Operational Bridging Dry Run Plan: Aviation Weather Statement

Version 3.0

May 23, 2012

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1 Introduction

1.1 Background

The Collaborative Decision Making (CDM) Weather Evaluation Team (WET) is tasked with investigating the feasibility of extending Collaborative Convective Forecast Product (CCFP) forecasts out to eight hours, and with evaluating and recommending convective forecast products suitable for use in both short and long range Traffic Flow Management (TFM) planning activities. While working to complete this task, it became clear to the WET that air traffic management (ATM) decision makers were often required to decide which available but dissimilar thunderstorm forecast products to consider before devising appropriate mitigation strategies.

In part to help resolve this problem, the WET introduced the concept known as Operational Bridging (OB). OB is a set of focused weather forecast processes, predefined engagement protocols between meteorologist and ATM decision maker and effective communications methods and tools. The overarching goal of OB is the accelerated transition of aviation weather constraint forecasts from probabilistic to near-deterministic, enabling TFM decision makers to more effectively devise and refine ATM strategies. To achieve this goal, the OB meteorologist will necessarily be required to reconcile any differences between forecast products, thus resolving the dissimilar forecast product problem for the ATM decision makers.

A key output of the OB process is a collaborated, event based forecast product called the Aviation Weather Statement (AWS). For convective weather, the WET believes that the AWS could be considered the natural evolution of, and eventual replacement for, the CCFP. In addition, the AWS is in line with the Next Generation Air Traffic System (NextGen) concepts of the Single Authoritative Source (SAS) forecast and the human-over-the-loop forecast process with automated convective forecasts.

The WET will be using a phased approach to introduce and demonstrate the capabilities of OB processes and the AWS. The first phase, called the OB Dry Run, will take place at the National Weather Service (NWS) Aviation Weather Center (AWC) and be a featured component of the 2012 AWC Summer Experiment. The results from the OB Dry Run will feed both a limited OB Operational Demonstration in the summer of 2012 and a more comprehensive OB Operational Evaluation during the 2013 convective season.

1.2 Purpose

The purpose of this OB Dry Run Plan is to describe the various activities and interactions required prior to and during the OB Dry Run, the testing to be accomplished, organizational responsibilities, activities and process, execution strategy, and how the results will be reported.

2 Reference Documents

The following documents provide additional information on OB, the AWS, and future plans beyond the OB Dry Run.

2.1 FAA Documents

Document Title
Collaborative Decision Making Convective Weather Forecast "Operational Bridging" Concept of Operations

2.2 NWS Documents

Document Title
Aviation Weather Statement Description Document
AWC Testbed Experiment Plan
National Aviation Meteorologist ConOps
National Aviation Meteorologist Implementation Plan

3 Operational Bridging Dry Run

3.1 Overview

The OB Dry Run is a two week demonstration of the core concept of, and processes associated with OB, which was first proposed by the CDM WET in the fall of 2010. It will take place at the National Oceanic and Atmospheric Administration (NOAA) NWS AWC in Kansas City, MO during the AWC's Aviation Weather Testbed (AWT) Summer Experiment, which will run for a two week span, Monday through Friday from June 4-15, 2012.

The primary purpose of the OB Dry Run is to validate core OB processes, including creation of the primary OB product, the AWS. This will be accomplished in part by demonstrating that the AWS can be technically produced, externally disseminated, and widely understood by users. Figure 1 below lays out the OB process diagram. Lessons learned from the OB Dry Run are expected to lead to further refinement of components of this process, which will then be used in the OB Operational Demonstration and OB Operational Evaluation moving forward.

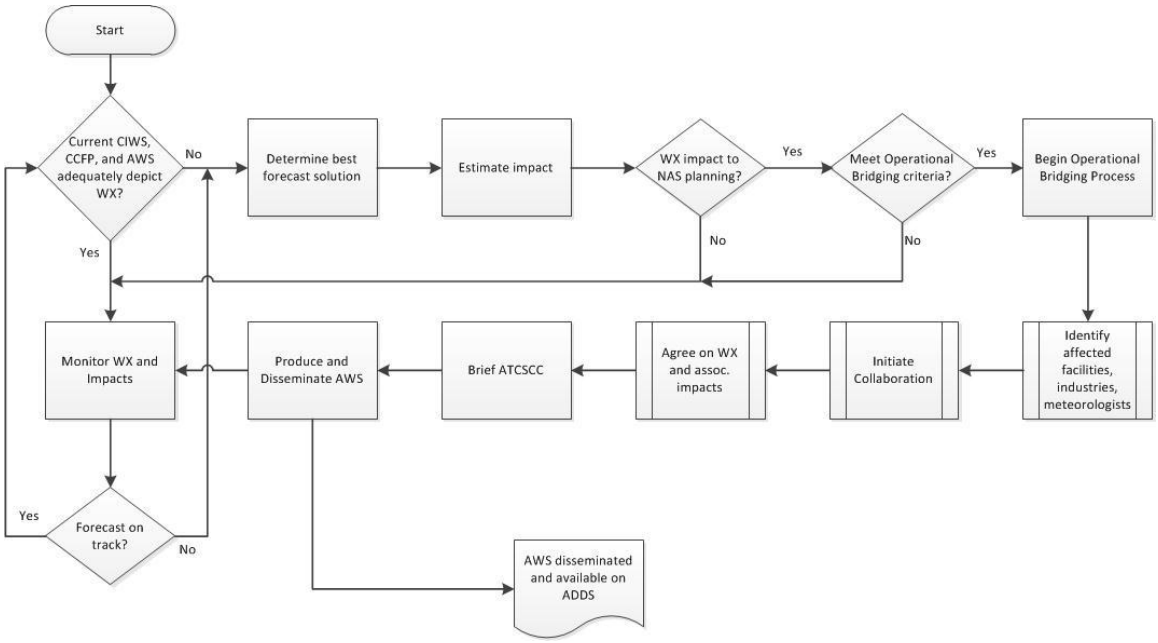

Figure 1 – Operational Bridging Process Diagram

3.2 Operational Bridging Meteorological Collaboration

A key component of the CDM is decisions and inputs to decisions are collaborated in a public form, where all CDM participants have equal and transparent access. In keeping with the spirit of CDM, the core of OB is collaboration. Event-driven collaboration can be initiated by any CDM participant. Collaboration will utilize the NWSChat collaboration chat system available to registered users at https://nwschat.weather.gov/. A private chat room named 'awschat' will be accessible only to CDM Operational Bridging participants. Detailed instructions on registering and accessing NWSChat can be found in Appendix F.

3.3 Aviation Weather Statement

3.3.1 Aviation Weather Statement Scope and Issuance Criteria

The AWS is a textual and graphical forecast product disseminated to TFM planners concerning weather constraints that are deemed critical to ATM decisions. The product is created and disseminated on an unscheduled basis and is collaborated

among meteorologists from all stakeholder groups. An AWS will generally be issued 0-4 hours ahead of an anticipated convective impact.

