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The Impact of Airport Delays on Airline Costs

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Objectives

- How close is the US air transportation system to its saturation point?
- What public and private policies can best reduce delay and increase system throughput?
- What are the economic losses at stake if we fail to increase airport capacity?

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Analysis Approach

- Compare baseline travel demand forecast to one that directly includes airport capacity constraints
  - Quantify the “performance gap” between the constrained and unconstrained forecasts
- Focus on system performance on good weather days at the top 64 airports
- Assess the impacts of alternative policies on delay, throughput, costs, and fares

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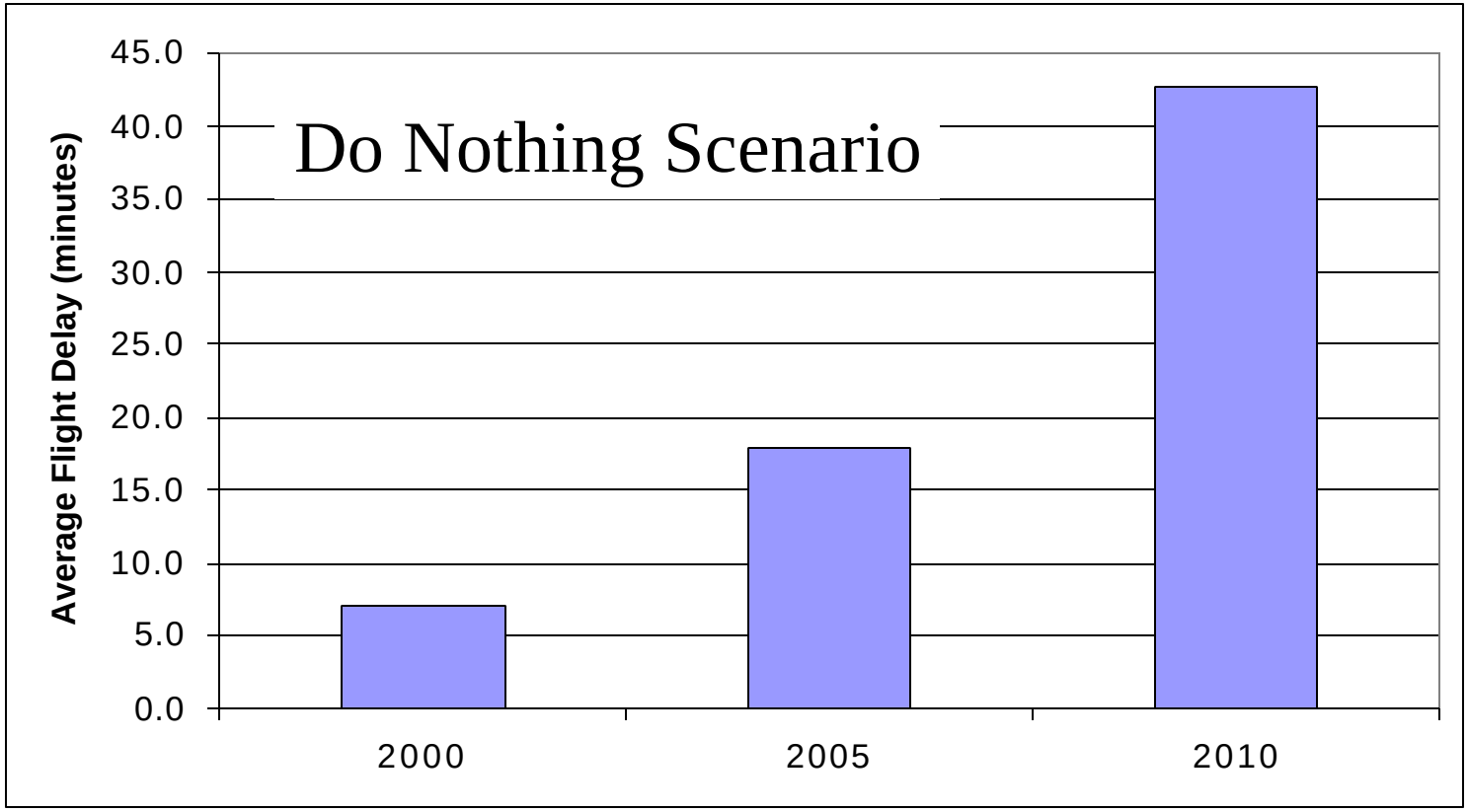
How Close is the NAS to Saturation?



Average airport delay per flight at the top 64 airports. Estimates do not include downstream delay effects.

Some Possible Policy Responses

- What might happen when airport capacity is less than demand?
  - Allow operations to grow and accept the increased cost from delay and pass it on to passengers through higher fares
  - Restrict growth in flights (demand management)
  - Move flights to different times or airports

Analysis Requirements

- Require a model of NAS operations that estimates delay and throughput under different capacity and demand scenarios
- Require an economic model of the airlines
  - Airline cost model
  - Air travel demand model to capture changes in demand in response to fare changes
- Connect the two models

