

# **Membership Agreement**

## **For**

# **Collaborative Decision Making (CDM)**

## **Exchange of Data**

**Effective Date: January 1, 2022**

### **1.0 Parties**

This Membership Agreement is entered into by and between the Federal Aviation Administration (FAA) and \_\_\_\_\_ . The parties do hereby agree and obligate themselves to abide by the rights, responsibilities, and other conditions defined in this agreement. Non-compliance with the conditions of this agreement may result in the termination of access to CDM data.

### **2.0 Authority**

The FAA's authority to enter into this agreement is governed by 49 U.S.C. 106 (l) and (m).

### **3.0 Purpose**

This Membership Agreement: (1) establishes the authority by which the FAA and industry exchange CDM data and (2) identifies the rights and responsibilities of the parties. The exchange of CDM data is solely intended to support FAA and industry flow management decision making associated with the daily management of aircraft flight operations.

### **4.0 Principles**

In the CDM data exchange process, individual industry CDM Members provide specific data elements to the FAA Traffic Flow Management System (TFMS). The FAA: (1) aggregates and processes that data into a form that is appropriate for use in the CDM process and (2) distributes that processed data to all government and industry CDM members. The CDM initiative provides for common situational awareness among participating stakeholders, improved demand predictions, enhanced traffic management decisions and reduced delays.

CDM membership is predicated on a realized systemic benefit to the National Airspace System (NAS) resulting from the exchange of unique flight data between the requesting NAS stakeholder and the FAA. CDM membership applications will be evaluated in part by the benefit provided to the NAS as a whole. This benefit adjudication may include number of unique flights, strategic benefit of unique flight data, or other operational advantages as determined by the FAA.

## 5.0 Definitions

- 5.1 **Air Traffic Flow Management (ATFM):** The air traffic management operational function that balances the aviation industry demand for air traffic control (ATC) services with the capacities and capabilities of the ATC system.
- 5.2 **Collaborative Decision Making (CDM):** A joint government/industry initiative aimed at improving ATFM by enhancing information flow within the aviation community and adding a customer focus to decision-making. CDM is an operating paradigm where ATFM decisions are based on a shared, common view of the NAS, resulting in ATM decisions and actions that are most valuable to the system.
- 5.3 **National Airspace System (NAS):** The complex collection of personnel, airspace, aircraft, equipment, and any and all other aviation components that comprise the United States' aviation system.
- 5.4 **NAS User:** A person or organization that operates or manages aircraft operations within the NAS utilizing NAS resources.
- 5.5 **CDM Data:** Industry-generated, unique flight data provided in real time as input to the CDM process; or FAA-generated aggregate information that is based upon the industry data. At the discretion of the agency, CDM data may be expanded to include other FAA-generated elements determined by the agency to enhance customer collaboration.
- 5.6 **CDM Products:** Applications provided to CDM members to enhance situational awareness, including but not limited to: TSD-C, Diversion Recovery web page, Tactical Customer Advocate (TCA) web page, and FAA testing and training systems. Additional information on CDM products may be found at <https://cdm.fly.faa.gov>.
- 5.7 **CDM Member:** A NAS user organization that: (1) provides raw CDM data to the FAA, (2) receives processed CDM data from the FAA, and (3) collaboratively works with the FAA traffic flow management function in responding to NAS demand-capacity imbalances and other system constraints.
- 5.8 **CDM Service Provider:** A vendor under contract to a CDM Member that provides the communications network that enables the exchange of CDM data and information between the FAA and the CDM Members.
- 5.9 **Third Party:** An entity not directly involved in a transaction between the FAA and CDM member.