Both the criteria used to start the OB process and the format of the AWS is expected to evolve during the initial phases of testing (i.e. OB Dry Run, OB Operational Demonstration, and OB Operational Evaluation). With the exception of the conditions used to begin OB for convective activity expected to impact the New York Metroplex airports and associated critical airspace, neither OB initiation criteria nor AWS format will be rigidly defined during the OB Dry Run. This has been purposely done to encourage and enable the discovery of appropriate OB initiation thresholds and effective AWS formats, both of which will then be used in future OB evaluations and the expected end state of OB and the AWS.

The following paragraph, applicable to OB in general and the OB Dry Run in particular, contains guidelines concerning when the OB process should be started (possibly resulting in the issuance of an AWS) for convective activity which may produce significant impact to critical airports or airspace.

In order to provide Federal Aviation Administration (FAA) and industry decision makers with information needed to make effective and timely ATM decisions, OB should be initiated, and an AWS issued, for thunderstorm-related events which fall into one or more of the following four categories:

1. Timing of initiation and/or cessation of expected high impact convective activity
2. High impact convective weather is not active and (official) forecast(s) (which predicted convective activity) are not verifying
3. High impact convective weather is active and (official) forecast(s) (which did not predict convective activity) are not verifying
4. High impact convective weather is active and some but not all forecasts are verifying

With the exception of the conditions used to begin OB for convective activity expected to impact the New York Metroplex airports and associated critical airspace (listed in Appendix B), the criteria noted above will be used as a baseline to begin OB and potentially issue an AWS regardless of geographical location.

Because the OB Dry Run represents the first attempt at using OB in a live environment, every attempt will be made to limit the use of OB, including AWS production, to significant NAS impacts associated with forecast or actual convective activity. However, if actual weather conditions during the two week OB Dry Run do not produce sufficient convection to allow proper testing of the process, OB use and

AWS production may be expanded to include any weather constraint that has the potential to cause a level of impact that meets or exceeds a threshold considered significant by the duty OB Meteorologist. Feedback from OB Dry Run activities will be used subsequently to help refine OB use/AWS issuance criteria for future demonstrations and the end state of OB.

3.4 Phases of the Dry Run

The OB Dry Run will be conducted in two phases. The first phase will be a quantitatively-oriented capabilities demonstration intended to verify that it is technically possible to perform OB and produce and disseminate the AWS. The second phase of the OB Dry Run will qualitatively focus on the OB process and the production of the AWS, specifically assessing the suitability and effectiveness of each in a non-operational environment. Each of the phases is described below.

3.4.1 Phase 1: Capability Demonstration (Days 1-2)

3.4.1.1 Phase 1 Objectives

The goals of Phase 1 of the OB Dry Run are as follows:

a. Verify the technical capability to perform OB and produce and disseminate AWS in accordance with format and criteria set by the CDM WET.
b. Confirm that external users can access the AWT website and see/use AWS graphic and text.

3.4.1.2 Phase 1 Approach

Phase 1 will be conducted during the first two days of the OB Dry Run. The first phase will verify that it is possible to technically perform OB and produce and disseminate the AWS. The AWC will provide the OB Dry Run team with a forecast desk equipped with access to weather observation and forecast data along with the platform(s) to generate the AWS.

OB Dry Run participants will include CDM WET members as well as other airline and air traffic operational users. Participants will be grouped into teams prior to the start of the OB Dry Run. Each team will consist of at least one forecaster, operational user and evaluator/observer. If possible, each team will have a remote member who will be located at an operational facility. OB Dry Run teams will execute the OB process as defined in the CDM Convective Weather Forecast Operational Bridging Concept of Operations document and as displayed in Figure 1. Since the purpose of Phase 1 is to test the technical capabilities of the process and the systems being used, OB will be initiated multiple times, using either expected or hypothetical weather conditions. Each instance of OB will include meteorological community collaboration and, as appropriate, the creation and transmission of a related AWS using the agreed-upon system.

The specific capabilities that will be demonstrated during the OB Dry Run Phase 1 include the following:

a. Production and dissemination of the AWS
    1. Ensure text and graphics appear as prescribed on the AWT web page
    2. Ensure numbering and date/time stamping are correct
    3. Ensure dissemination of AWS is successful
    4. Ensure previously issued AWSs can be amended, corrected and/or cancelled
b. Verification of the OB Process
    1. Ensure NWS Chat software is functioning and viable for OB process
    2. Ensure OB Meteorologist collaboration notification process is successful
    3. Ensure collaboration within the meteorologist community is successful
c. Verification of external user access to AWT site and access to AWS
    1. Ensure users can view both graphic and text
    2. Ensure current (vs. previous) AWS can be identified
d. Verification of the AWS archive capability and access to archived AWSs (from previous day)

Remote team members will play a key role in step c, verification of external user access. Evaluators will observe activities conducted during Phase 1 of the OB Dry Run and document outcomes and issues using the OB Dry Run Procedures Log located in Appendix C. Data from this log will be collated and reviewed prior to the start of Phase 2.

3.4.1.3 Phase 1 Activities

The following activities will be completed prior to the start of the OB Dry Run Phase 1:

a. WET members and operational users will confirm participation in the OB Dry Run.

b. OB Dry Run teams will be developed and scheduled for participation.

c. OB Dry Run platform training material will be developed and provided to participants at the start of the OB Dry Run.

d. AWC 2012 Summer Experiment personnel will provide a list of equipment/systems/ data that will be available at the OB Dry Run desk.

e. OB Dry Run Procedures log will be verified and approved for use.

f. Hypothetical weather scenarios will be developed and used if forecast weather conditions are not conducive to multiple tests of the OB process and issuances of the AWS

The following activities will be completed during the OB Dry Run Phase 1:

a. OB Dry Run participants will receive team assignments*

b. OB Dry Run participants will receive any required training (e.g., AWS generation software, NWS Chat, data platforms)*

c. OB Dry Run teams will conduct the OB process and generate/disseminate an AWS in accordance with the OB ConOps

d. Specific technical/software/communications capabilities will be demonstrated and verified in accordance with the OB Dry Run Procedures Log found in Appendix B – Aviation Weather Statement Issuance Criteria

Targeted Impact Area

New York Metroplex Airports (Newark [EWR], Kennedy [JFK], LaGuardia [LGA] and Teterboro [TEB]) and their associated arrival and departure routes

Targeted Weather Constraint

Thunderstorms

Issuance Criteria

An AWS will be issued under the following conditions:

1. During high demand hours (0800 – 1600 CDT), thunderstorm activity (i.e., lightning is present, echo tops of any height) is expected (high confidence) to develop or move into the New York Metroplex Convective Area of Concern within the next four hours, or is occurring and was not forecast.

2. During high demand hours (0800 – 1600 CDT), thunderstorm activity that was forecast to occur in the New York Metroplex Convective Area of Concern within the next four hours is no longer expected.

3. During high demand hours (0800 – 1600 CDT), thunderstorm activity occurring in the New York Metroplex Convective Area of Concern is expected (high confidence) to cease one or more hours earlier than previously forecast.

