



CDM

Collaborative
Decision Making

CDM General Meeting Summary

May 8th-May 10th, 2012

WELCOME

The 2012 Collaborative Decision Making (CDM) General Meeting was Tuesday, May 8 to Thursday, May 10 at the JetBlue University facilities in Orlando, Florida. CDM Participants were welcomed to the meeting by members of the CDM Stakeholders Group (CSG). Changes made over the past year to the CDM Leadership team were acknowledged and new members were introduced. JetBlue was recognized as graciously hosting the meeting this year. CDM Participants were encouraged to ask questions and make suggestions throughout the week, as CDM is a “we”, not a “me” process.

Welcoming statements by Nancy Kalinowski included the sharing of stories about growing up in Orlando and memories of early flight activities. Significant milestones in aviation have occurred and progress has been considerable. Individuals who have influenced these activities are in attendance. CDM recognizes the need to develop technologies by focusing in not so much of what the tool is; rather how we choose to use it.

Groups represented at the CDM Meeting were identified by Ellen King and included Traffic Management Officers (TMO), who also participated in the TMO training prior to the general meeting, Traffic Managers, Industry Representatives, and NATCA. Furthermore, Ellen recognized the CDM milestones accomplished during the past year. These milestones include the re-structuring of CDM into a business case process, the proud signing of a CDM memorandum by Korean Air, and the establishment of CDM as a global activity. NavCanada is also participating in CDM training activities, the CDM Surface Team (SCT) is assisting the newly established FAA Surface Office, the Weather Evaluation Team (WET) developed multiple aviation weather tools, the Flow Evaluation Team (FET) converted Playbook routes into Required Navigation (RNAV) capable routes and the Future Concepts Team (FCT) became engrossed in activities with the Flight Object.

Mark Hopkins provided additional insight to the accomplishments of CDM and acknowledged considerations for the future. The “Challenge of CDM” is that individuals should always be mindful of methods for enhancing operations and for addressing issues in innovative ways. Participants should always maintain a scope for how policies are driven and activities are managed in the operational world. The National Airspace System (NAS) must be managed dynamically while progressing forward.

Notable CDM Award Presentation

Marshall Mowery was recognized for his outstanding CDM participation and support as the prior SCT FAA Co-Lead. Marshall was presented with an award in acknowledgement of his many contributions to CDM which included participation in developing a written description of Surface CDM requirements, assisting in reducing the number of necessary data elements, working with EuroControl to establish a standard for surface acronyms and collaborating with the Surface CDM team to produce a document for surface metrics.

2012 CDM PRESENTATIONS

FAA Program Management Office (PMO) & Air Traffic Flow Management (ATFM)

A mapping perspective of the Air Traffic Organization (ATO) and activities was provided. The FAA is currently working to navigate the challenge of transitioning from older systems to the

new system. Time Based Flow Management (TBFM) activities were also briefed to include information about the Traffic Management Advisory (TMA) system deployed in 20 Air Route Traffic Control Centers (ARTCCs), 30 Terminal Radar Approach Control Facilities (TRACONS) and 29 Air Traffic Control Towers (ATCTs). The Traffic Flow Management System (TFMS) will enhance data sharing capabilities while assisting the development of Required Navigation (RNAV) procedures and information accessibility for flight trajectory modeling.

CDM Participant Inquiries for TMA:

Q: Will the information regarding TMA delays in addition to Ground Delay Program (GDP) delays be available to users?

A: The data will be published via System Wide Information Management (SWIM) and users will need to determine the mechanism to access the data via a data sharing capability. A suggestion to do this through CDM or SWIM publishing was made. The delivery of all SWIM services is accessible through current hardware used today. The services must be subscribed to; access to surface data information will be similar. The CDM agreement may be re-arranged to increase flexibility in data access and sharing.

Q: What changes to onsite TMA contract support have been made?

A: Onsite TMA support has been downsized to only include the facilities with a need. Re-Architecture developments will identify the remaining facilities that require support. The technical operations training will be amended to have staff fully trained on TMA so that front line support is available.

Q: What is the status on Chicago TMA implementation?

A: The Program Office is ready to work with these facilities and recognize this as a top priority.

Q: Is there a way to provide a replay of 'what-if' screens in TMA?

A: Currently, there are no methods to provide post-analysis in TMA. An engineering tool that will dynamically receive the communication strings and provide 'what-if' analysis is needed. This shortfall has been identified as the next topic to be baselined.