## 6.0 Roles and Responsibilities

### 6.1 Federal Aviation Administration (FAA)

The FAA shall:

- 6.1.1 provide the CDM Member with specifications, communications protocols, equipment requirements, interface requirements, standards, message formats, and other relevant technical information and support as necessary to transmit, receive, interpret, and analyze CDM data,
- 6.1.2 provide a point of contact for twenty-four hour technical support,
- 6.1.3 encrypt FAA processed CDM data in accordance with the current industry standard data format (published at <https://cdm.fly.faa.gov>),

- 6.1.4 provide the CDM Member or its CDM Service Provider with physical access to the encrypted CDM data,
- 6.1.5 release encrypted CDM data and provide CDM product access to CDM Members only after the CDM Member has demonstrated the capability to provide raw CDM data consistent with the documented data quality standards defined by the FAA,
- 6.1.6 provide processed CDM data consistent with the accuracy, reliability, maintainability, and availability of the operational traffic management system and/or other processing and communications capabilities,
- 6.1.7 have the sole right to relocate, upgrade, and/or update the CDM data stream in order to take advantage of advances in technology and for other reasons. The FAA shall provide notice of such changes not less than sixty (60) days prior to their implementation,
- 6.1.8 have the right to identify and disclose to the CDM Steering Group (CSG), CDM Members not in compliance with, or in violation of, this agreement and may interrupt, or direct the interruption of, the CDM data stream until such time that compliance is demonstrated to the satisfaction of the FAA CDM Point of Contact (POC) identified in paragraph 15.0 below,
- 6.1.9 have the right, with timely and appropriate advance notification and coordination, to modify and amend this agreement if it is in the interest of the United States Government, the aviation industry, or the general public,
- 6.1.10 have the right to rate and identify CDM Members not in compliance with the expected level of performance as specified in Appendix B of this agreement.

## 6.2 CDM Member

The CDM Member shall:

- 6.2.1 acquire and maintain the hardware, software, communications, facilities, training, and any and all other resources needed to transmit, receive and interpret the CDM data. In the event the CDM data stream is relocated, upgraded, updated, and/or modified, the CDM Member shall be responsible for providing and maintaining the hardware, software, communications, facilities and any and all other resources needed to continue to transmit, receive and interpret the CDM data,
- 6.2.2 provide unique industry-generated CDM data to the FAA TFMS consistent with the data elements and quality standards as specified in Appendix A of this agreement; and consistent with the accuracy, reliability, maintainability, and availability of the CDM Member's operational system and/or other processing and communications capabilities,
- 6.2.3 obtain the FAA's written consent and approval for any third-party (designated by the CDM Member) to access CDM data or products for research, development, analyses, conclusions, or other capabilities commissioned by the CDM Member. No products or results developed by a third-party will be guaranteed, sponsored, warranted or endorsed by the FAA.
- 6.2.4 in the event of technical or system problems, ensure that any contact with the FAA CDM POC, any FAA air traffic control facility, or the ATCSCC regarding operational traffic flow management matters originates with the CDM Member and not a third-party,
- 6.2.5 track and report to the FAA on an annual basis any Member-provided third-party access related to CDM data.

## **7.0 Exclusion of Warranties**

All warranties, expressed or implied, are excluded from this agreement and shall not apply to the data or services that the FAA, CDM Member, CDM Service Provider, or any other data recipient receives under this agreement. There is no warranty of merchantability or of fitness for a particular purpose for the data or services that the FAA, CDM Member, CDM Service Provider, or any other data recipient receives under this agreement.

## **8.0 Limitation of Remedies**

The FAA shall not be liable to the CDM Member, CDM Service Provider, or any other data recipient for any loss, damage, claim, liability, expense, or penalty, or for any indirect, special, secondary, incidental, or consequential damages deriving from the use of the CDM data. CDM Member shall not be liable to the FAA, other CDM Members, or any other data recipient for any loss, damage, claim, liability, expense, or penalty, or for any indirect, special, secondary, incidental, or consequential damages deriving from information or data, including CDM data, it provides to the FAA, other CDM Members, or any other data recipient.

## **9.0 Indemnification**

The CDM Member agrees to indemnify and hold harmless the Government and their respective officers, employees, and agents, from and against all claims, demands, damages, liabilities, losses, suits, and judgments (including all costs and expenses incident thereto), which may accrue against, otherwise be chargeable to the Government by reason of, or as a direct and proximate result of CDM Member's use of the CDM data or software received under this agreement; provided however CDM Member shall not be liable to the Government to the extent that such claims, demands, damages, liabilities, losses, suits, and judgments result from the Government's negligence or willful misconduct.