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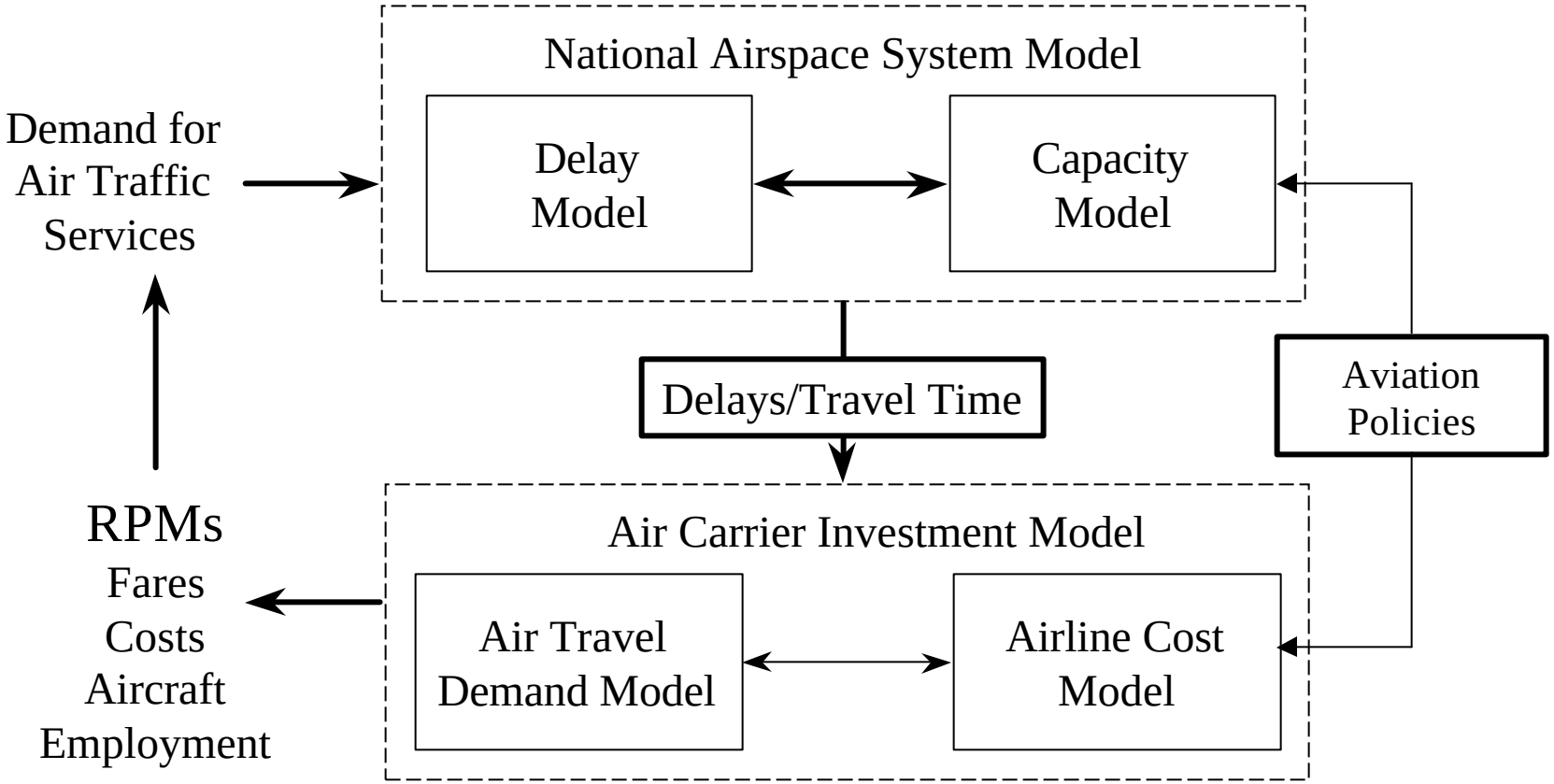
Integrating Air Traffic Management With the Economics of Air Travel



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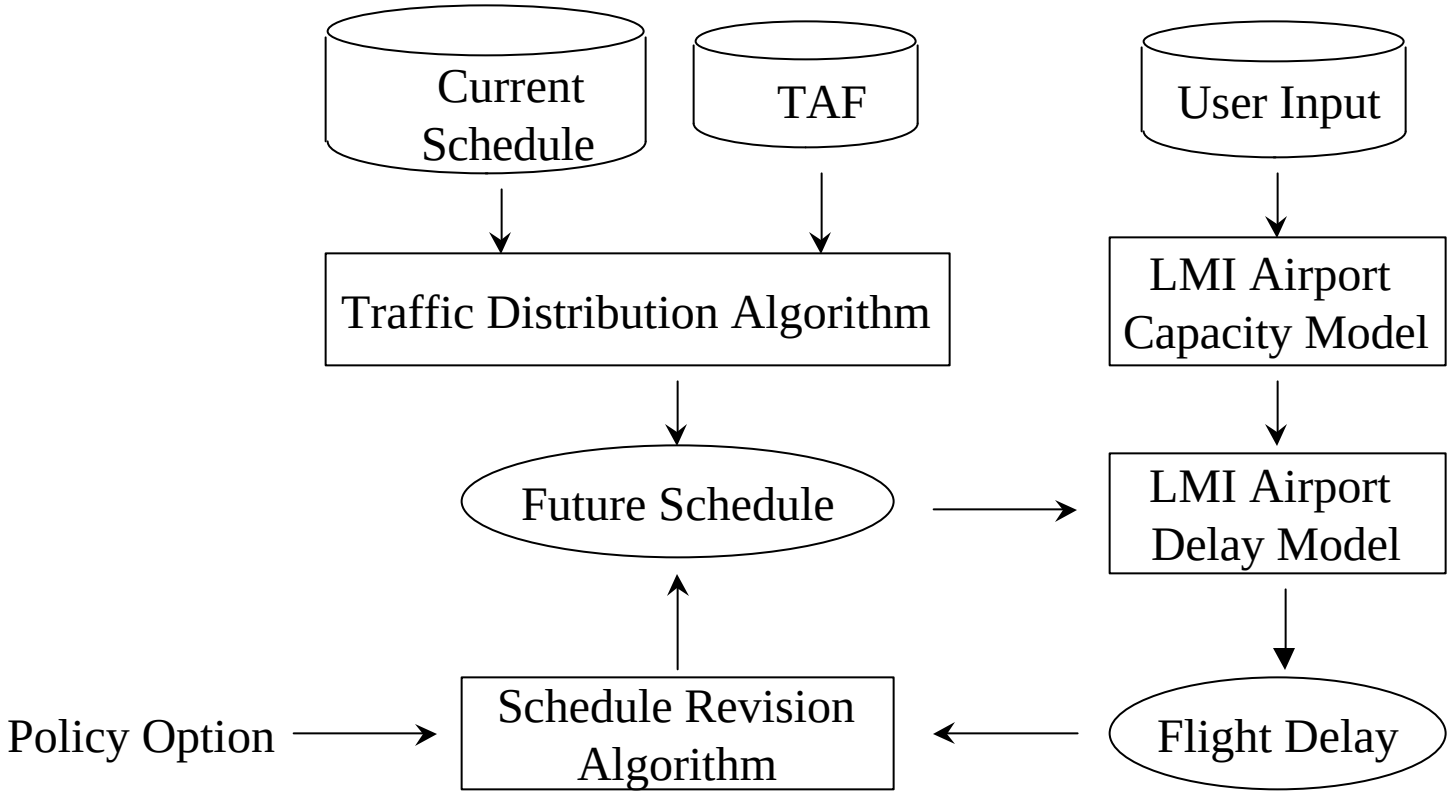
Modeling the National Airspace System