A timeline for Traffic Flow Management (TFM) development was presented. Deployment items consisted of Collaborative Airspace Constraint Resolution (CACR) Phase 1 in May 2012. The R7 Deployment Team will take one day each month to practice and evaluate Trajectory Option Set (TOS) submissions. These evaluations will coincide with the Collaborative Trajectory Options Program (CTOP)/CACR scenarios. CACR Phase 2 will deploy in September 2013. A request for volunteers to assist in testing the Traffic Situation Display (TSD) upgrades was made.

Deployment Team Update

Members from the Work Package 2 & 3 Deployment Team were available to present an overview of the enhancements that will become available in the coming months. TFMS will now accept TOSs and provide the user with constraint information so alternative solutions may be established. The flight operator is able to combine the information with their own preferences and receive an award of routes based on available capacity and projected demand. Multiple

Flow Constraint Areas (FCAs) may be used and future automation will provide additional enhancements to the process.

Collaborative Air Traffic Management Technology (CATMT) Work Package 4

The CATMT Work Package 4 concepts are a testament to what CDM accomplishes toward changing the approach for dealing with traffic management complexities. Currently available tools are not dynamic due to their singular nature. Engineers are evaluating the technologies for methods and capabilities that may be combined to enhance the flow of information. The Work Package 4 development schedule may be found within the full presentation on the CDM website.

Embry Riddle Aeronautical University (ERAU) Next Generation Florida Testbed

A representative of ERAU was present at the meeting to brief CDM Participants of the activities and possibilities of using the Florida NextGen Testbed. The Florida Testbed is a joint business venture of both the FAA and Industry. Current Florida Testbed taskings are labeled A through P and development is completed by individuals working together to determine the best method to solve a problem. Each individual involved understands that an investment will be made and risks will be accepted. Florida Testbed activities are only those at the front end of the development lifecycle. The Florida Testbed may be used to evaluate issues, such as weather constraints or other constraints that affect a flight beyond the 2 minute TMA timeframe. These issues may then be included in a scenario and alternative approaches are provided to the facilitator to make necessary operational changes.

Q: Is there a method to get information into TFMS at the Florida Testbed?

A: Yes, the platform or delivery method must be determined, and then TFMS capabilities may be integrated. TFMS integration could also be incorporated with exploration of integration suite components.

Encouraging Support for CDM and Goals for Operational Improvements

Leadership responsibilities are faced with strategic and tactical opportunities to make decisions and allocate the necessary resources for safe and efficient operations. Leaders must understand what everyone wants or needs and what is important to the operator's business goals.

Office of Environment & Energy

The FAA Office of Environment and Energy is actively participating in TFM areas promoting a reduction in fuel burn and emissions as well as optimizing flights. Their involvement in projects is available in the full presentation located on the CDM website. Furthermore, the Office of Environment and Energy is providing benefit data analysis to the Flow Evaluation Team (FET).

Core Airport Delay Forecast

The Core Airport Delay Forecast is an attempt at predicting system delays. Monthly reports provide information for each selected airport. Certain airports are not represented well, due to the dynamic circumstances involved, which makes overall trends difficult to identify. Items used for delay analysis include the Estimated Time Enroute (ETEs), weather delays, gate-out delays (actual departure time vs. scheduled departure times). Operational assistance is needed to determine the cause of a delay and to better evaluate delay program effectiveness.

Ground Delay Program (GDP) Parameters Selection Model (GPSM) Trial

The GPSM trial is being conducted at San Francisco International Airport (SFO) and involves the integration of probabilistic weather forecast information into Air Traffic Management (ATM) decision making. The SFO web-based Stratus Forecast Product information and FSM data is used to determine GDP parameters. GPSM was tested in 2011 via a shadow demonstration to monitor GPSM recommendations for an SFO GDP. Analysis was performed to evaluate benefits and situations evolving due to the use of GPSM. Operational trials will begin May 2012. The SFO Stratus Forecast Product is available for integration into the CDM decision making process. Users should contact Ed Corcoran or Dan Horton to request additional ATCSCC perspective information.

Q: How was the Human-in-the-Loop (HITL) process handled?

A: The HITL process assisted in understanding the integration of weather forecast modeling. Furthermore, it established the necessity for human interaction with the process. Individual input will determine the value of a situation through identifying the tools appropriate for making decisions. Forecast models are often used for 'typical' events which take place a fraction of the time. Procedures have been integrated into the GPSM tool to identify non-typical events.

Q: What is the difference between High Confidence and Low Confidence levels?

A: The confidence level guidelines are still being determined. Low confidence is used for days that have a weather issue that may make forecasting slightly more conservative. GPSM uses the confidence level assigned to the forecast. The Stratus Forecast Product is stronger after 15Z due to the addition of satellite data and flexible parameters.

