1 E. CURRENT ATM TOOLS

Tool		Description	Tool Weather Interaction	Current Plans	Future Plans
AIR TRAFIC MANAGEMENT					
TFM-S **TDS** **CCSD** **WSD**	(Replaced ETMS) Includes: Traffic Situation Display, Common Constraint System Display, Web Situation Display	It is the principle component of the TFM infrastructure used by the FAA and NAS stakeholders to predict demand, identify constraints, mitigate delays and maintain common situation awareness. TFMS is based on an open architecture platform supporting the integration of TFM subsystems, facilitating integration with other domains, and supporting responses to new initiatives. In addition to improving development bandwidth, TFMS establishes a platform that is sustainable and scalable for the next decade and beyond.		TFMS displays certain weather products (CCFP, NCWF, and WSI Radar mosaic) onto the Traffic Situation Display function of the TFMS.	TFM-S will incorporate CIWS in 2011. NextGen Weather Processor WP2 will replace CIWS's function in 2017.
FSM GDP AFP GS	Flight Schedule Monitor Includes: Ground Delay Program, Airspace Flow Program, and Ground Stops	FSM creates a common situational awareness among all users and service providers in the National Airspace System. All parties need to be aware of NAS constraints in order to make collaborative air traffic decisions. Designed to effectively interact with existing FAA systems, FSM displays the Aggregate Demand List (ADL) information for both airport and airspace data elements for its users, which means everyone is looking at the same picture.	NONE	FAA and airlines use FSM to monitor demand through receipt of FSM demand pictures of airports updated every 5 minutes. FSM constructs "what if" scenarios for best options (i.e., best parameters) prior to making a GDP, AFP, or GS decision.	Software upgrades with no weather integration through 2025
TMA	Traffic Management Advisor	Traffic Management Advisor (TMA) analyses traffic approaching an airport from hundreds of miles away and can calculate scheduled arrival times in order to maximize arrival capacity.	NONE	Current plans are for multi-center integration of TMA and for weather integration so TMA can work re-routes due to convection.	
ARMT	Airport Resource Management Tool	The ARMT gathers additional flight information from the Atlanta Common Automated Radar Terminal System (CARTS) IIIE and the manual scanning of bar coded paper flight strips at the Atlanta Airport Traffic Control Tower (ATCT). This manual bar code scanning is used to produce a near real-time recording of taxi clearance and takeoff clearance times. The ARMT also captures the traffic flow management (TFM) constraints, airport configuration and weather conditions currently in effect. The ARMT prototype system is also in the Potomac TRACON and the Chicago TRACON.	ARMT captures the weather conditions currently in effect.	Begin decommissioning of ARMT in 2010 with complete decommissioning in 2017. The purpose of decommissioning is so that it can be incorporated into the Tower Flight Data Manager.	
SEVEN	System Enhancements for Versatile Electronic Negotiation (Under development by CDM FCT workgroup)	Allows NAS customers to submit a prioritized list of alternative routing options for their flights. SEVEN provides traffic managers with a tool that algorithmically takes these customer preferences into consideration as it assigns reroutes and delays to flights subject to traffic flow constraints	Weather is not a function of the tool at this time, SEVEN's goal is for an impact value of weather on normal traffic flows.	Phase 1 will be deployed in a selected geographic area for testing/evaluation. Phase 2 will expand Phase 1 functions throughout the NAS 2011 timeframe. (Phase 1 functionality still not fully defined.)	
IDRP	Integrated Departure Route Planning (under development MITRE/MIT-LL)	IDRP takes the benefits identified from RAPT and integrating active traffic into the DST.	MITRE working with MIT/LL are working to develop a new weather model that can provide a 3D display of convection and its impact on traffic flows.	Deployment date not defined	
EFPT	Enroute Flow Planning Tool (under development MITRE/MIT-LL)	Builds on the development of RAPT and the work being done on IDRP applied to enroute airspace. Once an area of weather is selected and timeframe to evaluate aircraft through the area can be selected and options for reroutes are given.	MITRE working with MIT/LL are working to develop a new weather model that can provide a 3D display of convection and its impact on traffic flows.	Deployment date not defined	