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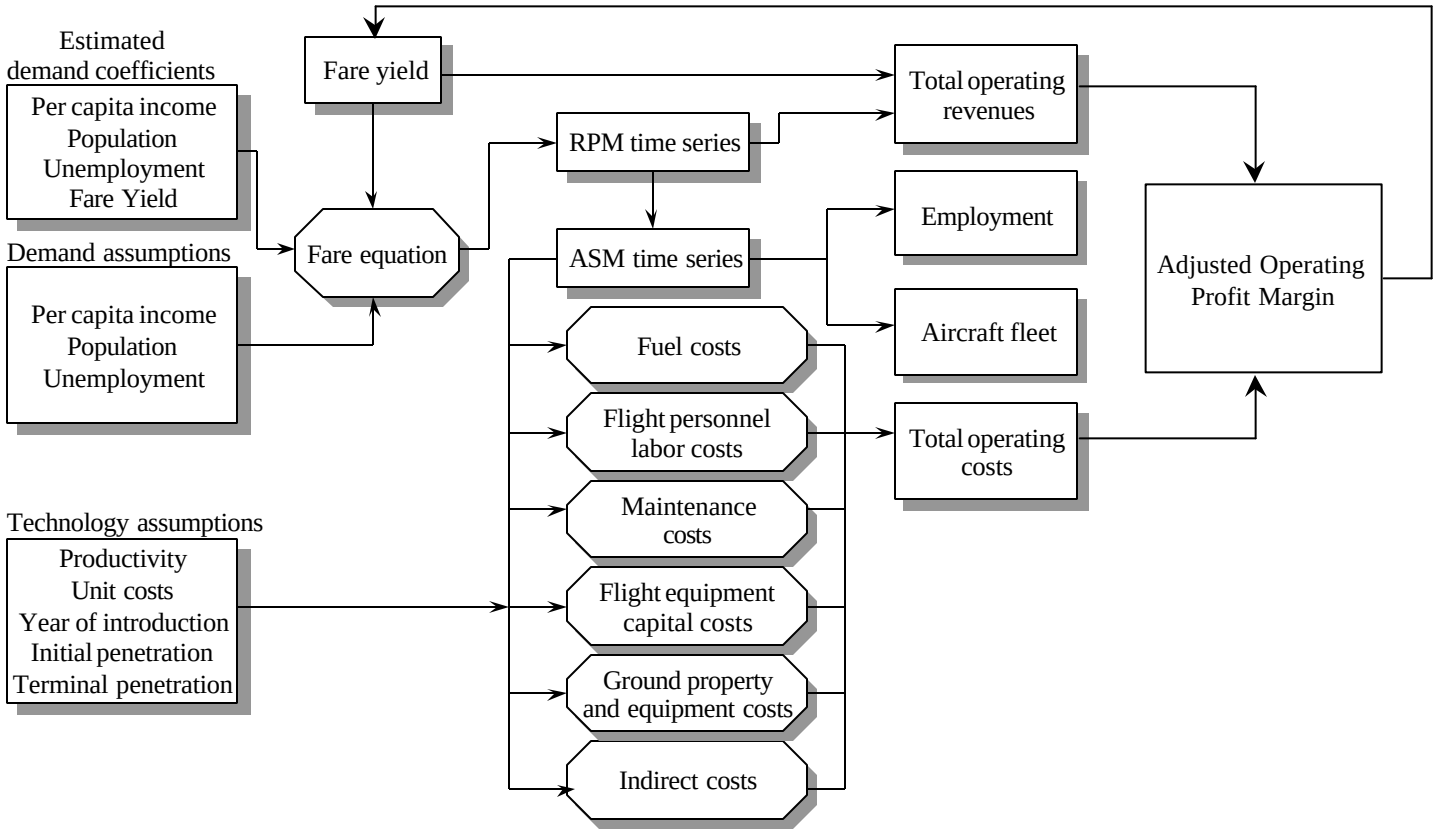
Air Carrier Investment Model- Integrating Demand With Airline Costs



Air Transportation Policy and Strategy Alternatives

- Operations growth restrictions based on airline delay tolerance or demand management
- Airline strategies in response to airport capacity constraints
  - Schedule modifications
  - Aircraft size changes
  - More geographically dispersed scheduling

Forecasts With Flight Delay Constraints

- Define limits on acceptable flight delays (increases in schedule time)
- When an airport reaches that limit, no more flights will be allowed during that hour
- Delay maximum will be set for each airport based on current operations or a system-wide average
- Estimate system throughput under the different policies
- Estimate change in fare yields to match the lower throughput

