

CDM MEMORANDUM

From: Ken Howard
To: New CDM Participant
Subject: How to Participate in the CDM Data Exchange
Date: 6/4/04

This memo provides an overview of the steps required to participate in the Collaborative Decision Making (CDM) data exchange.

The CDM Data Exchange allows an organization that operates and/or dispatches flights to gain access to FAA-provided tools and data, such as the Flight Schedule Monitor (FSM) and Runway Visual Range (RVR), in exchange for providing flight schedule data to the FAA. The participant notifies the Enhanced Traffic Management System (ETMS) about new flights that are planned to operate, changes to planned flights (for example, a change in departure time), and cancellations of planned flights. The participant provides this data to FAA by sending automated messages to ETMS. In turn, the participant gets access to a variety of products and data: FSM, RVR, Route Management Tool (RMT), Post-operational Evaluation Tool (POET), Flight Schedule Analyzer (FSA), the Diversion Recovery web page, the Common Constraint Situation Display (CCSD), the Collaborative Convective Forecast Product (CCFP) and the ATCSCC Intranet web page, which provides comprehensive information about traffic management operations and ties together access to many of the tools. The CDM data exchange also includes the ability for a participant to actively interact with an airport ground delay program (GDP) by substituting flights.

To fully participate in this data exchange, the participant must establish network connectivity with the ETMS system. There are currently three ways to get a connection to ETMS:

- Through a third-party vendor. Currently ARINC is the only vendor that provides this service, known as the AOCNET.
- By establishing a VPN connection over the Internet. (It is expected that the Integrated Terminal Weather System (ITWS) data will be NOT available over the Internet. Otherwise, all CDM services available over AOCNET are available over the Internet.)
- By establishing a direct leased-line connection to Volpe and setting up the necessary network infrastructure at the participant end to support it. (No one is currently doing this.)

The documents provided in this packet are focused on the core data exchange with ETMS, which consists of two parts: the feeding of flight data messages to ETMS and gaining access to the ETMS data that drives FSM. Related information is also provided on how to participate in the ground delay program substitution process. The documents are as follows:

- CDM System Requirements r2_0 – The original document that defines that general requirements for the data exchange. In short, a CDM participant is required to send a message to ETMS to inform it of every flight. Moreover, if anything about the flight changes, e.g., its departure time, or if it is cancelled, the CDM participant must send a message to ETMS to inform it of this.
- CDM Message Formats v.2.0 – A detailed description of the message formats along with information about their usage.

- CDMNET Protocol v2.0 – A detailed description of the protocols used for communicating with ETMS using TCP/IP. This includes the protocol for sending the flight data feed, the protocol for doing substitutions, and the protocol that FSM uses to get Airport Demand List (ADL) data.
- Simplified Substitutions_v1.0 – A comprehensive description of how to actively participate in the ground delay program process using simplified substitutions.
- Slot_Credit_Subst_System_Req_v1.4 – The ETMS requirements document for adding the Slot Credit Substitution (SCS) functionality to simplified subs.
- adl_v8_desc_sept_16_2003 – Describes the format of the ADL file – the ETMS data that is displayed by FSM.

The steps for becoming a participant are as follows:

1. The participant signs an MOA with the FAA.
2. The participant establishes IP-network connectivity with the ETMS test servers.
3. The participant develops software to provide the required flight data message feed.
4. The participant notifies the Volpe Center (who develops ETMS for FAA) that they are ready to test.
5. Volpe configures the ETMS test system to allow access to the participant and provides the configuration data to the participant:
 - a. IP addresses of test system
 - b. Port numbers for FSM and flight data feed
 - c. Client name and tag for FSM
 - d. Client tag for flight data feed
6. Participant gets FSM from Metron (who develops FSM for FAA) with connectivity to the test system.
7. Volpe collects data and analyzes quality of data feed. Volpe and participant iterate through improvements to data feed until data quality is acceptable. (NOTE: This can take weeks – or longer.) See Appendix for more details on the data quality checks.

When the data feed has passed the data quality checks and FAA has approved:

8. The participant establishes IP-network connectivity with the ETMS operational servers.
9. Volpe configures the ETMS operational system to allow access to the participant and provides the configuration data to the participant:
 - a. IP addresses of test system
 - b. Port numbers for FSM and flight data feed
 - c. Client name and tag for FSM
 - d. Client tag for flight data feed
10. Participant establishes FSM and flight data feed connections to the operational ETMS.

At this point, the participant is allowed to access other data and tools.

If the participant wishes to participate in the GDP substitution process, that data exchange follows the same process as the above. Since the substitution message exchange uses the same connections and

formats as the flight data exchange, many of the steps are already done. The substitution processing can be developed and tested at the same time as the basic data feed, if desired.

There are two additional documents that the participant may want:

- CDM IP Addresses – A complete list of the services available to CDM participants along with the associated IP addresses and ports. This document may be requested from Volpe once the MOA is signed.
- Establishing a VPN Connection – A document that describes how to establish a VPN connection with ETMS. This document is available from Volpe at any time on request.

Appendix – Data Quality Checks

A CDM participant is required to provide good quality flight data to become a CDM member. The Volpe Center, in support of FAA, performs data quality checks by analyzing a live data feed from the participant to the test system. The evaluation of the data feed is somewhat subjective. In short, it is required that the data feed provides significant value to ETMS and that the quality of the data is similar to other participants with similar constraints (e.g., a small regional carrier is not expected to provide the same quality as a major airline). The analysis focuses on very specific areas, which are listed below.

Reliability

- Does the data feed run consistently over a period of time?
- If the ETMS server restarts, does the data feed client re-connect?
- If one ETMS server fails, does the client connect to the alternate server?

Quality

- Does the data feed consistently provide advance notification of planned operations?
- If a planned operation is cancelled, is there a timely notification of the cancel?
- If a planned operation is delayed, is there a timely notification of the new departure time?
- Are the estimated departure times accurate?
- If there is a change in itinerary, is there a timely notification in the correct format? This includes:
 - Changing the destination while still on the ground.
 - Changing the destination while in the air.
 - Return to gate; i.e., taxiing out to the runway, then returning back to the gate for some reason such as a mechanical problem.
 - Return to station; i.e., taking off, then returning to the departure airport for some reason such as a mechanical problem.