ATM-Weather Integration Plan

Tool		Description	Tool Weather Interaction	Current Plans	Future Plans
	Future Traffic Display	Under development by Volpe 2010 - 2011 timeframe. A function of the TFMS system giving the traffic manager the ability to move the traffic along its filed flight path and view the systems impact.	NONE		
Reroute Impact Tool		Under development by Volpe 2010 - 2011 timeframe. A function of the TFMS system giving the traffic manager the ability to view and evaluate the impact of reroutes on NAS sectors	NONE		
DSP	Departure Spacing Program (ZNHY, N90 and Towers only)	DSP enables air traffic controllers to work more efficiently with traffic management coordinators to better use existing capacity for departing aircraft by reducing departure sequencing delays and minimizing terminal-area ground, airspace and telephone congestion. DSP also reduces the need for voice communication between air traffic control facilities by providing dynamic flight plan information and reports, via data transfer through the DSP network, to air traffic control towers, terminal radar approach control facilities and air route traffic control centers.	NONE		
KVDT	Keyboard Video Display Terminal	A tool which allows air traffic controllers to amend flight plans	NONE		
DSR	Display System Replacement	Provides controller workstation displays and input/output devices and a communications infrastructure to connect the DSR with external processing elements of the en route air traffic control automation system.	Since this is a display system only, any weather integration will be associated with the ERAM system that it supports.	Currently in a technology refresh 2005 - 2020 with and end of service of 2022.	
ERAM	En Route Automated Modernization	ERAM will replace HOST and will increase capacity and improve efficiency in the nation's skies. En route controllers will be able to track 1,900 aircraft at a time, instead of the current 1,100. Coverage will also extend beyond facility boundaries, enabling controllers to handle additional traffic more efficiently, made possible by processing data from 64 radars instead of the current 24. Controllers will be able to share and coordinate information seamlessly between centers, making the use of three-mile (rather than five-mile) separation. Flight plan processing will also improve, and hand-offs performed when planes divert from their planned course will be done automatically rather than manually. This will improve operational efficiency during weather and congestion.	ERAM will be delivered in multiple releases and varying capability improvements will occur with each release.	Weather data integration: Air traffic controllers will use information from weather systems to help pilots route away from storms, avoid turbulence, and give passengers smoother flights.	
URET	User Request Evaluation Tool	combines real-time flight plan and radar track data with site adaptation, aircraft performance characteristics, and winds and temperatures aloft to construct four dimensional flight profiles, or trajectories, for pre-departure and active flights. For active flights, it also adapts itself to the observed behavior of the aircraft, dynamically adjusting predicted speeds, climb rates, and descent rates based on the performance of each individual flight as it is tracked through en route airspace, all to maintain aircraft trajectories to get the best possible prediction of future aircraft positions. URET uses its predicted trajectories to continuously detect potential aircraft conflicts up to 20 minutes into the future and to provide strategic notification to the appropriate sector. URET enables controllers to "look ahead" for potential conflicts through "what if" trial planning of possible flight path amendments. URET enables controllers to accommodate user-preferred, off-airway routing to enable aircraft to fly more efficient routes, which reduce time and fuel consumption.		RUC Winds and Temperature	The future plans call for integrating URET into ERAM.
NTML	National Traffic Management Log	The National Traffic Management Log (NTML) was developed to provide a single system for automated logging, coordination, and dissemination of traffic management initiatives throughout the National Airspace System.	NONE		

