TTI's Rail/Multimodal Research Programs

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AASHTO SCORT Meeting
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Presentation Outline

- Overview of TTI
- TTI Rail Research
- Four Key Research Areas
- Current and Recent Project Examples

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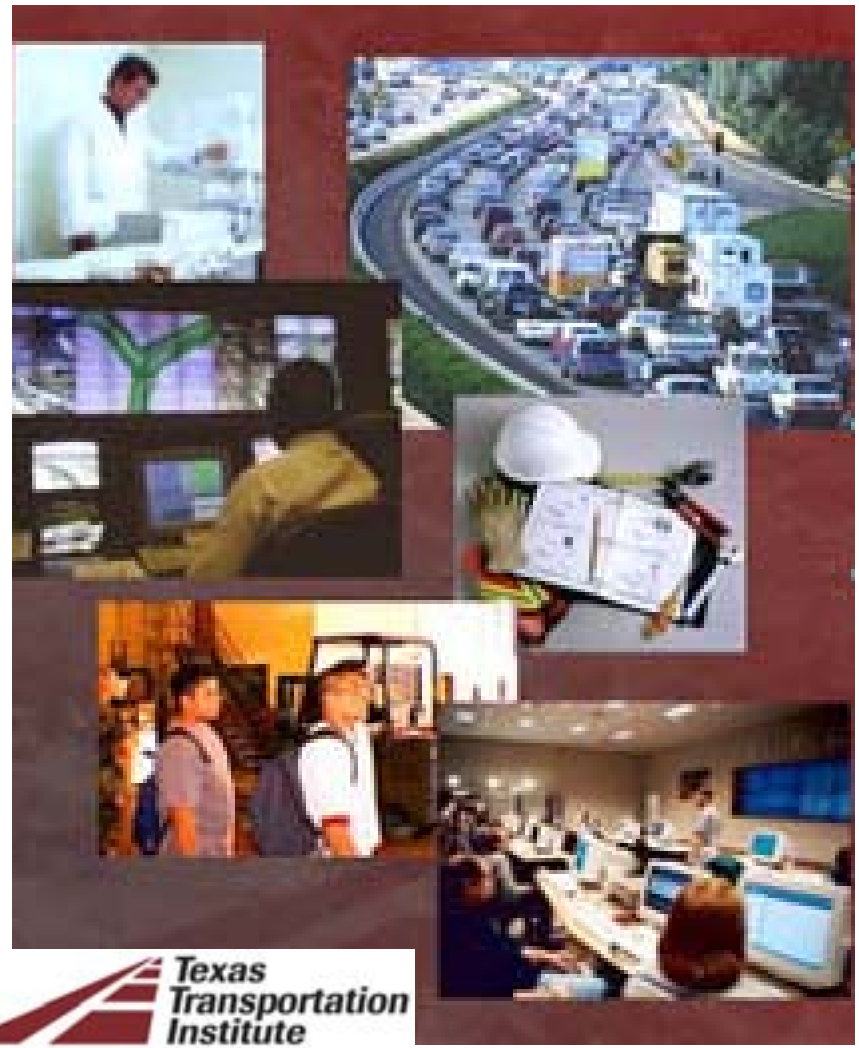
- Texas State Agency
- Part of TAMU System
- Applied Research
- @580 Employees
- All Modes
- NOT Only the Annual Urban Mobility Report



TTI's Rail Research Program

- Part of TTI's Multimodal Freight Transportation Programs Group
- Technical and Planning/Policy Research

- Freight and Passenger Rail
- Interaction of Rail with Other Freight Modes

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Key Research Areas

- Rail-Highway Interaction
- Planning/Policy Analysis
- Evaluation of Innovative Technologies
- Rail Safety Research

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Rail-Highway Interaction

- ***Houston Region Grade Crossing Public Cost Model***
- National Highway-Rail Grade Crossing Safety Training Conference
  - Nov. 4-7, 2007 San Antonio

