

# **Product Description Document**

## **Experimental Gate Forecast**

### **Part 1 – Mission Connection**

#### **1. Product Description:**

The Experimental Gate Forecast is an online display of a decision algorithm that uses the High-Resolution Rapid Refresh (HRRR) model to determine potential thunderstorm activity (TS) in a particular terminal arrival or departure sector.

The product display overlays the sector boundaries on the current radar loop. The sectors are color-coded with the current gate status using a three tiered approach:

- Green - no significant weather;
- Yellow - some significant weather that might affect some portions of the gate; and
- Red - significant weather that could affect large portions of the gate.

Around each gate is an icon with the gate name, type (arrival “A” or departure “D”) and the forecasts for the next nine hours. Clicking on the icon will bring up a dialog box that shows the percent coverage of low ( $25 < TS < 60$ ) and high ( $TS > 60$ ) thunderstorm probability, the three HRRR runs used in the forecast and the time of the last update.

Selected NWS forecasters have the capability to log-in and edit the time periods displayed. The Federal Aviation Administration (FAA), pursuant to Title 49 United States Code Section 44720, established requirements for this weather information and service which is necessary for the safe and efficient conduct of operations in the National Airspace System (NAS).

#### **2. Purpose/Intended Use:**

There is a need for forecasts of significant weather in arrival and departure sectors for major airports. These sectors, also called gates, are polygonal regions which roughly follow Air Route Traffic Control Center (ARTCC) low level sectors where arrivals and departures to these airports will be routed. It is important to know whether significant weather, such as thunderstorms, could affect large portions of the sectors so that traffic can be rerouted, if needed, to other sectors.

#### **3. Audience/Users:**

The Experimental Gate Forecast is intended to be used by the FAA Traffic Managers in coordination with Airline industry representatives to coordinate FAA management and strategic planning of the NAS. The aviation public will have access to the Experimental Gate Forecast for situational awareness.

#### **4. Presentation Format:**

Online display.

## **5. Feedback Method:**

Feedback will typically be collected via comments provided to the AviationWeather.gov Webmaster.

For more information, please contact:

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## **Part 2 – Technical Description**

### **1. Format and Science Basis:**

The Experimental Gate Forecast is a decision support algorithm that uses the High Resolution Rapid Refresh (HRRR) model to determine whether there is the potential for thunderstorm activity in a particular terminal gate. The algorithm initializes with the HRRR composite reflectivity forecasts and then create a time lag ensemble using the previous three HRRR model runs. It produces a grid with the maximum composite reflectivity at each grid point from the three runs (for example, the 1 hr. forecast from the 18 UTC run plus the 2 hr. forecast from the 17 UTC run and the 3 hr. forecast from the 16 UTC run). From that grid, a probability factor is computed. Low composite reflectivity equates to low probability. High reflectivity equates to high probability. The algorithm computes the gate sector coverage of these probabilities. If more than 1% of the sector is covered in low probability (.25 chance), the gate is colored yellow. If more than 4% of the sector is covered in high probability (.60 chance), then it is colored red. These are then computed for each forecast time from the HRRR.

### **2. Training:**

No additional training is required to generate the product.

### **3. Availability:**

The Experimental Gate Forecast is available online 24/7 and updated with each run of the HRRR model (hourly).

The Experimental Gate Forecast is currently available for Atlanta International Airport (ATL), Charlotte International Airport (CLT), Chicago O'Hare International Airport (ORD), Dallas/Fort

Worth International Airport (DFW), Denver International (DEN), Detroit Metropolitan Airport (DTW), Houston Intercontinental Airport (IAH), Las Vegas International Airport (LAS), Memphis International Airport (MEM), Miami International (MIA), Minneapolis-St. Paul International Airport (MSP), New York City (NYC), Phoenix Sky Harbor International Airport (PHX), and Washington Reagan Airport [**Potomac**] (DCA). It will be expanded to include additional airports in the future.

The Experimental Gate Forecast will be available at:  
<https://www.aviationweather.gov/trafficflowmgmt/gate>