International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)
Second Meeting of the Communications, Navigation and Surveillance / Air Traffic Management Subgroup (CNS/ATM/SG/2)
(Mexico City, Mexico, 16 to 19 November 2010)

Agenda Item 2: Follow-up to the implementation status of the performance-based navigation systems plans in the CAR and SAM Regions and to the latest amendments to the ATM- and CNS-related SARPs

COLLABORATIVE DECISION-MAKING (CDM) MANUAL FOR THE SAM REGION

(Presented by the Secretariat)

EXECUTIVE SUMMARY	
This working paper presents, in its Appendix A, a draft CDM Manual for the South American Region, prepared by a group of experts who worked at the Lima Office on 4-15 October 2010.	
ICAO Strategic Objectives:	A: Safety — Enhance global civil aviation safety D: Efficiency — Enhance the efficiency of aviation operations
Financial impact:	No additional resources are required.
References:	**References:** SAM ATFM Manual; Doc 4444 – Air Traffic Management; Doc 9426 – Air Traffic Services Planning Manual; Doc 9854 – Global Air Traffic Management Operational Concept for the Caribbean and South American Regions; and Workshop/Seminar on the Collaborative Decision-Making Process, Rio de Janeiro, Brazil, 29-30 March 2010

1. Introduction

1.1 United States, Europe and other countries have made significant progress in the implementation of the collaborative decision-making (CDM) concept, a mechanism that has given very good results. Likewise, the SAM ATFM Manual has a chapter devoted to this concept that involves the implementation of a methodology covering all the areas involved in the system.

1.2 Consequently, CDM is a key element for maximising airport and air operations, since it takes into account all the elements of coordination between air navigation service providers (*e.g.*, flow management units - FMUs) and the recipients of such services (*e.g.*, aircraft and airport operators).

1.3 The CDM strategy consists in embodying all those who participate in the planning process, sharing information about aircraft position, predictions, meteorological forecasts, traffic forecasts, and, in general, any aspect that contributes to an efficient operation of a regional airspace system.

1.4 CDM also allows system participants to optimise their decisions, in collaboration with others, learning about their preferences, limitations, and the actual and foreseen situation.

1.5 Taking into account the experience of other countries more advanced in the organisation and use of this CDM concept, the SAM/IG/4 meeting deemed it advisable to develop a basic manual to guide the States in the implementation of CDM, and thus approved Conclusion *SAM/IG/4-6 -Manual for the Implementation of CDM in the SAM Region*, in which Regional Project RLA/06/901 is requested to sponsor the development of a CDM Implementation Manual for the SAM Region, initially focused on ATFM, with a view to guiding the States of the Region that have not yet implemented this mechanism.

2. Discussion

2.1 In view of the above, experts from Brazil, Colombia and the United States developed the draft CDM Manual in October 2010, which was submitted to the consideration of the SAMIG/6 meeting.

2.2 The meeting reviewed the CDM Manual and felt that it was suitable for the current requirements of the South American Region, and thus approved if for regional implementation. It also requested the Secretariat to submit the aforementioned document to the Second Meeting of the GREPECAS CNS/ATM Subgroup for it analysis and study of the possibility of its implementation in the CAR Region, with a view to harmonising the ATFM implementation process in the two Regions. In this sense, the meeting formulated *Conclusion SAM/IG/6-7, Manual on Collaborative Decision-Making (CDM) for ATFM,* adopting the cited document.

3. Suggested action

3.1 The Meeting is invited to:

a) Take note of the information provided;
b) Review the draft CDM Manual that appears in **Appendix A** to this working paper; and
c) If deemed advisable and with a view to harmonising the ATFM implementation process in the two Regions, extend the application of the CDM Manual to the CAR Region.

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APPENDIX A

MANUAL ON THE COLLABORATIVE DECISION-MAKING PROCESS FOR THE SOUTH AMERICAN (SAM) REGION

(SAM CDM MANUAL)

Version 1.0	
Date	**October 2010**

FOREWORD

The *CDM Manual for the South American (SAM) Region* is published by the SAM Implementation Group (SAMIG), and describes the collaborative decision-making management methods and procedures to be applied in the SAM Region.

The SAMIG will publish revised editions of the Document as necessary to reflect any future implementation activities. Copies of the *SAM CDM Manual* can be obtained from:

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The present edition (Draft Version 1.0) includes all revisions and modifications made until October 2010. Subsequent amendments and corrigenda will be listed in the Record of Amendments and Corrigenda Table, according to the procedure established in page X.

Chapter 1: Background

1.1 ICAO CNS/ATM Systems were endorsed by the Tenth Air Navigation Conference held in 1992 at ICAO Headquarters in Montreal, Canada. That same year, the CAR/SAM Regional Planning and Implementation Group (GREPECAS) started to work towards the regional implementation of this new air navigation service concept.

1.2 Subsequently, at the Eleventh Air Navigation Conference (AN-Conf/11, Montreal, September 2003), the States endorsed and approved the new ICAO Global ATM Operational Concept, which promotes the implementation of a service management system that permits a seamless regional airspace through the application of a series of ATM functions.

1.3 According to the guidelines established by the ICAO Council regarding facilitation of inter-regional harmonisation, regional CNS/ATM implementation plans should be prepared in keeping with the general profiles defined in the Global Air Navigation Plan for CNS/ATM Systems. Following a careful analysis of the guidelines of this Global Plan, GREPECAS adopted them and incorporated characteristics inherent to the CAR/SAM Regions based on the definition of Homogeneous Areas and Main Traffic Flows. Homogeneous Areas are those airspace portions with similar ATM requirements and levels of complexity, while main traffic flows are airspaces with a significant amount of air traffic.

1.4 From the analysis conducted by ICAO/UNDP Project RLA/98/003, it may be inferred that, although in general there is no traffic congestion currently in the CAR/SAM Regions that requires a complex flow management, some congestion has been identified at some airports and airspace sectors, mainly during special periods and specific hours, which should be avoided.

1.5 Consequently, GREPECAS felt that early ATFM implementation would ensure an optimum air traffic flow towards or through certain areas during periods in which demand exceeds or is expected to exceed the available capacity of the ATC system. Therefore, an ATFM system should reduce aircraft delays, both in flight and on the ground, and avoid system overloading. The ATFM system shall help the ATC to attain its objectives and make a more effective use of airspace and available airport capacity. ATFM should also ensure that the safety of air operations is not jeopardised in case of unacceptable levels of air traffic congestion, while ensuring effective air traffic management with no unnecessary flow restrictions.

