A Presentation on the new book

**American Railroads: Decline and Renaissance in the Twentieth Century**

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Quaequumque Sunt Vera:

Whatsoever Things Are True

-- Northwestern University Motto
Who Was John R. Meyer (1927–2009)?

- Distinguished Harvard Professor of Economics
- Conrail and UP Board Member
- Author (with Peck, Stenason and Zwick) of seminal work, *Economics of Competition in the Transportation Industries (1959)*
- Chair of CEA Productivity Task Force (1973)
- REG’s dissertation advisor (1968)
Rapid Growth of RRś in last decades of 19th Century, and consolidation through mergers in second half of 20th Century → today’s major carriers and hundreds of short lines
The Twentieth Century’s Macro Trends for Railroads

- Expansion
- Regulation and Deregulation
- Legislation (at least 20 major laws affecting RRs)
- War and Depression (macroeconomic effects)
- Competitive Modes
- Demand Shifts
- Technology
- Mergers and Restructuring
American Railroads: Decline and Renaissance in the Twentieth Century

**Twentieth Century Railroad Timeline**

- **2001-2010**: Implementation / defense of deregulation. Renaissance
- **1991-2000**: Final Four mergers, ICC termination and STB start-up
- **1981-1990**: Staggers Rail Act deregulation, 1980s large mergers
- **1971-1980**: Amtrak, 3R Act, Northeast RR Reorg, Conrail, 4R Act
- **1961-1970**: Mid-century mergers, Penn Central, Interstate Highways
- **1951-1960**: Demand shifts, post-war migration, regulatory rigidity
- **1941-1950**: World War II – Peak passenger levels, Reed-Bulwinkle
- **1931-1940**: The Great Depression, Transportation Act of 1940
- **1921-1930**: 1920 Act – Planned Mergers, rise of highways
- **1911-1920**: Harriman Empire dissolved. Federal Control in WWI
- **1901-1910**: Northern Securities split-up, Hepburn and Mann-Elkins Acts
Railroads Lead Other Modes in Ton-Mile Volume

U.S. Revenue Ton-Mile Distribution by Mode - 2009

- Trucks: 33.4%
- Railroads: 39.9%
- Domestic Air: 0.3%
- Oil Pipelines: 14.3%
- Water: 12.0%

Source: Bureau of Transportation Statistics

Gas pipelines have been excluded.
Growth and Shares of Modal Freight Ton-Miles, in Billions (1929-2007)

Source: AAR, Railroad Facts, Various Years. Primary Date from Regulatory Bodies.
Inland Waterways – Built and Maintained by Federal Government, and Not Tolled until 1980

- Great Lakes, St. Lawrence Seaway, and coastal system
- Also riverine “brown water” inland system
- Includes such uneconomic extensions as Arkansas River to Tulsa, Tennessee-Tombigbee to Mobile
- Waterway user charges small initially and still far less than full cost recovery
- Based on per gallon fuel use = inefficient
- *American Railroads* proposes segment charges to relate user fees to lockage and dredging costs
The US Inland Waterway System

Tulsa

Tennessee-Tombigbee
Public Roads Built with Fuel Taxes Aided the Motor Vehicle Mode

- The “Good Roads” movement was to “get farmers out of the mud”
- Federal, state, and local fuel excises developed local roads and intercity highways for cars and trucks
- At first, divided highways were toll turnpikes in the East, later freeways in the West
- Interstate and Defense Highways date from 1956 = 90% federal construction share, states own and maintain
- Larger and heavier trucks alternately approved at state and federal level until “frozen” at 1991 levels
- FHWA says heaviest trucks pay only ~ 60% of true costs
Interstate Highways Overlap the US Railroad Network
Amtrak (1971) Sought to Preserve Essential Service –

But Most Immediate Goal Was to Relieve Burden of Passenger Deficits on Freight Railroads

Some Benefits from Integrated National Fleet and Marketing

Perpetual Lack of Assured Funding

No Consensus on Future Structure / Mission

Only Northeast Corridor Service Seems Assured and Truly Needed
Was Amtrak a Success ★ or Failure ✗?
Or something less than planned or hoped ★?★?