- Crossbuck + Stop/Yield Sign Study
- TransLink© Lab/Instrumented Rail Corridors

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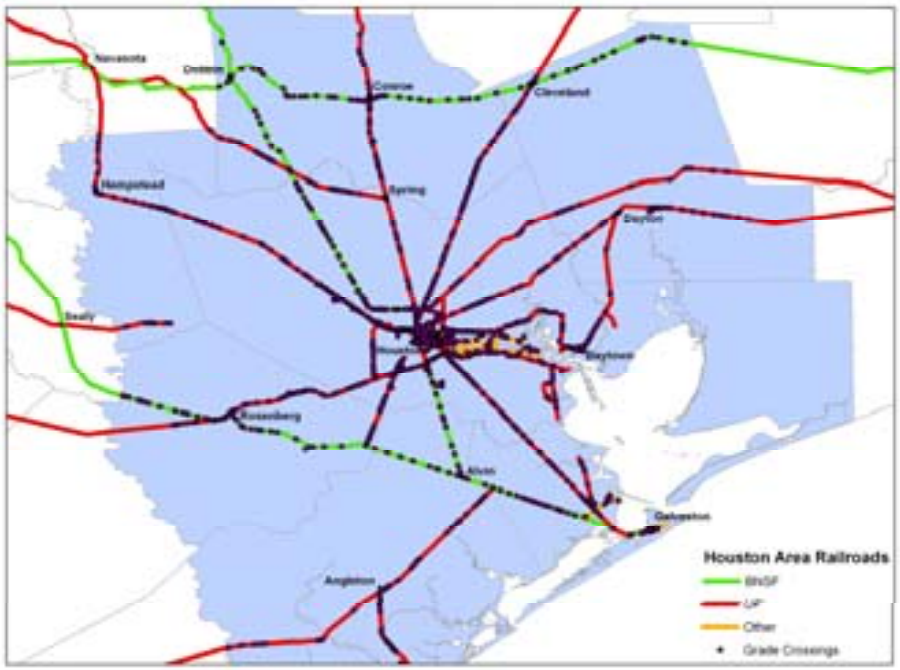
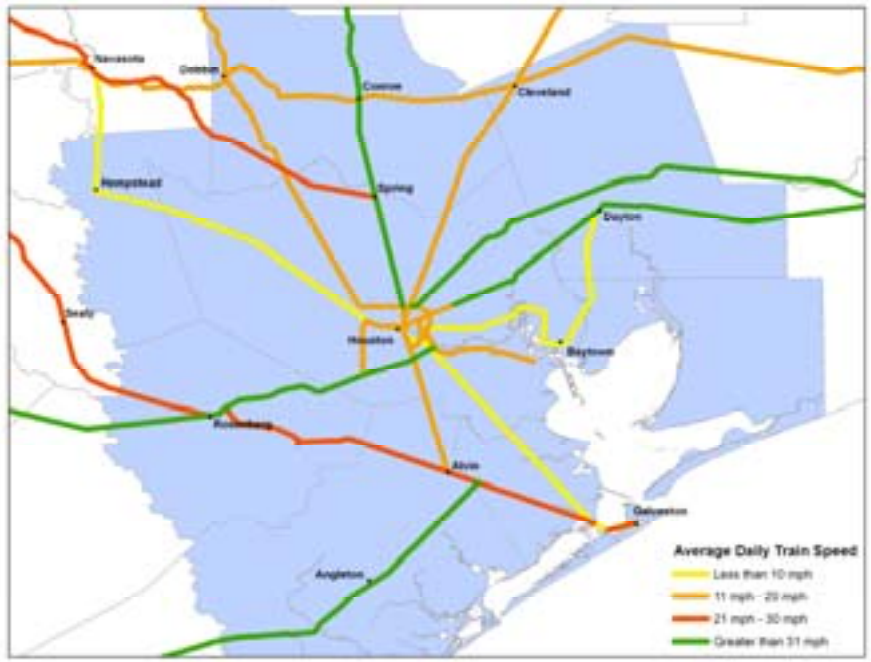
Houston Region Grade Crossing Public Cost Model

- Calculates net public costs over a 20-year period for individual grade crossings throughout the 8-county study area