Tool		Description	Tool Weather Interaction	Current Plans	Future Plans
VSCS	Voice Switching and Communications System	VSCS allows air traffic controllers to establish all air-to-ground and ground-to-ground communications with pilots and other air traffic controllers. The system offers unprecedented voice quality, touch-screen technology, dynamic reconfiguration capabilities to meet changing needs, and an operational availability of 0.9999999.	NONE		
ESIS Displays	Enhanced Status Information System	ESIS is a display system which is coupled with NTML to provide controllers and NAS managers with pertinent information	NONE		
ERIDS	En Route Information Display System	ERIDS provide real-time access to air traffic control information not currently available from the Host Computer System (HCS) and makes this auxiliary information readily available to controllers. ERIDS is installed at various positions, including the Traffic Management Units (TMU), Center Weather Service Units (CWSU), and ARTCC Monitor and Control (M&C) Centers. ERIDS is integrated into the display system consoles at each sector, uses the center's airspace configuration for sector assignments, and allows changes in sector assignments. ERIDS displays graphic and text data products, including air traffic control documents, Notices to Airmen (NOTAMS), and general information.	NONE		
IDS – 4	Information Distribution System, Model 4	Integrates several National Airspace System (NAS) data weather sensors and operational data onto a single display platform. The information is used by several thousand air traffic controllers.	IDS is a general weather information display.	Decomissioning of IDS-4 (Systems Atlanta Information Display System - SAIDS) is scheduled for 2009 - 2015.	TFDM (Tower Flight Data Management System) will be replacing the SAIDS and IDS-4 system beginning in 2010 and will continue through 2030.
HOST		Facility located at the ARTCC which operates user application software, as well as certain peer network layer protocols required to communicate with adjacent ATN routers.	Host displays NEXRAD weather data.		
STARS	Standard Terminal Automation Replacement System	STARS is a joint Federal Aviation Administration (FAA) and Department of Defense (DoD) program to replace capacity-constrained, older technology systems at FAA and DoD terminal radar approach control facilities and associated towers. Controllers use STARS to provide air traffic control services to pilots in the airspace immediately around many major airports. These air traffic control services include the separation and sequencing of air traffic, the provision of traffic alerts and weather advisories, and radar vectoring for departing and arriving traffic.	Displays are specially developed for air traffic control and are capable of displaying six distinct levels of weather data	Currently in 49 FAA facilities and 50 DOD facilities, FAA is evaluating future deployment based on possibly combining smaller facilities.	
WEATHER TOOLS					
RAPT	Route Availability Planning Tool	The Route Availability Planning Tool (RAPT) addresses an urgent need to increase the airport departure capacity in convective weather. In busy metroplexes such as New York, airways are tightly clustered and the proximity of adjacent arrival flows means that deviations around thunderstorms by departures cause serious disruptions to arrivals. As a result the departure flows are often shut down. The RAPT is a weather-assimilated decision support tool (DST) that supports the development and execution of departure management plans that more fully utilize the available departure capacity during Severe Weather Avoidance Plans (SWAP).	The RAPT integrates 3-dimensional (3-D) convective weather forecasts from the Corridor Integrated Weather System (CIWS) with the National Airspace System (NAS) airspace structure information (including aircraft trajectory information) to predict the availability of the filed departure route and, specifically designated coded alternative departure routes for an aircraft. Specifically the RAPT algorithms are dependent on CIWS convective	Test and evaluation in NY metropolitan area	Using CIWS weather information to determine route availability and using automation to select best flight/flights to operate on the available route. i.e. Working to improve the modeling capabilities.

Tool		Description	Tool Weather Interaction	Current Plans	Future Plans
			and echo tops forecast products.		
ITWS	Integrated Terminal Weather System	The Integrated Terminal Weather System (ITWS) is a recent technology that helps make air traffic flow more efficient in periods of adverse weather at NAS pacing airports. The ITWS is an air traffic management (ATM) tool that provides terminal air traffic managers and controllers plus airline dispatchers with highly accurate, easily understood and immediately useable graphical weather information and hazard alerts on a single, integrated color display. The ITWS provides aviation-oriented weather products via situation displays to air traffic control (ATC) personnel in Airport Traffic Control Tower (ATCT), Terminal Radar Approach Control (TRACON), and some Air Route Traffic Control Center (ARTCC) facilities, as well as in the FAA's Air Traffic Control System Command Center (ATCSCC). These products are immediately usable without further meteorological interpretation. In addition, the ITWS subsumes the functionality of Terminal Weather Information for Pilots (TWIP) [from TDWR] and provides depictions of impacting weather to jetliner flight decks via a communications service provider (ARINC).	The ITWS uses highly sophisticated meteorological algorithms to integrate and analyze data from multiple FAA and National Weather Service (NWS) sources, including data from the Terminal Doppler Weather Radar (TDWR), Airport Surveillance Radar Model 9 (ASR-9) weather channel, the Next Generation Weather Radar (NEXRAD) or WSR-88, the Low-Level Windshear Alert System (LLWAS), Automated Weather Observing System (AWOS) Data Acquisition System (ADAS), aircraft observations from Meteorological Data Collection and Reporting System (MDCRS), and NWS gridded model data to display current and near-term forecasts of weather conditions and hazards in the terminal area. The ITWS gets 1-minute ASOS data and ground stroke lightning data from ADAS.		
CIWS	Corridor Integrated Weather System	CIWS is a web-based, Nation-wide operational decision support tool to improve traffic flow management. It is envisioned that the CIWS will be implemented at the FAA's Tech Center to provide traffic flow managers with comprehensive convective weather information needed for tactical modifications (0-2 hours). CIWS provides information on the current convective weather situation as well as fully automated forecasts of convection and attributes, e.g., Echo Tops, out to 2 hours.	The CIWS collects various data, then processes, generates, displays, and distributes convective (thunderstorm) weather products to traffic managers at the FAA David J. Hurley Air Traffic Control System Command Center (ATCSCC), numerous Air Route Traffic Control Center (ARTCC) facilities, large Terminal Radar Approach Control (TRACON) facilities, and some large airports. By concentrating its	CIWS will be operational through 2017.	CIWS is a developmental prototype for COSPA and will be integrated with the TSD in 2011