4. There are conflicting (probability of occurrence, timing, coverage, severity) thunderstorm forecasts for the New York Metroplex Convective Area of Concern during the high demand hours of 0800 – 1600 CDT. The AWS is issued to provide clarification, and is considered the Single Authoritative Source (SAS) forecast for the purpose of TFM decision making.

Definition – New York Metroplex Convective Area of Concern

The New York Metroplex Convective Area of Concern is a combination of a 150NM circle centered on JFK, that portion of the New York Air Route Traffic Control Center (ARTCC) (ZNY) airspace that is more than 150NM from JFK, that portion of the Cleveland ARTCC (ZOB) that is east of the western Pennsylvania state border line and the imaginary extension of that border line north and south, and that portion of the Washington ARTCC (ZDC) north of Flow Constrained Area (FCA) A08. The red outlined/red shaded area in Figure B1 below depicts the New York Metroplex Convective Area of Concern.

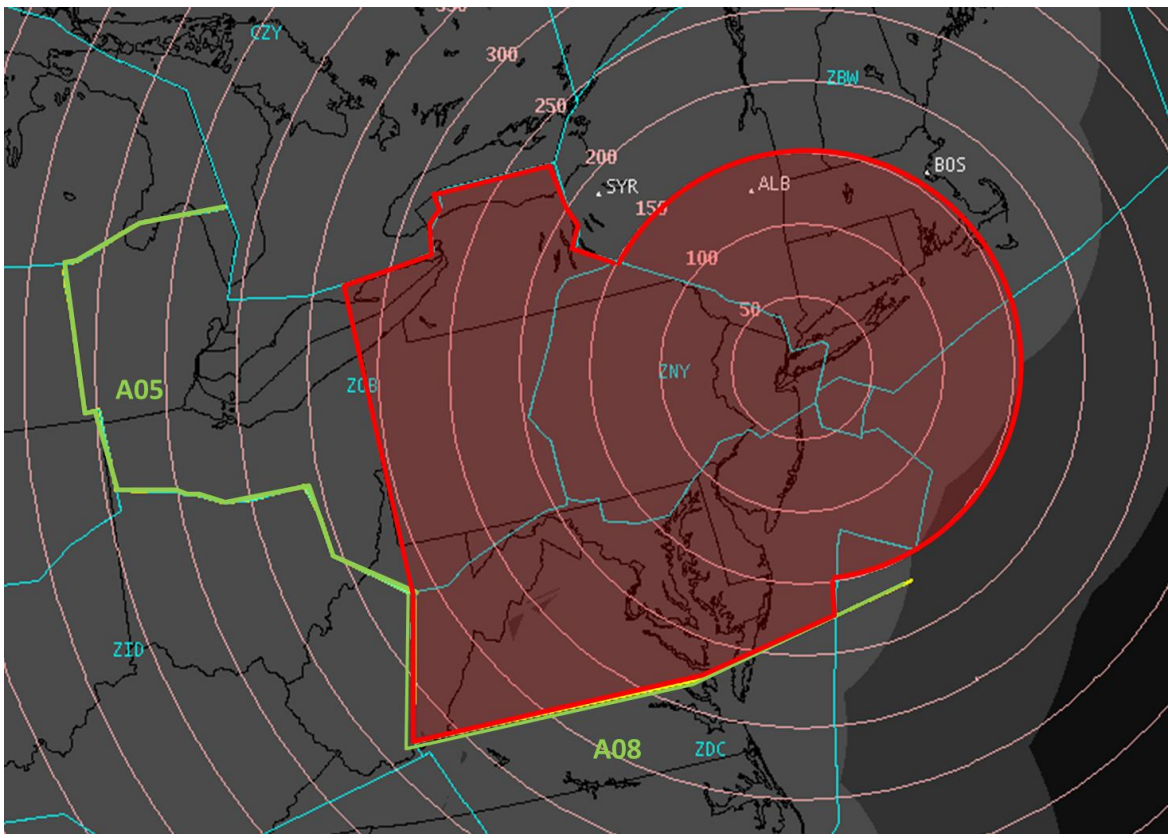

Figure B1 – New York Metroplex Convective Area of Concern (red outlined/red shaded area)

Discussion – New York Metroplex Convective Area of Concern

The arrival and departure routes used by aircraft flying to and from the New York Metroplex airports (EWR, JFK, LGA, TEB) are characterized by high traffic density and route complexity. Thunderstorms in the vicinity of these routes can cause a level of impact comparable to that felt when the same thunderstorm is located near the airport areas

themselves. Most air traffic flying to and from the New York Metroplex airports transit ZOB, ZDC or ZNY airspace. Consequently, in addition to the airspace immediately surrounding the four major New York airports, it is considered standard TFM practice to focus on the eastern portion of ZOB airspace, ZNY airspace and the northern portion of ZDC airspace when assessing the potential impact of thunderstorms on air traffic destined for or originating in one of the New York Metroplex airports.

e. **Appendix C**

f. Outcomes and issues will be documented and reviewed, with mitigations and resolutions discussed and implemented as appropriate

* Note – to the extent that circumstances allow, both a. and b. will be accomplished prior to the start of the OB Dry Run.

3.4.2 Phase 2: Operational Dry Run (Days 3-10)

3.4.2.1 Phase 2 Objectives

The goals of Phase 2 of the OB Dry Run are as follows:

a. Qualitatively validate and assess the OB process.
b. Obtain feedback from ATM decision makers on the usability, format, content and value of the AWS.

3.4.2.2 Phase 2 Approach

Phase 2 will be conducted during the final eight days of the OB Dry Run. The focus of Phase 2 will shift from demonstrating the technical aspects of the OB process to the qualitative ones, specifically assessing the suitability and effectiveness of the OB process and the AWSs in a non-operational environment.

OB Dry Run team members with experience as aviation meteorologists will staff the OB Dry Run demonstration desk each day between 8:00 A.M. and 4:00 P.M. central daylight time (CDT) in the capacity of OB Meteorologist. The OB Meteorologist will be responsible to use the OB process (including issuing the AWS if appropriate) throughout the day, using defined OB process initiation criteria when appropriate and AWS issuance criteria and format. Each AWS will be externally available on the AWT website. To the extent that circumstances allow, collaboration using the designated system (e.g., NWSChat) will be done live with at least AWC meteorologists working the CCFP desk and the National Aviation Meteorologist (NAM) on duty at the FAA Air Traffic Control System Command Center (ATCSCC). Other remote team members will participate in this meteorological collaboration as they are available. OB Dry Run team members with ATM experience (e.g., FAA ATC/TFM and airline

operations and operational control personnel) will review the AWS and provide feedback regarding the utility and suitability of the product for ATM decision making.

Feedback from team members will be recorded using observation logs and questionnaires. The designated evaluator/observer will be responsible for documenting all feedback during Phase 2.

