Rightsizing the Conductor Roster at MTA Metro-North Railroad

Model Development and Application

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Metro-North at a Glance

- 121 Stations (including world-renowned Grand Central Terminal)
- Five Main Line & three Branch Line operations
- Operations cover nine counties in three states

Introduction

Issue

- Metro-North verifies fares manually using on-board visual inspection methods
- Insufficient personnel leads to overtime and lost revenue

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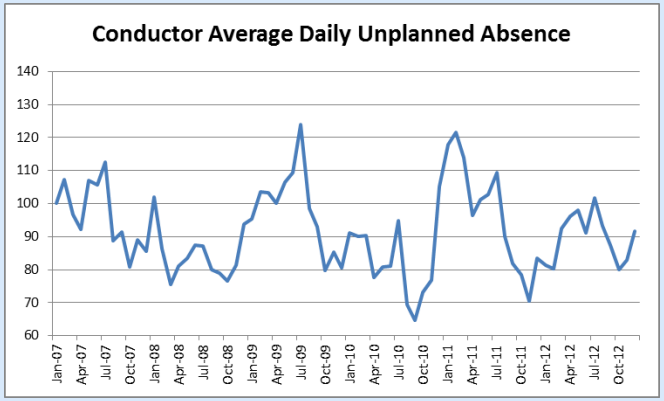
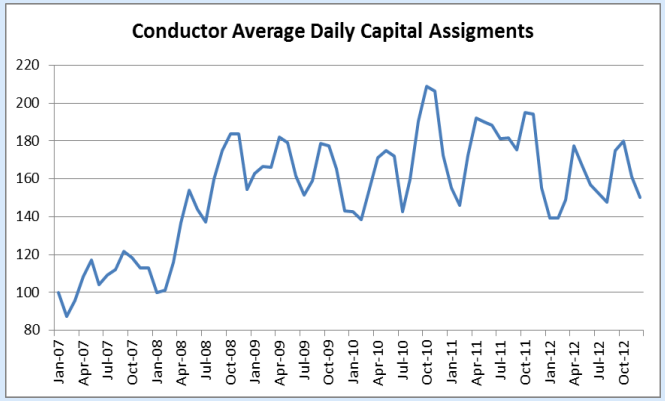
- Insufficient personnel leads to OT and lost revenue

Drivers

- Fluctuations in absenteeism
- Fluctuation in unscheduled work





January 2007 indexed to 100 in each chart

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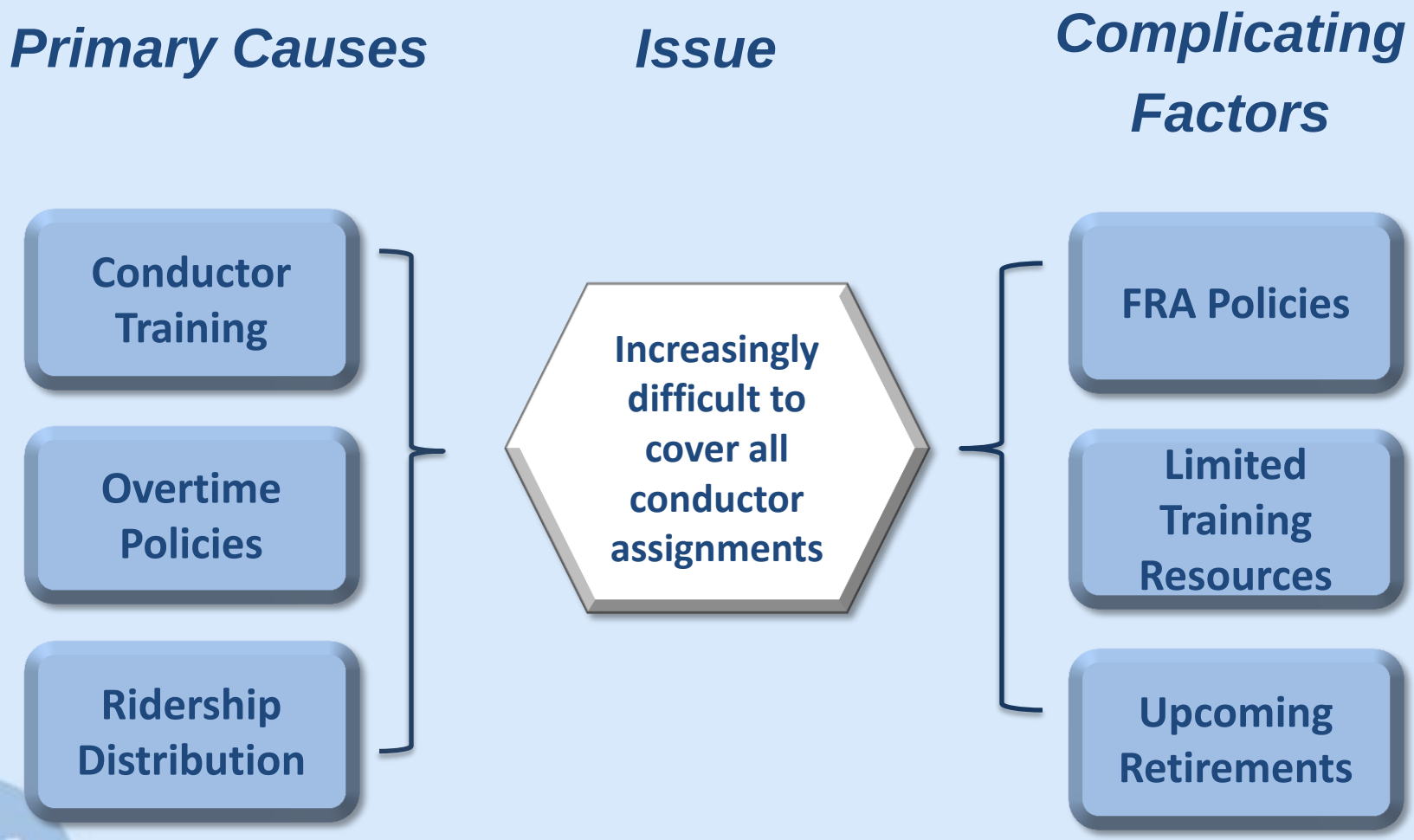
Tradeoff

