USDA 2003 Agriculture Outlook Forum

Transportations Role on Competitiveness Effects of Rail Services and Capacity

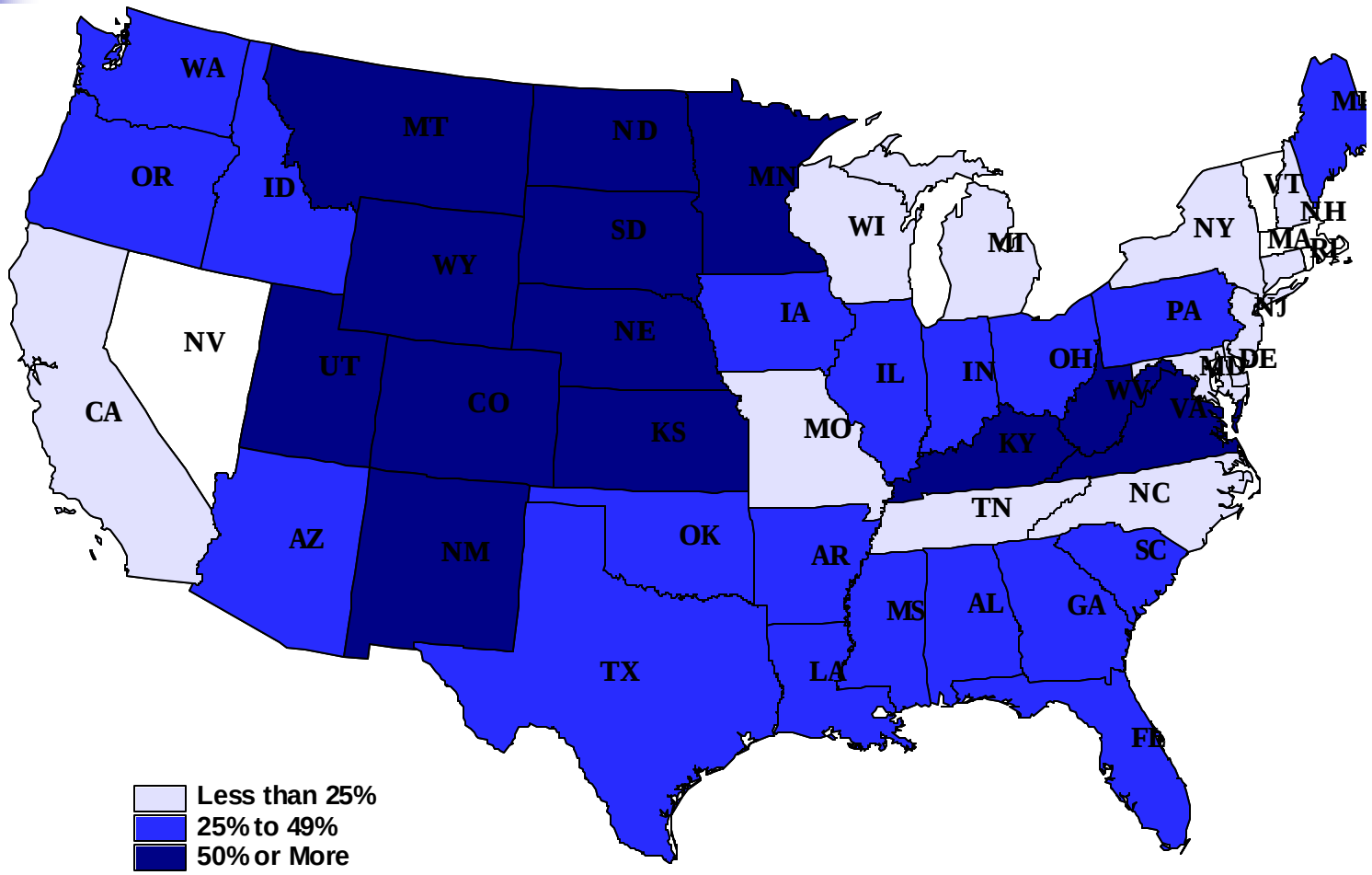
Gene Griffin and Kim Vachal
Upper Great Plains Transportation Institute
North Dakota State University