1.6 The ATFM/5 meeting examined the draft ATFM manual to be used in the FMUs/FMPs of the SAM Region, containing guidelines on matters related to ATFM implementation, such as demand and capacity, traffic management tools, traffic management initiatives (TMIs), communications and coordination, organisation and structure, system performance measurement, collaborative decision-making, common ATFM terminology. The purpose of the manual was to provide guidance on ATFM.

1.7 The document was in its initial stage, and the meeting deemed it advisable to continue its development. Subsequently, some States that participated at the ATFM/TF/5 meeting reviewed the document and suggested some corrections. Finally, the ATFM Manual was submitted to the First Meeting of the GREPECAS CNS/ATM Subgroup (CNS/ATM/SG/1, Lima, March 2010) and approved for use by CAR/SAM States, Territories and International Organisations.

1.8 The SAM/IG/4 meeting, held under the auspices of Project RLA 06/901, examined different matters related to ATFM, including the lack of a common methodology to calculate airport and ATC sector capacity. The meeting also reviewed the information provided by the States with respect to flow management data processing and display, surveillance and automation systems in support of ATFM, the means available to capture meteorological information, communication systems, and collaborative

decision-making processes (CDM), State coordination between units, the ATFM Manual, amongst other things. It also analysed the tasks that should be performed by the Regional Project, as well as the ATFM action plan.

1.9 The SAM/IG/4 meeting examined pending tasks and ATFM matters analysed by the ATFM work group. As a result, the ATFM Action Plan was updated.

1.10 The Meeting, upon reviewing the progress made in the activities of Regional Project RLA/06/901, analysed, amongst other things, the development of a CDM implementation manual for the SAM Region, initially under an ATFM approach, to serve as a guide for SAM States that have not yet implemented this mechanism.

Chapter 2: Purpose of the Document

2.1 The purpose of this document will be to assist SAM States in the establishment of a common understanding of the Collaborative Decision-Making process (CDM), with a view to the application of this work methodology, which seeks the participation of all the parties involved in ATFM, with measures implemented equitably among ATM system users.

2.2 This document is intended as an introduction and not as a comprehensive body of knowledge. It is understood that this will be considered as a living document that will be modified as required to reflect growth, future requirements and harmonisation in the SAM Region.

Chapter 3: Collaborative Decision-Making Process (CDM)

3.1 CDM has evolved towards a collaborative philosophy or approach to operations. It brings together operators, government, air navigation service providers, the private industry, the military and academia with a view to improving decision-making related to ATM through a better exchange of information, data sharing and better automated tools in support of decision-making.

3.2 As the aeronautical community evolves, the States and/or service providers will have to keep pace with increased demand, the requirement for greater capacity, and technological development. To face these challenges, a new sense of work in partnership will be required from all stakeholders that, directly or indirectly, contribute to the well-being and general success of the aeronautical industry.

3.3 This new work in partnership will combine the talents of all individuals, thus facilitating the harmonisation and globalisation of the global airspace system.

3.4 In an ATFM environment, collaborative decision-making (CDM) is a methodology that brings together service providers and the parties involved in the system in order to obtain better decisions concerning air traffic flow management.

3.5 Thus, CDM is a key element in ATFM for maximising airport and air operations, since it takes into account all the coordination elements between air navigation service providers (like flow management units - FMUs) and the recipients of such services (like aircraft and airport operators). CDM embodies all the participants in the planning process, *sharing information* about aircraft position, predictions, meteorological forecasts, traffic forecasts and, in general, anything that will contribute to the efficient operation of a regional airspace system.

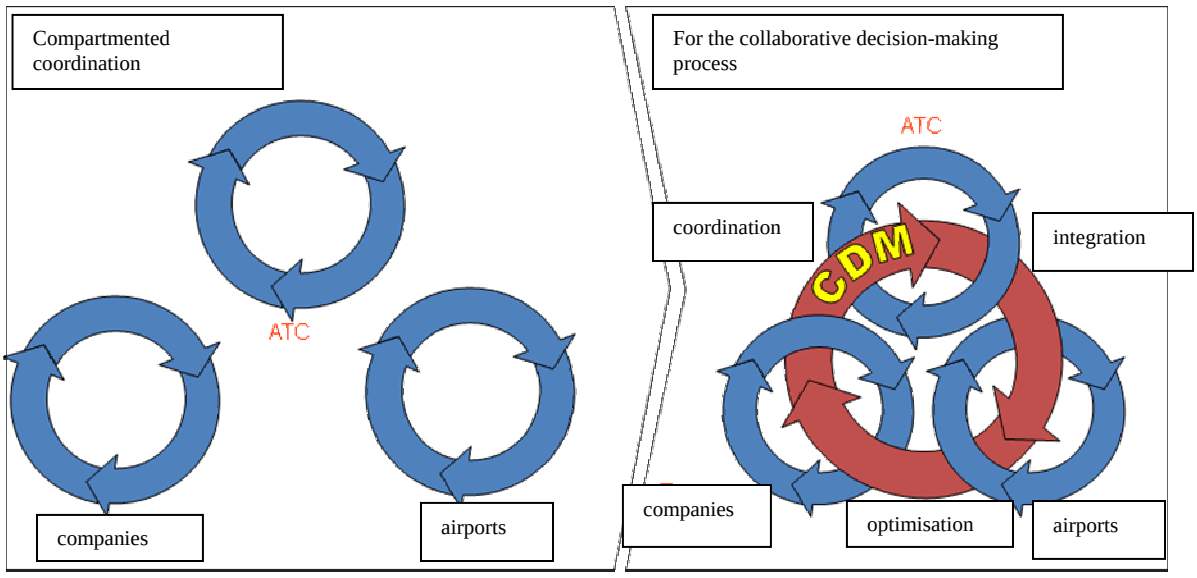

Figure 1: Illustrates a shared coordination scenario for the collaborative decision-making process (CDM).

3.6 The CDM concept is based on the exchange of a large amount of information among the participants, a fact that may sometimes generate concern. The problem does not lie on obtaining or distributing the information. The challenge is to develop a culture of mutual trust and cooperation.

Chapter 4: Exchange of Information based on CDM

4.1 In order to understand the usefulness of the exchange and fluidity of information, some questions may be asked, such as:

a. Have you ever arrived at an airport and had to wait in the taxiway because a parking position was occupied?

b. Have you ever arrived at a parking position that had no ground-based personnel or equipment to take care of your aircraft?

c. Have you ever boarded a flight and had to look for your own seat for a long time before the aircraft left the parking position?

d. Have you known of flights that wait until the last minute to inform that they are not ready and that they will miss their estimated take-off time?

e. Do you know of any airport where immigration, customs and security processes are expensive?

These are the visible symptoms of airport problems that should be addressed. There can be many causes, such as:

a. Insufficient or unreliable information.

b. One system participant does not have the whole picture of the situation.

c. Precise information is provided too late for a participant to be ready on time.