Software Data Rights: All data, software, and documentation, furnished by the Government to the CDM Member pursuant to this Agreement, are provided on an "as is" basis.

## **10.0 Changes and Modifications**

Changes and/or modifications to this agreement shall be in writing and signed by the original FAA signatory or his representative, designee, or successor. The modification shall cite the subject Agreement, and shall state the exact nature of the modification. No oral statement by any person shall be interpreted as modifying or otherwise affecting the terms of this agreement.

## **11.0 Disputes**

Where possible, disputes will be resolved by informal discussion between the parties. In the event the parties are unable to resolve any disagreement through good faith negotiations, the dispute will be resolved by the Director, System Operations, ATCSCC. The decision is final unless it is timely appealed to the FAA Administrator, whose decision is not subject to further administrative review and, to the extent permitted by law, is final and binding.

## **12.0 Construction of the Agreement**

This agreement is an "other transaction" issued under 49 U.S.C. 106 (l) and (m) and is not a procurement contract, grant or cooperative agreement. Nothing in this agreement shall be construed as incorporating by reference or implication any provision of Federal acquisition law or regulation.

## **13.0 Termination of this Agreement**

Any party may terminate its participation in the CDM activity under this Agreement by written notice to the remaining parties provided no termination may be effective in less than ninety (90) days from the date of such written notice.

If the CDM Member fails to abide by the requirements of this agreement and its failure is not cured within five (5) working days of the initial notice of noncompliance, the CDM Member's access to data, information and systems covered under this agreement may be terminated immediately by the FAA for cause.

Whenever written notice of termination is issued by or received by the CDM Member, the CDM Member shall immediately return all Government equipment (if any), software and documentation that the Government issued to the CDM Member under this Agreement.

## **14.0 Duration**

This agreement shall be effective on the date that the FAA signatory below executes it and shall remain in effect for five (5) years or until terminated, whichever is earlier.

## **15.0 FAA Point of Contact (POC)**

Written notices to the FAA shall be sent to the FAA CDM POC at the address shown below.

Federal Aviation Administration  
David J. Hurley Air Traffic Control System Command Center  
Director, NAS Operations  
3701 Macintosh Drive  
Warrenton, Virginia 20187

ATTN: CDM Point of Contact

## 16.0 Industry Contact

This Agreement will be updated as needed. Written/electronic notices to the CDM Member will be provided. The mail and electronic address for notices are:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

E-Mail address: \_\_\_\_\_

Phone: ( \_\_\_\_\_

## 17.1 Approval Signatures

<b>CDM Member</b>	<b>Air Traffic Operations</b>
_____ Signature	_____ Signature
_____ Name (Printed)	_____ Name (Printed)
_____ Title	<b>Director of NAS Operations</b> _____ Title
_____ Date	_____ Date
_____ <b>CDM Data Service Provider</b>	

# Appendix A

## CDM Data Elements

The exchange of flight data is a fundamental tenet of CDM and a requirement for membership. The application, connectivity and protocols used to exchange messages are detailed in the CDM Message Protocol Specification document.

Information that must be exchanged within CDM data exchange includes, but is not limited to:

- Flight Create – Message sent to create a flight.
- Flight Modify – Message to update data, such as times, for a flight.
- Flight Cancel - Message that indicates a flight has been cancelled. Identifies a cancelled flight to ensure that resources are not engaged and/or fully utilized. (CNX)

Information that should be exchanged within CDM data exchange includes, but is not limited to:

