

# Observations from the Traffic Flow Optimization Track

Amy Pritchett



# Questions from the Traffic Flow Optimization Track

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#### What is Traffic Flow?

- Trajectories
- Routes / ribbons / tubes
- Arrival slots / arrival times
- Flight schedules



#### How Do We Model Traffic Flow?

Continuous trajectory

- Flight dynamics
- Needs to avoid conflicts, winds, weather
- Traffic network

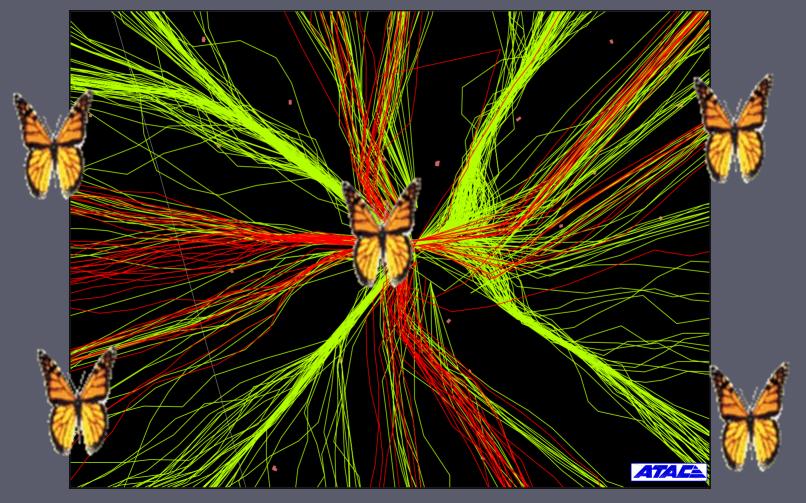
- Network / graph
- Needs to not overload network elements
- Arrival / departure schedule



- Schedule needs to be "robust" and "flexible"
- Schedule needs to be "maintained"

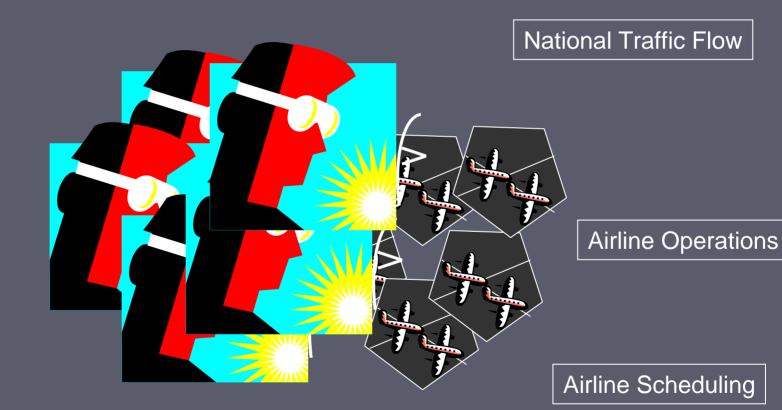
### Some Decomposition Is Needed...





## What Is the Right Decomposition?





### What Is the Right Decomposition?



Analysis of broader economic, social, political and environmental context

National airspace system analysis

Regional airspace/airport analysis

Localized sector analysis

Detailed Component Thursday, July 14, 2005 analysis Assessment of changes in flight schedules, demand, broader impacts on economy, environment

Assessment of changes in national traffic flow, capacity and delays

Assessment of local changes in traffic flow in center and terminal area, and local noise impact

Assessment of sector boundaries, controller workload, sector loads, entry/exit points

Studies of specific technologies (e.g. ILS placement, radar coverage) and human activity

OAG Airline business models Policies and regulations

National traffic flow management strategies Preferred routes to airport

Local traffic flow management strategies Local Letters of Agreement (LOA) Noise abatement strategies Standard Terminal Arrival Routes (STAR) Standard Instrument Departures (SID)

Approach procedures Sector descriptions Controller workload

Specific technologies, - bincluding human interfaces



## Remaining Challenges: Battling Complexity

- Decomposition of the problem
  - For modeling and for operation
- Integration of the communities
  - Approaches, objectives, vernacular
- Range of concerns and models
  - Engineering, human factors, economic, policy