



Overview of Congestion Management Issues and Alternatives

by

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NEXTOR Activities Related to Addressing Airport Congestion Management



Airport Congestion Management project

- Sponsored by the U.S. Department of Transportation (Office of the Secretary & FAA)
- Participants: University of Maryland, George Mason University, MIT, U of California, Berkeley, Harvard, GRA, Inc.
- Carried out research in anticipation of expiration of High Density Rule (HDR) at New York's LaGuardia (LGA) Airport.
 - Analysis of several administrative and market-based mechanisms
 - Design of slot auction
 - Strategic simulations involving cross section of stakeholders
 - Toolbox of congestion management alternatives

Follow-on projects to design of fair allocation methods to support FAA proposals and to perform related analysis

Participation in NY Area Rule-Making Committee



NEXTOR Activities (continued)

Workshops held at the University of Maryland and Aspen Institute Wye River Conference Facility

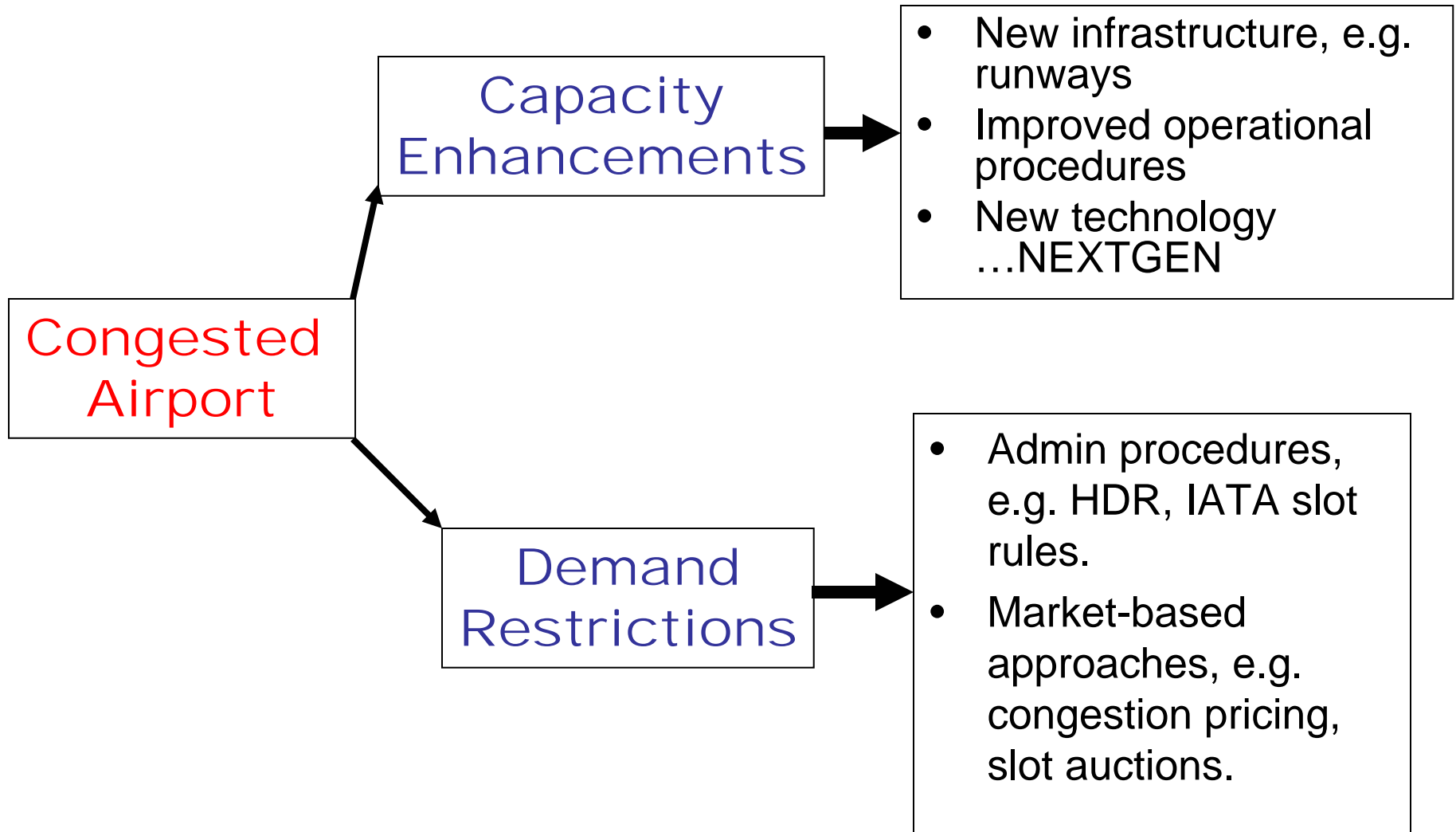
Airline and National Strategies for Dealing with Airport and Airspace Congestion (March 15-16, 2000)