Context

- 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 -



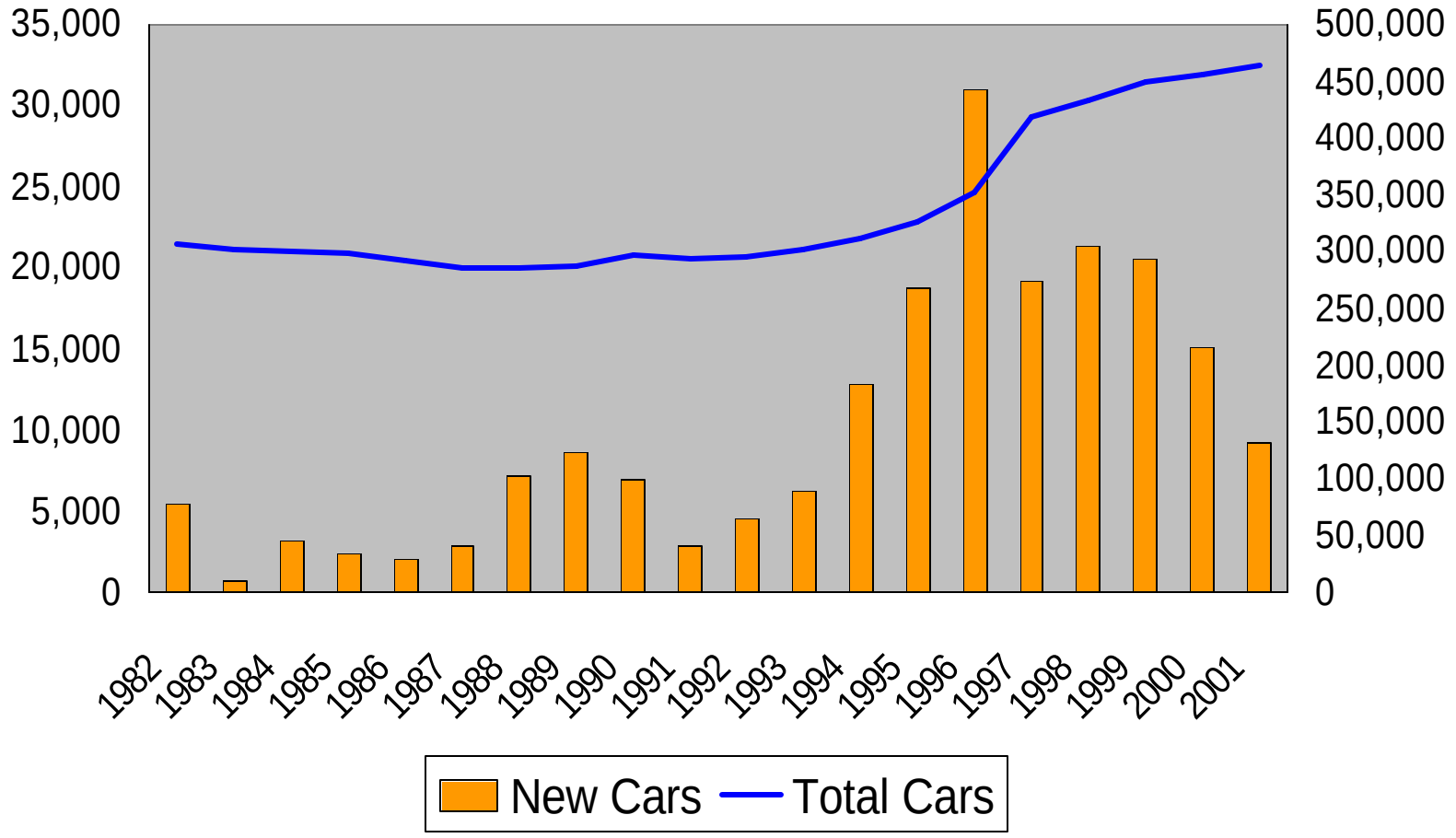
Cover Two Broad Points

- 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

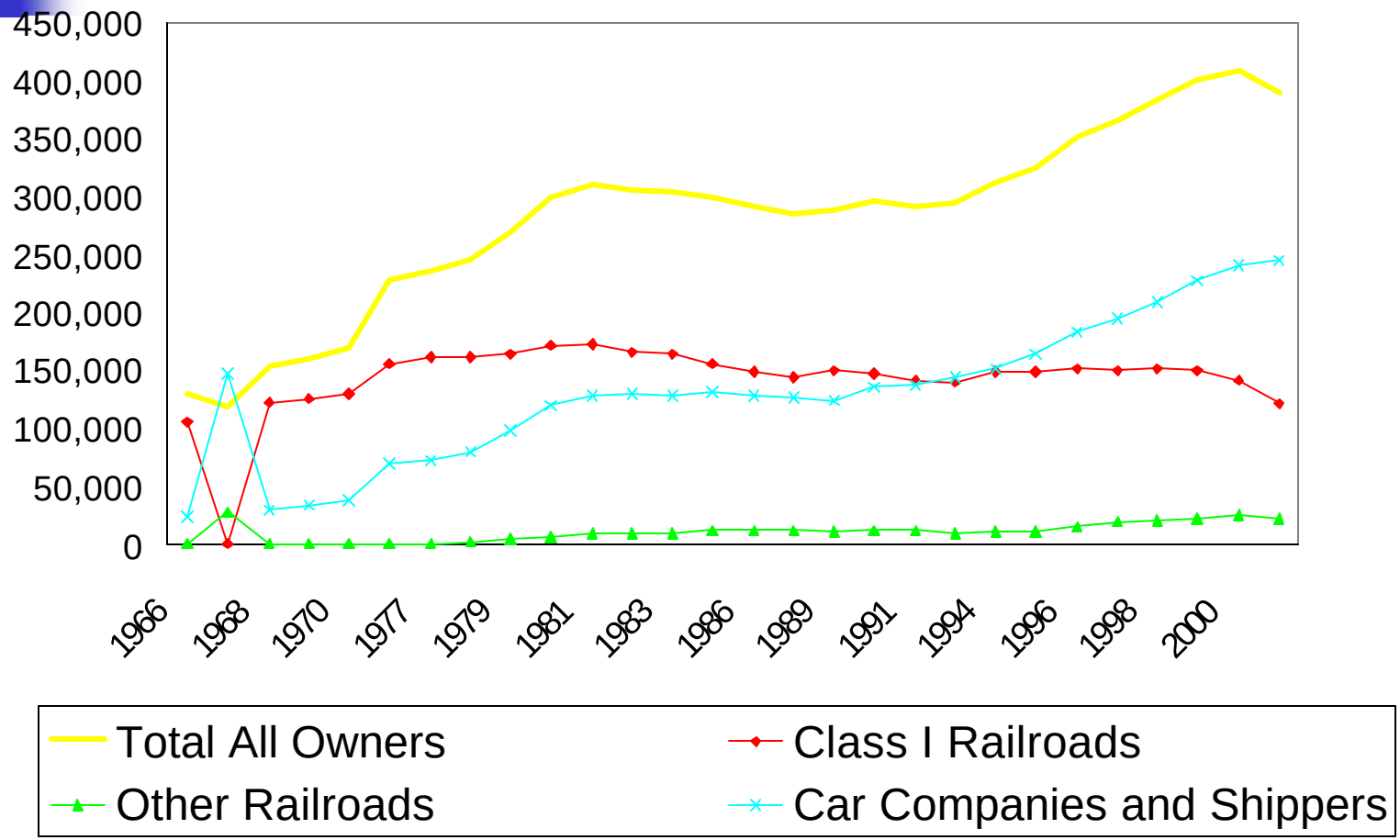
Present Capacity

- 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



Hopper Car Ownership



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

Estimated Incentive	**$/Car**	**$/Bu**
Rate (vs. 52-car)	$150	$0.04
Origin Efficiency	$100	$0.03
Destination Efficiency	$100	$0.03
24-Trips (Seasonal)	$150	$0.04
Commodity (Wheat)	$50	$0.01
TOTAL	**$550**	**$0.15**

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

Matt Rose: Speech to PNWARS

- “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.”