Chapter 5: Objectives of CDM in ATFM

5.1 CDM is a work methodology that forms groups at different levels, specifically focusing on the solution to common problems in a transparent and equitable manner for all participants. However, pursuant to the purpose of this document, we will only discuss CDM within the context of finding the best solution to ATFM-related problems.

5.2 The CDM concept in ATFM seeks to improve air traffic flow and airport capacity management, reducing delays and anticipating events through a better management of resources.

5.3 These objectives include:

a. Providing updated information in real time to all stakeholders, thus ensuring a more accurate prediction of events and a better utilisation of capacity, with the support of a collaborative decision-making process.

b. Service demand/capacity balancing, while meeting the agreed levels of safety and efficiency.

c. Enabling system participants to optimise their decisions in collaboration with others, learning about their preferences, limitations and the actual and foreseen situation.

d. Enabling all members of the ATM community, especially airspace users, to participate in the adoption of decisions affecting them; the level of participation is in keeping with the extent to which the decision affects them.

e. Achieving a solution acceptable to the needs of stakeholders, based on a spirit of cooperation.

f. Foreseeing conflicting situations.

g. Defining a solution.

h. Transferring information among the parties involved.

i. Requiring all parties involved in the system to operate in an equitable manner to improve the system.

Chapter 6: The ATFM Community and its Objectives

6.1 ATFM stakeholders include the organisations, bodies or entities that could participate, collaborate and cooperate in the planning, development, use, regulation, operation and maintenance of the ATFM system. These include:

6.1.1 The aerodrome community - The aerodrome community includes aerodromes, aerodrome operators and other parties that participate in the provision and operation of the physical infrastructure required to support take-offs, landings, and handling of aircraft. Its objective in ATFM is to maximise performance and efficacy, as long as they follow their operational plan. The greatest impact of delays on airport operators is a bad image/name and an inefficient use of airport resources and infrastructure (parking positions, etc.). Furthermore, timeliness of arrivals and departures is the basis for operational efficiency, which should lead to a possible reduction of delays, foreseeing for example new investments in infrastructure.

6.1.2 Airspace providers - In general terms, it refers to Contracting States/Territories, in their capacity as airspace owners, with legal powers to grant or deny access to their sovereign airspace. The term may also be applied to State organisations responsible for establishing the standards and guidelines for the use of airspace. Their objective is to ensure air safety provided the best use is made of available CNS and airport infrastructure.

6.1.3 Airspace users - It refers to commercial, military and general aviation operators that use the sovereign airspace of the States/Territories/Organisations. Their objective is to comply with their planned schedule. The greatest impact that delays have on airspace users is the additional cost (additional fuel, lost connections and side effects).

6.1.4 ATM service providers - All of the organisations and personnel (for example, controllers, engineers, technicians) involved in the provision of ATM services to airspace users. Their objective is to provide air navigation services in a safe, economic and efficient manner during all flight phases, protect air traffic services from overloads, and at the same time, allow aircraft operators to carry out their flight operations as planned, with minimum penalties. This is achieved by making the best use of ATC and airport capacities.

6.1.5 Military aviation - It refers to the personnel, aircraft and equipment of military organisations that play a vital role in airport security of States/Territories. Its objective is to achieve a proper definition of reserved airspace, and collaboration in the area of special operations that meet military operational requirements and its specific requirements.

Chapter 7: Benefits for the ATFM Community

7.1 Aerodrome community

a. Reduction of the environmental impact – noise and emissions.
b. Improved punctuality.
c. Improved management and planning of parking positions.
d. Increased possibility of serving additional flights and passengers.

7.2 Airspace providers

a. Better traffic forecasts – thus reducing workload.
b. Reduced likelihood of errors.
c. Better departure sequencing.
d. Better service quality.
e. Beneficial airport networking effects.

7.3 Airspace users

a. Shorter taxiing times, shorter holding time at the runway-holding positions, no more holding to access occupied parking positions.
b. Fuel savings.
c. Reduced delays, savings in operational costs and customer satisfaction.

d. Increased capacity with the same aircraft fleet.

7.4 ATM service providers

a. More en-route and airport capacity available.

b. Improved compliance with ATFM SLOTs.

c. Less SLOTs wasted.

7.5 Military aviation

Air defence and military control systems will require timely and precise information about flights and intentions of the ATM system. It will participate in airspace reservation and the reporting of aviation activities as well as in the implementation of security-related measures.

7.6 Safety

In order to make sure that safety is not compromised whenever traffic demand in a given airspace or aerodrome is expected to exceed the available ATC capacity, measures will be applied to regulate traffic volumes accordingly.

Note: The community in general will benefit from a mutual understanding based on trust.

Chapter 8: Performance Indicators for Compliance with CDM Objectives

8.1 In order to establish CDM continuous improvement processes to improve the operational efficiency of the system, performance indicators may be established according to the general strategic objectives of the system and the specific objectives of each participant.

8.2 Specific improvement objectives and their performance indicators for CDM implementation are established in order to verify the improvements achieved following implementation.

8.3 Performance indicators are selected based on the availability of historical data and the objectives defined in conjunction with CDM participants.

8.4 The improvements achieved must be measured by comparing the status of indicators “before” and “after” operations. These measurements must be continuously monitored in order to improve the quality of the service.

8.5 Furthermore, the measured improvements will feed the cost-benefit analyses that each participant must perform.

Note: **Appendix A** to this document shows some examples of performance indicators. As the CDM community gains more experience, it will be able to determine and define performance indicators according to its expectations, priorities and requirements.

Chapter 9: Information Management

9.1 The integrated information management vision should guide application developers to consider *CDM as an essential requirement for the generation and distribution of information.* This requirement involves:

a. *Precision and accuracy*: Information must be sufficiently precise and/or accurate, and the user must be informed about safety levels or information validity periods.

b. *Stability:* Information must be sufficiently stable and not subject to illegitimate oscillations. In many cases, even valid information must be filtered.

c. *Coverage:* Information must be sufficiently complete in terms of including all the elements that are relevant to a given situation.

d. *Timeliness:* Information must be available when required.

e. *Consistency:* There must be no conflict in the information, which must make sense (for example, the entity must receive an ATC flight plan before and not after the flight). Since information is the basis for the decision, information updating must be synchronised to allow for consistent decisions.

f. *Security and reliability:* Unauthorised intervention in the system must be avoided. Confidential information, especially concerning special operations, must be protected.

g. *Availability:* The level of availability of the system must be compatible with the implementation environment. Lack of availability may give rise to safety problems.