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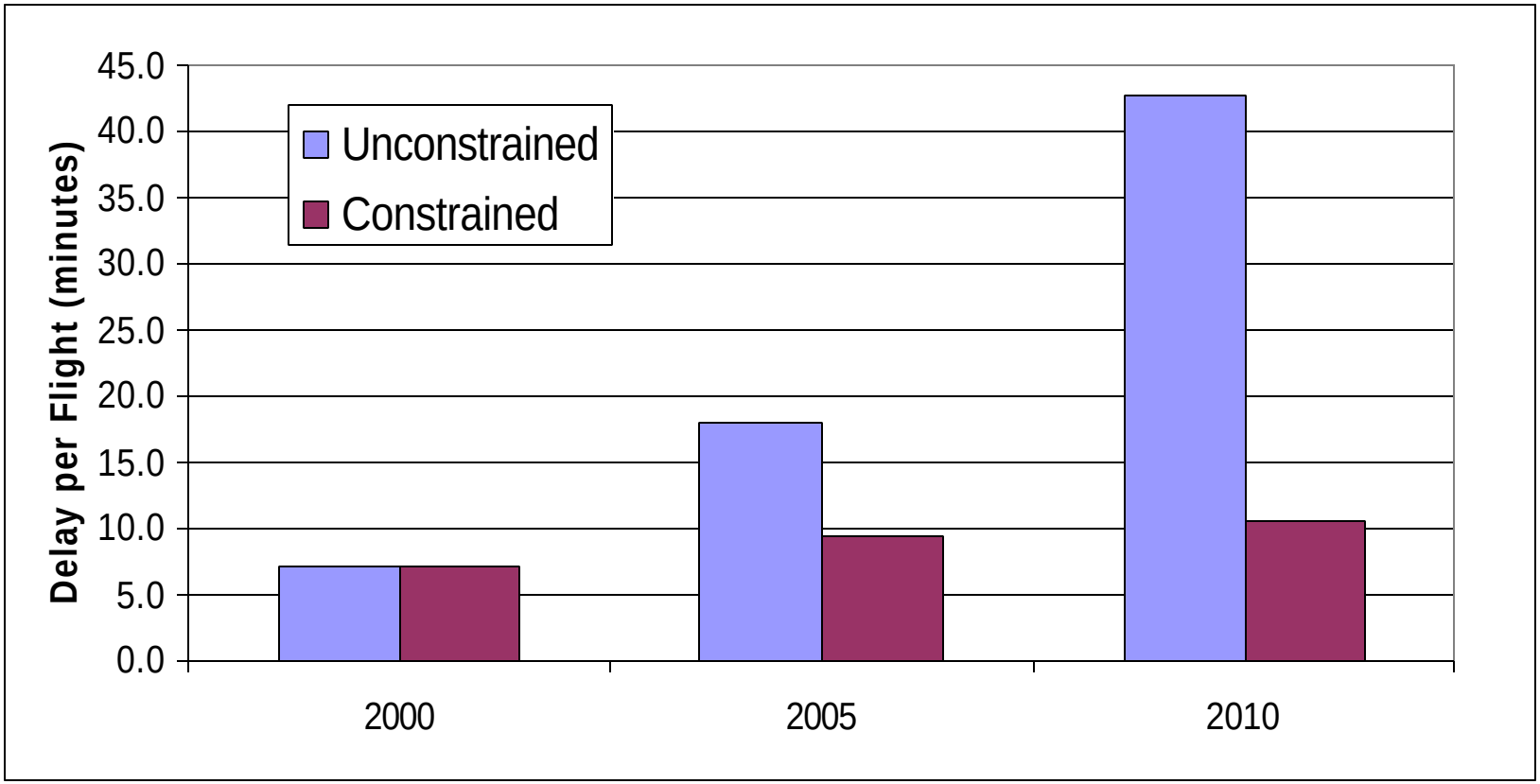
Average Delay for Constrained and Unconstrained Forecasts



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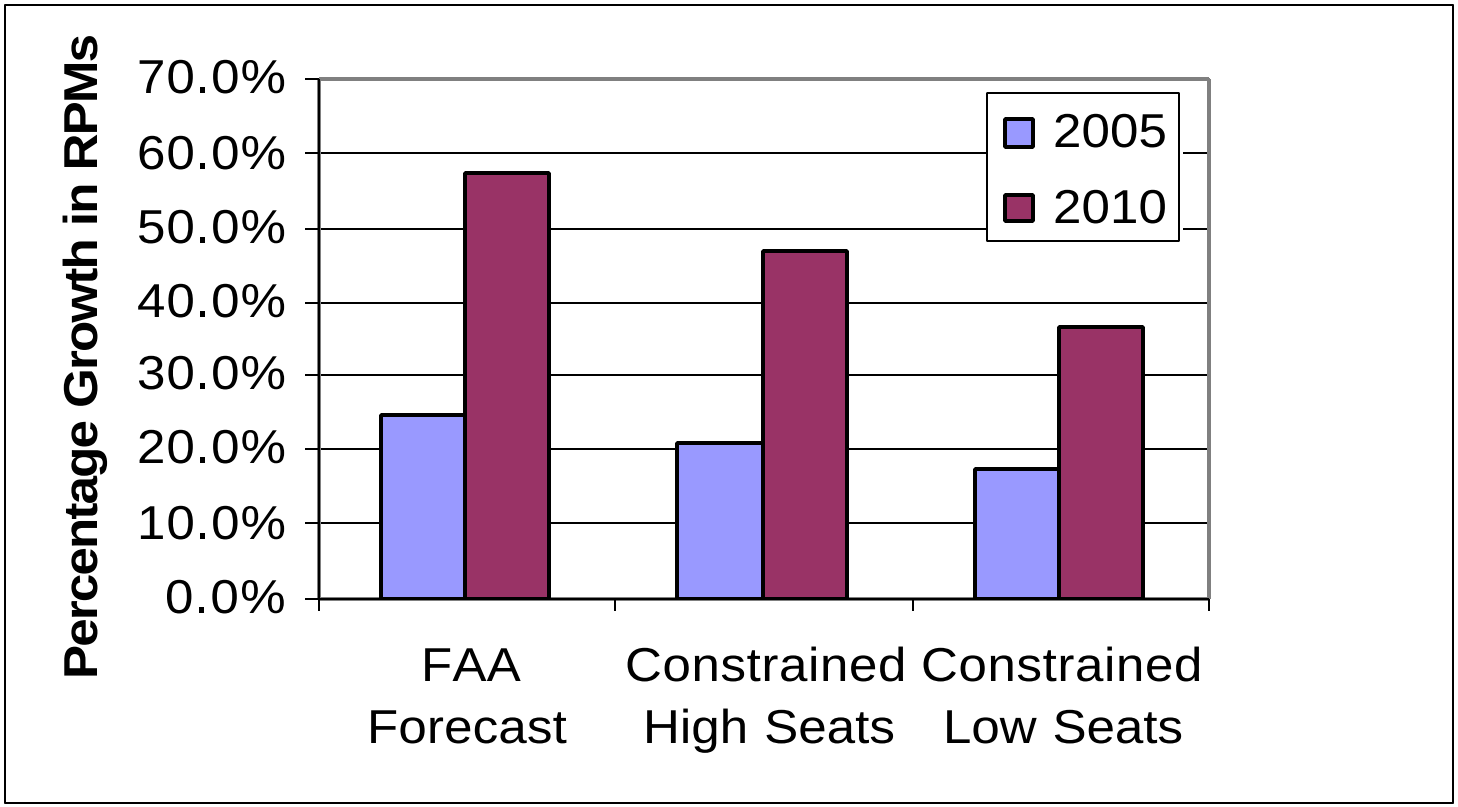
Congestion Reduces Growth From the FAA Forecast