National Airspace System Resource Allocation: Economics and Equity (March 19-20, 2002)

Government, the Airline Industry and the Flying Public: a New Way of Doing Business (June 21-23, 2004)

Allocation and Exchange of Airport Access Rights (June 6-8, 2007)

Airport Congestion Management Options



Congestion Management Goals



- I. Control of congestion and delay
- II. Maintenance of a vibrant air transportation business environment,
- III. Support for certain societal and community objectives
- IV. Consistency with international obligations
- V. Create feedback loops that:
 - 1) encourage flight operators to make best use of NAS.
 - 2) encourage stakeholders to make appropriate investments in NAS technology and infrastructure.

What about the two “easy” options for LGA??



- 1.) No action – e.g. at LGA do not replace High Density Rule (HDR).
- 2.) Status quo – continue under HDR-like rule.

Question re 1): *If there are no access controls on a high-demand airport such as LGA, is it likely that congestion and delays would become excessive, i.e. is it likely that goal I. would not be met?*

Relevant Evidence: recent ORD experience and experience at LGA during “Air 21” period.

Question re. 2.) -- HDR or similar measure:

Is economic efficiency, i.e. a vibrant air transportation business environment, achieved under HDR, i.e. is goal II. being met?

Relevant Evidence:

Yes: economic index of competition (HHI) indicates highly competitive environment

No: {
Experience with secondary market
LGA average aircraft gauge analysis.

Basic Options and Tradeoffs



Administrative measure vs market mechanism

Slots (aka arrival or departure authorization) vs
no slots

Market mechanism: auctions vs congestion
pricing

Should slots have finite lifetimes (lease vs
own)?

Slots vs No Slots



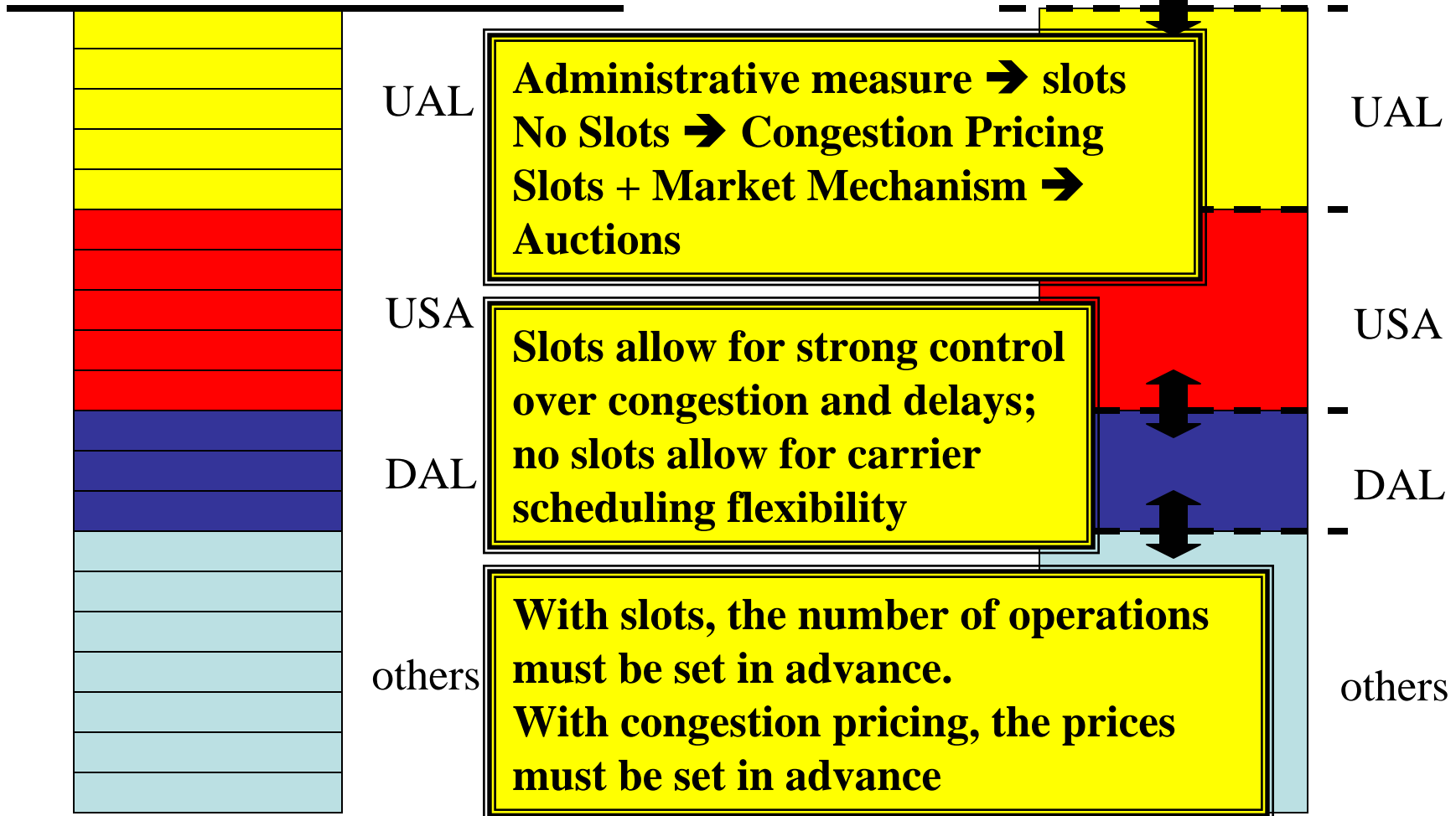
(Congestion) Prices provide "incentive" to limit operations