- Relieve freight railroads of passenger deficits ★
- Preserve essential service ★/★
- Integrate operations for economies of scale & fleet ★
- Save taxpayer $ vs. direct subsidy to RRs ★
- Achieve long term consensus on pax rail funding ✗
- Provide state-of-the-art equipment fleet for future ✗
- Serve as long run alternative to highways and air lines ✗
3R Act (1973) – Northeast Restructuring Planning Process

- Established US Railway Association to make Preliminary and Final System Plans and select lines for Conrail
- USRA proposed a “Three Systems East” solution, but Solvent railroads would not participate
- Default was Big Conrail – approved by 4R Act
- Selected lines conveyed to Conrail from Bankrupt Estates April 1, 1976
- Courts ruled these “takings” required Constitutional minimum payments by US to estates
- Congress then passed Northeast Rail Services Act (NERSA) to assist Conrail start-up (trimmed lines, employees, commuter services)
- Total bill to taxpayers ~ $8 billion
- Conrail IPO 1987 (largest to that time) → $1.8 billion
Northeast Restructuring Culminated in Staggers Rail Act

• Earlier regulatory reform efforts were too little, too late
• ICC kept 4R Act changes from being effectively implemented
• American Railroads asserts Staggers Rail Act of 1980 could not have passed without example of Conrail to show problem
• AND Conrail could not have succeeded without Staggers Rail Act reforms
• Staggers Act declared railroads needed “adequate revenues”
• These were approved unless shippers could show inadequate competition and rates > about 180% of variable costs
• Truly “captive” shippers could use alternative (hypothetical) “stand alone cost case” (SACC) procedures
• ICC had to consider the effect of mergers on competition, and had to act within time limits
What the Staggers Rail Act Accomplished

The AAR provides data and frequently updates this chart after a design developed by R. E. Gallamore and J. R. Meyer in the late 1990s. See American Railroads, p. 424.
Since 1980 (the year the Staggers Act partially deregulated the rail industry), the number of reportable train accidents per million train-miles has fallen 79 percent. The Federal Railroad Administration data below cover all U.S. railroads.

### Train Accidents by Type Per Million Train-Miles

<table>
<thead>
<tr>
<th>Year</th>
<th>Collisions</th>
<th>Derailments</th>
<th>Other</th>
<th>Total</th>
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<tr>
<td>1980</td>
<td>1.67</td>
<td>8.98</td>
<td>0.78</td>
<td>11.43</td>
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<tr>
<td>1985</td>
<td>0.64</td>
<td>4.37</td>
<td>0.73</td>
<td>5.74</td>
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<tr>
<td>1990</td>
<td>0.52</td>
<td>3.52</td>
<td>0.69</td>
<td>4.73</td>
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<tr>
<td>1995</td>
<td>0.35</td>
<td>2.60</td>
<td>0.72</td>
<td>3.67</td>
</tr>
<tr>
<td>2000</td>
<td>0.33</td>
<td>2.92</td>
<td>0.88</td>
<td>4.13</td>
</tr>
<tr>
<td>2003</td>
<td>0.27</td>
<td>2.87</td>
<td>0.93</td>
<td>4.06</td>
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<tr>
<td>2004</td>
<td>0.31</td>
<td>3.16</td>
<td>0.93</td>
<td>4.40</td>
</tr>
<tr>
<td>2005</td>
<td>0.35</td>
<td>2.92</td>
<td>0.87</td>
<td>4.14</td>
</tr>
<tr>
<td>2006</td>
<td>0.25</td>
<td>2.70</td>
<td>0.74</td>
<td>3.68</td>
</tr>
<tr>
<td>2007</td>
<td>0.26</td>
<td>2.44</td>
<td>0.69</td>
<td>3.39</td>
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<tr>
<td>2008</td>
<td>0.25</td>
<td>2.31</td>
<td>0.65</td>
<td>3.21</td>
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<tr>
<td>2009</td>
<td>0.20</td>
<td>2.05</td>
<td>0.61</td>
<td>2.86</td>
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<tr>
<td>2010</td>
<td>0.18</td>
<td>1.90</td>
<td>0.62</td>
<td>2.70</td>
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<tr>
<td>2011</td>
<td>0.22</td>
<td>2.05</td>
<td>0.55</td>
<td>2.82</td>
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<tr>
<td>2012</td>
<td>0.21</td>
<td>1.76</td>
<td>0.42</td>
<td>2.39</td>
</tr>
</tbody>
</table>

Remarkable Improvements in Railroad Safety Since Deregulation.

