
Implementing Relevant Performance Measures for Traffic Flow Management

Friends/Partners of Aviation Weather Forum

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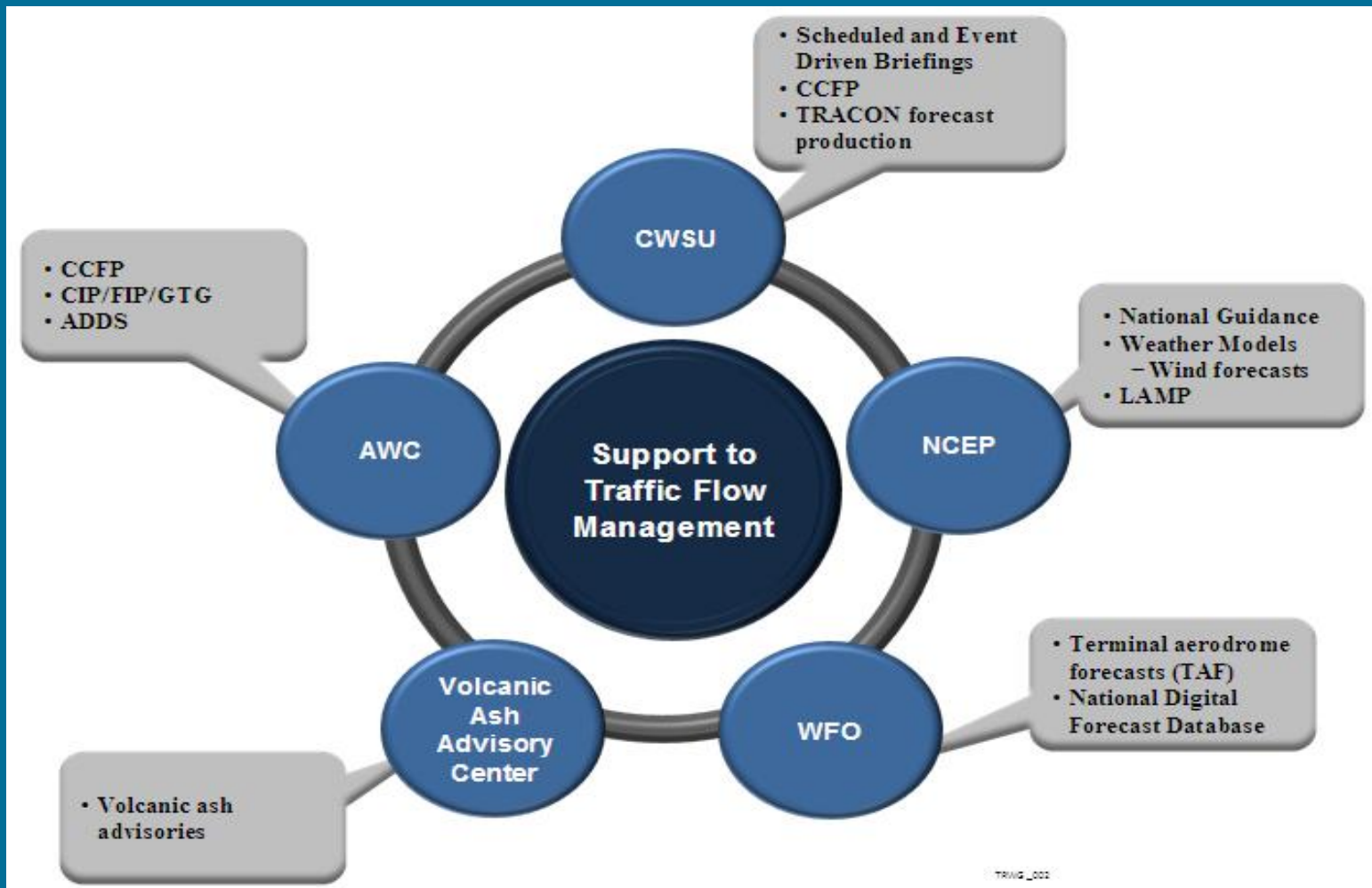
NOAA/NWS Aviation Services

Baseline of Services

- *Traffic Flow Management Weather Requirements Working Group (TRWG)*
 - **Joint Team with FAA and NWS**
 - **Established to take weather services to NextGen Middle Operating Capability (MOC)**
 - **Need to baseline current services and performance**
- *Original TRWG Meeting established a list of aviation weather products in support of TFM*