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NO SLOTS

SLOTS

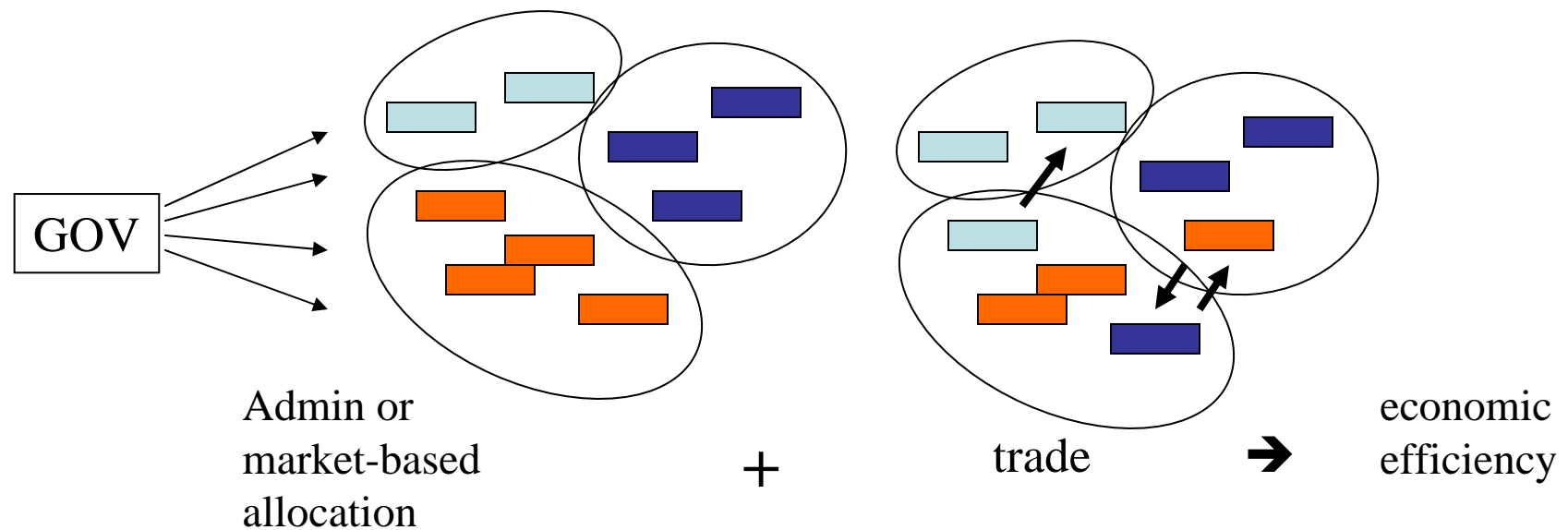
Fixed limit on number of operations



When slots are employed, there is always a question of determining the right number of slots.