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Operational Concepts under Capacity Constraints

- Accommodate growth by increasing fares and rationing demand in the face of scarce capacity
- Establish new hub airports to mitigate congestion at existing hubs
- Increase direct service to avoid congested hubs
- Move flights to off-peak times
- Increase nighttime operations
- Employ larger aircraft equipment

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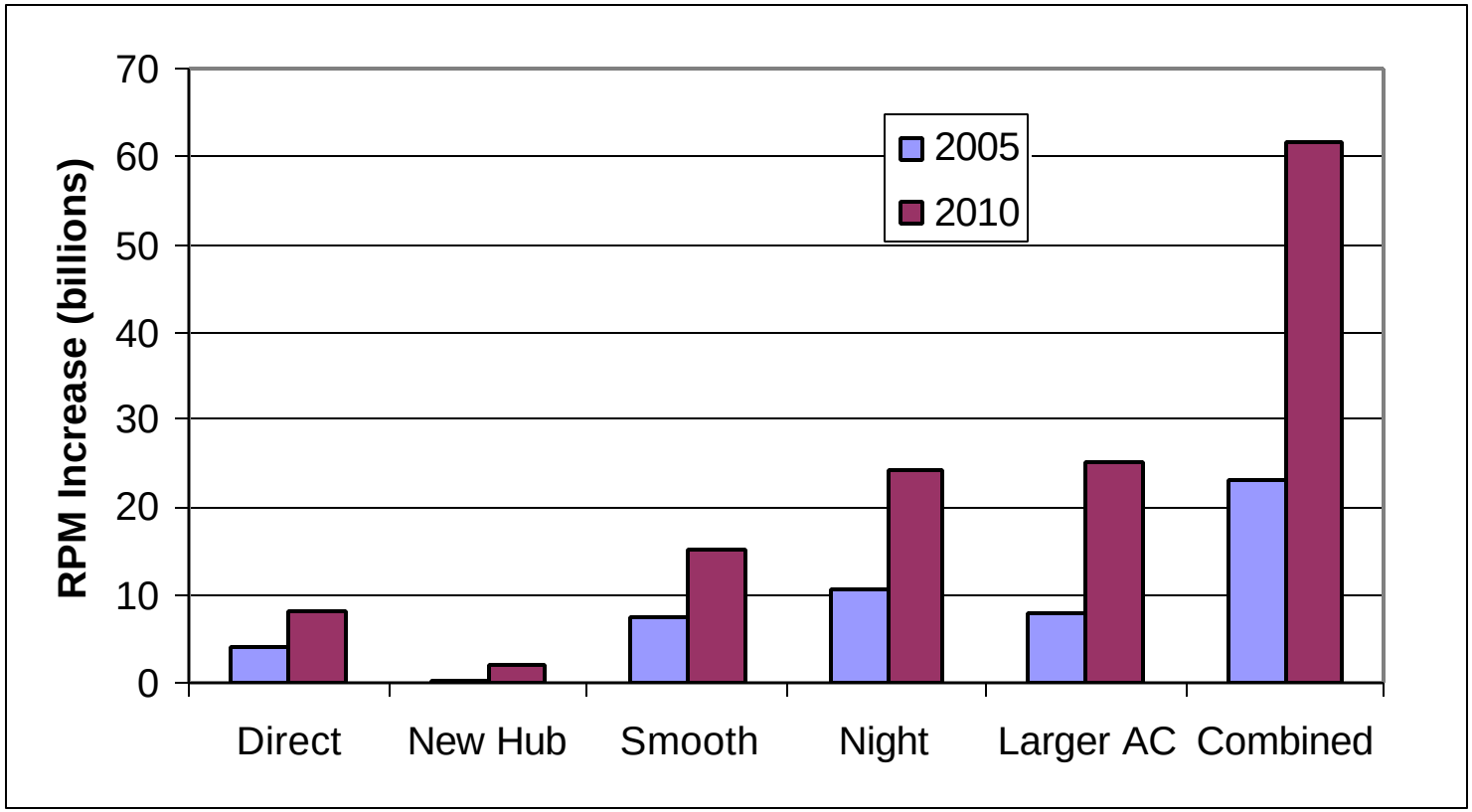
Increase in RPMs Over Constrained Forecast



FAA assumptions for growth in seats per departure.

