USDA 2003
Agriculture Outlook Forum

Transportations Role on Competitiveness
Effects of Rail Services and Capacity

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Transportation and logistics are key to global competitiveness (has to be put into context itself)

- Steve Fuller, et. al., Texas A&M

Transportation a substantial portion of delivered price

Principle of economics – mobility is fundamental to enhancing competition
Rail Use in Grain Shipping
- Ton Miles -

Less than 25%
25% to 49%
50% or More
Cover Two Broad Points

- Present situation
- Three looming issues
  - Shortline and light density rail viability
  - Availability of viable intermodal service
  - Can Class I railroads survive in the long run
- These issues are related to the present situation
Present Capacity

- Size the church for Easter or average Sunday
  - We will always have shortages unless we want to pay for excess capacity
- Ability to move grain has increased substantially over the past two decades
  - 1970’s vs. today
Covered Hopper Cars Placed in Service

- 1982: 0
- 1983: 5,000
- 1984: 10,000
- 1985: 15,000
- 1986: 20,000
- 1987: 25,000
- 1988: 30,000
- 1989: 35,000
- 1990: 40,000
- 1991: 45,000
- 1992: 50,000
- 1993: 55,000
- 1994: 60,000
- 1995: 65,000
- 1996: 70,000
- 1997: 75,000
- 1998: 80,000
- 1999: 85,000
- 2000: 90,000
- 2001: 95,000

- New Cars
- Total Cars
Hopper Car Ownership

- Total All Owners
- Class I Railroads
- Other Railroads
- Car Companies and Shippers
Capacity (cont.)

- Efficiency gains through larger movements and fewer terminals – shuttle trains
- ND Example – wheat to Portland
  - 110 car train, 410,000 bushels, 14 sq miles of production in the Red River Valley
  - Cost savings in car days, locomotive days, crew costs, terminal costs, clerical, etc
- Rev/Var Cost ratios to PNW reflects efficiencies
  - Single car 1.85
  - 52 car 2.71
  - Shuttle train 3.11
Shuttle Train Incentives

<table>
<thead>
<tr>
<th>Estimated Incentive</th>
<th>$/ Car</th>
<th>$/ Bu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate (vs. 52-car)</td>
<td>$150</td>
<td>$0.04</td>
</tr>
<tr>
<td>Origin Efficiency</td>
<td>$100</td>
<td>$0.03</td>
</tr>
<tr>
<td>Destination Efficiency</td>
<td>$100</td>
<td>$0.03</td>
</tr>
<tr>
<td>24-Trips (Seasonal)</td>
<td>$150</td>
<td>$0.04</td>
</tr>
<tr>
<td>Commodity (Wheat)</td>
<td>$50</td>
<td>$0.01</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$550</strong></td>
<td><strong>$0.15</strong></td>
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</tbody>
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Bushel est. based on 3,600 Bushels/Car
Efficiencies only One Reason

- Complexity of network economics
  - Combinations explode exponentially as nodes increase
  - Corresponding increase in cost and operational difficulty
- Class I railroads are simplifying their system to improve dependability, efficiency, profitability
“The coal and intermodal networks are well defined, with a limited number of origins and destinations and a network of O/D pairs that makes it fairly straightforward to define a service plan and execute consistently against that service plan. The grain shuttle network – the part of the grain network that works best, in terms of on-time performance and reliability – shares that characteristic of a limited number of origins and destinations, and well-defined service standards.”
Leads to 3 Looming Issues

- Viability of shortlines
- Availability of Intermodal Service
- Long run viability of Class I’s
Shortlines

- Tremendous job at what Class I’s can’t do
  - Service smaller shippers
  - Operate more efficiently in complex small networks
  - Gather and distribute local freight efficiently

- Issues
  - Shortline network not as necessary in shuttle train environment
  - Upgrading for 286,000 lb cars
US Rail Network
Estimated Costs per Mile to Upgrade Short-Line Rail Lines to Handle 286,000 Pound Cars (Three Studies)
Viability of Intermodal

- Growth in ag/food trade will not be in bulk commodities but I.P., specialized, and processed
- This will require container shipping
- Providing capacity at competitive rates is in conflict with simplified network
- Turn around time of containers is also an issue
Long Run Viability of Class I’s

- Context – Class I’s have to survive in a market driven, capitalistic system where there is competition for financial capital
- Have not sought public sector support, for the most part
- However, this may change for a couple of reasons
  - Lack of profitability
  - Potential for a dramatic changes in energy production
Class I’s ROI vs. Cost of Capital

Source: Louis Thompson, World Bank
Rail’s Stock Market Value

Rail’s stock-market value compared to the S&P 500 is one-fifth of its 1990 size; with capital expenditures of $64 billion in the past decade and net operating income of $31 billion, capital has fled.

Source: Morgan Stanley, Standard & Poor's
Capital Expenditure Deficit

**Graph:**
- **Title:** Class I Net Funds Available for Reinvestment versus Capital Expenditures
- **Y-axis:** Billions of Dollars
- **X-axis:** Years (1982 to 2000)
- **Legend:**
  - Funds Shortfall (Red)
  - Net Funds Available for Reinvestment (Blue)

**Source:** AAR
Causes - Speculations

- One of the oldest industries in the world
  - Technologically mature
    - No breakthroughs to reduce costs or improve the type of service
  - Markets are mature
    - No great increases in existing market share or new markets
  - Existing markets are commodity based
    - Profit margins are already maxed out
    - Increased competition from foreign countries is probable
  - Cost savings from rationalization and other management initiatives Have been mostly realized
Distributed Energy Production

- Technology driven
  - Much more efficient solar cells
  - Fuel cells in homes and businesses
  - High efficiency gas turbines
  - Wind power
  - Wave power

- Shift could come in next twenty years
- What does this have to do with railroads
Rail Tonnage by Commodity

- **Coal**: 41%
- **Misc. Mixed Shipments**: 8%
- **Food or Kindred Products**: 6%
- **Non-Metallic Minerals**: 8%
- **Primary Metal Products**: 4%
- **Metallic Ores**: 3%
- **Lumber or Wood Products**: 3%
- **Clay, Concrete, Glass, or Stone**: 3%
- **Farm Products**: 8%
- **Chemicals or Allied Products**: 8%
- **All Other**: 11%
Conclusions

- Things are pretty good at the moment
- Long run is cloudy and uncertain
  - Shortline network will diminish in size
  - Intermodal could be expensive and thus reduce profits and market share for producers
- How can the present private sector rail system survive
The U.S. rail system included 40 Class I rail carriers and 179,000 miles of road in 1980. Farm products comprised 8 percent of the 23 million car loadings in that year, with the two largest grain hauling railroads accounting for 30 percent of the grain revenue car loadings (AAR, The Grain Book). In 2001, eight Class I rail carriers owned 97,631 miles of road - a 46 percent decline from 1980. The most recent data showed that 5.4 percent of the total 27 million cars loaded were farm products (AAR, Railroad Facts). Although farm share of the total rail ton-miles has declined, total rail ton-miles have increased 63 percent over the past two decades, growing from 918,958 million in 1980 to 1,495,472 million in 2001 (AAR, Railroad Facts).
References

Association of American Railroads, Various Years, Yearbook of Railroad Facts, Washington, DC.


Bitzan, John and Denver D. Tolliver, 2002, Heavier Loading Rail Cars, UGPTI, MPC 1-127.4

