Corridor Integrated Weather System (CIWS)

1. Situational awareness
2. Interfacility coordination
3. Reduced workload
4. Proactive Reroutes
5. Routes open longer
6. Improved Arr/Dep Transition
7. Area (ATA/DTA) management
8. Reduced MIT restrictions
9. Improved Ground Stop Program management
10. Directing pathfinders
11. Close route proactively
12. FAA facility staffing assistance
13. Directing traffic through weather gaps
14. More SWAP departures
15. Improved safety
16. Improved Ground Delay Programs (GDP) management

ZMP ZOB ZDC ZAU ZNY ZBW

CIWS Usage per Storm Day

TMU

Observed RAPT Benefits

It's Not Just What's in the Tool, But Who Gets to Use It

0 – 2 Hour Echo Tops

Forecast

0 – 2 Hour Winter Precipitation

Forecast

Storm Growth & Decay Trends

Storm Motion & Extrapolated Position

Echo Tops Tags

Real-Time Forecast Accuracy Scores

MIT Lincoln Laboratory
Framework for Integrated Weather-ATM Decision Making

4-D Weather Forecast
Tactical: 0-2 hrs
Strategic: 2-8 hrs
Forecasts of Precipitation, Echo Tops plus Turbulence, Shear, Growth, etc.
Includes Forecast Uncertainty

Wx – ATM Integration
Pilot Model
Pilot deviation likelihood as a function of weather

Capacity Impact Forecasts
(Terminal and Enroute)

Flow Impacts / Sector Capacity Loss
Route Impacts
Weather Avoidance Fields

Effective Response Strategies
Route Availability Planning Tool

Air Traffic Management Decision Making and Execution
Develop and decide on air traffic management plan
Execute plan
Real-time evaluation and decision review

User Demand
NY Route Availability Planning Tool (RAPT)

- Estimated 2007 RAPT Delay Savings: 2,300 hours, $7.5 M
  - Early 2008 field study results show increased benefits
- Lessons learned from real-time field use assessment:
  1. Don’t expect to get it right the first time – best to design WX-ATM DST with this in mind
  2. Close collaboration with operational user community is critical (in case of RAPT – includes FAA and airlines)
  3. Aggressive training program crucial to DST acceptance and success

CIWS forecasts

Probability of Deviation

Weather Avoidance Field (WAF)

Deviation sensitivity

Blockage calculation

Convective weather avoidance model*

* NASA-funded foundational research at MIT-LL

Weather Input — Weather Translation — Airspace and WX-Blockage Models
Building a Scalable Network of WX-ATM Response Strategies

“Building block” approach to expand response strategy capabilities in a specific ATM decision-making arena (e.g., departure management)

Extending framework for integrated WX-ATM decision-making from tactical to strategic wx-impact mitigation planning (e.g., AFP management)