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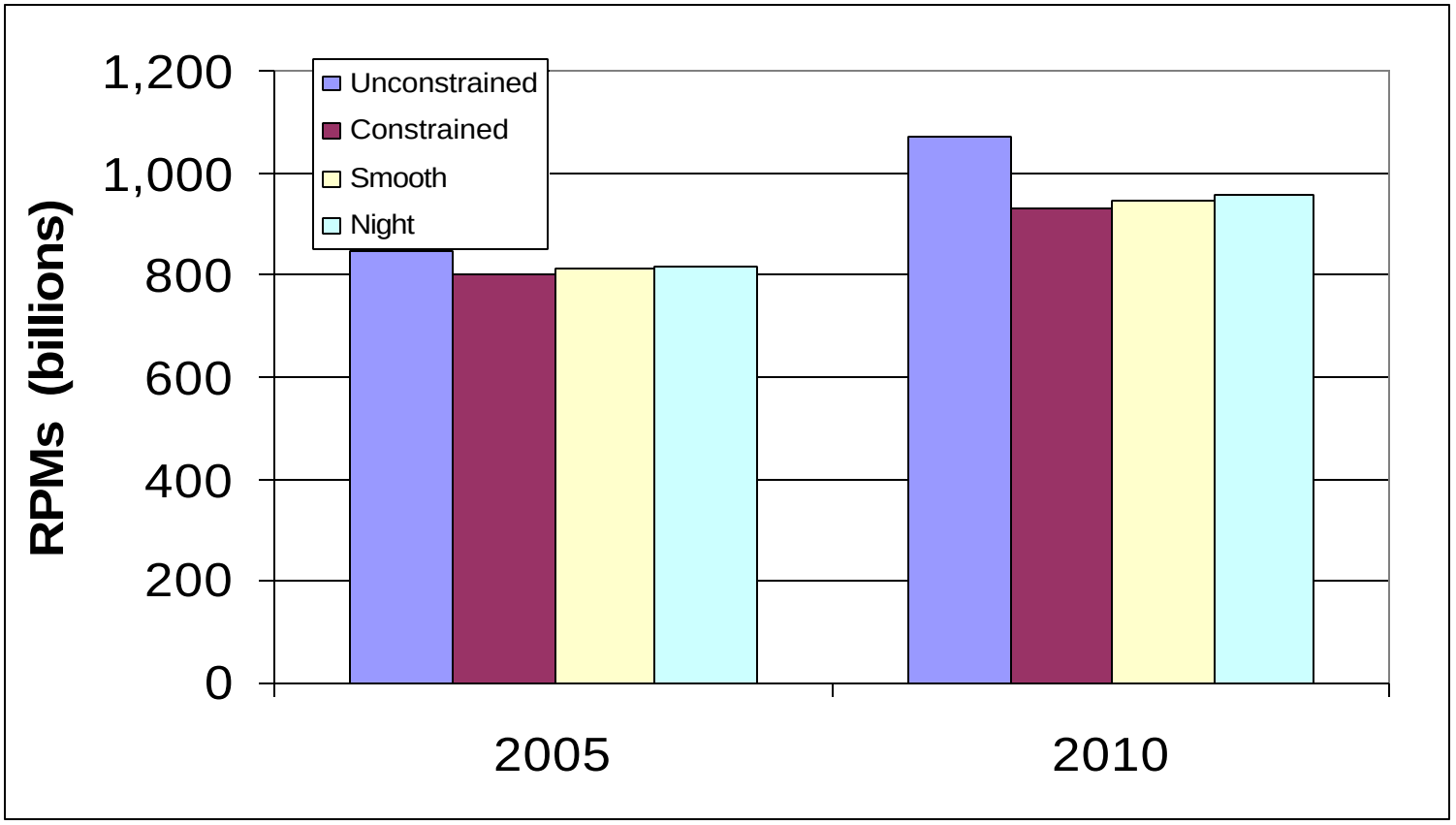
RPM Forecast With Schedule Changes



No growth in aircraft seats per departure

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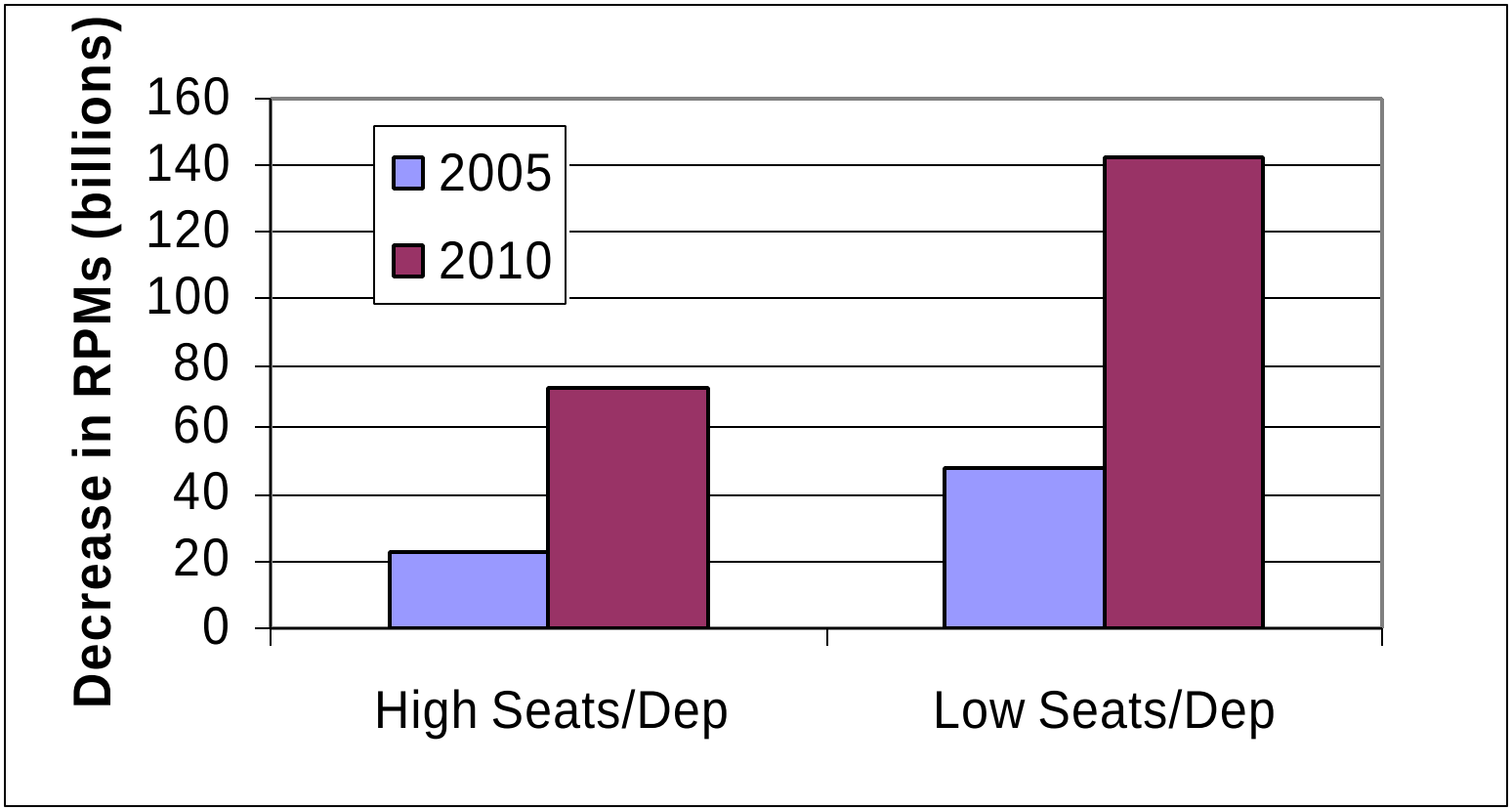
Lost Industry Output