3.4.2.3 Phase 2 Activities

Specific activities that will take place during OB Dry Run Phase 2 include the following:

a. Maintain OB Met Watch (top row and left column of Figure 1)
    1. Identify NAS resources currently affected, or expected to be affected, by weather constraints
        i. Coordinate with the CCFP desk (pre-CCFP chat)
        ii. Participate in CCFP chats
        iii. Participate in appropriate scheduled and ad hoc FAA Strategic Planning TELCONs
    2. Determine if current or expected weather conditions and traffic levels are likely to result in impact levels which meet or exceed existing OB initiation criteria for identified high impact areas
        i. Look for the presence of "impact enhancers", weather conditions which might cause even greater impact than that associated with the primary impacting weather constraint (e.g., gusty surface winds, low ceilings and visibility, icing, turbulence or low level wind shear expected to occur along with strong convective activity, the primary impacting condition)
        ii. Use available translated weather products (e.g., Aviation Impact Guidance for Convective Weather [AIGCW]) for interpretation consistency
        iii. Consider secondary impacts based on existing or anticipated Traffic Management Initiatives (TMIs)
    3. Analyze current weather forecasts and expected weather for identified high impact areas
        i. Evaluate the various forecasts (e.g., CIWS/CoSPA, CCFP, LAMP, TAF, existing AWS and others for convection) for consistency

        ii. Compare the forecasts as a group against the expected weather for the identified high impact areas
    4. Determine if forecast inconsistencies or difference between the forecasts as a group and the expected weather warrant initiation of the operational bridging process
b. Create and Communicate Operational Bridging Products (middle row and bottom cell of Figure 1)
    1. Identify affected FAA facilities (e.g., Air Route Traffic Control Centers [ARTCCs], Terminal Radar Approach Control facilities [TRACONs], Air Traffic Control Towers [ATCTs]), industry organizations (e.g., airlines, industry trade groups) and forecast offices (e.g., Center Weather Service Units [CWSUs], National Aviation Meteorologist [NAM], airline weather units)
    2. Initiate collaboration among affected weather forecast offices/units
        i. To the extent that circumstances allow, collaboration will be done live with at least AWC meteorologists working the CCFP desk and the NAM on duty at the FAA ATCSCC
    3. Reach consensus on weather forecast and associated impact
    4. Record consensus weather forecast and associated impact information in AWS Convey weather forecast and associated impact information via AWS and/or briefing(s)
        i. For the purposes of the OB Dry Run and to the extent that circumstances allow, once the AWS is "issued", the OB meteorologist will brief, at a minimum, the ATCSCC National Operations Manager (NOM) via telephone

During these activities, designated evaluators/observers will utilize observation forms to document all aspects of the OB process and creation of the AWSs during Phase 2. Questionnaires will be issued to team members upon completion of their participation in the OB Dry Run. The questionnaire will focus on the utility, usability and perceived value of the OB process and resulting AWS.

3.4.2.4 Phase 2 Evaluation and Analysis Tools

Questionnaire

During Phase 2 of the OB Dry Run, a questionnaire will be used to assess participants' perceptions of the utility, suitability, and effectiveness of the OB Process and the AWS. It includes questions about participant perceptions of the product presentation, forecast length, update rates for strategic planning horizons, utility of forecast information for specific planning tasks, and other general perceptions. The five point scale used in the questionnaire is defined as follows:

5. Very Effective. This response indicates that the forecast being rated provides aviation planners exceptional support for strategic planning in response to convective weather.

4. Somewhat Effective. This response indicates that the forecast being rated provides aviation planners sufficient support for strategic planning in response to convective weather.

3. Borderline. This response indicates that the forecast being rated is neither effective nor ineffective in providing aviation planners support for strategic planning in response to convective weather.

2. Somewhat Ineffective. This response indicates that the forecast being rated does <u>not</u> provide aviation planners much support for strategic planning in response to convective weather.

1. Very Ineffective. This response indicates that the forecast being rated impedes aviation planners in strategic planning in response to convective weather.

0. Not Applicable (N/A). This response indicates that the feature or capability in question does not apply to the system.

In addition, the questionnaire provides space to document comments from operational evaluation participants. The questionnaire is located in

Appendix **E**.

Observation Log

The observation log will be used to document outcomes of Phase 2. The designated evaluator/observer will use the log while Phase 2 is in progress to note any issues, concerns and successes during the OB Process and AWS creation. The log is located in Appendix D.

3.5 Participants

3.5.1 Evaluation Management Perspective

With the various management groups that will be participating in the Dry Run, it is important to note what each organization/group is responsible for. The list below describes the roles and responsibilities of each organization.

- AWC – The AWC will be the host of the summer experiment and with that they will be responsible for providing the facility, hardware, and software that will be needed to perform the OB Dry Run. This will include the collaboration tool, the software to produce the AWS, a desk and hardware/software for both meteorologists and air traffic personnel. The AWC will also provide the website, fax machines, and phones for AWS dissemination purposes.

- WET – The WET will be responsible for staffing the WET desks at the AWC. The desks will consist of a combination of air traffic personnel and meteorologists. Since the WET is staffing those two desks, it is inherent that the WET will be responsible for demonstrating hardware/software capabilities, producing AWSs, and recording the results.

3.5.2 Participant Roles and Responsibilities

The technical proficiencies and backgrounds of the expected participants are similar in both Phase 1 and Phase 2 of the OB Dry Run. Their roles will be dependent on the phase that is being worked. **Error! Reference source not found.** below highlights the participants and associated roles during phase 1 and phase 2 of the OB Dry Run. On-site refers to participants that will be physically located at the AWC during the OB Dry Run.

Table 1—OB Dry Run Participants and Roles

Participant	Level of Participation	Phase 1 Role	Phase 2 Role
On-site Meteorologist	Phase 1 and 2	Coordinate, collaborate, create, and disseminate AWS	Coordinate, collaborate, create, and disseminate AWS for areas where meteorological activity is expected to impact the NAS
Off-site Meteorologist (NAMs, Industry Mets)	Phase 1 and 2	Assist with demonstrating capabilities of the collaboration tool; ensure that adequate collaboration can occur	Collaborate on AWS for areas where meteorological activity is expected to impact the NAS
On-site Airline/Air Traffic Operational Users	Phase 1 and 2	Ensure AWS appear in the correct locations and format as designated	Evaluate AWS when released; examine content, usability, and structure
Off-site Airline/Air Traffic Operational Users	Phase 2	N/A	Evaluate AWS when released; examine content, usability, and structure. Reflect on impact AWS would have on operations

3.5.3 Participant Training

The majority of the training material for the OB Dry Run is contained within this document. All participants should read through this Plan and other related OB documents (see section 2) to become familiar with the OB process and particularly the AWS. At least two weeks prior to the OB Dry Run the AWC will release a training package that will include information on the system(s) that will be used to create the AWS and on the collaboration tool. It is important that participants read through the training material to become familiar with the tools that will be used for the OB Dry Run. A training PowerPoint presentation will also be released prior to

the OB Dry Run to provide participants with some brief knowledge on OB and what can be expected from the Dry Run.