<i>CCFP</i>	<i>LAMP/CCFP Hybrid</i>
<i>CWSU Briefings</i>	<i>Winds in ERAM</i>
<i>CIP/FIP</i>	<i>Volcanic Ash Advisories</i>
<i>GTG</i>	<i>TRACON Forecasts</i>
<i>TAF</i>	<i>Aviation Impact Guidance</i>

Baseline Aviation Weather



Phased Approach to Baseline

- *Phase 1 – assessment of quality of current NWS products and services*
- *Phase 2 – assessment of current capability of NWS TFM products to new requirements*
- *Phase 3 – assessment of performance measures for TFM decision making*
- *Phase 4 – analysis of end-to-end TFM decision-making, from the provision of weather information through the decision-making process and the impact on the NAS*

Phase 1 for Baseline

- **Baseline current set of products and services using existing tools**
 - Real-time Verification System (RTVS)
 - Stats-on-Demand
 - NCEP verification tools
- **Few requirements in place to baseline against**
- **Result was generally performance measures for accuracy and availability but not meaningful to decision-makers**
 - *How do PODs and FARs translate to users for confidence in the forecast?*

Phase 2 for Baseline

- **Assess the performance based upon TFM requirements**
 - *New TFM requirements provided to NWS this spring*
 - **Initial set of requirements more meaningful to TFM**
 - » *Lead-time to onset and cessation*
 - » *Location error*
 - » *Timing error*
 - » *Accuracy*
 - *New requirements will be refined as we determine the capability to assess performance*
- **Other performance measures will follow**

New Performance Measures for Baseline

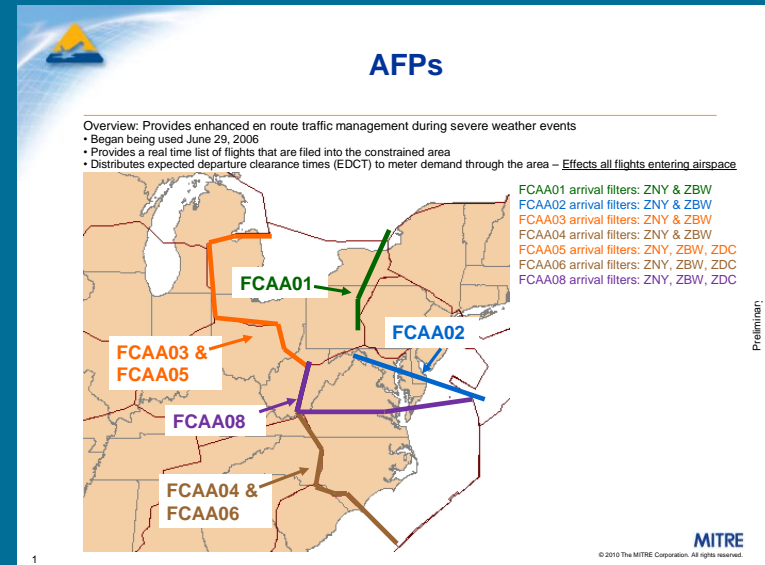
- **Entirely new way of assessing weather forecast performance – linked to traffic management initiatives**
 - *Current tools assess accuracy (PODs, FARs, etc.)*
 - *Leverage existing tools but look at data differently*
- **New measures are more event-driven than current methodology**
- **Focus on digital services**
 - *Manual and text products difficult to generate performance measures*

Example

The NAS shall forecast the time of the onset of thunderstorms with a probability greater than or equal than 50 percent and with tops over 30,000 feet expected to intersect jet routes that cut across the Flight Constrained Areas for areas greater than 20 miles in diameter with a lead-time of 4 hours with an accuracy of plus or minus 30 minutes.