Note: In order to have the best possible information available to support operational efficiency, the exchange of such information should be established within the framework of a memorandum of understanding, starting in the initial stages of CDM implementation. This will help ensure that participants:

a. Provide quality information.

b. Meet their commitments.

c. Define appropriate levels of access to sensitive information.

d. Share data only within the scope of CDM.

9.2 Give airlines the right to decide what information to share or not to share with their passengers. Benefits of the exchange of information in ATFM:

9.2.1 The exchange of information among the parties responsible for aircraft flight planning and operations will increase system capacity and thus improve:

a. The quality and stability of operations.

b. The reliability and capacity of prediction.

c. Traffic synchronisation among the parties involved.

d. Airspace organisation, which is indispensable for maximising capacity and improving the safety of the system.

9.2.2 The use of all possible tools and electronic media for a more effective sharing of information.

Note: Experience worldwide has demonstrated that teleconferences and the electronic exchange of information are the mechanisms recommended for active participation throughout the system. However, each State/service provider may use any available means to encourage sharing of information.

9.2.3 Accurate and timely information to facilitate decision-making within the framework of CDM, the goal being to adjust the procedures, mechanisms and tools in order to improve system performance.

9.3 Information shared between community members and the ATFM centralised unit/FMU/FMP.

9.3.1 *Airspace users* - Cooperation will be achieved through the precise delivery of information from aircraft operators to the ATFM (*e.g.,* flight data) and from the ATFM (on impact and opportunities that may arise). In order to achieve an efficient cooperation, procedures and tools should be developed to provide transparency, efficacy and precision (automation).

9.3.2 *ATM service providers* - The provision of resources will be the starting point for dialogue between ATC and ATFM, in which information about equipment availability and staffing is used.

9.3.3 *Units involved in airspace management (ASM)* - The route network structure, sector design and airspace definition will be essential inputs for CDM. Airspace managers will have to participate actively in the decision-making process (CDM). Their activity has significant impact on flow management measures and the best way of providing the required efficiency would be through the integration of these decisions within the capacity management process. Airspace managers also provide key information for flight planning. In this sense, flight planning activities will make use of the flexibility provided by airspace management, for example, taking into account the airspace when making changes to flight plans filed in advance.

9.3.4 *Aerodrome community* - Airport slot coordination processes will provide valuable information for demand analyses. Airline schedules will provide updated information about flight departure and arrival times. This information will be aligned with the operational data in order to integrate the ATFM process into a timeliness framework. For an effective gate-to-gate management, an ongoing exchange of information between airports, and between airspace managers and ATFM is required.

Chapter 10: CDM Implementation

10.1 The CDM implementation process could be based on the following basic steps:

a. Familiarisation with the CDM concept

In this phase, it is important to recognise that:

- The CDM is a new collaboration culture.

- It is a low-cost, high-benefit process.
- It requires the cooperation of all stakeholders.
- Information must be provided free of cost.
- Commercially sensitive and security information must be handled accordingly.

b. Project configuration

- This new project must have clear objectives and responsibilities.
- The entire community must participate from the beginning.
- Objectives must be adjusted according to the priorities established by the CDM community.
- The project should begin with the information exchange concept.
- An inventory of the information required and the information already available must be developed.
- The systems of each participant must be adapted to the information exchange platform to be developed.
- The community must be educated and trained in the basic concepts and the tasks to be performed in the different processes.
- It must be implemented in a harmonised manner, through the use of guidance material for all participants.

c. Implementation

- A unit must be designated to manage the project.
- The corresponding documentation must be developed.
- A Memorandum of Understanding must be established for participation in CDM.
- Expensive solutions or complicated interfaces are not required.
- The technological platform must be developed based on existing procedures and not *vice versa*.
- A plan must be in place with clear, defined, measurable tasks and realistic target dates.
- All activities must be kept within the CDM framework.
- Small, effective working groups must be created.
- The same team must be maintained for the required process continuity.

d. Measurement of success

- The agreed objectives must be reviewed.
- Appropriate indicators for the objectives must be agreed upon.
- The status of the system must be established before implementation to compare it with the progress made.

Chapter 11: CDM Organisation and Structure

11.1 It is important to note that CDM is not limited to an ATFM service provider; it must be implemented at all ATM facilities of the State, for real-time sharing of relevant and necessary information amongst all stakeholders interested in the progression of a flight. However, this document addresses CDM implementation in the ATFM environment.

11.2 Its flexibility accommodates any existing means of communication, it does not require the investment of valuable resources, and may be adjusted to meet regional and local needs.

11.3 For example, service providers may start involving stakeholders as follows:

a. Scheduling daily meetings
b. Previously establishing an agenda that is of interest to all
c. Discussing in what way will tactical decisions be handled, shared, and disseminated
d. Identifying CDM participants and issuing a *memorandum* of understanding (MOU) (**Appendix B**) that provides guidelines in areas such as the distribution of information, rules and regulations, and how shared leadership will be achieved.
e. Creating working subgroups under the direct leadership and guidance of the CDM organisation, with the specific task of generating solutions.

11.4 It is important to note that despite technological developments in the aviation industry, CDM requires a change in culture and a teamwork approach. But global experience has shown that CDM can be an integral part of success and the building of the future.

11.5 CDM Structure

11.5.1 It is understood that each State and/or service provider will develop a CDM structure that meets its needs. An example of CDM structure is shown below:

a. ATFM authority (or CDM leader) - responsible for CDM implementation;

b. Aerodromes - representatives of aerodrome operators and other parties that participate in the provision and operation of the physical infrastructure required to support take-offs, landings and aircraft handling;

c. Airspace providers - in general, will coordinate between the organisation, CDM and the State;

d. Users - representatives of commercial and general aviation operators;

e. ATM service providers – in general, will coordinate between the organisation, CDM and ATS units;

f. Working group and subgroup - Made up by individuals designated by the CDM or ATFM leader to perform specific tasks related to the solution of ATFM issues.