4 Post-Demonstration Activities

4.1 Weather Evaluation Team Meeting

During the final three days of the OB Dry Run, June 13-15, the WET will conduct its regular quarterly meeting at the AWC. A significant portion of this meeting will be used to review the outcomes and lessons learned from the OB Dry Run. Although the WET will be meeting, it is still expected that the WET desks will be staffed and continue to use the OB process and issue AWSs as prescribed in this document. The WET will go over the checklists in Appendix B – Aviation Weather Statement Issuance Criteria

Targeted Impact Area

New York Metroplex Airports (Newark [EWR], Kennedy [JFK], LaGuardia [LGA] and Teterboro [TEB]) and their associated arrival and departure routes

Targeted Weather Constraint

Thunderstorms

Issuance Criteria

An AWS will be issued under the following conditions:

5. During high demand hours (0800 – 1600 CDT), thunderstorm activity (i.e., lightning is present, echo tops of any height) is expected (high confidence) to develop or move into the New York Metroplex Convective Area of Concern within the next four hours, or is occurring and was not forecast.

6. During high demand hours (0800 – 1600 CDT), thunderstorm activity that was forecast to occur in the New York Metroplex Convective Area of Concern within the next four hours is no longer expected.

7. During high demand hours (0800 – 1600 CDT), thunderstorm activity occurring in the New York Metroplex Convective Area of Concern is expected (high confidence) to cease one or more hours earlier than previously forecast.

8. There are conflicting (probability of occurrence, timing, coverage, severity) thunderstorm forecasts for the New York Metroplex Convective Area of Concern during the high demand hours of 0800 – 1600 CDT. The AWS is issued to provide clarification, and is considered the Single Authoritative Source (SAS) forecast for the purpose of TFM decision making.

Definition – New York Metroplex Convective Area of Concern

The New York Metroplex Convective Area of Concern is a combination of a 150NM circle centered on JFK, that portion of the New York Air Route Traffic Control Center (ARTCC) (ZNY) airspace that is more than 150NM from JFK, that portion of the Cleveland ARTCC (ZOB) that is east of the western Pennsylvania state border line and the imaginary extension of that border line north and south, and that portion of the Washington ARTCC (ZDC) north of Flow Constrained Area (FCA) A08. The red outlined/red shaded area in Figure B1 below depicts the New York Metroplex Convective Area of Concern.

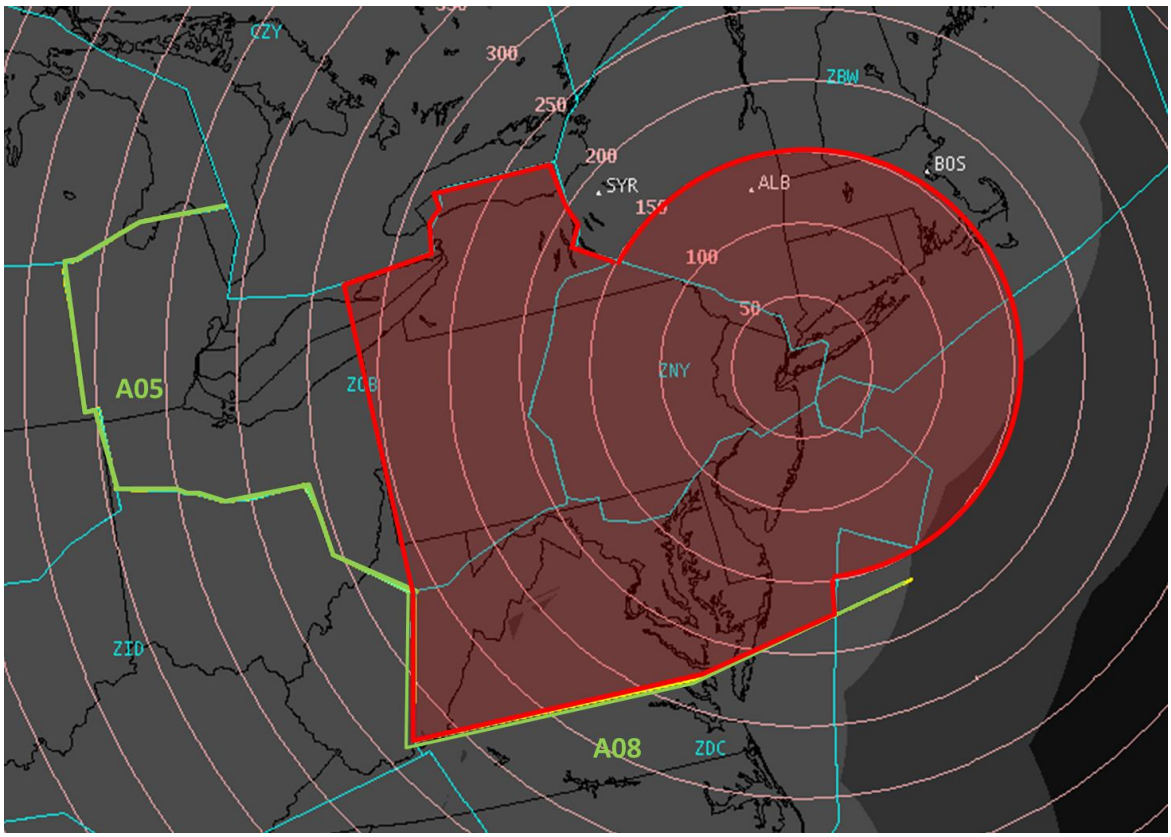

Figure B1 – New York Metroplex Convective Area of Concern (red outlined/red shaded area)

Discussion – New York Metroplex Convective Area of Concern

The arrival and departure routes used by aircraft flying to and from the New York Metroplex airports (EWR, JFK, LGA, TEB) are characterized by high traffic density and route complexity. Thunderstorms in the vicinity of these routes can cause a level of impact comparable to that felt when the same thunderstorm is located near the airport areas themselves. Most air traffic flying to and from the New York Metroplex airports transit ZOB, ZDC or ZNY airspace. Consequently, in addition to the airspace immediately surrounding the four major New York airports, it is considered standard TFM practice to focus on the eastern portion of ZOB airspace, ZNY airspace and the northern portion of ZDC airspace

when assessing the potential impact of thunderstorms on air traffic destined for or originating in one of the New York Metroplex airports.

Appendix C and Appendix D , and engage in discussions regarding what specifically needs to be adjusted heading into the Operational Demonstration in July. The following topics are expected to be discussed at length during this meeting:

- Technical capabilities
  - Was collaboration tool adequate?
  - Was AWS produced and disseminated?
- OB Initiation and AWS Issuance Criteria – Convective Weather Constraints
  - For New York Metroplex and related airspace
  - For other Core airports
  - For other critical NAS airspace
- OB Initiation and AWS Issuance Criteria – Non-Convective Weather Constraints (if appropriate)
- Translation of AWS to other weather parameters

4.2 Post OB Dry Run Report

Incorporating the results from the OB Dry Run, the WET will develop a post-Dry Run report highlighting the Dry Run activities, areas of success, findings, and lessons learned. The report will be completed and delivered to the CDM community as soon as possible and, in any case, no later than the start of the OB Live Demonstration in mid-July. Information from the report will feed Operational Demonstration planning that will commence immediately following the OB Dry Run. The report will include the following information:

- Overview of results/successes
- Completed pass/fail logs from Appendix C and Appendix D
- Lessons learned
  - From AWSs issued for convective activity in NY Metroplex
  - From AWSs issued for convective activity outside NY Metroplex
  - From AWSs issued for other meteorological parameters
- Suggested refinements to OB and the AWS
- List of actions that need to be completed before Operational Demonstration

5 Schedule

Provided below is a high level schedule highlighting the expected WET activities and associated dates for 2012-2013.