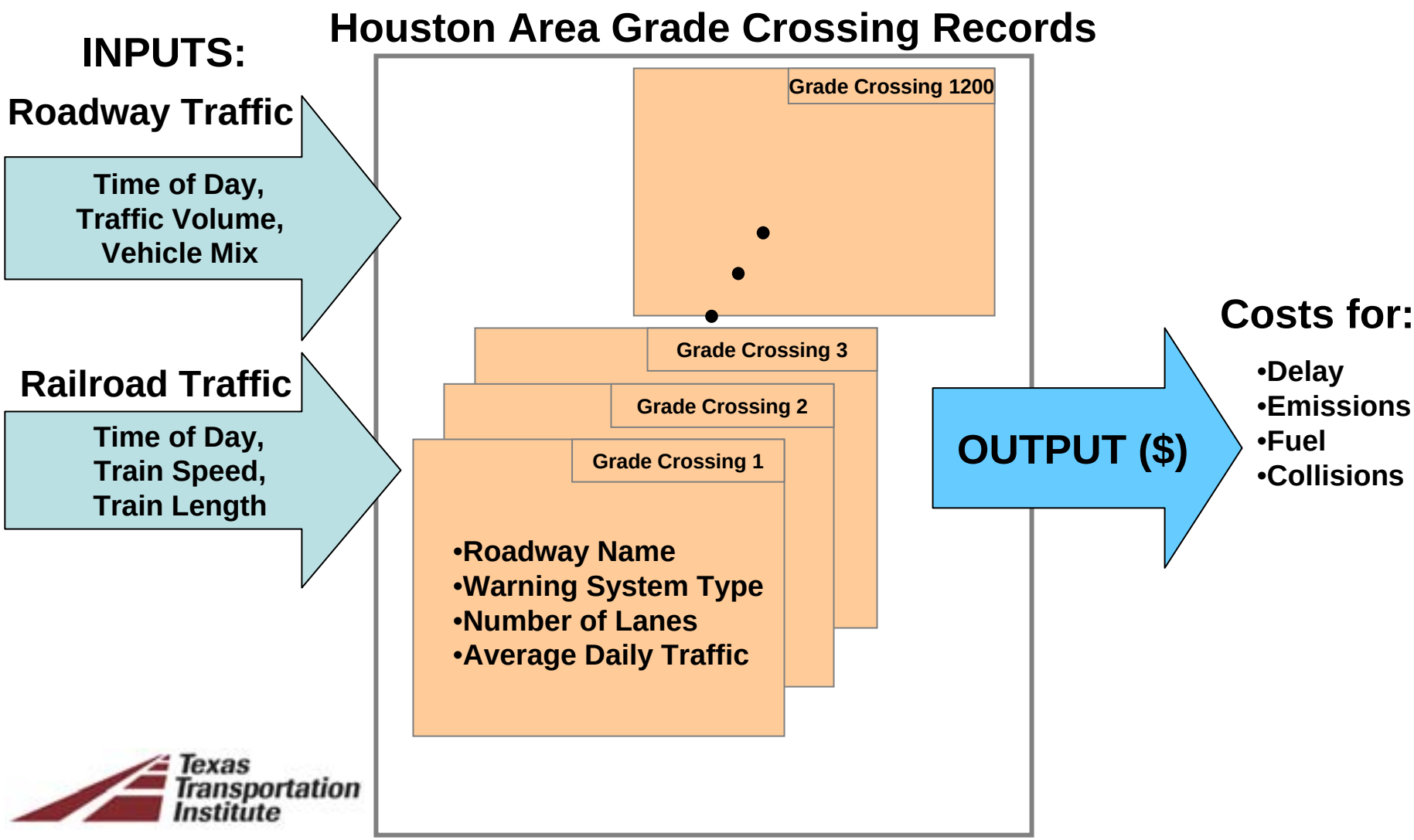


Crossing Locations/Hwy Class



Avg. Train Speed by Segment

Houston Region Grade Crossing Public Cost Model



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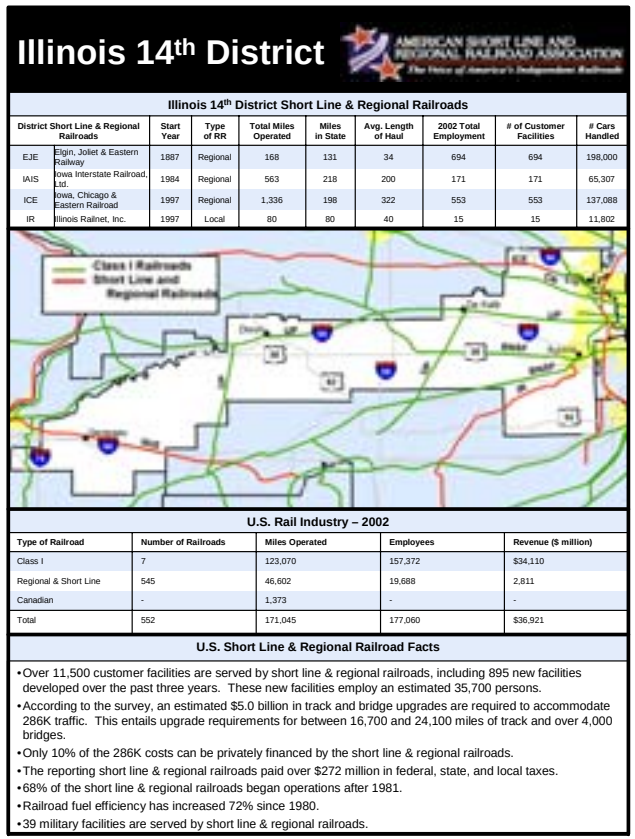
Planning/Policy Analysis

- ***Study of U.S. Rail Relocation Projects***
- ***PPP Economic Evaluation Model***
- Study of State-Funded Passenger Rail Systems
- State/Congressional District Short Line Fact Sheets
- Rural Rail Transportation Districts



Illinois 14th District

AMERICAN SHORT LINE AND REGIONAL RAILROAD ASSOCIATION

Illinois 14th District Short Line & Regional Railroads

District	Short Line & Regional Railroads	Start Year	Type of RR	Total Miles Operated	Miles in State	Avg. Length of Haul	2002 Total Employment	# of Customer Facilities	# Cars Handled
EJE	Elgin, Joliet & Eastern Railway	1887	Regional	168	131	34	694	694	198,000
IAIS	Iowa Interstate Railroad, Ltd.	1984	Regional	563	218	200	171	171	65,307
ICE	Iowa, Chicago & Eastern Railroad	1997	Regional	1,336	198	322	553	553	137,088
IR	Illinois Railnet, Inc.	1997	Local	80	80	40	15	15	11,802

U.S. Rail Industry – 2002

Type of Railroad	Number of Railroads	Miles Operated	Employees	Revenue ($ million)
Class I	7	123,070	157,372	$34,110
Regional & Short Line	545	46,602	19,688	2,811
Canadian	-	1,373	-	-
Total	552	171,045	177,060	$36,921

U.S. Short Line & Regional Railroad Facts

- Over 11,500 customer facilities are served by short line & regional railroads, including 895 new facilities developed over the past three years. These new facilities employ an estimated 35,700 persons.
- According to the survey, an estimated $5.0 billion in track and bridge upgrades are required to accommodate 286K traffic. This entails upgrade requirements for between 16,700 and 24,100 miles of track and over 4,000 bridges.
- Only 10% of the 286K costs can be privately financed by the short line & regional railroads.
- The reporting short line & regional railroads paid over $272 million in federal, state, and local taxes.
- 68% of the short line & regional railroads began operations after 1981.
- Railroad fuel efficiency has increased 72% since 1980.
- 39 military facilities are served by short line & regional railroads.