- Actual Off-Block Time (AOBT) – The actual time at which a flight has sent a “block out” message from the gate or parking location. This information will be used to help determine the accuracy of light operators’ Earliest Off Block Time (Currently known as OUT time)
- Actual Take Off Time (ATOT) – The time at which a flight lifts off from the runway as reported by the CDM Member via a CDM message. If the CDM member sends more than one value, the most recently submitted time is contained in this field. Otherwise the value is null. (Currently known as the OFF time)
- Actual Landing Time (ALDT) – The Actual time the flight has landed on the runway. Sharing arrival information provides essential information to facilitate gate conflict and demand/capacity imbalance predictions. (Currently known as the ON time)
- Actual In-Block (AIBT) – The Actual time the flight has blocked in at the gate. Sharing arrival information provides essential information to facilitate gate conflict and demand/capacity imbalance predictions for both gate and departure predictions on availability. (Currently known as the IN time)
- Aircraft Tail/Registration - The unique alphanumeric string that identifies an aircraft. Sharing the unique registration number will allow the Surface system to identify possible turn-around conflicts and other departure problems.
- Gate Assignment - Airport Gate that is assigned to a flight. Gate information will lead to more accurate ramp transit time (RTT) calculations and therefore more accurate ETD.
- Earliest Off-Block Time (EOBT) Time when the flight operator plans for an aircraft to push back from its assigned gate. The system can forecast surface demand vs. capacity based on flight operator’s best estimation of push back time. The fidelity of EOBT is required for proper surface predictions and process.
- Flight Intent - The Flight Intent would be limited to Flight Operator plan to push back early during a DMP and hold in the Aircraft Movement Area.



- Initial Off-Block Time (IOBT) - The initial off-block that a flight provided. Used to save the original Off-Block time of the flight. Useful for flight data matching. (Currently known as IGTD).
- Earliest Runway time of Departure (ERTD) - Flight operator Provided Runway Departure Time.
- Simplified Substitutions, as necessary for the flight operator and/or member
- Trajectory Option Sets, as necessary for the flight operator and/or member
- Other data elements as detailed in the CDM Message Protocol Specification document.

## **Appendix B**

# **Data Quality**

Ensuring data quality is one of the primary concerns of the traffic flow management community. The Data Quality Report Card (DQRC) provides a measure of the quality of the data feed for each CDM member. Poor data quality can negatively impact the system by creating inaccurate traffic demand predictions.

### **Data Quality Code of Conduct:**

1. Flight data submitted to the FAA, whether via Official Airline Guide (OAG) schedule data, CDM messages, or individual flight plan, must represent how the flight is planned to operate:
  - a. Flights must only be created that have a real intent to operate. Flights shall not be created for the purpose of gaining more slots or better control times.
  - b. Operators must submit and update accurate, expected flight operating times. False or inaccurate times or times that do not represent how the flight is planned to be operated shall not be submitted for the purposes of gaining more advantageous slots.
  - c. Estimated Time En Route must represent the most accurate time based on the planned route of flight and cruise speed, and forecasted en route winds.
  - d. Operators must notify the FAA of maintenance, test or ferry/repositioning flights as soon as they are known via CDM message or normal flight plan filing. Operators will not be permitted to substitute with these flights and they should not be filed for the purpose of gaining more slots or better control times.
2. In order to provide the FAA with strategic route planning capabilities operators are expected to file IFR flight plans, Trajectory Options Sets, and/or early Intent messages at least four hours prior to estimated time of departure.
3. Operators must eliminate and correct data errors.
4. Operators must comply with assigned Expect Departure Clearance Times, FAA assigned routes (i.e., Required Reroute, Collaborative Trajectory Options Program (CTOP) assigned trajectory, or other assigned trajectory) and operate flights in accordance with filed flight plan parameters.
5. Flights must not be filed with the intention of requesting an airborne change of destination or route to avoid delay associated with a traffic management program (Ground Delay Program, Ground Stop, Airspace Flow Program, CTOP, etc.).
6. Delay shall not be allocated, through substitutions, to a flight that cannot or will not absorb that delay (e.g., airborne or international flight).
7. When applying substitutions, SCS must be the preferred method over attempting a 20 minute window substitution.
8. EDCT change requests must be accompanied by an appropriate and accurate reason for the request.

9. Operators should release slots generated by a traffic management program that have been canceled and flagged as “Held” once those slots are no longer useable by the operator, so that other operators or FAA automation can make use of the slots.

