Impact-Based Decision Support Services for the National Airspace System:

A Case Study of Two High-Impact Thunderstorm Events on Traffic Flow Management

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NWS/NCEP/AWC – National Aviation Meteorologist
NWS Support to FAA

- NWS Meteorologists provide Impact-Based Decision Support Services (IDSS) at the FAA Command Center (ATCSCC) as well as the 21 Air Route Traffic Control Centers (ARTCCs)
- NWS meteorologists at the ATCSCC are called National Aviation Meteorologists (NAM)
Top 30 Airport Terminals

• Traffic Management Initiatives (TMI) such as Ground Delay Programs (GDP), Ground Stops (GDP).
• Most often caused by low ceilings, visibilities, thunderstorms, etc.

En-Route

• Routing air traffic across the 21 FAA ARTCC’s.
• Affected by thunderstorms, turbulence, icing, etc.
Where is the bigger “aviation” impact?

- Isolated Cell?
- Squall Line?
NY Airspace is most congested in the NAS

It’s all about the real estate...

Location...Location...Location
Timing...Timing...Timing

EWR, JFK, and LGA Arrivals and Departures (unimpacted flows)
May 18, 2012 - 1700-0459Z

Arrivals – Green
Departures - Red
July 3, 2018 – Isolated TS EWR

- 1600z – GDP for Volume
- 1635z – Convection develops near EWR
- 1730z – Holding in ZDC, ZNY & ZOB
- 1745z – Diversions in ZDC, ZNY & ZOB – 79 Diversions
  - A Diversion costs ~ $8,000.00*
  - Total Diversion cost ~ $632,000*
- 2000z – Ground Stop for Thunderstorms. GDP amended to lower rate
- 2100z – Diversions start recovering

* Airlines for America estimates
RED = EWR
Dashed Tail = Divert
Holding aircraft going in circles
July 3, 2018 – Isolated TS - EWR
Day Before:
Thunderstorm potential briefed to FAA Leadership and airlines through:

- Morning National Systems Review, and
- PERTI (Plan, Execute Review, Train, Improve) planning webinar.

Decision Support Services
11Z July 3: +8-hour TFM Convective Forecast (TCF) indicates medium coverage:
Decision Support Services

TAF Briefings:

- Provided to FAA Command Center terminal specialists and supervisors every 2 hours.
- Initially briefed potential at 09Z. Continued through the day.

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Use of NAM Forecast Briefings:

- PERTI develops a timetable of potential Traffic Management Initiatives with critical decision windows for the following day.

- FAA En-route Specialists publish alternate routes several hours in advance.
  * Helps FAA Air Route Traffic Control Centers prepare for changes in demand/traffic flow.
  * Airlines prepare for adjusted fuel, possible crew scheduling impacts, etc.

- FAA Terminal Specialists monitor weather conditions/forecast in relation to airport demand.
  * Potential for Ground Stops and Ground Delay Programs at affected airports.
Widespread scattered thunderstorm event East Coast to North Texas.
Weather Prediction Center
Surface Analysis 21Z
2100Z July 6

Source: MIT/COSPA
July 6, 2018 – En-route TS
Day Before:
Thunderstorm potential briefed to FAA Leadership and airlines through:

- Morning National Systems Review, and
- PERTI (Plan, Execute Review, Train, Improve) planning webinar.
17Z July 6: 4-hour TFM Convective Forecast (TCF):
Acknowledgements

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- Lincoln Labs: Massachusetts Institute of Technology