U.S. Rail Relocation Projects Study

- Classifications
- Example Case Studies
- Decision Process
- Funding Methods
- Results
- Project List

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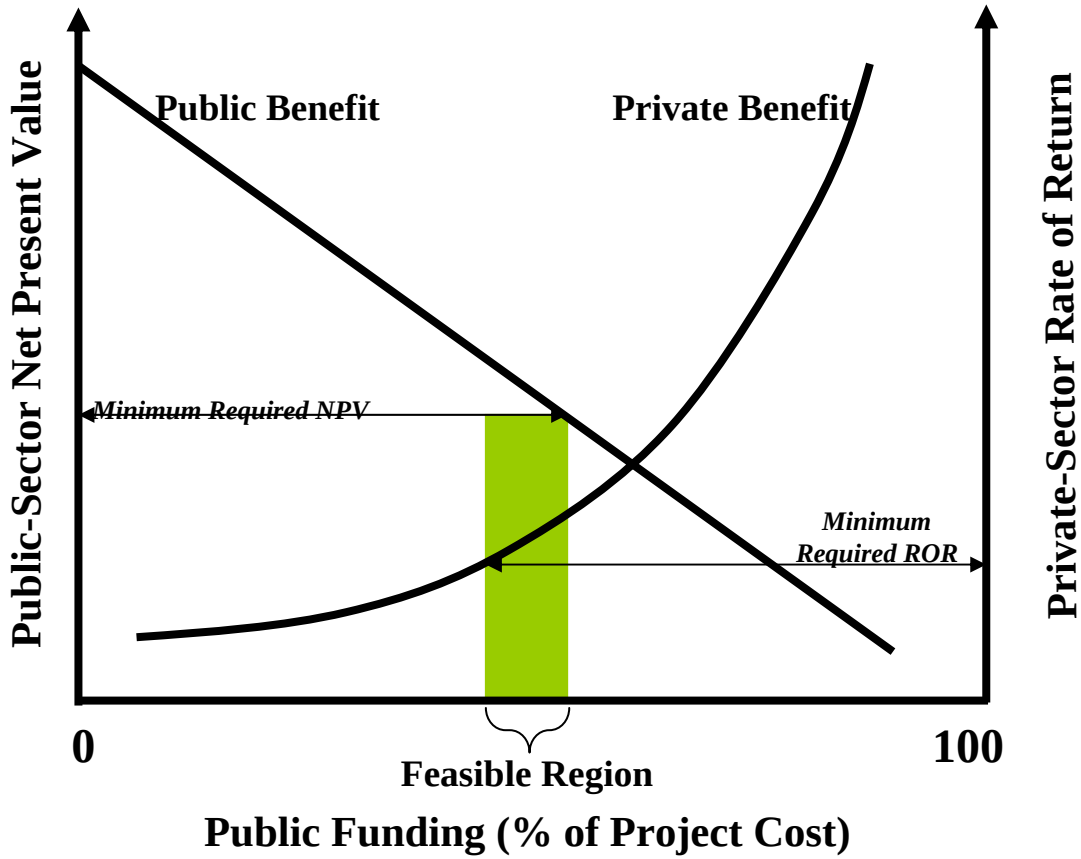
PPP Economic Model

- Analysis Tool for PPP Projects
- Compares Public NPV and Private ROI
- Determines Initial Funding Feasibility



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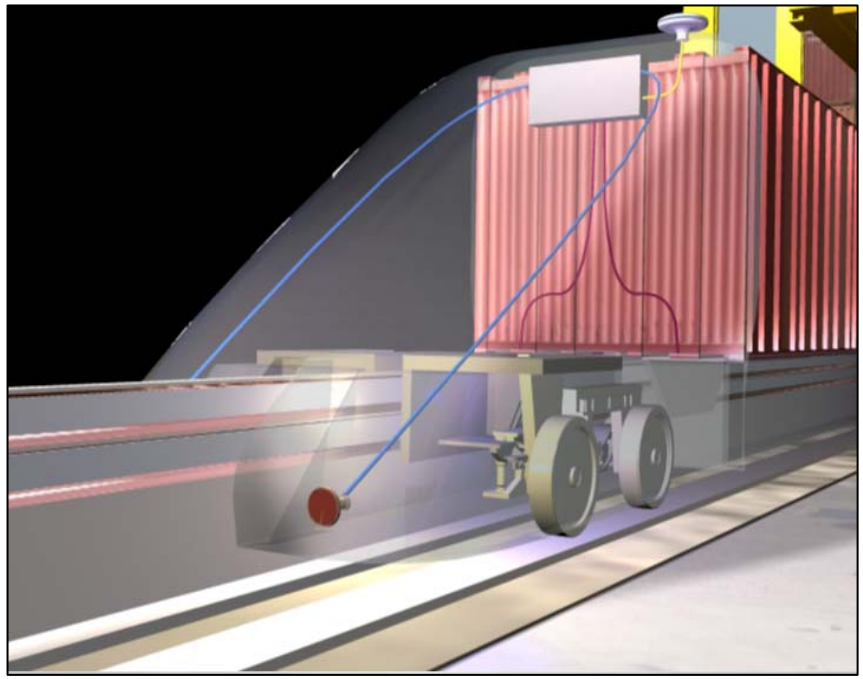
Evaluation of Innovative Technologies

