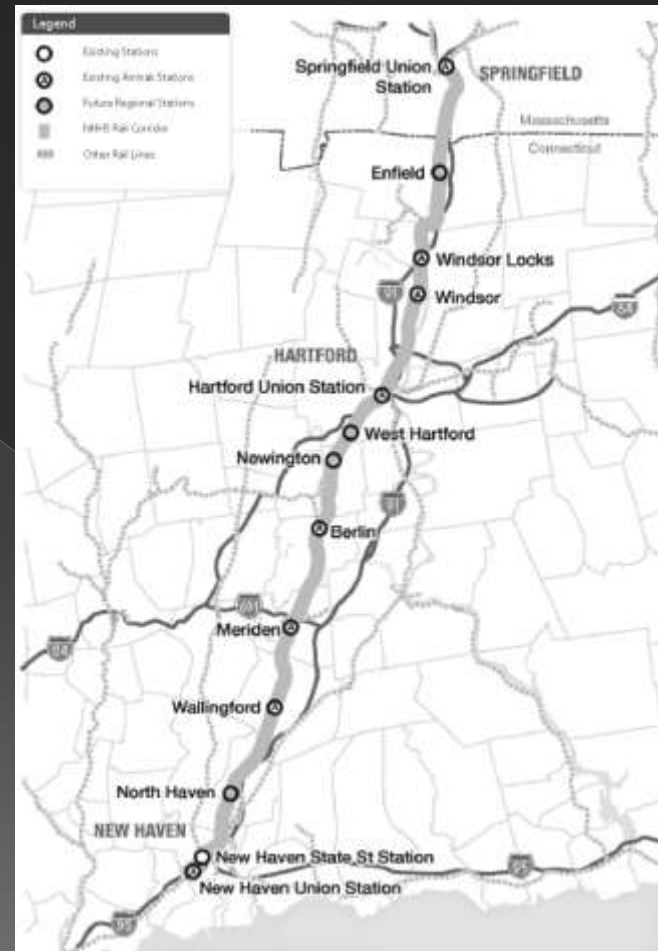
- Conceptual planning study
- Methodology: Grid time analysis
- Objective: Link capital investments to train volumes over a 15-year period



LOSSAN study area in Southern California: Line thickness shows relative train volumes

Case Study: New Haven-Hartford-Springfield Line

- Detailed planning study
- Methodology: RTC operations simulation
- Objective: Identify capacity improvements to support new commuter trains, high speed rail trains, and increasing freight train volumes



Study area:
Amtrak's Springfield Line highlighted

Case Study: North Sound

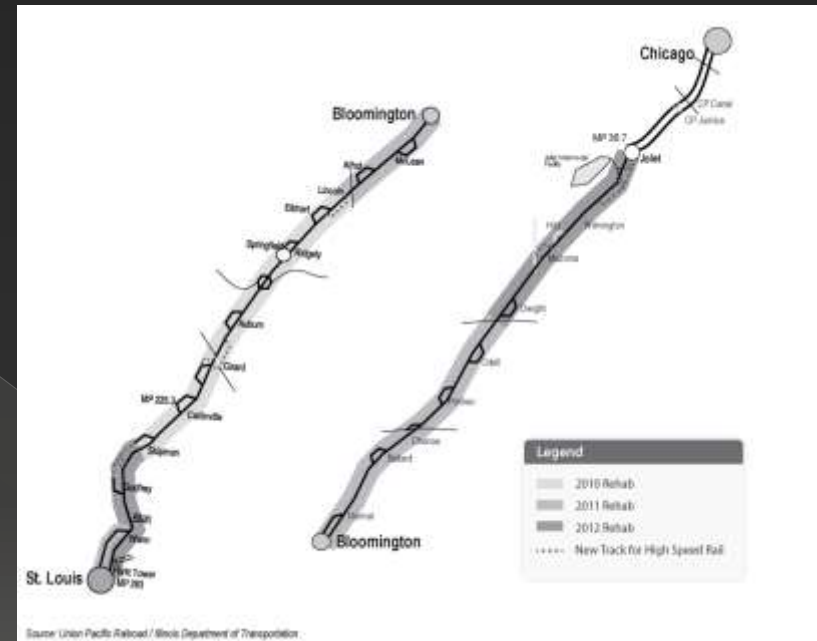
- Conceptual planning study
- Methodology: Grid time analysis, RTC, and Shared-use Tool application
- Objective: Compare results of three analysis methodologies