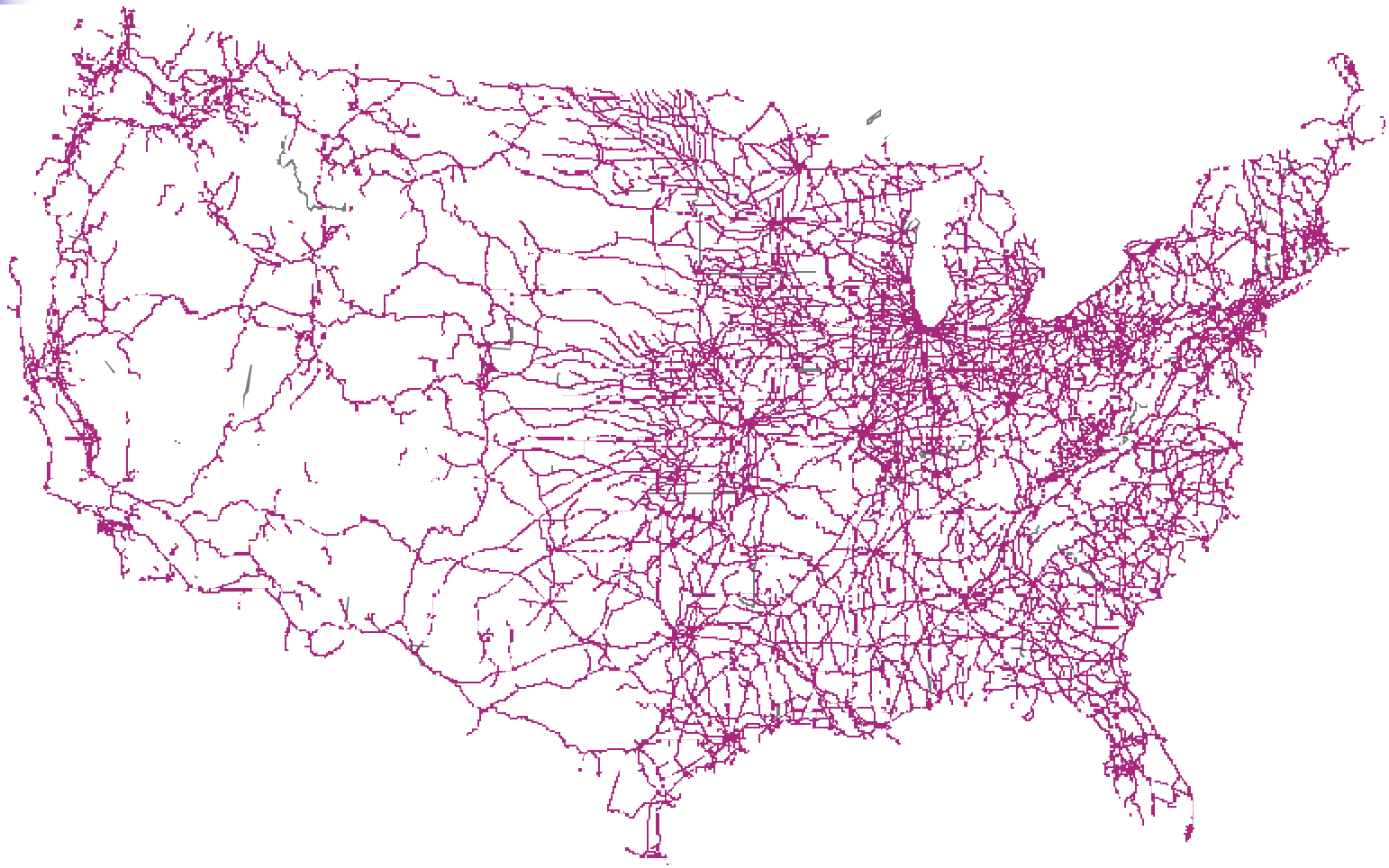
Leads to 3 Looming Issues

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

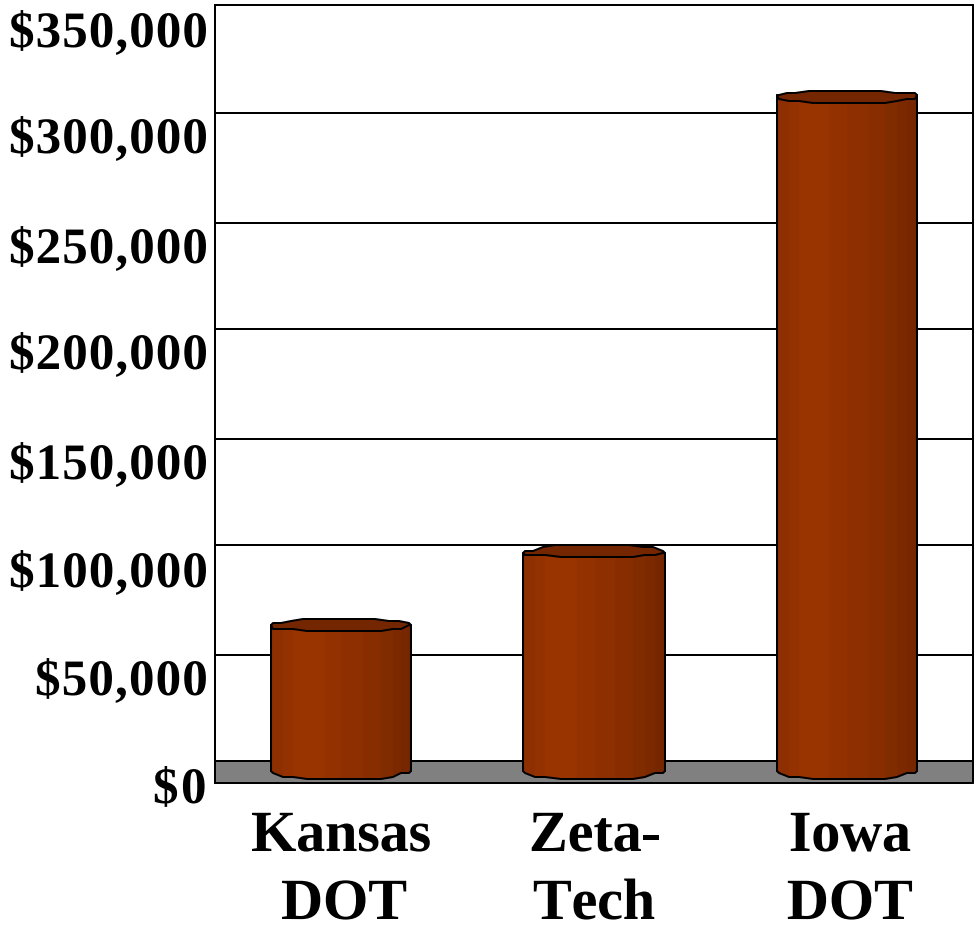
Shortlines

- 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)