- ***Freight Shuttle***
- ***NCHRP Low-Cost Grade Crossing Warning Systems***
- DHS Tank Car Placard Study



- Magnetorhealogical Fluid Damper
- Alternative Fuels/Rail Emissions Reduction

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Freight Shuttle

- Concept for Automated Container Movement
- Combines Positive Features of Both Rail and Trucking
- Applications
  - Port to Near-Dock Railyard/Transload Facility
  - Railyard to Trucking Hub
  - Railyard to Port

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Freight Shuttle

- Vehicle Uses Proven Technology
  - Steel Wheel on Steel Running Surface
  - Linear Induction Motor
  - Few Moving Parts
  - Regenerative Braking
  - Moderate Speed (30-70 mph)
- Low Operating Costs
  - Electricity @$0.10 per mile
- Public Savings from Reduced Highway Maintenance

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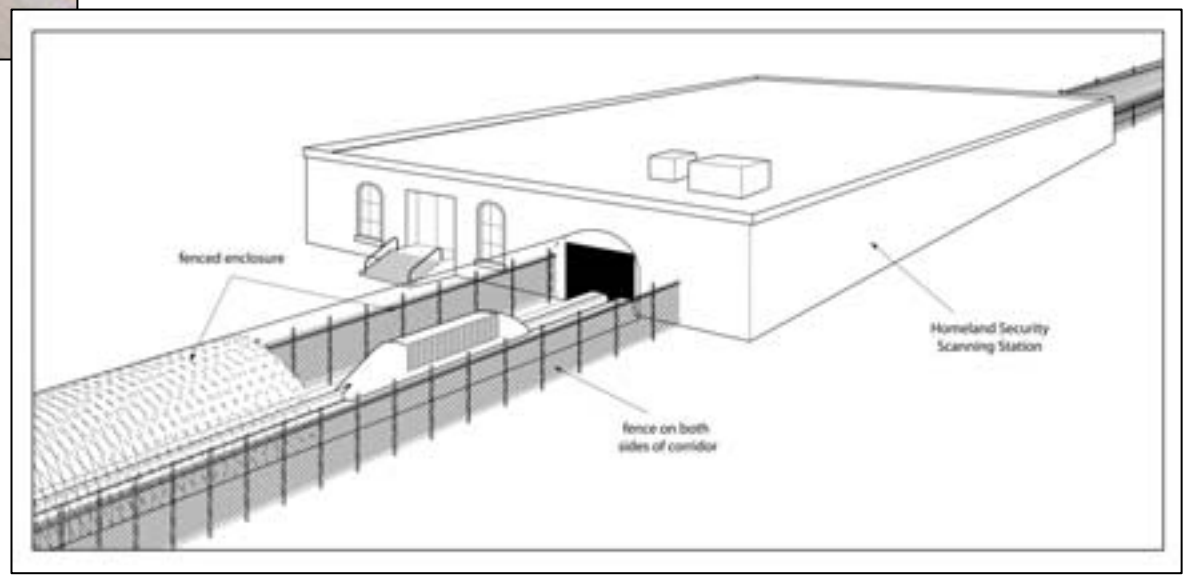
Freight Shuttle

- Reduced Highway Impacts from Containers
- Security Applications
- Units Can Be Linked