Study Area: BNSF's Scenic and Bellingham's Subdivisions

Case Study: Chicago-St. Louis

- Detailed planning study
- Methodology: RTC operations simulation
- Objective: Deliver a long-term shared investment program for new intercity and increasing rail freight services



Route shown in two segments:
Chicago to Bloomington, then
Bloomington to St. Louis

Capacity Modeling – Partnership Principles

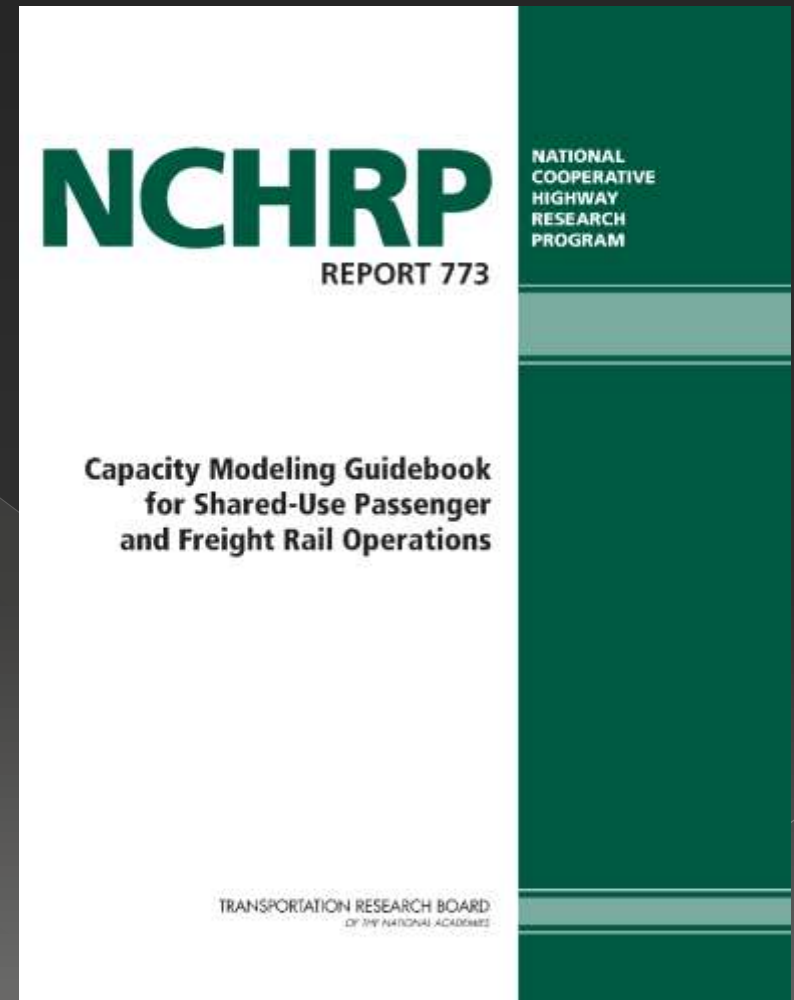
- Build trust between stakeholders: this is a long-term relationship, not a “purchase of space”
- Take the long view. What is the “vision of success” 20 years out, and is it consistent with your short term requests?

Capacity Modeling – Partnership Principles (cont)

- Acknowledge the large scale network impacts of local passenger operations: the most cost effective mitigations may be remote from the direct service area
 - May require agency to explain benefits of improvements made distant from a subject corridor
- Rigorous, detailed capacity assessment and modeling is a worthy investment, and delivers a framework to assess future changes in corridor needs

Link to Guidebook

- ◎ NCHRP Report 773
 - > “Capacity Modeling Guidebook for Shared-Use Passenger and Freight Operations”
 - > <http://www.trb.org/Main/Blurbs/171662.aspx>



Additional Opportunity



- Breaking down the barriers: the “virtual automobile”
- LA Workshop, 09/15
- <https://vimeo.com/album/3754857>