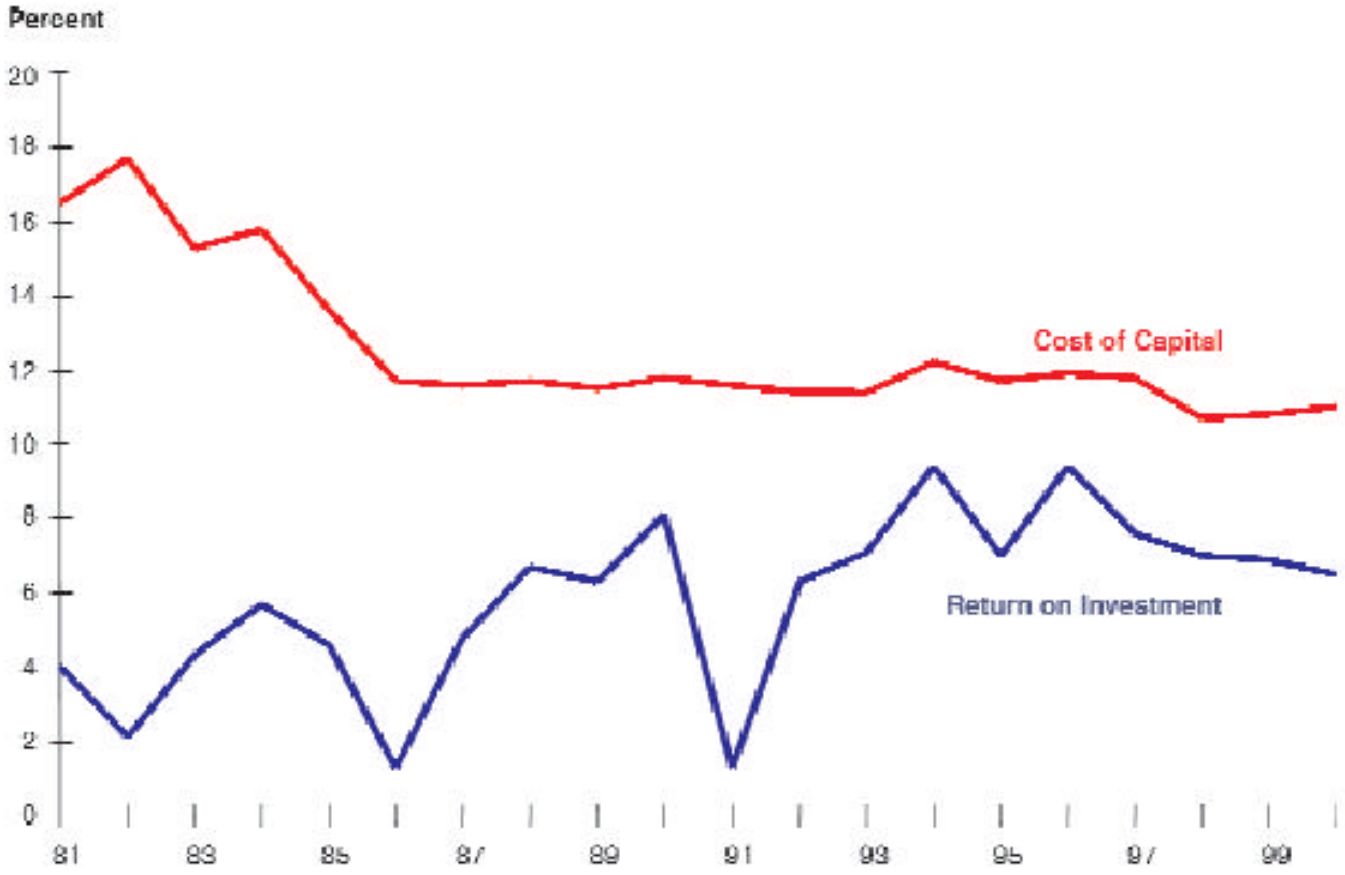
Viability of Intermodal

- 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

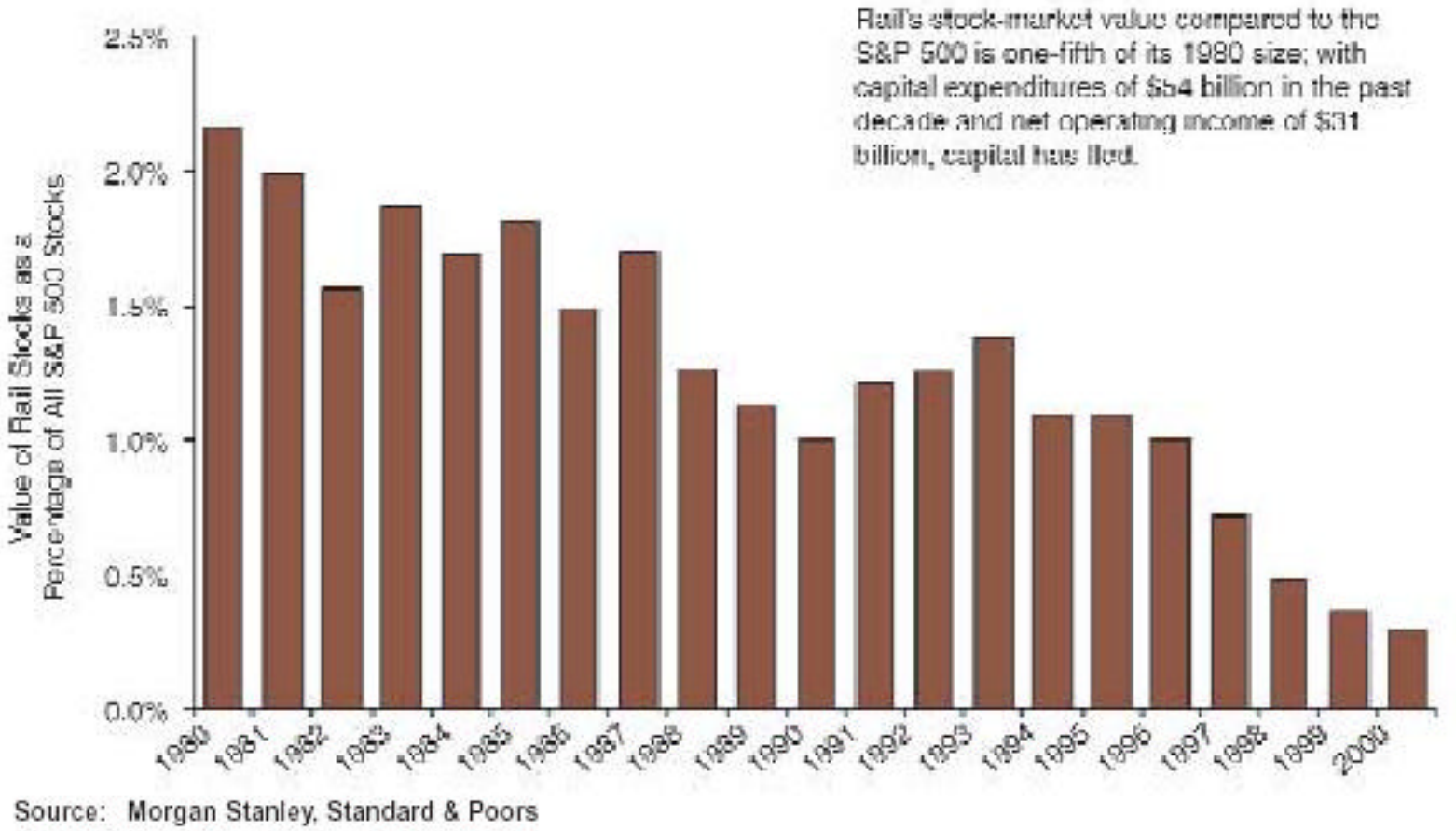
- Context – Class I's have to survive in a market driven, capitalistic system where there is competition for financial capital
- Have not sought public sector support, for the most part
- However, this may change for a couple of reasons
  - Lack of profitability
  - Potential for a dramatic changes in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