Here’s Why:

- Increased Cash Flow
- Stimulates Reinvestment
- New Capital Brings Technology Improvements
Total Operating Revenue and Expenses
U.S. Class I Railroads, 1978-2010

- Total Operating Revenues (billion)
- Total Operating Expenses (billion)
But More Capital Means ROI Has to Improve Still Further

Class I RR Cost of Capital vs. Return on Investment

Note: In 2006, the Surface Transportation Board significantly changed the method by which it calculates the rail industry cost of capital. 2010 cost of capital is preliminary. Source: STB
Advancing Technology Gave Railroads Great Productivity and Safety Benefits

• Railroads are defined as:
  – locomotives (engines with pulling or pushing power)
  – moving trains of rolling equipment (freight or passenger cars)
  – on fixed tracks and other infrastructure facilities (such as bridges)
  – under control (rules, dispatcher instructions, signal systems)

• Railroads have been mis-characterized as having old or obsolete technology, but in fact they have remained young in their old age.

• One indicator of railroad progress from 1900 to 2000 is that railroads today carry 10 times the ton-miles annually with one-sixth the employees as in 1900.
Railroads Have Gained New Technologies in all Key Areas: Infrastructure, Equipment, and Operations

— Some Examples:

- **Locomotives**
  - Diesel-electric locomotives replacing steam
  - Fuel economy and emissions

- **Track and Structures**
  - Welded steel rail
  - Maintenance-of-way mechanization

- **Rolling Stock / Freight Cars**
  - Tapered roller bearings in sealed journals
  - Larger equipment – more weight on rail
  - Double-stack intermodal cars and containers

- **Control**
  - Track circuits and lighted signals
  - Centralized traffic control (CTC)
  - Positive train control (PTC)
Technology Purchased with Improved Cash Flows from Deregulation Led the Rail Renaissance

- Growth of traffic consumes existing capacity and often requires additional capacity expansion
- Technology improvements typically come about with increased capital investments
- New investments incorporate labor-saving and safety enhancements
- New technology often facilitates operating innovations and yields profitable returns on investment

This is the Virtuous Spiral of Deregulation ➔ Productivity ➔ Cash Flow ➔ Reinvestment ➔ Technology Deployment ➔ Safety Improvement ➔ Industry Growth
Return on Investment is Crucial

IF ROI > COST OF CAPITAL:
• Capital spending expands
• Stronger physical plant; more and better equipment.
• Faster, more reliable service
• Sustainability

IF ROI < COST OF CAPITAL:
• Lower capital spending
• Weaker physical plant, equipment
• Slower, less reliable service
• Disinvestment
We Were Lucky – Policy and Managerial Blunders Might have Derailed the Renaissance

Lines Built or Not Built – Facilities Destroyed

- Overbuilding rail network in 19th Century, account poor ICC oversight
- Milwaukee Road Pacific extension
- Harriman Empire split up; Central Pacific not left with UP, so Western Pacific was built.
- Railroads prematurely took up much 2nd main track, then had to replace it; e.g. Southern Crescent, New York Central 4-track “water level” route, Chicago-St. Louis, Donner Pass.
  - But sometimes maintenance savings in interim (opportunity cost savings) made rail-banking worthwhile.
- Chicago tangle not fixed in timely manner, so CREATE must now.
- Monumental Penn Station torn down (1963) – Architectural gem lost.

Policy or Strategic Mistakes

- Penn Central merger, and forced inclusion of New Haven
- Failure to Rationalize [NOT Nationalize!] industry under 1920 Transportation Act
- ICC handling of Rock Island merger with UP and SP
- Rejection of USRA’s 3-System East plan, resulting in Big Conrail
- ICC’s Value of Service rate-making kept long after rail dominance lost.
- BN merger (1970) approved with few competitive conditions, hurting regional competition and Milwaukee Road ability to compete / reorganize.
- 1940 Transportation Act - Inherent Advantages doctrine
- RRs understand importance of passenger service to the public, but don’t embrace PTC the same way.
Six Transport Policy Principles for the Future

- Let markets and efficiency principles guide policy
- Allow RRs to earn adequate returns for reinvestment
- Respect private property and franchise values
- Take advantage of railroad fuel efficiency and relatively benign environmental impact
- Encourage migration of cargo and passenger traffic to most efficient modes
- In response to global climate change (GCC) challenge, encourage adaption of energy development and use to environmentally sustainable alternatives
Takeaways

❖ US Railways are the “Enduring Enterprises”; they survive more than they prosper.
❖ Continuing investment, and with it – deployment of new technology – is key to competitive survival.
❖ To warrant new investment, rate of return must improve, and that means real increases in revenue and lower costs.
❖ Revenues will not increase to full potential without improvements in service reliability – and these will be based on information technologies.
❖ Railway customers, suppliers, employees, shareholders, and the economy all benefit from smarter policies toward the industry.
Questions?

Ending Observations?

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