Tool		Description	Tool Weather Interaction	Current Plans	Future Plans
			two-hour forecast product over busy National Airspace System (NAS) corridors, CIWS would enable traffic managers to plan for routing/re-routing due to impacts on the airspace from major thunderstorm disruptions. The CIWS receives weather data from multiple sensors (primarily radars) and distributes processed information to NAS traffic managers via situation displays, and later via the System Wide Information Management (SWIM) network.		
WARP	Weather and Radar Processor	The primary purpose of the WARP system is to improve the timeliness and quality of weather information provided to Air Traffic Control (ATC) and Traffic Flow Management (TFM) specialists at the Air Route Traffic Control Center (ARTCC) facilities and at the David J. Hurley Air Traffic Control System Command Center (ATCSCC) in order to support the tactical and strategic decision-making process. WARP has an interface to the Display System Replacement (DSR) in order to provide mosaics of Next Generation Weather Radar (NEXRAD) data to air traffic controllers. It also provides imagery depicting traffic-impacting thunderstorm activity to the traffic management unit (TMU) and weather coordinator on briefing terminals.	The Weather and Radar Processor (WARP) system provides the capability to simultaneously and continuously receive, process, generate, store, and display aviation-related weather information and radar products from external sources and to disseminate this information to other National Airspace System (NAS) subsystems.		
TOWER					
DBRITE	Digital Bright Radar Indicator Tower Equipment	Provides tower controllers with radar workstation displays and input/output devices and a communications infrastructure to connect the DSR with external processing elements of the en route air traffic control automation system.	NONE	End of Service 2012 replaced by Remote Automated Radar Terminal System Color Display End of service 2014	
TDLS PDC FDIO ATIS		The Tower Data Link System (TDLS) automates tower-generated information for transmission to aircraft via data link. The TDLS interfaces with sources of local weather data and flight data and provides pilots with Pre-Departure Clearance (PDC), Digital-Automatic Terminal Information System (D-ATIS), and emulated Flight Data Input/Output (FDIO). The PDC helps tower clearance delivery specialists compose and deliver departure clearances. The Digital Automatic Terminal Information Service (D-ATIS) provides high reliability messages of runway and taxiway instructions, information on avionics equipment, frequency outages, and local weather conditions worldwide. The TDLS data is transmitted in text form via the Aircraft Communication and Reporting System (ACARS) to an ACARS-equipped aircraft for review and acknowledgment by the flight crew.			
IDS-4 (5)	(see above)				
DSM					
AMASS		The Airport Movement Area Safety System			