Class I's ROI vs. Cost of Capital



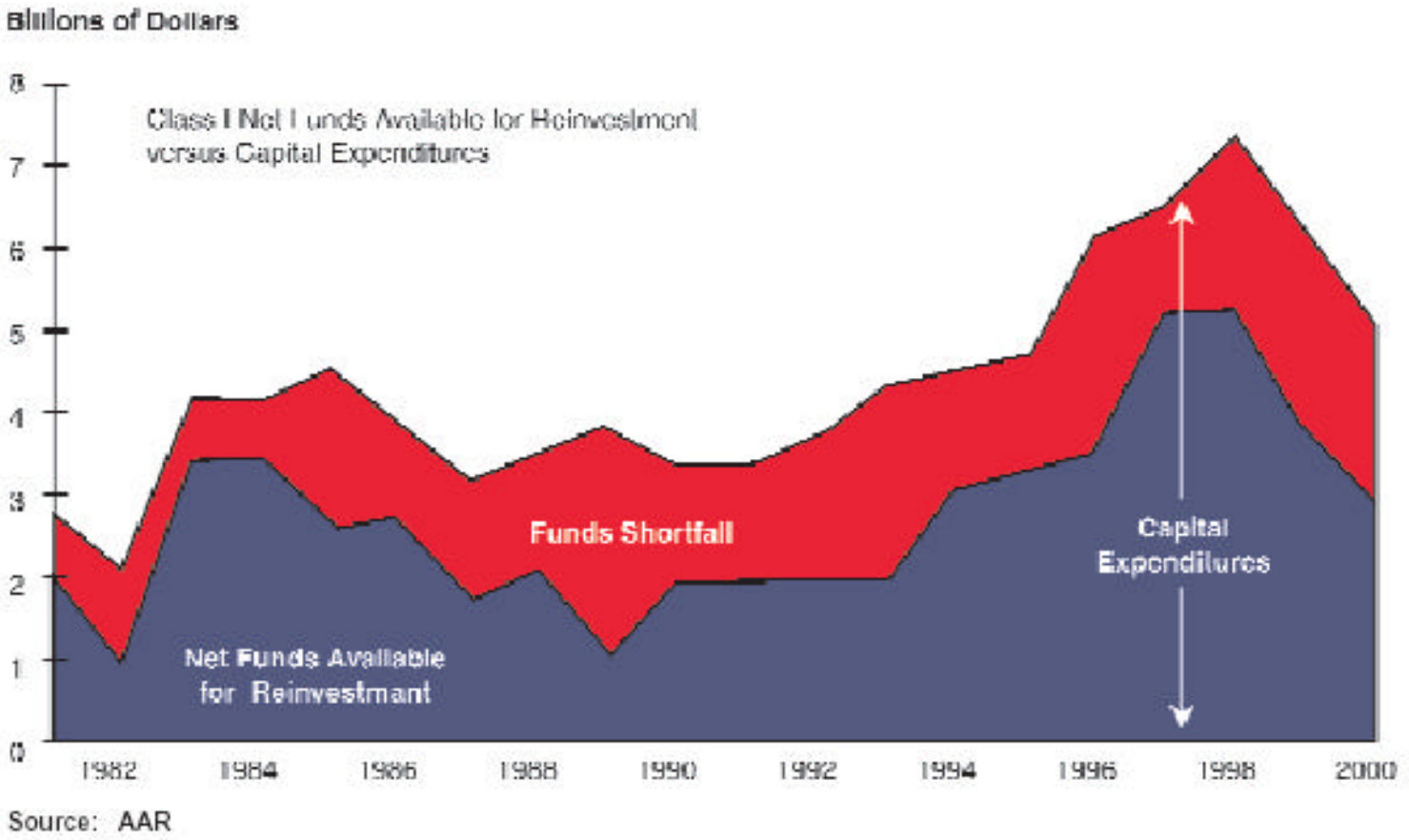
Source: Louis Thompson, World Bank

Rail's Stock Market Value



Source: Morgan Stanley, Standard & Poors

Capital Expenditure Deficit



Source: AAR

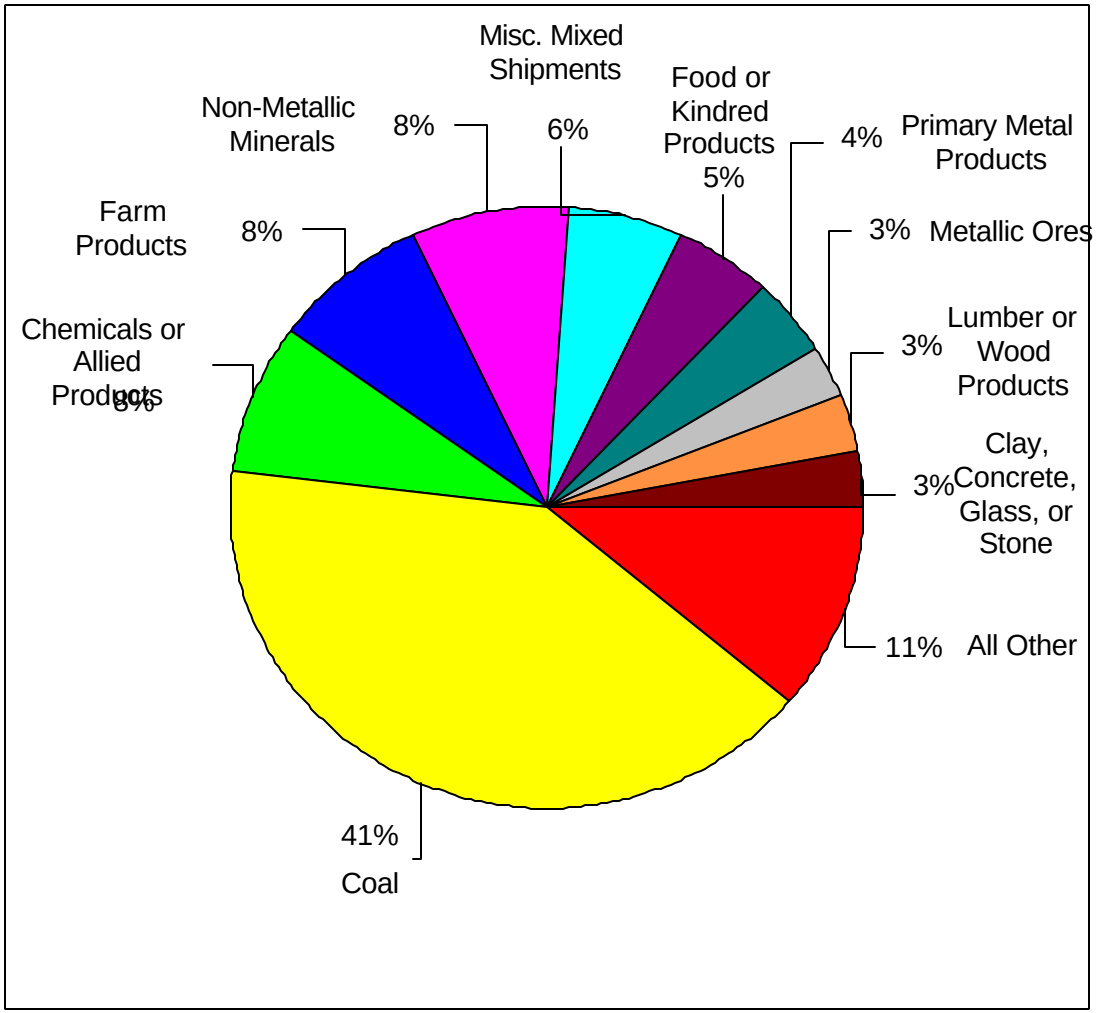
Causes - Speculations

- 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



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

Notes of Interest

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.

Association of American Railroads, "Railroad Ten-Year Trends." 1992-2001, Vol 19, Policy and Economics Department.

Commodity Flow Survey, 1997, Bureau of Transportation Statistics, U.S. Department of Transportation, Washington, DC.

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

Vachal, Kimberly and Denver Tolliver, 2001, *Region Elevator Survey: Grain Transportation Industry Trends for Great Plains Elevators*, UGPTI Pub. No. 143.

Vachal, Kimberly and John Bitzan, 2000, *The Long-Term Availability of Railroad Services for U.S. Agriculture*, MPC Report No. 01-116.

American Association of State highway and Transportation Officials, 2003, *Transportation Invest in America, Freight – Rail Bottom Line Report*, Washington, DC.