- Increasing staffing reduces unfilled ("blanked") assignments and overtime
- BUT - increases new hire training costs, guaranteed wages/salary and benefits

Complicating Factors



Excel Model Calculation

Model calculates total cost of service with a several year look ahead

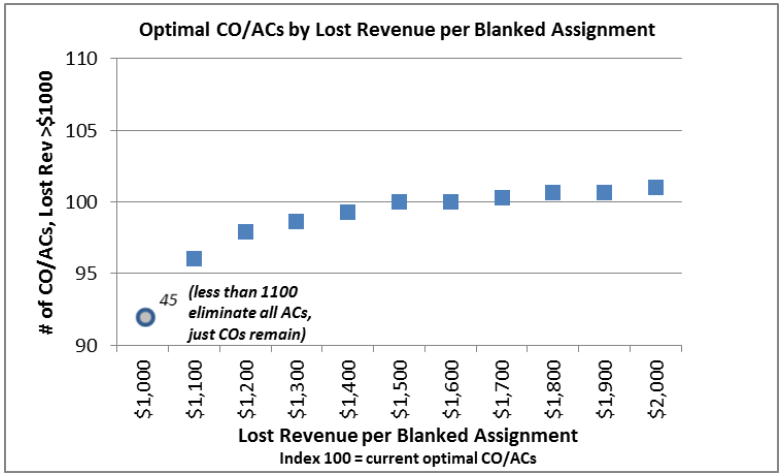
Estimating Revenue Loss

Data and Calculation

- Ridership data
  - Ticket counts
  - Terminal boarding/alighting counts
- Estimated revenue exposure per assignment, per train
  - Distribution of ridership by ticket type
    - Include on-board sales and tickets that require conductor action
      - Punching tickets, paying fares onboard
- Probabilities assigned
  - Based on historical per train blanking frequency
  - Average assignment = four trains

Estimate

- Lost Revenue = $1500 per blanked assignment
  - Initial range of $1000 to $2000
  - < $1000 results in widespread blanking



Revenue Exposure

Factors that Reduce Revenue Loss

- Remaining staff "picks up the slack"
- Monthly/weekly passes
- More passenger transfers
  - Ticket may be collected on the next train
- Ticket expiration policies
  - Refund Fees

Factors that Increase Revenue Loss

- More crowded trains
- Manual on-board fare collection
  - Single trip/round-trip tickets
  - Ten-trip tickets
  - On-board ticket sales
- Frequent blanking
  - Customers may switch to ten trip tickets from weekly/monthly passes

Model Calculations

Key Tradeoff	– Higher Staffing level
	  – Higher fixed personnel cost, fringe benefits, training costs
	– Lower Staffing Level
	  – Increased overtime, blanked assignments/potential revenue loss

Supply and Demand	– Supply
	  – Rest days, planned / unplanned absence, overtime availability
	– Demand
	  – Scheduled assignments, extra assignments, capital flagging

Assignment Process	– Daily at the crew base level – Number of available FTEs on a daily basis (Supply) – Number of total daily assignments (Demand) – Surplus/Shortfall

Optimizer	– Simulation
	  – Varies the number of FTEs by quarter (multiple iterations)
	• Provides adjustments to the planned hiring plan
	  – Propose additional/reduced training classes
	  – Hiring plan includes attrition and service plan
	  – Identify areas of under/overstaffing

Conclusions

- The model is an important tool for:
  - Determining / justifying staffing levels
  - Analyzing the cost impact of adding additional service
  - Valuing changes in fare policy
  - Input scenario testing

- Senior executive support and cooperation across multiple departments was instrumental in project success