Q: What time was the data comparison (see presentation) taken?

A: The actual GDP time on each day was evaluated. GPSM recommendations were reviewed at the exact same time as well as satellite images for 15Z.

Q: What would a revision have done to the forecast?

A: Revision considerations were factored into the modeling process to make the comparison more appropriate and weighted heavier than ground delay minutes.

Additional Comments:

- GPSM should not to be used singularly; it should be used during the decision making process. The use of the primary GPSM recommendation is encouraged to establish the tools accuracy.
- The presentation's identified 'risks' refer to the workload issues of managing traffic loads during the holding example. Pressures on the airport determine the risk.

Miami Center (ZMA)/Jacksonville Center (ZJX) Launch Process

CDM Participants were provided a briefing of the planning process for missile launch activities. These activities are tentatively scheduled and information is provided by Cape Canaveral Mission desk at Miami Center. Jacksonville Center is given a launch count to prepare for quick transitions to the normal route structure. Aircraft with a flight path through the identified launch path are rerouted. To assist in the reroute process a playbook has been established. Additional

information for the ZMA and ZJX collaborative launch process may be viewed in the presentation on the CDM website.

IDEAS FESTIVAL PRESENTATIONS

Equipage Aware CDM

Mark Klopfenstein, Metron Aviation, presented an equipage aware CDM concept outside of the current 'best equipped, best served' viewpoint. The idea considers increasing capacity at certain airports during Instrument Meteorological Conditions (IMC). The data exchange element would be enhanced through CDM messages, which will increase capacity and reduce delays on all users. A CDM Sub-team would need to investigate and understand all the requisite logistics for this concept and establish the workload requirements and understanding toward changes in traffic flow. Ultimately the concept presents a need to identify aircraft capabilities to optimize arrival traffic flows. A suggestion to add equipped slots by removal of unequipped aircraft slots was made. Airport capacity and specific airport procedures would be a consideration.

Q: Has making this concept an FCA based scenario been considered?

A: Yes, near term considerations began with GDP and Flight Schedule Monitor (FSM) based solutions. CTOP or TMA based solutions may also be possible, once these concepts are available.

Q: What do you see as being the pilot issues?

A: Willingness to fly the approach. The data exchange should include information regarding equipage, capability and willingness. Pilot requests for Required Navigation Performance (RNP)/RNAV approaches should always be accepted by controllers. This is the only way to build pilot familiarity with these approaches and to make the transition easier.

Q: Could Performance Based Navigation (PBN) arrival fix be used in the routing?

A: A PBN fix may be a good method for sorting aircraft with the equipage and capabilities i.e. routing the equipped flights over a particular fix.

Social Media for CDM

Katelyn Potts, TASC, and Ron Foley, NATCA, presented an idea that may establish CDM in the world of social media. An initial step towards presenting CDM to social media was suggested to be through a Facebook page. A positive note for this concept is that many CDM participants currently have a personal Facebook page. Other FAA and Industry participant business pages are also currently on the social media site. The Social Media for CDM must be approved by the CSG prior to the concept being further developed and implemented. The full presentation may be found on the CDM website.

Delay Program 'Gotchas'

Pat Somersall, FAA, presented a collection of under-delivery issues and concerns that have been voiced through collaboration. In order to avoid these issues, individuals must review all available information to include revisions and updates. The operational decisions made will affect revisions and potentially create under-delivery circumstances. The delay program algorithms cannot be altered when the flight operator sets low delivery preferences. Users must understand how the tool is operated and what it should be used for. To aid in this understanding

the TFMS Auxiliary Platforms (TAPs) CDM Sub-team has developed realistic scenarios. These scenarios will be validated and presented to the CSG for approval. Once approved, the scenarios will be uploaded to the CDM website for the CDM community to review and use solely for testing purposes.

Collaborative Trajectory Options Program (CTOP) Scenario Discussion

Pat Somersall, FAA, and Don Wolford, United, briefed CDM Participants on updates to the CTOP development and implementation. The data stream for CTOP coordination is now open and scenarios must be made available to test, train and provide potential functionality information. A request for scenario ideas may be made to Pat or Don. The Interface Control Document (ICD) for CTOP may be found on the CDM website in addition to the 2011 TFM Industry day presentations. The CTOP deployment date and ICD information has been available to CDM Participants for over a year. CTOP will deploy in September of 2013. Operators will need to establish CTOP capabilities, for example, subbing capabilities. If these provisions have not yet been made or are not established as of September 2013, operations will continue as normal with an Estimated Departure Clearance Time (EDCT) assignment. CTOP benefits are recognized with participation of at least one carrier; however, if no carriers are willing to use CTOP, Airspace Flow Programs (AFPs) will be used.