Tool		Description	Tool Weather Interaction	Current Plans	Future Plans
		(AMASS) with Airport Surface Detection Equipment (ASDE) provides controllers with automatically generated visual and aural alerts of potential runway incursions and other potential unsafe conditions. AMASS includes the Terminal Automation Interface Unit (TAIU) that processes arrival flight data from the Terminal Approach Control (TRACON) automation system and beacon target data from the Airport Surveillance Radar (ASR) and generates a track. The track is compared with the movement of aircraft and ground vehicles on the airport surface based upon surveillance data from the Airport Surface Detection Equipment (ASDE-3). AMASS adds to the ASDE-3 by presenting alarms to the tower controllers when evasive action is required. AMASS integrates and displays data from ASDE-3 and the ASR. The FAA has installed AMASS at the nation's top 34 airports.			
ETVS		The ETVS (installed in the ATCT) provides the air traffic control (ATC) operational ground-to-ground (G/G) voice communications intra-connectivity between controllers within an ATCT (intercom), interconnectivity between controllers in separate ATCTs (interphone), and interconnectivity between ATCT controllers and TRACON controllers/Air Route Traffic Control Center (ARTCC) controllers/Flight Service Station (FSS) specialists/David J. Hurley Air Traffic Control System Command Center (ATCSCC) specialists. Air-to-ground (A/G) radio connectivity between ATCT controllers and pilots is also supported by the ETVS.			
TOWER WEATHER					
	Wind and Wind Shear Equipment				
ASOS / AWOS	Automated Surface Observation System /Automated Weather Observation System	The Automated Surface Observing Systems (ASOS) program is a joint effort of the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the Department of Defense (DOD). The ASOS systems serves as the nation's primary surface weather observing network. ASOS is designed to support weather forecast activities and aviation operations and, at the same time, support the needs of the meteorological, hydrological, and climatological research communities.	REPORTS BASIC WEATHER ELEMENTS: Sky condition: cloud height and amount (clear, scattered, broken, overcast) up to 12,000 feet Visibility (to at least 10 statute miles) Basic present weather information: type and intensity for rain, snow, and freezing rain Obstructions to vision: fog, haze Pressure: sea-level pressure, altimeter setting Ambient temperature, dew point temperature Wind: direction, speed and character (gusts, squalls) Precipitation accumulation Selected significant remarks including-	With the largest and most modern complement of weather sensors, ASOS has significantly expanded the information available to forecasters and the aviation community. The ASOS network has more than doubled the number of full-time surface weather observing locations. ASOS works non-stop, updating observations every minute, 24 hours a day, every day of the year.	

Tool		Description	Tool Weather Interaction	Current Plans	Future Plans
			variable cloud height, variable visibility, precipitation beginning/ending times, rapid pressure changes, pressure change tendency, wind shift, peak wind.		
RVR	Runway Visual Range	Runway Visual Range (RVR) systems provide support to precision landing and takeoff operations in the NAS. RVR is a system that will measure visibility, background luminance, and runway light intensity to determine the distance a pilot should be able to see down the runway. RVRs consist of visibility sensor, ambient light sensor, runway light intensity monitor, and processing units. The RVR interfaces with the ASOS system as well which enhance safety, increase system capacity, and improve maintenance with in CONUS.			
TDWR	Terminal Doppler Weather Radar	The Terminal Doppler Weather Radar (TDWR) system detects hazardous weather conditions such as wind-shear, micro-bursts and gust fronts, tornadoes, winds, heavy precipitation (inferring thunderstorms at an airport). This weather information is generated by the Radar Product Generator (RPG) and provided to air traffic on displays at terminal facilities. In addition, a TDWR provides alerts (both aural and textual) of detection wind shear/microburst activity in the approach/departure corridors. The TDWR also provides a 10- and 20-minute prediction of gust front location and movement using a Machine Intelligent Gust Front Algorithm (MIGFA).			
METAR					
OPERATORS					
	Flight Planning Systems				
	Flight Following Systems Includes: CCSD, Flight Explorer (vendor tools), Internet Weather				
AIRCRAFT					
FMS	Flight Management System	A flight management system is a fundamental part of a modern aircraft in that it controls the navigation. The flight management system (FMS) is the avionics that holds the flight plan, and allows the pilot to modify as required in flight. The FMS uses various sensors to determine the aircraft's position. Given the position and the flight plan, the FMS guides the aircraft along the flight plan. The FMS is normally controlled through a small screen and a keyboard. The FMS sends the flight plan for display on the electronic flight instrument system (EFIS), Navigation Display (ND) or Multi-Function Display (MFD).			
RADAR					
MDCRS	Meteorological Data Collection and Reporting System	The system collects and organizes up to 28,000 real-time, automated position and weather reports per day from participating aircraft. The data is then forwarded in BUFR format to the National Weather Service World Area Forecasting Center in Maryland, USA, where it's used as input for their predictive weather models.			
EFB	Electronic Flight Bag	It is an electronic information management device that helps flight crews perform flight management			

Tool		Description	Tool Weather Interaction	Current Plans	Future Plans
		tasks more easily and efficiently with less paper. It is a general purpose computing platform intended to reduce, or replace, paper-based reference material often found in the Pilot's carry-on Flight Bag, including the Aircraft Operating Manual, Aircrew Operating Manual, and Navigational Charts (including moving map for air and ground operations). In addition, the EFB can host purpose-built software applications to automate other functions normally conducted by hand, such as performance take-off calculations.			

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