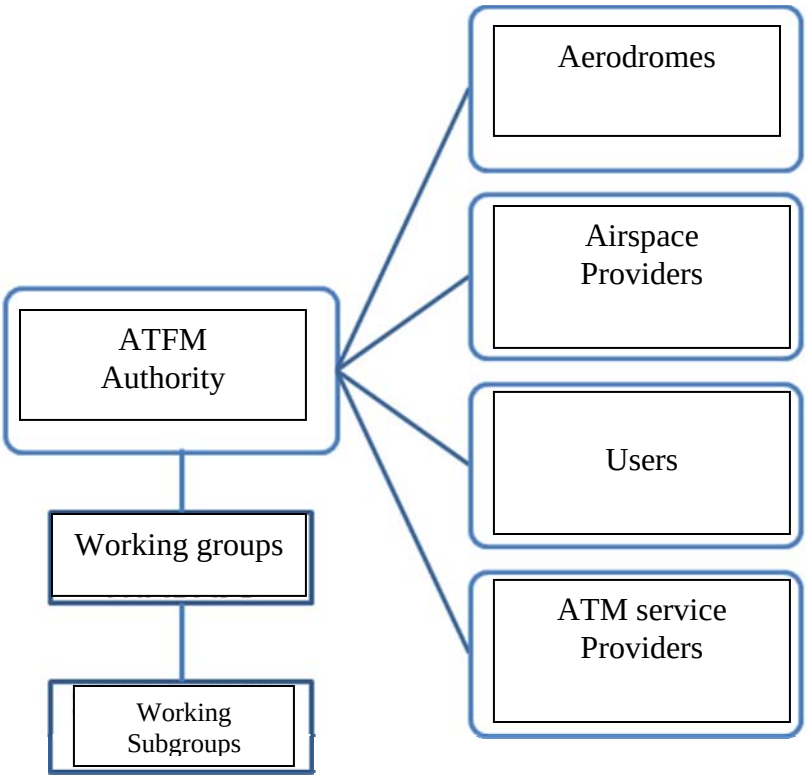

Figure 2: Illustrates a proposed CDM structure

Chapter 12: Conclusions

12.1 As in any collaborative effort, each participant should be aware that this will require some degree of sacrifice, commitment, and a sense of what is best for all and/or the system.

12.2 The participants must be willing to share:

a. Responsibility

b. Resources

c. Accountability

d. Goals

e. Mutual trust

12.3 And, as a direct result of these efforts, the participants may expect, in general:

a. More effective communications

b. A greater exchange of information

c. A more effective decision-making

d. Better solutions to ATFM issues

12.4 CDM entails a series of conceptual changes that will evolve throughout the planning horizon. The key is the notion of use, management and exchange of information, which will gradually generate a significant change of functions for all the participants in the ATM system, thus facilitating safety, economic and efficiency improvements throughout the system.

12.5 It is recognised that, regardless of technological developments in the aeronautical industry, CDM will require a change in culture, a teamwork approach, and will be an integral part of how the future will be defined.

APPENDIX A

PERFORMANCE INDICATORS

GENERAL STRATEGIC OBJECTIVES OF CDM

EXAMPLES

DESCRIPTION OF TABLES

STRATEGIC OBJECTIVE: WHAT IS TO BE ACHIEVED		
STRATEGIC PERFORMANCE CONDUCTOR: THE MEANS TO ACHIEVE THE STRATEGIC OBJECTIVE		
PERFORMANCE CONDUCTOR	**PERFORMANCE INDICATOR**	**PERFORMANCE MEASUREMENT**
A CONDUCTOR IS: HOW CAN THE OBJECTIVE BE ACHIEVED	AN INDICATOR IS WHAT WE OBTAIN FROM THE MEASUREMENT IS THE RESULT OF A MATHEMATICAL EQUATION BETWEEN TWO MEASURABLE QUANTITIES ADDITIONALLY, THE UPWARD OR DOWNWARD TREND OF THIS INDEX IS THE INDICATOR ITSELF	THIS ESTABLISHES THE WAY IN WHICH THE INDICATOR IS MEASURED THE PERFORMANCE MESUREMENT IS PRECISELY THE METHOD OF MEASUREMENT

CDM GENERAL OBJECTIVES OF CDM

STRATEGIC OBJECTIVE: Improve airport efficiency		
STRATEGIC PERFORMANCE CONDUCTOR: Improve timeliness and reduce delays		
PERFORMANCE CONDUCTOR	**PERFORMANCE INDICATOR**	**PERFORMANCE MEASUREMENT**
IMPROVE THE PREDICTABILITY OF ARRIVALS	PREDICTABILITY OF THE ESTIMATED TIME OF LANDING	COMPARE ESTIMATED AND ACTUAL TIME OF LANDING
IMPROVE THE PREDICTABILITY OF DEPARTURES	PRECISION AND PREDICTABILITY OF THE FORESEEN TIME OF APPROVAL OF ENGINE START	COMPARE TIME OF APPROVAL OF ENGINE START WITH ACTUAL TIME OF TOWING
REDUCE AVERAGE DELAY AT ARRIVAL	AVERAGE DELAYS - INCOMING FLIGHTS PUNCTUALITY INDEX OF INCOMING FLIGHTS	COMPARE ACTUAL AND SCHEDULED TIME OF ARRIVAL AT THE PARKING GATE MEASURE THE MINUTES OF DELAY BY DELAYED MOVEMENT
REDUCE AVERAGE DELAY AT DEPARTURE	AVERAGE DELAYS AT DEPARTURE PUNCTUALITY INDEX OF OUTGOING FLIGHTS	COMPARE ACTUAL AND SCHEDULED TIME OF TOWING

STRATEGIC OBJECTIVE: Reduce environmental impact		
STRATEGIC PERFORMANCE CONDUCTOR: Reduce engine time		
PERFORMANCE CONDUCTOR	**PERFORMANCE INDICATOR**	**PERFORMANCE MEASUREMENT**
REDUCE NOISE ON THE GROUND	NOISE ON THE GROUND (ENGINE TIME ON THE GROUND DURING THE DEPARTURE AND ARRIVAL PHASES)	COMPARE ESTIMATED AND ACTUAL TAXIING TIMES

STRATEGIC OBJECTIVE: Optimise the use of available capacity		
STRATEGIC PERFORMANCE CONDUCTOR: Increase airport efficiency		
PERFORMANCE CONDUCTOR	**PERFORMANCE INDICATOR**	**PERFORMANCE MEASUREMENT**
FILL THE GAP BETWEEN ACTUAL AND DECLARED CAPACITY	PRECISION OF DECLARED CAPACITY CAPACITY SURPLUS OR DEFICIT	COMPARE NUMBER OF ACTUAL MOVEMENTS TO DECLARED CAPACITY MEASURE THE NUMBER OF DELAYS RESULTING FROM OPERATIONAL CAPACITY

STRATEGIC OBJECTIVE: Improve safety by reducing apron and taxiway congestion		
STRATEGIC PERFORMANCE CONDUCTOR: Reduce the number of incidents in the movement area		
PERFORMANCE CONDUCTOR	**PERFORMANCE INDICATOR**	**PERFORMANCE MEASUREMENT**
REDUCE THE NUMBER OF AIRCRAFT MOVING SIMULTANEOUSLY ON THE MANOEUVRING AREA	NUMBER OF AIRCRAFT IN SEQUENCE	MEASURE THE NUMBER OF AIRCRAFT IN SEQUENCE
REDUCE THE NUMBER OF AIRCRAFT INCIDENTS ON THE APRON	NUMBER OF AIRCRAFT INCIDENTS	MEASURE THE NUMBER OF INCIDENTS

