Outline

- Introduction
- Freight Market Overview
- Intermodal Market Overview
- Economic Rationale for Intermodal
- Economic Impediment to Intermodal
- Conclusions: Coffee, TEA, or What?
INTRODUCTION
Legislative Background

- Federal Aid Highway Act 1956
- Surface Transportation Assistance Act (STAA) 1982
- Intermodal Surface Transportation Efficiency Act (ISTEA) 1991
- Transportation Equity Act for the 21st Century (TEA-21) 1998
Passenger Efficiency?
Freight Efficiency?
U.S. FREIGHT MARKET
Market Growth \((10^6 \text{ ton-km})\)
Mode Shares (ton-mile basis)
INTERMODAL FREIGHT
Intermodal Technology
Graintainer
Intermodal Market Growth

Domestic Intermodal Loadings

Millions

Source: AAR/IANA
ECONOMIC RATIONALE
Highway System Use (VMT/Lane-Mi)

- Urban Interstate
- Urban Arterials
- Rural Interstate
- Rural Arterials


Distance: 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200
Rail System Use (Ton-Mi/Mi)
ECONOMIC IMPEDIMENT
Railroad operating outputs

- Intermodal
- General Freight
- Bulk
Infrastructure output
## Rail Operating Margins in 2000
(STB Estimates using *Uniform Rail Cost System*)

<table>
<thead>
<tr>
<th>Category</th>
<th>Revenue</th>
<th>Variable Cost</th>
<th>Margin</th>
</tr>
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<tr>
<td>Coal</td>
<td>$8.8 b</td>
<td>4.8</td>
<td>4.0</td>
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<tr>
<td>Farm/ Food</td>
<td>5.9</td>
<td>4.1</td>
<td>1.8</td>
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<tr>
<td>Wood/ Paper</td>
<td>4.6</td>
<td>3.4</td>
<td>1.2</td>
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<td>Chemical</td>
<td>5.5</td>
<td>2.8</td>
<td>2.7</td>
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<tr>
<td>Auto</td>
<td>5.2</td>
<td>3.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Intermodal</td>
<td>5.4</td>
<td>6.0</td>
<td>(0.6)</td>
</tr>
<tr>
<td>Rest</td>
<td>9.0</td>
<td>6.7</td>
<td>2.3</td>
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<td><strong>TOTAL</strong></td>
<td><strong>44.3</strong></td>
<td><strong>30.9</strong></td>
<td><strong>13.4</strong></td>
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Rail Infrastructure Requirements

Railroad MOW Spending

Years 1978-2001
Railroad Cash Flow

Cash Flow/Capital Spending

Years 1978-2001
Concluding Observations: Coffee, TEA, or What?
Economic Definitions

- Economic gross substitutes - Two goods such that if the price of one increases, more of the other good will be demanded. *Example: coffee/tea*

- Economic gross complements - Two goods such that if the price of one increases, less of the other good will be demanded. *Example: coffee/cream*
Intermodal Economics

- Total shipper logistics costs (not just freight rates) determine mode shares.

- Railroads are substitutes for trucks in markets where shipment sizes are large.

- Railroads are complements to trucks in markets where length of haul is significant.

- Public policy influences relative costs of two modes and amount of intermodal investment.
Freight Market Prices
Conclusions

- Truckers and rail carriers are both under severe pricing pressures.

- These (and other factors) make it difficult for them to cooperate.

- Public policies will strongly influence:
  - Will rail and truck be substitutes?
  - Will rail and truck be complements?
Questions

- How can shippers, truckers, rail carriers and policymakers work together to design an effective national intermodal system.

- Are the traditional transportation policy tools--regulation and subsidy--adequate?