ID		Task Name	Duration	Start	Finish
1		WET Meeting at the ATCSCC	3 days	Wed 2/8/12	Fri 2/10/12
2		Development of Dry Run Demonstration Plan	55 days	Mon 2/13/12	Fri 4/27/12
3		Release Draft Dry Run Demonstration Plan to WET	1 day	Mon 4/30/12	Mon 4/30/12
4		WET CDM Meeting	4 days	Tue 5/8/12	Fri 5/11/12
5		Revision of Dry Run Demonstration Plan (as needed)	10 days	Mon 5/14/12	Fri 5/25/12
6		Release Final Version of Dry Run Demonstration Plan	1 day	Mon 5/28/12	Mon 5/28/12
7		**AWC Testbed Experiment and WET Dry Run**	**20 days**	**Mon 6/4/12**	**Fri 6/29/12**
8		Days 1-2 (Capability Demonstration)	2 days	Mon 6/4/12	Tue 6/5/12
9		Days 3-10 (Operational Dry Run)	5 days	Wed 6/6/12	Tue 6/12/12
10		WET Meeting	3 days	Wed 6/13/12	Fri 6/15/12
11		Post Dry Run Findings Report	10 days	Mon 6/18/12	Fri 6/29/12
12		WET Dry Run Complete	0 days	Fri 6/15/12	Fri 6/15/12
13		Revise 2012 Operational Demonstration Plan	10 days	Mon 6/18/12	Fri 6/29/12
14		Release 2012 Operational Demonstration Plan	1 day	Mon 7/2/12	Mon 7/2/12
15		Conduct 2012 Operational Demonstration	55 days	Mon 7/16/12	Fri 9/28/12
16		Review Results of 2012 Operational Demonstration	24 days	Mon 10/1/12	Thu 11/1/12
17		Plan 2013 Operational Evaluation	121 days	Fri 11/2/12	Fri 4/19/13
18		2013 Operational Evaluation	90 days	Mon 5/20/13	Fri 9/20/13
19		2013 Operational Evaluation Data Reduction and Analysis	30 days	Mon 9/23/13	Fri 11/1/13

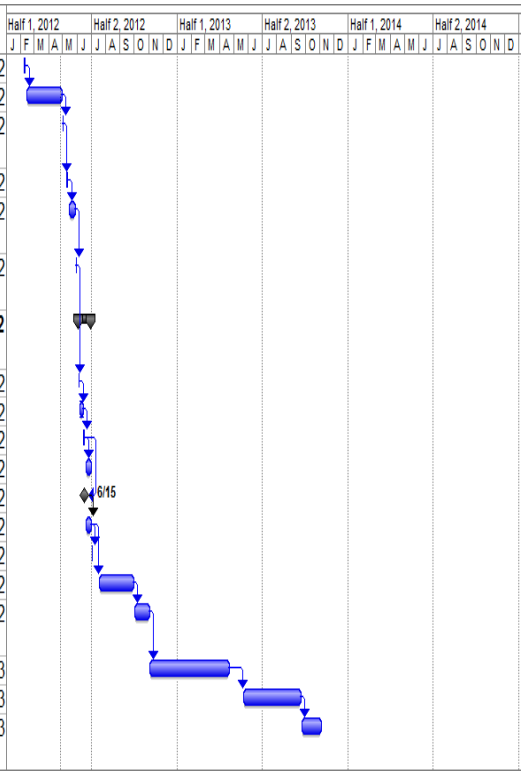

Figure 2 – Operational Bridging Schedule

Appendices

Appendix A – Acronyms

AIGCW……..Aviation Impact Guidance for Convective Weather
ARTCC……..Air Route Traffic Control Center
ATCT……..Air Traffic Control Towers
ATCSCC……Air Traffic Control System Command Center
ATM……Air Traffic Management
AWC……..Aviation Weather Center
AWS……..Aviation Weather Statement
AWT……..Aviation Weather Testbed
CCFP……..Collaborative Convective Forecast Product
CDM……..Collaborative Decision Making
CIWS……Corridor Integrated Weather System
CoSPA……..Consolidated Storm Prediction for Aviation
CWSU……Center Weather Service Unit
FAA……Federal Aviation Administration
LAMP……Localized Aviation MOS Product
NAM……..National Aviation Meteorologist
NextGen……..Next Generation Air Traffic System
NOAA……National Oceanic and Atmospheric Administration
NOM……National Operations Manager
NWS……National Weather Service
OB……..Operational Bridging
SAS……..Single Authoritative Source
TAF……..Terminal Aerodrome Forecast
TFM……..Traffic Flow Management
TMI……..Traffic Management Initiative
TMU……Traffic Management Unit
TRACONS…….. Terminal Radar Approach Control facilities
WET……..Weather Evaluation Team

Appendix B – Aviation Weather Statement Issuance Criteria

Targeted Impact Area

New York Metroplex Airports (Newark [EWR], Kennedy [JFK], LaGuardia [LGA] and Teterboro [TEB]) and their associated arrival and departure routes

Targeted Weather Constraint

Thunderstorms

Issuance Criteria

An AWS will be issued under the following conditions:

9. During high demand hours (0800 – 1600 CDT), thunderstorm activity (i.e., lightning is present, echo tops of any height) is expected (high confidence) to develop or move into the New York Metroplex Convective Area of Concern within the next four hours, or is occurring and was not forecast.

10. During high demand hours (0800 – 1600 CDT), thunderstorm activity that was forecast to occur in the New York Metroplex Convective Area of Concern within the next four hours is no longer expected.

11. During high demand hours (0800 – 1600 CDT), thunderstorm activity occurring in the New York Metroplex Convective Area of Concern is expected (high confidence) to cease one or more hours earlier than previously forecast.

12. There are conflicting (probability of occurrence, timing, coverage, severity) thunderstorm forecasts for the New York Metroplex Convective Area of Concern during the high demand hours of 0800 – 1600 CDT. The AWS is issued to provide clarification, and is considered the Single Authoritative Source (SAS) forecast for the purpose of TFM decision making.

Definition – New York Metroplex Convective Area of Concern

The New York Metroplex Convective Area of Concern is a combination of a 150NM circle centered on JFK, that portion of the New York Air Route Traffic Control Center (ARTCC) (ZNY) airspace that is more than 150NM from JFK, that portion of the Cleveland ARTCC (ZOB) that is east of the western Pennsylvania state border line and the imaginary extension of that border line north and south, and that portion of the Washington ARTCC (ZDC) north of Flow Constrained Area (FCA) A08. The red outlined/red shaded area in Figure B1 below depicts the New York Metroplex Convective Area of Concern.

