

Foundations and Impact of NEXTOR

A Personal Perspective

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Questions that No one could Answer Well in My Program Reviews

- 1) Is there a Maximum Capacity of the NAS Network?
 - 1) If so, What is it? (**ANS: Sum of the Hub Airport RW Capacity under IMC conditions**)
 - 2) If not, Why not?
- 2) What is the Primary source of Congestion?
 - 1) En-Route Airspace Separation – MITRE
 - 2) Terminal Arrival Separation - NASA/ARC (**ANS: PDF of Arrival Separation**)
- 3) Is the NAS a Linear or Non-Linear System? (**ANS: Strongly NL**)
 - 1) I.e. Should the FAA be simply adding the predicted Delay Improvements (**ANS: No**)
- 4) Is the NAS a Deterministic or Stochastic System? (**ANS: Stochastic**)
 - 1) All of the FAA network performance models were Deterministic
- 5) Can we Measure or Estimate Passenger Delay? (**ANS: Yes**)
 - 1) PAX were our True Customers, not ATC or Air Lines
- 6) In the NAS Systems of Systems, where is the weakest Link? Why?
- 7) What are the Best ROI Programs that needed Priority? Why?
- 8) Why do the Airlines not want to invest to Decrease Delays?

Norm Fujisaki Came to me with a Proposed Center of Excellence for Operations Research

- **I approved the RFP**
- **I approved the NEXTOR Award**
- **Norm had one BIG PROBLEM:**
 - **He had no funds!**
- **I taxed the entire R&B Budget to find \$500K**
 - **Over much opposition from the rest of the R&D sponsors**

NEXTOR Independence from the Official FAA Positions:

Some Significant Impacts on Public Policy

- A True Test of a COE's Value

- **The Airport Slot Auction Game**
 - Informed the Public Debate on Slot Controls at Major Hub Airports
 - Informed the Debate on Congestion Pricing and how to Set (Find) the Prices
 - Opened the Debate on Airport Slot Ownership
 - Led to the development of a better Government Understanding of Airline Business Models that drove their Decision Making
 - Led to the President's Council of Economic Advisors to Approve a DOT proposed LGA Slot Auction (Killed in the Senate)
- **The LAX Expansion Game and Analysis**
 - Extensive study of A380 safety implications for US airport design standards
 - In opposition to Official FAA position, Recommended no large (\$) modification based on Safety Concerns
 - Provided Analysis to a Hotly Debated Public Investment Decision