



# Integrated Departure Route Planning

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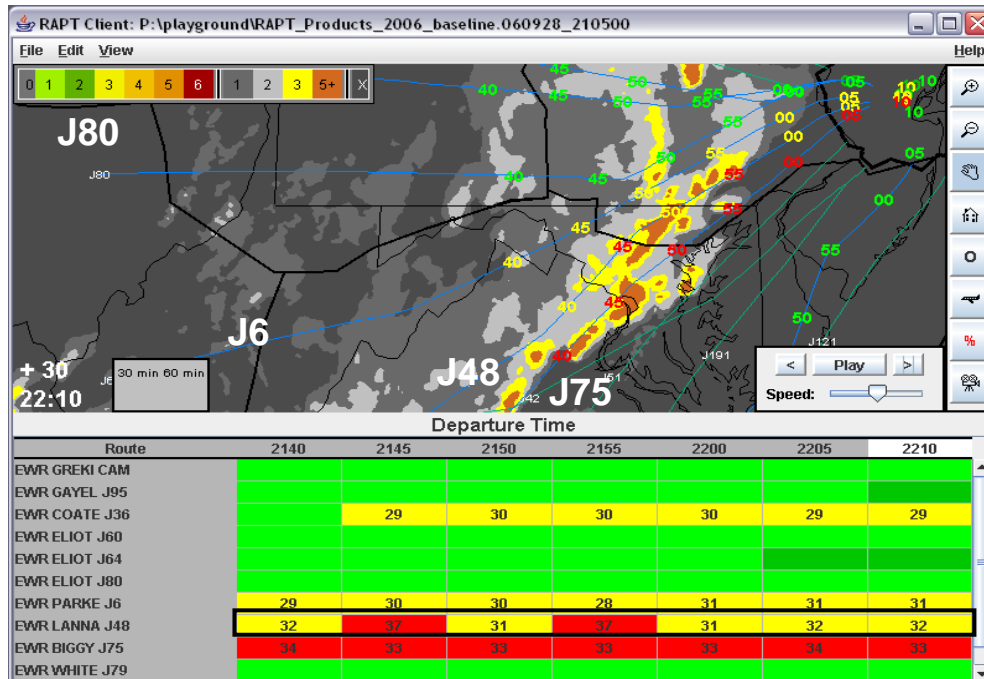
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# Problem

- **Departure route planning decisions are based on integrated future traffic, weather, and airspace resources (routes, fixes, and sectors) information**
- **In the current operation, traffic managers have to mentally predict and integrate the information, which is difficult, time-consuming and prone to error**
- **Traffic Management Initiatives (TMIs) are often too large-scale or inflexible to respond to dynamically changing weather, or they may not be used effectively**
- **How could we help traffic managers to manage departure traffic more efficiently and safely?**

# Background



- J80 is open for all departure time, but what is the demand and capacity along this route?
- J48 will be impacted or blocked for some departure time period, which flights are involved and what are their alternatives?
- What if more flights were moved from J48 to J80?