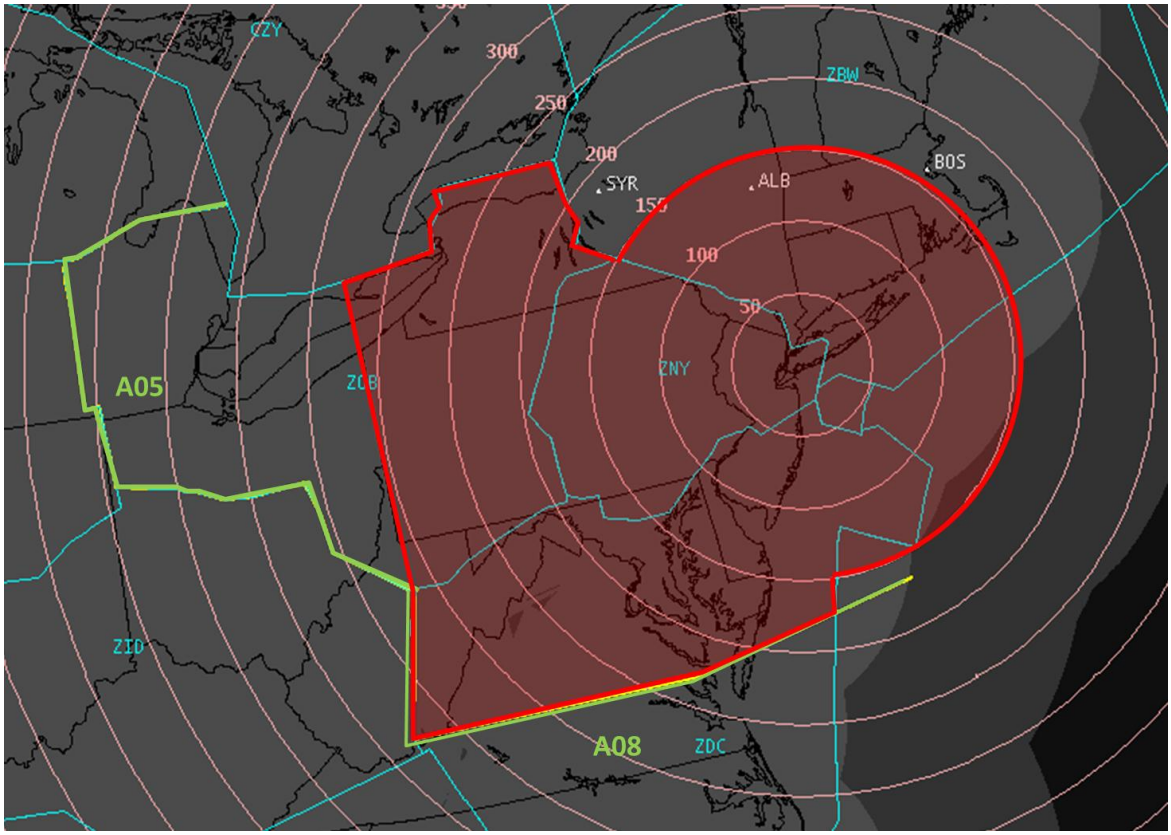

Figure B1 – New York Metroplex Convective Area of Concern (red outlined/red shaded area)

Discussion – New York Metroplex Convective Area of Concern

The arrival and departure routes used by aircraft flying to and from the New York Metroplex airports (EWR, JFK, LGA, TEB) are characterized by high traffic density and route complexity. Thunderstorms in the vicinity of these routes can cause a level of impact comparable to that felt when the same thunderstorm is located near the airport areas themselves. Most air traffic flying to and from the New York Metroplex airports transit ZOB, ZDC or ZNY airspace. Consequently, in addition to the airspace immediately surrounding the four major New York airports, it is considered standard TFM practice to focus on the eastern portion of ZOB airspace, ZNY airspace and the northern portion of ZDC airspace when assessing the potential impact of thunderstorms on air traffic destined for or originating in one of the New York Metroplex airports.

Appendix C – Phase 1 Test Log

Step	Instructions / Action	Expected Response	Actual Response	Pass / Fail
n/a	Open a test log entry.	NA	NA	☐ **Pass** ☐ **Fail**
1	Verify the technical capability to produce and disseminate the AWS	NA		☐ **Pass** ☐ **Fail**
2	a. Ensure text and graphics appear as prescribed when on the AWT Testbed web page	Text and Graphics appear as prescribed on the AWT web page.		☐ **Pass** ☐ **Fail**
3	b. Ensure numbering and date/time stamping are correct	Product numbering and date/time stamp are correct.		☐ **Pass** ☐ **Fail**
4	c. Ensure archiving of previous day's AWS is as prescribed (will likely not be started until Day 2	Previous day's AWS is archived.		☐ **Pass**

Step	Instructions / Action	Expected Response	Actual Response	Pass / Fail
	of the Dry Run)			☐ **Fail**
5	d. Test dissemination of AWS	AWS is disseminated.		☐ **Pass** ☐ **Fail**
6	1. Upload multiple AWSs to a specific web site	Multiple AWSs are uploaded to web site.		☐ **Pass** ☐ **Fail**
7	2. Fax multiple AWSs: Verify list of fax recipients, correctness of numbers, success of fax	List is verified and recipients receive fax.		☐ **Pass** ☐ **Fail**
8	3. Email multiple AWSs: Verify list of email recipients, correctness of addresses, success of email	List is verified and recipients receive email notification of AWS.		☐ **Pass** ☐ **Fail**

Step	Instructions / Action	Expected Response	Actual Response	Pass / Fail
9	e. Test update process to a previously issued AWS	Update process is successful		☐ **Pass** ☐ **Fail**
10	1. Amendments	AWSs can be amended and posted.		☐ **Pass** ☐ **Fail**
11	2. Corrections	AWSs can be corrected and posted.		☐ **Pass** ☐ **Fail**
12	3. Cancellations	AWSs can be cancelled.		☐ **Pass** ☐ **Fail**
13	Verify OB Processes	NA		☐ **Pass** ☐ **Fail**

Step	Instructions / Action	Expected Response	Actual Response	Pass / Fail
14	a. Test NWS Chat software functionality	NA		☐ **Pass** ☐ **Fail**
15	i. Verify NWS Chat user accounts working: All users have account	All users have an NWS Chat Account		☐ **Pass** ☐ **Fail**
16	ii. Verify NWS Chat user accounts working: All users can access their accounts	All users have access to their NWS Chat account.		☐ **Pass** ☐ **Fail**
17	iii. Verify NWS Chat user accounts working: All users can use NWS Chat	All users can use their NWS Chat account.		☐ **Pass** ☐ **Fail**
18	b. Test OB Meteorologist collaboration notification process	OB Meteorologist notification process is successful.		☐ **Pass**