OBJECTIVES OF THE AIRPORT COMMUNITY

STRATEGIC OBJECTIVE: Improve the use of infrastructure		
PERFORMANCE CONDUCTOR	**PERFORMANCE INDICATOR**	**PERFORMANCE MEASUREMENT**
OPTIMISE THE USE OF PARKING POSITIONS IN GENERAL	TIME OF OCCUPATION OF PARKING POSITIONS	COMPARE THE ACTUAL AND SCHEDULED TIME OF OCCUPATION OF PARKING POSITIONS

STRATEGIC OBJECTIVE: Improve the quality of data for the public		
PERFORMANCE CONDUCTOR	**PERFORMANCE INDICATOR**	**PERFORMANCE MEASUREMENT**
PROVIDE THE PUBLIC WITH PRECISE AND TIMELY INFORMATION ABOUT ARRIVALS AND DEPARTURES OF FLIGHTS	PRECISION OF TIME OF ARRIVAL	COMPARE ESTIMATED/SCHEDULED AND ACTUAL TIME OF ARRIVAL TO THE GATE COMPARE ESTIMATED AND ACTUAL TIME OF LANDING
	PRECISION OF TIME OF DEPARTURE	COMPARE ESTIMATED/SCHEDULED AND ACTUAL TIME OF TOWING

STRATEGIC OBJECTIVE: Improve airport slot adherence		
PERFORMANCE CONDUCTOR	**PERFORMANCE INDICATOR**	**PERFORMANCE MEASUREMENT**
IMPROVE AIRPORT SLOT ADHERENCE	AIRPORT SLOT ADHERENCE	COMPARE ACTUAL AND SCHEDULED TIME OF ARRIVAL AT THE PARKING POSITION COMPARE ACTUAL AND SCHEDULED TIME OF DEPARTURE FROM PARKING POSITION

OBJECTIVES OF AIR NAVIGATION SERVICE PROVIDERS

STRATEGIC OBJECTIVE: Increase and optimise runway performance		
PERFORMANCE CONDUCTOR	**PERFORMANCE INDICATOR**	**PERFORMANCE MEASUREMENT**
FILL THE GAP BETWEEN OPERATIONAL AND DECLARED CAPACITY FOR EACH RUNWAY CONFIGURATION	COMPLIANCE WITH THE DECLARED CAPACITY FOR EACH RUNWAY CONFIGURATION	COMPARE DECLARED CAPACITY TO: ACTUAL RUNWAY OPERATIONAL CAPACITY, ACTUAL DEPARTURE RATE, AND ACTUAL DEMAND. COMPARE DEPARTURE RATE WITH ACTUAL DEMAND (by time/day/week…and for each runway configuration)

OBJECTIVES OF ATFM UNITS

STRATEGIC OBJECTIVE: Compliance with ATFM measures (CTOT).		
PERFORMANCE CONDUCTOR	**PERFORMANCE INDICATOR**	**PERFORMANCE MEASUREMENT**
INCREASE PERCENTAGE OF FLIGHTS LEAVING WITHIN CTOT - 5 AND CTOT + 10	COMPLIANCE WITH CTOT	COMPARE CTOT WITH ACTUAL TAKE-OFF TIME FOR REGULATED FLIGHTS (-5´/+10´) MEASURE THE PERCENTAGE OF MISSED SLOTS (FLIGHTS DEPARTING OUTSIDE OF THE CTOT WINDOW)

NOTE: ***THE ATFM COMMUNITY MAY DETERMINE A LARGER NUMBER OF PERFORMANCE INDICATORS ACCORDING TO ITS EXPECTATIONS, PRIORITIES AND REQUIREMENTS.***

APPENDIX B

EXAMPLE OF A MEMORANDUM OF UNDERSTANDING (MOU) STRUCTURE

1. Objectives of an MoU

The main objectives are:

a. To secure the mechanisms for the exchange of information.

b. Implement procedures to improve predictability.

c. Promote the exchange of information between CDM and the ATFM authority.

d. Adjust the monitoring mechanisms by processing improvement proposals.

2. Obligations of CDM participants

It is important to clarify the general obligations of each participant of the project, such as:

a. Ensure an active participation, recognising project leadership.

b. Cooperate in all functional specifications.

c. Ensure the interaction between systems and the CDM platform to be developed.

d. Provide the platform with the required quality information.

e. Provide a representative throughout the different phases of the project to support and control its development and the implementation of the solutions adopted.

3. Confidentiality clauses

In this section of the MoU, confidentiality clauses must be established according to national regulations in order to create a sense of trust amongst the participants.

4. Validity

The MoU must establish the period of validity and describe the renewal or updating process.

5. General information and scope

This document provides, in general, the elements recommended for inclusion in the MoUs and confidentiality agreements for CDM. These agreements would be of great benefit before starting any CDM implementation, in order to safeguard data distribution.
This document has a limited scope, with a basic description of CDM functional requirements regarding the confidentiality agreements to be used by airport authorities, ATM, aircraft operators, handling and other services.

6. MoUs and confidentiality agreements

a. Safeguarding data exchange

The parties involved in data exchange activities should enter into written agreements to safeguard their interests.

b. Safeguarding data quality

Data precision, quality and delivery must be preserved and agreed by all the parties.

c. Users' trust

The parties must derive clear benefits and agree on the objectives of information exchange.
Transparency amongst the parties will maintain trust and guarantee long-term commitment.

Regular meetings should be coordinated amongst all the parties to discuss the resulting benefits or losses.

Agreements must be flexible enough to make improvements or mitigate deficiencies.

d. Ownership and leadership in the information system

The information system must be managed by a single entity. All the parties must agree, from the beginning, on who will have this responsibility.

e. Responsibility of the process leader

Manage the system on a day-to-day basis.
Promote the continuous improvement of the information system.
Establish rules for the exchange of data.
Develop procedures and regulations.
Coordinate the incorporation of new participants.
Distribute and decide on the ownership of data (who can see what and why).
Make sure confidentiality is not compromised.
Normally, data originators are the only owners of the information.

f. Funding

Costs must be taken into account. The parties shall bear their own participation cost.

g. Term of the agreements

The term of the agreements must be established in the MoU.

h. Example of contents of an MoU

- Parties
- Background
- Purpose
- Authority
- Definitions
- Scope
- Rights and responsibilities
- Exclusion of warranties

- Limits to liability
- Changes and modifications
- Construction of the agreement
- Termination of the agreement
- Effective date
- Notifications
- Point of contact
- Signatures
- Audit requirements

ATTACHMENT APPENDIX B

EXAMPLE OF MEMORANDUM OF UNDERSTANDING MoU USED BY A STATE

Memorandum of Agreement
For
Collaborative Decision Making (CDM)
Exchange of Proprietary CDM Data

Effective Date: March 1, 2009

1.0 Parties

This Memorandum of Agreement (MOA) 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) (6).