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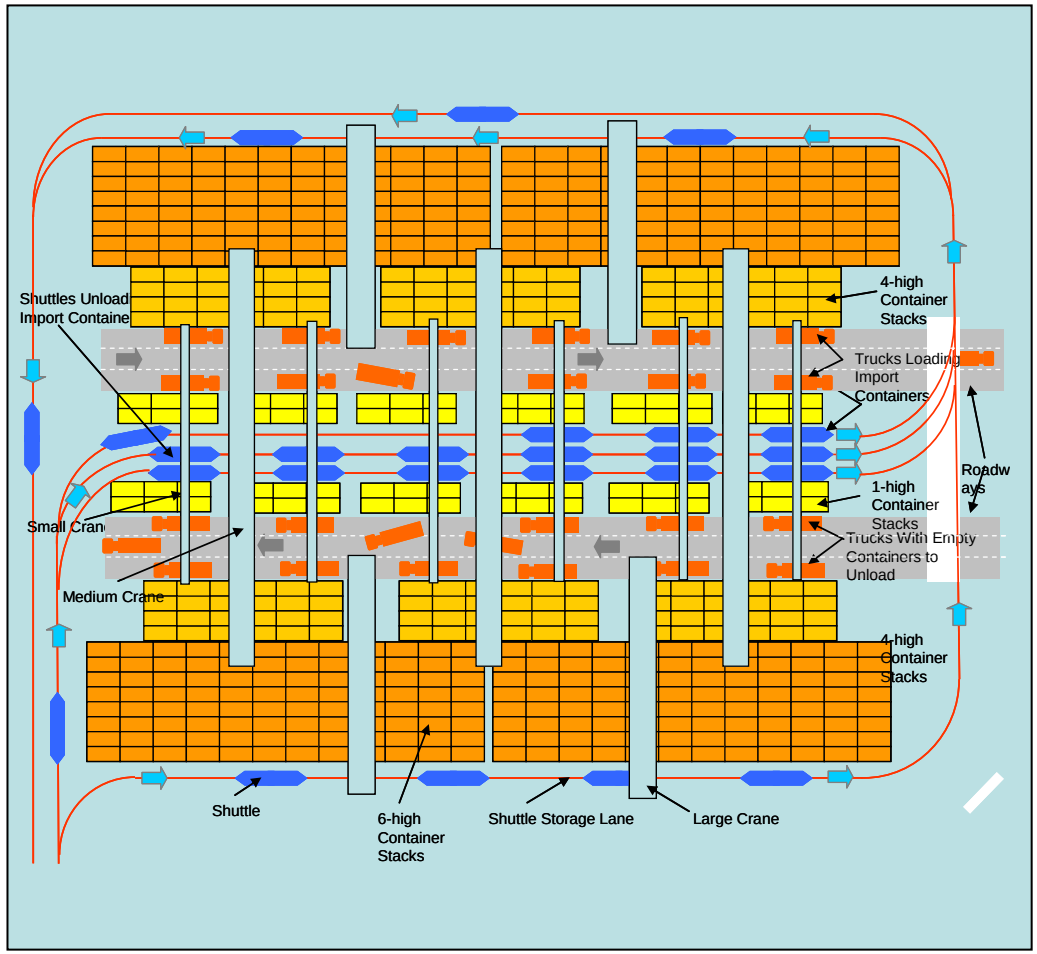
Freight Shuttle

- Conceptual Design for Freight Shuttle-Truck Transfer Facility
- @3000 Lifts/Day
- @ 25 acres
- Reduces port land needs



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NCHRP Low-Cost Grade Crossing Warning Systems

- Testing Two Commercial Systems
- Designed For Use at Current Passive Crossings
- Data Collection In Progress
- Submit Report Late 2006

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Other Research Areas

- **Rail Safety/Human Factors Research**
  - Railroad Teams Size/Make-up
  - Development of CRM Training Materials
  - Benefit-Cost Analysis of Implementing Operational Safety Training
- **Homeland Security**
  - SAVER Program
- **Center for Ports and Waterways**
- **Center for Pipeline Safety**

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