Outline

- Project background
- Project requirements and timeline
- What we have done
  - Qualitative research
  - Quantitative research
- What we are doing
  - And where we are going
Project Background

- *From GAO Report* – Are recent rate increases the result of capacity constraints or exercise of market power?

- As a follow up to the GAO study, the Board issued an RFP to study this and related issues, including
  - Assessment of competition and captivity
  - Capacity and investment
  - Service quality
  - Policy proposals

- The Christensen Associates team was selected to conduct an independent, rigorous study
Requirements from the Board’s RFP

- Initial qualitative research phase
  - Stakeholder input

- Quantitative research phase
  - Develop quantitative research plan
  - Assess competition and capacity issues
  - Investigate impact of competition and capacity constraints on service quality
  - Analyze economics of proposed policy reforms

- Prepare Final Report
Project Timeline

- Phase 1 - Qualitative Research
  - Through Spring (Complete)

- Phase 2 - Quantitative Analysis
  - Now through Summer (Ongoing)

- Phase 3 – Report
  - August through October

Final Report November 1, 2008
What We Have Done
Qualitative Research

- Interviews and other stakeholder feedback
- Institutional research
- Presentations and meetings

Summary of qualitative research findings will be a chapter in our Final Report
Stakeholder Input Process

- Input from various stakeholders, including
  - Shippers
  - Railroads
  - Industry analysts
  - Policy makers and regulators
  - Other interested parties

- Input obtained through various means
  - Over 60 interviews (in-person and phone)
  - Electronic forum on our website
  - Written comments via e-mail
Use of Stakeholder Input

- Findings from qualitative phase of project used in formulating empirical research questions
- We gained tremendous knowledge and insights
  - Perspectives on the workings of the industry
  - Perspectives on policy issues
- We thoroughly considered all input received
- In Final Report, we will summarize qualitative findings, including those where
  - Issues are outside the scope of our study
  - Data limitations prevented thorough examination
What We Have Done
Quantitative Analysis

- Specify research issues and empirical methods
  - Incorporate qualitative research findings
  - Literature search and review

- Data collection
  - Complete for “primary” datasets

- Research plan
  - Our “roadmap” for what we are currently doing and will be doing throughout the summer
What We Are Doing
Quantitative Research Plan

- Macro overview of industry
- Econometric analysis
  - Industry cost structure
  - Disaggregate pricing model
- Primary research issues
  - Identification of captivity
  - Existence and exercise of market power
  - Factors affecting service quality
  - Factors affecting capacity and investment behavior
  - Economic analysis of policy proposals
Macro Overview

- Purpose - set the stage for quantitative analysis, provide context

- Starting point is reconstruction and update of GAO analysis

- We are extending GAO analysis in two important respects
  - Use of alternative price index methods (e.g., BLS) and examination of differences
  - Develop economic measures of shipper captivity
Macro Overview

- In addition to rate and captivity trends we are examining
  - Industry input price and productivity trends relative to rate trends
  - Industry profitability trends relative to financial benchmarks

- We are also examining these macro trends relative to our quantitative results, including
  - Capacity and investment
  - Cost characteristics (e.g., economies of density)
Econometric Analysis

- Two types of models in economic literature
  - Industry cost function estimated with R-1 data
  - Disaggregate pricing model estimated with Waybill data

- Industry cost function
  - Cost/production characteristics of industry
    - Account for firm-specific effects
  - Test for various economies – scale, scope, density
  - Insights into economically feasible market structures

- Disaggregate pricing model
  - By O-D pair, commodity, etc.
  - Investigate pricing in specific markets
Econometric Analysis

- Each type of model has limitations
  - Industry cost function of limit use for market-specific analysis
  - Disaggregate pricing model limited by need to make assumptions on firm’s cost characteristics

- One of our innovations is attempt to synthesize models to address these limitations
  - Develop methods to produce estimates of commodity-specific marginal costs
  - This will allow market-specific analysis of market power issues and effects of proposed policy reforms
Econometric Analysis

- Differences from prior studies
  - Use of confidential, unmasked Waybill data to “drill down” to shipment-specific analysis
  - Supplementing rail data with Geographic Information Systems (GIS) and other data
    - Extensive mapping capabilities
  - Market definitions down to county level (and often lower)
  - Synthesize modeling approaches