3.0 Purpose

This Memorandum of Agreement (MOA): (1) establishes the authority, by which the FAA and industry exchange proprietary CDM data, (2) defines the conditions underlying the FAA release of proprietary CDM data, (3) identifies the rights and responsibilities of the parties, and (4) supports the process for managing the release of proprietary CDM data. The exchange of proprietary 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 History

Since the early 1980s, burgeoning growth in the demand for air transportation services within the United States led to correspondingly higher levels of air traffic control (ATC) congestion within the National Airspace System (NAS). To cope with this congestion, the FAA introduced the concept of Traffic Flow Management (TFM) aimed at balancing the demands for ATC services with the operational capacities of the ATC system.

Working with the industry through the RTCA Task Force #3 on Free Flight, the FAA recognized that the then existing ATC centered technologies and TFM techniques used to manage traffic flows had a limited capacity to consider user preferences, priorities, and other economic and non-economic operational considerations. Given the importance of those considerations to the health of the aviation industry, the FAA responded with a research program aimed at developing new technologies and associated

procedures that would expand the operational flexibility of both the FAA and NAS users. Building on the Aircraft Situation Display to Industry (ASDI) data feed that provided dispatchers and other aircraft fleet managers with filtered Aircraft Situation Display (ASD) flight information, a new TFM process, referred to as Collaborative Decision Making (CDM), was developed. The CDM process, which is based upon the ideas of data sharing and distributed decision making, results in TFM decisions and actions that are both economically and operationally sound.

5.0 Background

In the CDM process, individual industry CDM Participants provide specific data types to the CDM database. The industry participants consider much of that data to be proprietary. 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 participants. Since proprietary industry CDM data is the "property" of the data contributor, any release of raw or processed CDM data must be authorized by the contributor. The distribution of proprietary CDM data is considered to be in compliance with this requirement if it is handled in accordance with Appendix A of this document.

As of May 1998, the CDM industry participants have identified the Air Transport Association of America (ATA) as their single Point of Contact (POC) to the FAA for CDM matters.

6.0 Definitions

6.1 Traffic Flow Management (TFM): The Air Traffic Management (ATM) operational function that balances the aviation industry demand for air traffic control services with the capacities and capabilities of the air traffic control (ATC) system

6.2 Collaborative Decision Making (CDM): The TFM operational philosophy and associated technologies and procedures that enable FAA and the aviation industry to collaboratively manage strategic responses to NAS operational constraints in a manner that balances operational efficiency with aviation safety.

6.3 National Airspace System (NAS): The personnel, airspace, aircraft, equipment, and any and all other aviation components that comprise the United States' aviation system.

6.4 NAS User: A person or organization that operates or manages aircraft operations within the NAS utilizing NAS resources.

6.5 ASD data: Near real time flight and aircraft position data used by FAA traffic flow managers to monitor and strategically manage aircraft flows within the air traffic control (ATC) system.

6.6 ASDI Data: The filtered ASD data that is provided as a one-way data feed to airlines and other aviation related industries and institutions. For security purposes, military and other sensitive aviation operations are filtered out of the ASDI data stream.

6.7 CDM Data: Proprietary industry generated data elements provided as input to the CDM process. This also includes FAA generated data that is based upon the proprietary industry data (e.g., aggregate demand lists) and retains its proprietary nature.

6.8 Industry CDM Participant: A NAS user organization that: (1) provides raw industry data elements to the CDM database, (2) receives processed CDM data from the FAA, and (3) collaboratively works with the FAA traffic flow management function in responding to NAS operational constraints.

6.9 CDM Service Provider: A vendor under contract to a CDM Participant that provides the communications network that enables the exchange of TFM information between the FAA and the CDM Participants.

6.10 Industry CDM Point of Contact (POC): The consensus aviation industry entity identified by the individual industry CDM Participants as being the single point of contact regarding CDM matters. The industry POC also provides industry CDM Participants with guidance and other support relating to the CDM process and the conditions of this MOA. For CDM matters relating to this MOA, the industry CDM POC is the Air Transport Association of America (ATA).

7.0 Rights and Responsibilities

7.1 Federal Aviation Administration (FAA)

The FAA shall:

7.1.1; provide the CDM Participant with specifications, communications protocols, equipment requirements, interface requirements, data quality standards, message formats, government software, key management and other relevant technical information and support as necessary to transmit, receive, interpret, and analyze CDM data. The FAA shall also provide a point of contact for twenty-four hour technical support.

7.1.2; encrypt FAA processed CDM data in accordance with the current industry standard.

7.1.3; provide the CDM Participant or the Participant's CDM Service Provider with physical access to the encrypted CDM data.

7.1.4; release encrypted CDM data to CDM Participants only after: (1) authority to release that data has been conveyed through the industry CDM POC and (2) the CDM Participant has demonstrated the capability to provide raw CDM data consistent with the documented data quality standards defined by the FAA.

7.1.5; release encrypted CDM data in accordance with the industry data security and filtering requirements identified in Appendix A for the specific data types listed there.

7.1.6; 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,

7.1.7; prohibit FAA vendors, support contractors, or other FAA organizations from utilizing CDM data to conduct any analyses or product development without explicit industry authorization.

7.1.8; 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.

7.1.9; have the right to identify CDM Participants 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 16.0 below.

7.1.10; 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.

7.1.11; have the right to rate and identify CDM Participants not in compliance with the expected level of performance as specified in Appendix B of this agreement.

7.2 CDM Participant

The CDM Participant shall:

7.2.1; 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 Participant 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.

7.2.2; provide industry generated CDM data to the FAA CDM database consistent with the data quality standards defined by the FAA; and consistent with the accuracy, reliability, maintainability, and availability of the CDM Participant's operational system and/or other processing and communications capabilities.

7.2.3; clearly indicate on any and all research, development, analyses, conclusions, or capabilities commissioned by the CDM participant and based on CDM data that these products and results are not guaranteed, sponsored, warranted, or endorsed by the FAA.

7.2.4; ensure that all contracts related to CDM data: (a) reflect the rights, responsibilities, exclusion of warranties, limitation of remedies, indemnification, and other conditions defined in this MOA; (b) prohibit contacting the FAA CDM POC or the Air Traffic Control System Command Center (ATCSCC) in the event of technical or system problems, and (c) prohibit contacting the FAA CDM POC, any FAA air traffic control facility, or the ATCSCC regarding operational traffic flow management matters.