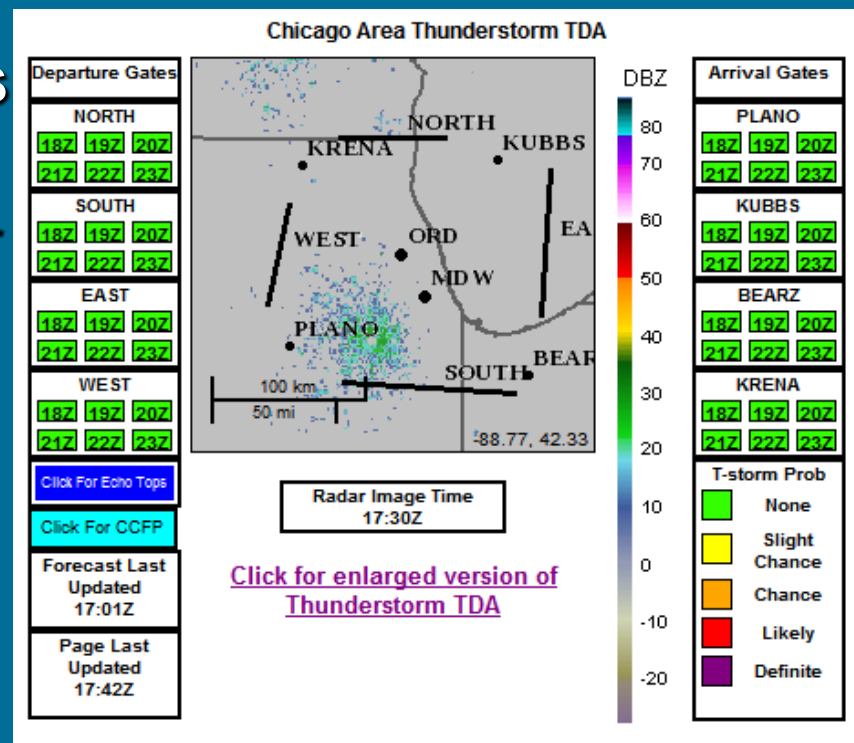
En Route Performance Measure

- **Lead-time for onset and cessation of thunderstorms expected to intersect jet routes in Flow Constrained Areas...**
 - *Thunderstorm is defined as*
 - A forecast of 50% probability or greater
 - Tops over 30,000 feet
- **Use NOAA/NWS National Digital Forecast Database**
 - *Forecast grids for thunderstorms generated by WFOs*
 - *Develop a new tool to assess accuracy of the grids and provide the lead-time, timing errors and location errors*



Terminal/TRACON Performance Measure

- **Lead-time for onset and cessation of thunderstorms within 150 nm of core airports**
 - *Thunderstorm is defined as*
 - A forecast of 50% probability or greater
 - Tops over 30,000 feet
- **Use NOAA/NWS National Digital Forecast Database**
 - *Forecast grids for thunderstorm generated by WFOs*
 - *Develop a new tool to assess accuracy of the grids and provide the lead-time, timing errors and location errors*



Airport Performance Measure

- **Lead-time for onset and cessation of weather events at core airports**
 - *IFR/MVFR*
 - *Wind shifts*
 - *Conditions change and remain in place for a period of time*
 - *Lead-time calculated from last uninterrupted forecast*
- **Use NOAA/NWS TAFs**
 - *Existing programs – Stats on Demand – provides a base tool for gathering and querying data*
 - *Will also assess forecasts for thunder*

SITE	CIG		VIS		Wx		WindS		WindG		RnWy	
	18z	21z	18z	21z	18z	21z	18z	21z	18z	21z	18z	21z
KBOS	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
KLGA	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Green	Green
KJFK	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
KEWR	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Green	Green
KPHL	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Green	Green
KIAD	Green	Green	Green	Green	Red	Green	Green	Green	Green	Green	Green	Green
KDCA	Yellow	Green	Red	Green	Red	Green	Green	Yellow	Green	Green	Green	Green
KATL	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
KORD	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Green	Green
KDFW	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
KDEN	Green	Green	Green	Green	Green	Red	Green	Yellow	Green	Green	Green	Green

Flight Category
Colors-Cig/Vis
VFR MVFR IFR LIFR

Challenges

- **Key challenges in meeting performance measures**
 - *Development of assessment tools*
 - **New way of looking at data**
 - **Verification of gridded thunderstorms is still in development**
 - » *Expected completion this fall*
 - » *Additional toolset needed to verify regions*
 - *Forecast methodology*
 - **Forecasts temporal resolution**
 - **Forecasts are generally in hourly increments**
 - **Requirements are for 15 minute windows**
- **Phase 2 will provide an indication of performance**

Summary

- **Using a phased approach to measure performance to new TFM requirements**
- **Current measurements focus on accuracy**
- **New measurements will provide more meaningful measures to decision-makers**
 - *Lead-time to onset and cessation*
 - *Location error*
 - *Timing error*
 - *Accuracy*
- **Additional development work is ongoing to baseline current services to requirements**
- **NWS addressing challenges to meet FAA needs**