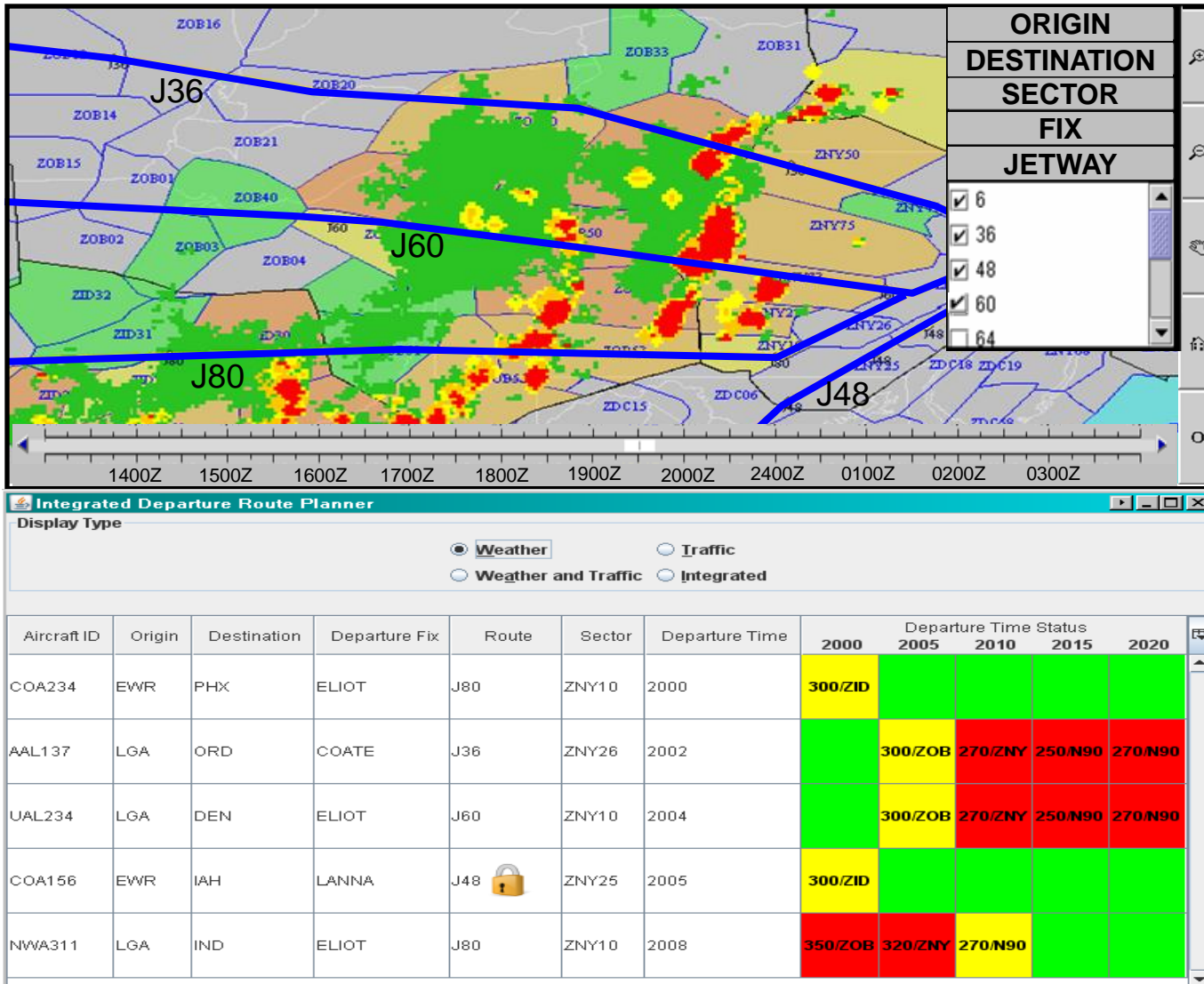
- MIT Lincoln Laboratory's Route Availability Planning Tool (RAPT) helps traffic managers determine the departure routes and times that will be affected by significant convective weather
- RAPT usage is limited without integrated traffic and other airspace resource information

# Objective

- **MITRE and Lincoln Lab will jointly develop a set of functions that can help traffic managers handle departure traffic more efficiently and safely using integrated weather, traffic, and airspace resource information, especially when convective weather is present**
  - Identify the need for TMIs
  - Explore alternatives
  - Monitor and evaluate the TMI
  - Make adjustments, as necessary
  - Implement the TMI

- **Operational concept development for departure route management**
  - When, who, and how to initiate reroutes
  - How to identify reroute options
  - How to evaluate reroute impact
  - How to implement reroutes
- **Demonstration prototype development of reroute option function**
  - Help to identify the impacted flights and their action needs (reroute/delay)

# Highlight



# Demonstration



- **Identify the possible airspace resource constraints (routes, sectors, fixes) with the integrated future situation display**
- **Identify the list of aircraft within the constraints and the departure time status of each aircraft, based on the integrated airspace demand and capacity information**
- **Group and prioritize the list with aircraft features (origin, destination, departure route, departure fix, departure sector, departure queue, etc.) to help identify the need of TMIs**
- **Evaluate the TMI with the integrated future situation display**

# Impacts



- **Integrated departure route planning function could greatly improve the efficiency of departure traffic management, especially under severe weather conditions**
- **The integrated approach provides a base for incorporating other decision support functions for traffic flow management**
- **The approach supports the collaborative process of flow contingency management as described in the NextGen system concept of operations**

# Future Plans

