

# Intermediate Capacity Allocation Methods

Jennifer Gentry

703-983-7884 • [jenniferg@mitre.org](mailto:jenniferg@mitre.org)

FAA MOIE

 **MITRE  
Technology  
Program**

This work was produced for the U.S. Government under Contract DTFA01-01-C-00001 and is subject to Federal Aviation Administration Acquisition Management System Clause 3.5-13, Rights In Data- General, Alt. III and Alt. IV (Oct. 1996). The contents of this document reflect the views of the author and The MITRE Corporation and do not necessarily reflect the views of the FAA or the DOT. Neither the Federal Aviation Administration nor the Department of Transportation makes any warranty or guarantee, expressed or implied, concerning the content or accuracy of these views.

# Problem

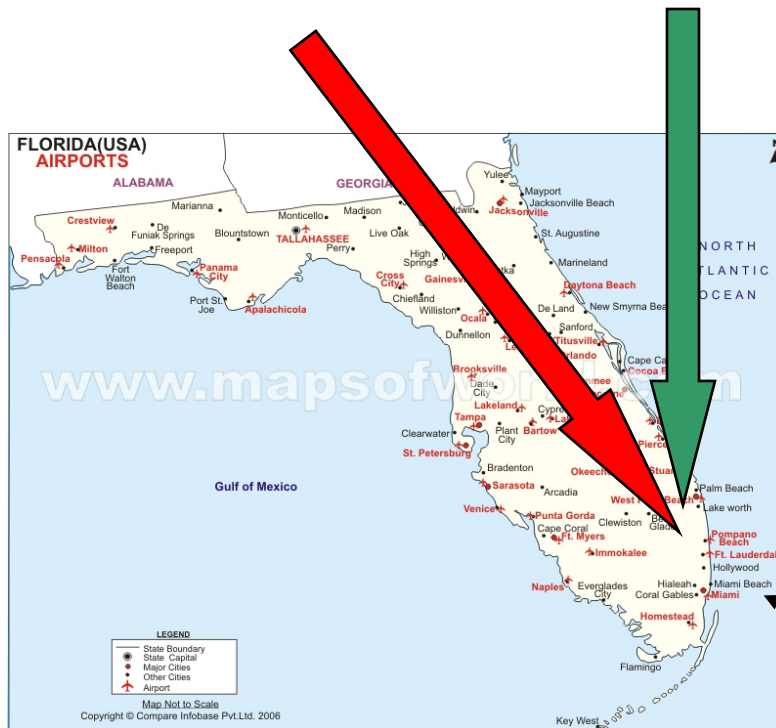
- **In the future, competition will increase for already congested airports and airspace. Government and the aviation community need to investigate incentives that will encourage users to reduce the number of flights using these congested resources.**

# Background

## What Incentives Can Be Used to Solve Congestion Problems?

Over Land Routes

Over Water Routes



What incentives would influence the aviation community to better balance the use of National Airspace Space resources?

For example

- Incentives to use the longer, less busy overwater route
- Incentives to use the higher capacity Miami (MIA) airport

FLL (Ft. Lauderdale)

MIA- New Arrival Runway

**MITRE**

© 2007, The MITRE Corporation

# Objective

- **Apply common pool resource management principles to the congestion problems in the National Airspace System**
- **Develop tools that would allow the Federal Aviation Administration to explore the effect of potential incentive schemes to resolve different classes of congestion problems**

# Activities

- **Research emerging applications of common pool resource management**
- **Identify different incentive systems that can be used to modify users' behavior**
- **Create a tool for evaluating impact of fee-based incentive structure**

# Highlight

**Today's System:** Current tax structure provides no incentive to minimize the number of flights required to meet passenger demand. Nor does it provide incentives to reduce the use of congested resources.

Approximately 300-mile flight from Los Angeles to San Francisco

<b>Plane type</b>	<b>One 737 flight</b>	<b>Three CRJ-200 flights</b>
Number of seats	132	144
Number of passengers	105	105
Average fare	\$100	\$100
Gallons of fuel consumed	937	1,797
Ticket tax	\$788	\$789
Passenger segment tax	\$348	\$348
Waybill tax	\$2	\$0
Fuel tax	\$40	\$78
<b>Total revenue</b>	<b>\$1,178</b>	<b>\$1,215</b>

**Each RJ flight pays only 34% compared to 737, but uses the exact same ATC services.**

Source: GAO 2006 FAA Funding Options

**MITRE**

© 2007, The MITRE Corporation

# Demonstration

### Fee Adjustments

#### Terminal Environment

Airport Tier	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Tier 6	Tier 7	Tier 8	Tier 9
	\$58	\$35	\$23	\$21	\$19	\$17	\$15	\$12	\$10