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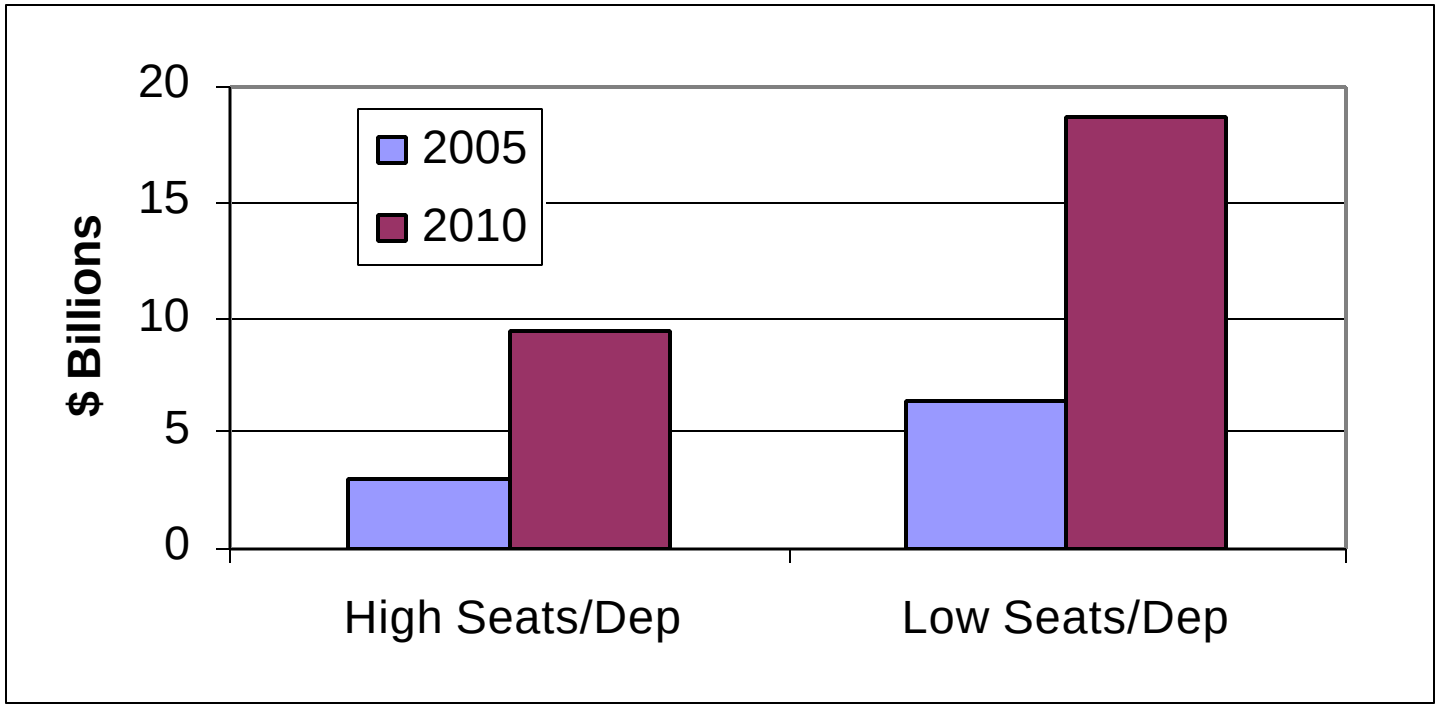
Value of Lost RPMs



Does not include the cost of decreased utilization from increased schedule time.

Comments

- Benefits of the policies examined are limited
  - Results are conservative since they do not include the costs of the strategies
- Cost analysis required to assess whether any of the policies are worth implementing
- Flight delays continue to increase under all of the policies
  - Rise to 10-11 minutes per flight in 2010
- Can any of these strategies be implemented?
  - Passenger acceptance
  - Airline operations impacts

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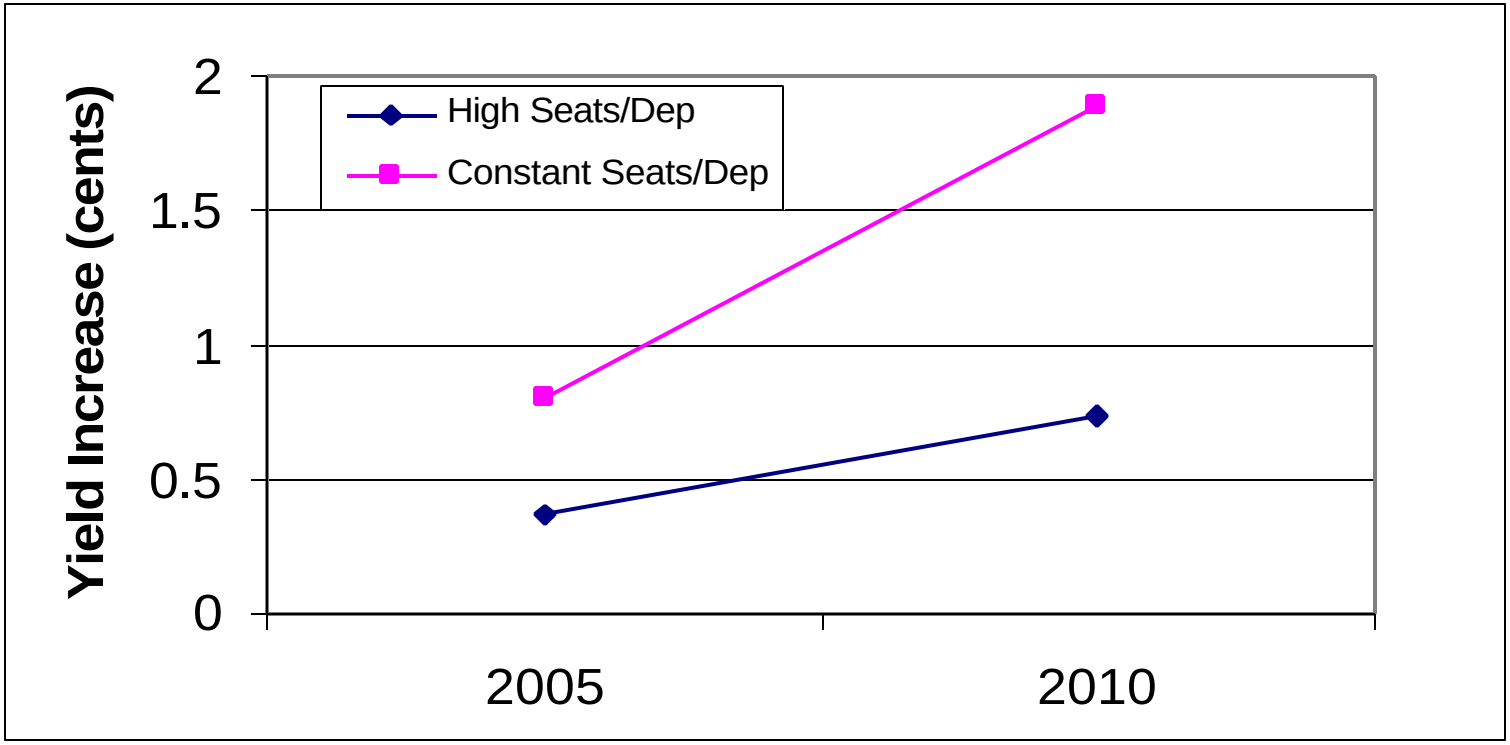
Congestion Impact on Fare Yields