- *The excessive delays at LGA may indicate that the current number of slots is too high.*
 - *At certain European airports (that are under IATA slot controls) there is strong evidence that the number of slots is too low.*
- *An ideal slot-based congestion management mechanism should have a carefully designed system for setting the number of slots that seeks to maximize stakeholder welfare (and is devoid of political influence) ... it may be possible to design market mechanisms that allow the market to set the number of slots.***

Slots, Secondary Markets and Economic Efficiency



This conclusion requires that the secondary market “works well”!!!

Stimulating Secondary Market (if it needs to be stimulated)



- Increasing “cost” for holding a slot.
- Forcing slot owner to participate in market (even if owner can buy back slot).
- Forcing all exchanges to go through “blind” market.
- Clarifying rights associated with slot ownership and eliminating politics associated with airport access.

Congestion Management and Incentives for Capacity Expansion



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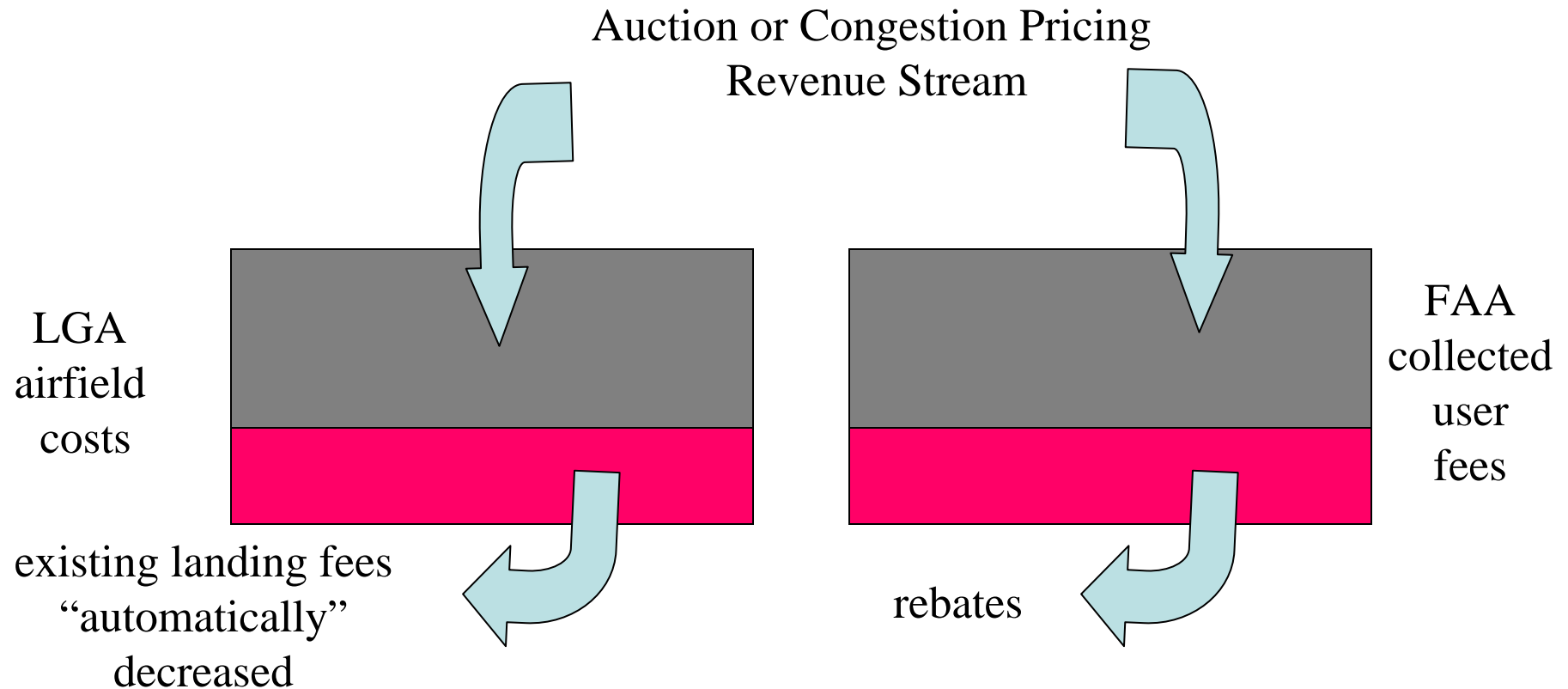


Congested
Airport

Congestion Management and Incentives for Capacity Expansion



Using New Revenue Stream to Off-set Existing Distortionary Fees



The current fee structure is “distortionary”

- Cost imposed on system \neq fees paid \rightarrow fees encourage misuse of resources
- Consideration should be given to displacing existing fees, e.g. landing fees & FAA collected user fees.