8.0 Exclusion of Warranties

All warranties, expressed or implied, are excluded from this agreement and shall not apply to the data or services that the CDM Participant, 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 CDM Participant, CDM Service Provider, or any other data recipient receives under this agreement.

9.0 Limitation of Remedies

The FAA shall not be liable to the CDM Participant, 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.

10.0 Indemnity

The CDM Participant, CDM Service Provider, and/or any other data recipient 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, that CDM Participant's or CDM Service Provider's use of the CDM data or software received under this agreement.

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

11.0 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 MOA, 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.

12.0 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, Air Traffic Control System Command Center (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.

13.0 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.

14.0 Termination of this Agreement

Any party may terminate its participation in the CDM activity under this MOA 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 Participant 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 Participant's access to data covered under this agreement may be terminated immediately by the FAA.

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

15.0 Effective Date

This agreement shall be effective on the date that the FAA signatory below executes it and shall remain in effect until terminated.

16.0 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, System Operations
13600 EDS Drive
Herndon, VA 20171

ATTN: CDM Point of Contact

17.0 Industry Contact

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

Name: _____

Address: _____

_____

E-mail address _____

Phone: _____

18.0 Approval Signatures

CDM Participant	**Air Traffic Operations**
Signature	Signature
	Mike Sammartino
Name (Printed)	Name (Printed)
	Director, System Operations ATCSCC
Title	Title
Date	Date

CDM Data Service Provider

Appendix A

CDM Data Security Conditions

CDM Data Type	Industry Security Requirements
Aggregate Demand List (ADL)	(1) Encrypt messages (2) Filter the following data elements: (1) Carrier Identification (2) Flight number (3) Departure airport (4) Aircraft type (not weight category) * NOTE: Individual CDM Participants will receive the data elements for their own operations. (3) An exception to item (2) above would provide unfiltered data to users who wish to participate in Integrated Program Modeling and who meet all 4 requirements below: 1. The requesting airline limits the availability of this data to authorized CDM participants only as defined in section 6.8 of this document. 2. Submits a plan that limits the unauthorized access to this data that is under the control of the signatory of this memorandum of agreement. 3. Acknowledges that this data stream may be interrupted by the FAA under section 7.1.9 of this document if the requesting airline is found not to be in compliance with these limitations. 4. Users would need to resign the MOA on an annual basis to continue use of unfiltered data until hub site changes can accomplish a technical solution to the issue of unfiltered data. This unfiltered data will be made available until encryption or filtering mechanisms are in place.
Industry arrival/departure priorities	Not released outside of FAA Air Traffic Operations

Appendix B

Data Quality Report Card

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 participant. Poor data quality can negatively impact the system by creating inaccurate traffic demand predictions.

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 ETMS 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 ETMS expects to operate, but either never does, or operates well after its ETD. ETMS 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 cancelled by ETMS 90 minutes after its ETD; a flight only with OAG data is time-out cancelled 10 minutes after its ETD. A sample scenario of a time-out cancel is: the participant submits a CDM create message for a flight, does not operate the flight, and never sends a cancel message for a flight. If a participant sends a cancel message for a flight, it will not be considered a time-out cancel. Time-out cancels cause ETMS to over-predict the traffic demand. *For grading purposes, time-out cancels are computed as a percentage of all flights created in the ETMS database for the participant.*
- ***Cancelled-but-flew flights*** – A cancelled-but-flew flight is a flight that the participant cancels but that ends up operating. A sample scenario of a cancelled-but-flew is: the participant sends a CDM create message, files a flight plan, sends a CDM cancel message, and then ETMS gets a departure message for the flight from ATC. If the participant 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 ETMS to under-predict traffic demand. *For grading purposes, cancelled-but-flew flights are computed as a percentage of all flights cancelled by the participant.*
- ***Undeclared flights*** – An undeclared flight is a flight that operates without prior notice to ETMS. The prior notice can be either the flight being in the OAG schedule, or the participant 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 ETMS received of this flight. Undeclared flights cause ETMS to under-predict the demand. *For grading purposes, undeclared flights are computed as a percentage of all of the participant's flights that operate.*

CDM participants will be expected to have no unacceptable 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 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 Assurance resources and the CDM participant to develop plans for improvement.

The report card will be produced monthly and distributed to a designated representative for each airline. Each airline will only be able to receive and view its own data. The data may be distributed to all participants and within the FAA if the data is not directly associated with airlines by name. The metrics are currently tracked on the CDM Data Quality website, so CDM participants can access the website to view data not associated with specific airlines.

Grading Criteria

The grading scheme is based on average performance and variability for each metric across all CDM participants. 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 participants will be advised of any changes in the grading criteria.

APPENDIX C

CDM MEETINGS

The purpose of the CDM planning meetings is to attain an effective and collaborative management of ATM system improvements, enabling the ATFM community to monitor the expected results.

The CDM planning meeting framework will permit the consolidation of tasks to be performed with their corresponding responsible parties, and the follow-up of the results and reports generated.

PLANNING

The following should be taken into account for the implementation of CDM meetings:

1. Develop a strategic plan, agreed amongst the CDM participants. This plan shall include a timetable of activities, and goals.
2. Develop a tactical plan, with short-term goals aligned with the strategic plan.
3. The plan shall include the tasks, broken down for each responsible working group.
4. Each working group shall keep the timetable of activities (progress) up-to-date, and ensure compliance with the strategic plan.
5. Assign work priorities in order to optimise results in terms of the most beneficial efficiency and safety objectives, meeting the needs of the majority of participants.
6. Specify the use of teleconferences for virtual meetings in order to expedite progress on certain topics.
7. Develop a timetable of monthly or biweekly meetings as required.
8. Develop the mechanisms required to conduct effective extraordinary meetings.
9. Adjust the meeting agenda with an established time in advance to allow for the preparation of each meeting.
10. Formalise the decision-making process for the analysis, consideration and approval of proposals.
11. Standardise the reports to be submitted by the working groups.
12. Implement a biyearly meeting to discuss the strategic plan and approve the tactical plan to be developed.
13. Share the lessons learned during the fulfilment of the agreed tasks.
14. Prepare a compilation of tasks for follow-up purposes, containing basically:

- Task reference number.
- Task originator.
- Start date of the task.
- Group responsible.
- Description of the task.
- Sub-task and responsible party.
- Status of development.
- Target date of the task.
- Remarks and links.

For the compilation of tasks, an updating process shall be established and it shall be conducted with a given frequency (for example, every month).