Compared to Unconstrained Forecast

Some Good News!

- Airline operating costs will rise significantly
  - But fares will increase even faster
- Airlines will not need to buy as many new aircraft
  - By 2010, US airlines will require about 600 fewer aircraft
- Airlines will not need as many new employees
  - 84,000 fewer workers in 2010

The Forecast is Already Here: Schedule Creep

- From 1993-2000, the average OAG scheduled flight time among the top 28 airports increased an average of 4-5 minutes
- How much more padding can the system absorb before it can no longer accommodate growth?

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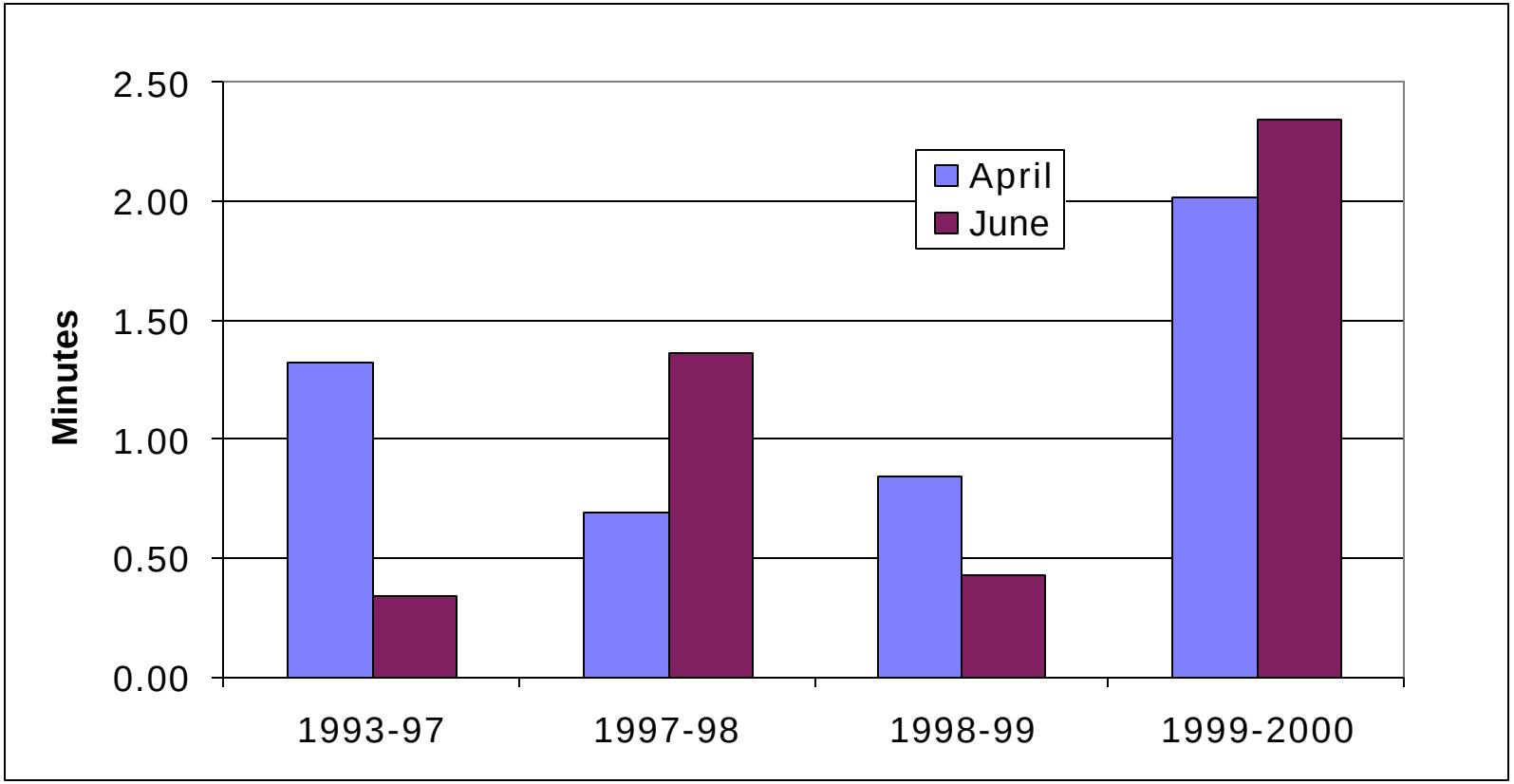
Changes in Schedule Time – 29 Hub Airports



Source: OAG weekday schedule.

Cost of Schedule Creep

- Recent costs are mostly increases in operating costs
  - Labor Utilization
  - Aircraft Utilization
  - Customer dissatisfaction
- As it becomes more difficult to meet demand, opportunity cost will dominate
  - Potential revenue losses of about $85 per minute
  - Loss of high value passengers

Final Forecast

- Lack of airport capacity indicates an industry shift
  - From high-growth with expanding markets
  - To a high-fare, slow-growth industry
- Political visibility and pressure will increase substantially
- There will be no “gridlock”
  - Steady evolutionary response to supply and demand forces
  - Pushing fares higher and airlines into less efficient service delivery strategies