- Enhancements to our econometric analysis
  - We are making liberal use of maps, charts, graphs
  - We may also use case study approach
Service Quality

- Proposed research questions included
  - Current state and trends in service quality
  - Impact of capacity constraints on service quality
  - Relationship of competition and market power to service quality

- We have heard a lot about service quality performance (and it will be in Final Report)
  - Over time
  - Relative to price, captivity

- However, rigorous empirical investigation of these issues is limited by lack of available data
Service Quality – Data Limitations

- Primary data set is weekly Rail Performance Reports
  - We have complete panel back to 1999 for each reporting Class 1
  - Primary measures are terminal dwell time and train speed

- Other possibilities
  - R-1 schedule 720, Track and Traffic Conditions
  - Case study approach

- It has been suggested to us that the Board should require reporting of service metrics that many shippers and railroads keep
Two general approaches to evaluate railroad capacity and utilization

- Transportation flow modeling (e.g., Cambridge Systematics study)
  - Advantage of detailed view of network
  - But no account of economic incentives that affect capacity and demand

- Econometric modeling of cost functions
  - Advantage of accounting for economic incentives
  - But largely limited to macro, network-wide view
Capacity and Investment

- We are relying primarily on cost function approach
  - We will attempt to apply at more disaggregate level

- “Capacity equation” derived from cost function results
  - Comparison of investment’s value of marginal product to its market price (“Tobin’s q”)
  - Indicator of investment incentive
  - Indicator of shortage, excess or optimal capacity
  - Explicitly recognizes capacity depends on substitutability of other inputs and technology
Augment with other information and analysis

- Identify and analyze select congestion points and corridors. For example:
  - Chicago
  - PRB corridors (West) and I80 corridor (East)
- Elements of Cambridge Systematics study
- Evaluation of demand projections to assess future needs
- Extensive use of maps, charts, etc
Economic Analysis of Policy Proposals

- Board RFP requests analysis of proposals mentioned in GAO study
  - Reciprocal switching, terminal agreements, trackage rights, bottleneck rates, paper barriers
  - STB reforms
    - Increased use of simplified guidelines and arbitration
    - Alternative cost methodology to SAC
  - Other potential candidates
    - Investment tax credit
Economic Analysis of Policy Proposals

- Focus of economic policy analysis is to assess economic benefits and costs
  - Effect on economic efficiency
  - Measurement of distributional effects
  - Per RFP, GAO – examine effects on railroad profitability and investment incentives
  - No judgment on equity effects

- Our assignment is to evaluate, not recommend proposals
  - Provide meaningful information for policy debates
Our quantitative analysis provides a basis for assessing industry structure and performance, including:

- Extent of captivity
- Extent and exercise of market power
- Industry production technology and cost structure
- Investment requirements and incentives

This assessment provides an initial “filter” for evaluating economic effects of proposals.
Our evaluation of economic effects will consider

- Our assessment of industry structure and performance – i.e., the “filter”
- Simulations based on our empirical results
  - Price and output effects (i.e., economic efficiency)
  - Distributional effects (i.e., shippers and railroads)
  - Investment incentives
- Results and/or inputs from other analyses
Recommendations for Future Research and/or Data Collection

- We are compiling a list of important issues that merit further study
  - Some are outside the scope of our study
  - For some, data are not available to adequately analyze

- Examples of important issues where analysis is limited by data availability
  - Service quality
  - Cost shifting
  - Shipper access to rail networks
Summary

- Our research agenda includes
  - Ambitious set of questions
  - Implementation of methodological innovations

- We are in the process of estimating econometric models
  - We are linking this analysis to unique, detailed geographic analysis of shipments

- A number of people and organizations have been extremely helpful and cooperative
Summary

- Our primary goal: produce an academic-quality study that is a useful tool for all stakeholders
  - Theoretically rigorous
  - Accessible and meaningful to non-economists
    - Liberal use of maps, charts, graphs
    - We may also make use of case study approach

- Application to policy analysis is a critical aspect of this goal
Study Website

www.LRCA.com/railroadstudy

- Allows project team to provide information to stakeholders about the study
- Allows stakeholders to provide information to the project team
  - Electronic forum and e-mail access to study team