### Data Quality Report Card:

The Data Quality web site and database generate three metrics (time-out cancels, cancelled but flew, and undeclared). Each of the metrics relate directly to the ability of the Traffic Flow Management System (TFMS) to accurately predict traffic demand within the traffic management planning time frame. The DQRC metrics are as follows:

- **Time-out cancels** – A time-out cancel is a flight that TFMS expects to operate, but either never does, or operates well after its ETD. TFMS has no alternative but to wait for some time period after the expected departure time and eventually drop the flight from the demand predictions. The current rule is that a flight with a flight plan or a CDM flight create message is time-out canceled by TFMS 90 minutes after its ETD; a flight only with OAG data is time-out canceled 10 minutes after its ETD. A sample scenario of a time-out cancel is: the member submits a CDM create message for a flight, does not operate the flight, and never sends a cancel message for a flight. If a member sends a cancel message for a flight, it will not be considered a time-out cancel. Time-out cancels cause TFMS to over-predict the traffic demand. *For grading purposes, time-out cancels are computed as a percentage of all flights created in the TFMS for the member.*
- **Cancelled-but-flew flights** – A cancelled-but-flew flight is a flight that the member cancels but that ends up operating. A sample scenario of a cancelled-but-flew is: the member sends a CDM create message, files a flight plan, sends a CDM cancel message, and then TFMS gets a departure message for the flight from ATC. If the member cancels a flight but re-instates it with a CDM message before it operates, the flight is not considered a cancelled-but-flew flight. Cancelled-but-flew flights cause TFMS to under-predict traffic demand. *For grading purposes, cancelled-but-flew flights are computed as a percentage of all flights cancelled by the member.*
- **Undeclared flights** – An undeclared flight is a flight that operates without prior notice to TFMS. The prior notice can be either the flight being in the OAG schedule, or the member sending a CDM create or modify message for the flight. A sample scenario of an undeclared flight is simply a flight that operates and for which a flight plan is the first notification that TFMS received of this flight. Undeclared flights cause TFMS to under-predict the demand. *For grading purposes, undeclared flights are computed as a percentage of all of the member’s flights that operate.*

CDM members are expected to have no unacceptable (F, based on grading criteria detailed below) grades on any metric during the 6-month time span, and would be expected to make corrective actions to improve marginal performance to at least a satisfactory (A, B or C, based on grading criteria detailed below) level. Some month-to-month fluctuation is to be expected, so the primary grade for each category will be a six-month, sliding average. Unacceptable averages for any category will trigger communications between ATCSCC Quality Control resources and the CDM member to develop plans for improvement. Failure of the CDM member to improve the quality of data provided through the CDM process is grounds for termination of the CDM Agreement in accordance with Section 14 of the agreement. The DQRC will be produced monthly and distributed to the industry members of the CSG.

## Grading Criteria

The grading scheme is based on average performance and variability for each metric across all CDM members. Airlines performing significantly better than average (that is, that have a lower percentage score for a metric) will receive good grades, and those performing significantly worse than average will receive marginal or unacceptable grades.

The list below shows the initial criteria for determining letter grades. This data was computed by Volpe and represents a 6-month span from December 2003 through May 2004. The averages and standard deviations of scores for each metric were computed and the following conversion was applied:

A = At least .5 standard deviations better (lower) than average

B = Between .5 standard deviations better and .5 standard deviations worse than average

C = Between .5 standard deviations and 2.5 standard deviations worse than average

F = More than 2.5 standard deviations worse than average.

Based on the criteria above and the computed averages and standard deviations, the following table shows the letter grade criteria:

	A	B	C	F
Time Out Cancels (% of Planned Flights)	$\% \leq .8$	$.8 < \% \leq 2.5$	$2.5 < \% \leq 6.2$	$6.2 < \%$
Cancels that Flew (% of Airline Cancels)	$\% \leq 1.2$	$1.2 < \% \leq 3$	$3 < \% \leq 6.6$	$6.6 < \%$
Undeclared Flights (% of Flights that Operated)	$\% \leq .7$	$.7 < \% \leq 2.1$	$2.1 < \% \leq 4.9$	$4.9 < \%$

**Table 1. Percent to Letter Grade Conversion Table**

The criteria will be re-calculated each January using the available data from the previous 6-month period (July through December). CDM members will be advised of any changes in the grading criteria.