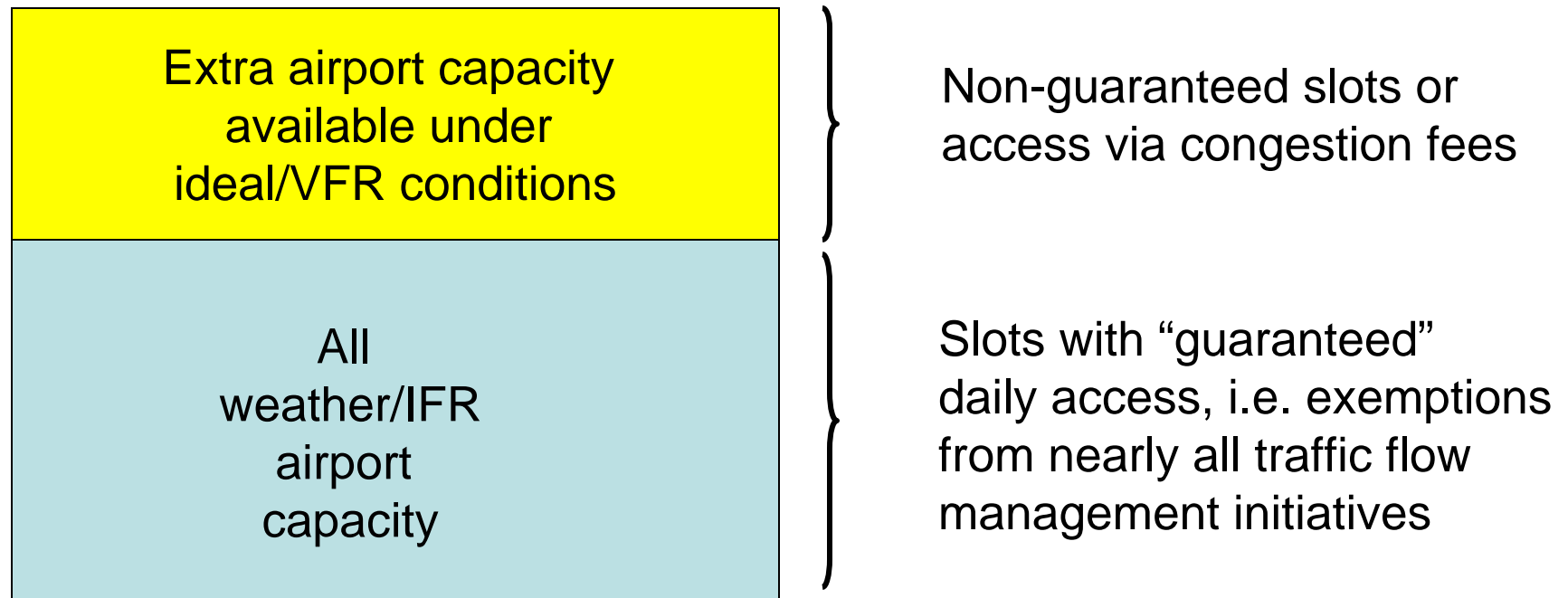
Who implements the solution (manages process, collects new fees, etc.)



FAA/Federal Government vs Airport Operator???

- Airport operator “owns” the *ground* at an airport and the FAA “owns” the *air* above it → both have legal argument for controlling access.
- FAA solution: allows for NAS-wide coordination and better “system optimization”; more flexibility with respect to collecting fees.
- Airport operator solution: allows for “custom” implementation, better management and better coordination with access to “other” airport resources, e.g. gates, overnight parking, baggage handling, etc.
- Challenges in both cases → ***obvious solution: both should have role***

Access rights and traffic flow management: transferring more control to flight operators



Final Thoughts

- The performance of the NAS depends in a substantial way on the manner in which flight operators use it.
- To achieve the best performance system designers should seek to find the best combination of new technologies, operational procedures and economic incentives.