Step	Instructions / Action	Expected Response	Actual Response	Pass / Fail
				☐ **Fail**
19	c. Ensure collaboration within the meteorologist community	Collaboration is complete.		☐ **Pass** ☐ **Fail**
20	i. Verify coordination contact information is correct	Contact information is verified and updated.		☐ **Pass** ☐ **Fail**
21	Verify external user access to AWT Testbed site and ability to see graphic and text	NA		☐ **Pass** ☐ **Fail**
22	a. Ensure users can view graphic information	Graphics can be viewed.		☐ **Pass** ☐ **Fail**

Step	Instructions / Action	Expected Response	Actual Response	Pass / Fail
23	b. Ensure users can view text information	Text can be viewed.		☐ **Pass** ☐ **Fail**
24	c. Ensure text is associated with correct graphic	Text is associated with correct graphic.		
25	d. Ensure current (vs. previous) AWS can be identified	AWS can be identified as the current product.		☐ **Pass** ☐ **Fail**
26	Verify AWS archive capability	NA		☐ **Pass** ☐ **Fail**
	a. Verify AWS can be archived	AWS can be archived.		
27	b. Verify AWS archive is accessible for previous days AWSs	AWS from a previous day can be accessed from archive.		☐ **Pass** ☐ **Fail**

Step	Instructions / Action	Expected Response	Actual Response	Pass / Fail
5	Close the test log entry.	N/A	N/A	☐ **Pass** ☐ **Fail**

Appendix D – Phase 2 Test Log

NAME:

DATE/TIME:

AREA OF IMPACT:

Assessment of Wx Impact on NAS	Wx Forecasts used	Concerns with current forecasts leading to OB	Concerns/ Issues/ successes with OB Process	Concerns/ issues/ successes with AWS issuance	Impact of and response to AWS

Appendix E – OB Dry Run Questionnaire

Please mark one: ☐ **Aviation Meteorologist**

☐ **TFM Planner (AT or Airline)**

2012 Operational Bridging Dry Run

QUESTIONNAIRE

Prepared by:

CDM Weather Evaluation Team

Operational Bridging Dry Run Questionnaire

The objective of this questionnaire is to provide the opportunity for Operational Bridging Dry Run participants to rate specific aspects of the Operational Bridging Process and the Aviation Weather Statement as to their effectiveness in providing support in conducting strategic planning activities in response to convective weather.

NOTE: Personal identification recorded on the questionnaires is optional. However, it would be helpful, in the event we need clarification regarding your responses. Responses to this questionnaire will be treated as anonymous. All data collected during the dry run will be analyzed and reported as group data. No individual responses will be identified or reported.

INSTRUCTIONS: A five-point scale is provided for you to rate the effectiveness of the OB Process and the AWS on various features or capabilities in providing support to aviation planners for strategic planning. Please assign an effectiveness rating for each question regarding the listed feature or capability, according to the following descriptors:

RATING SCALE DEFINITIONS

5. Very Effective. This response indicates that the forecast being rated provides aviation planners exceptional support for strategic planning in response to convective weather.

4. Somewhat Effective. This response indicates that the forecast being rated provides aviation planners sufficient support for strategic planning in response to convective weather.

3. Borderline. This response indicates that the forecast being rated is neither effective nor ineffective in providing aviation planners support for strategic planning in response to convective weather.

2. Somewhat Ineffective. This response indicates that the forecast being rated does not provide aviation planners much support for strategic planning in response to convective weather.

1. Very Ineffective. This response indicates that the forecast being rated impedes aviation planners in strategic planning in response to convective weather.

N/A This response indicates that the feature or capability in question does not apply to the forecast.

In addition, this questionnaire form provides space to document comments from dry run participants.

Please circle the rating that best describes your view of the effectiveness of **the OB Process and AWS** to support strategic planning as it applies to:

OB Process/AWS Questions	Comments
OB Process	

1. Weather Criteria for OB Initiation

5	**4**	**3**	**2**	**1**	**NA**
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

2. Initiation of Collaboration Process

5	**4**	**3**	**2**	**1**	**NA**
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

OB Process/AWS Questions	Comments

3. Effectiveness of Collaborative Process

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

4. Development of the AWS

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

5. Dissemination of AWS

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

OB Process/AWS Questions	Comments

6. Notification of AWS Issuance/Briefing

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

AWS

7. Accessibility

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

8. AWS Header Information

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

OB Process/AWS Questions	Comments

9. AWS Graphic: Interpretation

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

10. AWS Graphic: Utility

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

11. AWS Graphic: NAS Element Overlays

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

OB Process/AWS Questions	Comments

12. AWS Graphic: Use of Color

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

13. AWS Text: Interpretation

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

14. AWS Text: Utility

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

OB Process/AWS Questions	Comments

15. AWS Text: NAS Elements Affected

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

16. AWS Text: Impact definition

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

17. AWS Text: Discussion

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

OB Support for Planning Horizons

OB Process/AWS Questions	Comments

18. Sufficiency of AWS for strategic planning:

(0-2 Hour Timeframe)

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

(2-4 Hour Timeframe)

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

OB Process/AWS TMI Decision Support

OB Process/AWS Questions	Comments

19. AFP Support – Impact on planning AFP start times?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

20. AFP Support – Impact on planning AFP exit strategies?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

21. AFP Support – Impact on initial rate setting?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

OB Process/AWS Questions	Comments

22. AFP Support – Impact on <u>modifying</u> rate setting?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

23. GDP support - Impact on program rate setting?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

24. GDP support. Impact on program timing?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

OB Process/AWS Questions	Comments

25. Playbook reroutes - Impact on identification of playbook options?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

26. Playbook reroutes - Impact on coordination of Playbook route usage?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

27. Group Situation Awareness (SA) - Impact on collaborative decision-making?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

OB Process/AWS Questions	Comments

28. ICR management - Impact on planning and use of ICRs?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

29. Chokepoint/RNAV wind route management - Impact on route management?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

30. Ground stop (GS) usage. Impact on GS usage?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

OB General Feedback

OB Process/AWS Questions	Comments

31. General Operational Effectiveness of OB Process to support strategic planning during convective weather?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

32. General Operational Effectiveness of AWS to support strategic planning during convective weather?

5	4	3	2	1	NA
Very Effective	Somewhat Effective	Borderline	Somewhat Ineffective	Very Ineffective	

Appendix F – NWSChat Instructions

NWSChat location:

https://nwschat.weather.gov/

Chat participants must register with NWSChat and create a user account at the above URL.

Once users have registered, they will receive an email directing them to required annual training. Access to chat rooms will not be granted until the training is complete. Training should take only a few minutes.

To participate in chats users can utilize the web version, which requires no third party software, or downloading of files. This site can be accessed at:

https://nwschat.weather.gov/live/

To access the Operational Bridging Collaboration chat room, click on the "Actions" pull-down menu on the upper left side of the screen and select "Join Group Chat". This will bring up a dialogue box where you need to fill in:

- Room Name: awschat
- Handle: (name identifying you) this is automatically filled in from your account name, but can be edited each visit
- Click "Save Bookmark for Chatroom".
- Then "Join Room".