Quantifying Aviation Weather Forecast Benefits

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10/12/11
Goals

- Define and implement a process to monitor and compare forecast performance with airline and airport performance results.
- Develop a process which is portable enough so that it can be used on a variety of forecast sources.
- Keep the process simple and automated enough – so that it gets done!
- Use a process to create historical benchmarks on forecast performance.
Items for Consideration

- Make results meaningful so that both the provider and the consumer can relate to them from an operational perspective.
- Separate the terminal and en-route environments as they are two very different problems to evaluate.
- Allow logic to be portable among both providers and consumers.
Very tough to Measure

- Forecasts can be very “squishy”, especially with confidence levels, precipitation coverage, precipitation intensity rates etc.
- Need to be able to “translate” forecasts to reflect some sort of an operational impact.
- Airline performance can be impacted by many things (crews, security, airport throughput, ATC, passengers etc.)
- Need to solely concentrate only on direct weather related airline statistics.
An approach

- Start with the terminal environment.
- Use NWS TAF products as they are “regulatory”.
- Define a desired data set of performance information from airlines/airports. (cancellations, diversions, delays etc.)
- Develop communication mechanisms for NWS and airline/airport data sets to a central database.
- Execute the process using forecast and airline/airport input.
- Build historical database that can be used to track results over time.
- Database can also be used to measure new forecast improvements to help provide a quantitative value of the enhancement.
TAF

No Anticipated Operational Implications

Possible Operational Disruptions

Probable Operational Disruptions

Definite Operational Disruptions

- Forecast criteria based on airport and airline operational thresholds
- TAF performance scored on airport and airline operational thresholds.
- Both regularly scheduled and TAF amendments will be used, and greater point totals towards a higher score are provided for longer lead time forecasts.
- Significant consideration will be needed relating to differences between “Possible” and “Probable” Operational disruptions
Data above only refers to terminal related activity
Examples

- A no operational impact forecast is delivered and a high operational impact is realized; then the monetary impact would be high.
- A no operational impact forecast is delivered and no operational impact is realized; then the forecast monetary impact would be low.
Results

- More closely ties forecast accuracy with operational performance.
- Helps to quantify the value of weather forecasts.
- Allows various forecasting sources to be scored similarly.
- Builds a historical database for TAF and other similar forecast performance.
- Measures forecast improvements with historical benchmarks to determine effectiveness and improvements.