The changing demand at the sector level will be managed tactically through knowing the trajectory by use of CTOP. The route assignments are based on flight operator preferences. Intent information is provided early and an understanding of planning primary routes and alternative routes for gate balancing is available. CTOP will provide the traffic manager with the understanding that the operator is able to take the suggested route. The route becomes frozen one hour prior to P-time; however, acceptance of the possibility of additional ground delay would make amendments to TOS options possible after submission. Flight plans will not be altered. The TOS is submitted as a separate option and the route assignment is provided as early intent information that may be entered into the flight plan. Route awards will drive information provided by Monitor Alert.

Questions:

- How or when do you apply the CTOP Traffic Management Initiative (TMI)?
- How will the secondary constraints, created when flights are moved from the primary constraint area, be managed?
- How long must the operator wait to be provided a route? (ex. AZUZU alternative)

Additional Comments:

- Space launch procedures seem like an ideal situation for CTOP. The CTOP scenario list should include this type of application.
- International arrivals are exempt, which is similar to current GDP operations.
- An arrival scenario may include the variation of use cases for mitigating Miles-in-Trail (MIT) through the use of TMA.
- The capacity limit will define the control time period and set the route allocation process, which will mitigate creating additional demand.
- The training process and understanding toward CTOP procedure transition will be thoroughly assessed.

SUB-TEAM INTRODUCTORY BRIEFINGS

Each CDM Sub-team was asked to present a briefing of team taskings and concepts being developed through team member collaboration. Five CDM Sub-teams provided a fifteen minute presentation. Following the briefings, individuals were invited to breakout meeting rooms to receive additional information and participate in discussions. The presentations may be found on the www.flycdm.org website. A synopsis of each briefing is below:

The **Future Concepts Team (FCT)** is providing operational Subject Matter Expertise (SME) to the FAA AJV-7 teams developing the Flight Object (FO) concept, National Airspace System (NAS) Common Reference (NCR), Unified Flight Planning and Filing (UFPF), and TMI Cubed concepts, to list a few. The FCT has been collaborating to assist in building the incremental steps toward the desired end state for each of the activities listed. An exploration of concepts and procedures is taking place to provide a thorough set of scenarios that will aid in continued development.

The **Flow Evaluation Team (FET)** is developing a Required Time of Arrival (RTA) Concept of Operations (ConOps) that is theorized to help decrease the gap between TMA and TMI delays. Methods for measuring capacity during an AFP are also being discussed and recorded in a ConOps. The FET has also developed thirteen new RNAV Playbooks; three more than the tasking requirement. Discussions surrounding Overnight/Extended Planning methods also remain an FET tasking item.

The **Surface CDM Team (SCT)** has been assisting the FAA Surface office in scenario development based off the SCT ConOps for a new surface tool. Human-in-the-Loop (HITL) testing will begin in June 2012. The SCT has identified a selection of airports, with assistance from FAA recommendations, to be used in scenario development. The use of a surface tool at these airports has been identified through collaboration of industry representatives and FAA employees. A storyboarding process was used to develop a single delivery platform tool. The SCT is currently determining five new data elements to be utilized in surface movement projections.

The **Weather Evaluation Team (WET)** has provided input to many new tools being developed and used by aviation facilities. The National Weather Service (NWS) is currently using the Extended Area Forecast Product that was recently developed and implemented. The Aviation Winter Weather Dashboard (AWWD) was also produced and provides a rough estimate of the impact of winter weather. The WET will participate in HITLs during June 2012 which will showcase the Operational Bridging (OB) concept being developed. A live OB evaluation is planned to commence in mid-July.

The **CDM Training Team (CTT)** provided an update to the success of the FAA's 50113 class, which provides insight to FAA activities with TFM to a selection of FAA employees and contractors. This year seven classes were offered and due to the success and response, additional classes for 2013 have been requested. Next year's classes will begin in November 2012 at the ATCSCC. Participation must be requested and approved. Furthermore, an FAA Management

class offering is being considered. The TFM webpage has been redesigned to include Unified Delay Program (UDP) information.

FUTURE MEETING DATES

October 22-26, 2012 End-of-Season Review and Fall CDM Meeting

Location: TBD (either MITRE or Xerox Building)

November 14-15, 2012 TFM Program Office Industry Day

The 2013 CDM General Meeting will be in the spring of 2013. A request for volunteers to host the meeting was made. Meeting hosts would need to guarantee a space large enough for 200-250 participants as well as 4-5 breakout rooms.