Aircraft Size	S	L	H	757
	\$9	\$15	\$24	\$25

#### General Fees

Time of Day	AM		Noon		PM		Night	
	Peak	NonPeak	Peak	NonPeak	Peak	NonPeak	Peak	NonPeak
	\$37	\$15	\$47	\$7				

Day of Week	Weekday		Weekend	
		\$37	\$15	

FZ Lead Time	<1 hr	<2 hrs	<3 hrs	<4 hrs	<5 hrs	<6 hrs	<8 hrs	>8 hrs
	\$34	\$23	\$19	\$15	\$12	\$9	\$7	\$5

#### Enroute Environment

Center	ZAB	ZAU	ZBW	ZDC	ZDV	ZFW	ZHU	ZID	ZJX	ZKC
	\$38	\$25	\$38	\$27	\$38	\$27	\$27	\$27	\$27	\$27

Center	ZLA	ZLC	ZMA	ZME	ZMP	ZNY	ZOA	ZOB	ZSE	ZTL
	\$38	\$27	\$38	\$29	\$38	\$29	\$31	\$12	\$20	\$30

Equipage	Surveillance Capability			RVSM Capable (implies Mode C)
	None	Mode A	Mode C	
No DME	X \$32	T \$29	U \$27	
DME	D \$26	B \$24	A \$21	
TACAN	M	N	P	

### Fee Revenue

The chart shows two bars: 'Demand Incentives' and 'Operations Based'. The 'Operations Based' bar is significantly higher, reaching approximately \$4,200,000,000. The 'Demand Incentives' bar is around \$2,800,000,000. The legend indicates various fee components contributing to the total revenue.

### Example Calculation for Single Flight

Dep Tier: 1, Arr Tier: 1, Aircraft: H  
 Total Fee: **\$472**

Dep Time Bin: AM Peak, Arr Time Bin: AM Peak, Day: Weekday, Lead Time: < 1 hr

Equipage: Q, Centers: [Map showing selected airports: ZSE, ZLA, ZLC, ZMA, ZME, ZMP, ZAU, ZOB, ZBW, ZDV, ZKC, ZID, ZNY, ZDC, ZHU, ZJX, ZMA]

# Impacts

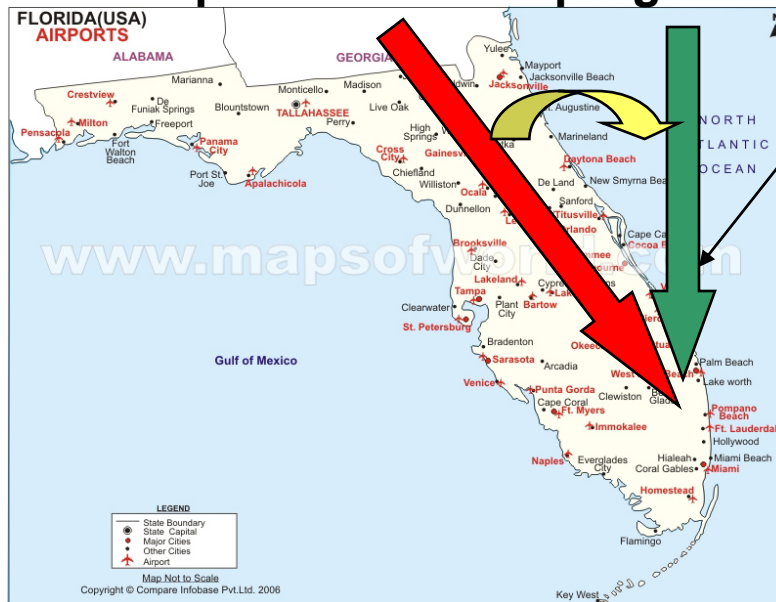
- **Meeting Sponsor Needs: Improve the Federal Aviation Administration's ability to efficiently manage the air traffic control system through the use of incentives (new capability proposed in 2007 FAA reauthorization)**
  - Tool allows FAA to analyze a range of incentives for a variety of congestion problems
- **Innovation: Application of use of common pool management to a challenging new area**
- **Public Interest: More efficient and equitable use of national resources**

# Future Plans

Broaden exploration of types of incentives:

- Future credits
- Penalties for last-minute demand
- Exemption from flow programs

Less Impacted  
Overwater Routes



**Example:**

Give Ground Delay Program exemptions to flights that take overwater routes into MIA. This gives an incentive to take on the cost of extra fuel burn since it will minimize schedule disruption.

**MITRE**

© 2007, The MITRE Corporation