2002 ENROUTE WORK GROUP

REPORT AND RECOMMENDATIONS

2002 AND BEYOND

2002 Enroute Work Group
Report and Recommendations
2002 and Beyond

November 13, 2001

We the undersigned submit this report consisting of 26 pages as a joint effort based on the findings of our surveys.

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Section 1

Introduction

The purpose of this report is to provide alternatives and guidance to the Spring 2000 Committee (S2K) and others in making investment choices for solutions to the challenge of enroute congestion management in 2002 and beyond.

1.1 Background

In August 2001, the S2K Committee designated a group of individuals to research the potential of changes for the 2002 severe weather season. This group was charged to "not leave any stone unturned" in their quest to improve the system during the 2002 severe weather season and beyond.

1.2 Mission

The mission of the 2002 Enroute Work Group (EWG) was to find the technology, procedures, processes, or combination of these to be applied to the Spring 2002 NAS initiatives to allow for a more efficient process during disruptive weather months or other phenomena. One of the main objectives is to eliminate or reduce the reliance on Ground Delay Programs in support of SWAP. Quoting from the National Airspace System Operational Evolution Plan (OEP), "Changing operations involves new procedures or modifications to existing procedures for aircraft crew members, airline operations personnel, FAA controllers, traffic flow management specialists, and maintenance specialists". Ideally, embedded in these procedures, processes, and technology will be the capability of developing universal situational awareness in all aspects of the TFM process.

This document does not address in any way, capacity enhancement based on CNS/ATM initiatives, DRVSM, Airspace Redesign, nor Personnel Resources.

1.3 Work Group Process

Due to the brief amount of time the work group had to explore this problem, three core areas were identified which became the basis of our research:

- Explore existing tools to see if their functionality can be expanded to fit into the concept design.
- Determine and define what can be developed and delivered in 2002 and on what scale. It should be noted for clarification that April was the target date for the Spring Initiatives but not being able to deploy something by April did not render the work of the group void. It is commonly accepted by the NAS users and FAA Air Traffic Personnel that a posture has developed whereby we wait until Fall to start attempting to put something together for the following spring's initiatives. This subject will be addressed later in this report.
- Lay out milestones and identify essential people.

It is an accepted fact that CDM, using FSM as a basic tool, has enhanced the NAS by providing real time input by both the users and the FAA in relation to Ground Delay Programs. Development of an enroute tool analogous to FSM is a long-term objective, but there may be functionality in existing tools that can provide some universal situational awareness and offer benefits earlier. Based on the experience of the work group members gained through participation in CDM activities, a group of Objectives, Concepts, and Characteristics were developed. These were used when interacting with the different entities during this process. The problem statement of the EWG is included in its entirety as Appendix 2.

Below are the individuals and organizations surveyed by the EWG. The list is in chronological order with no level of importance or priority. Copies of the letter of introduction and problem statement were provided to each. Any written information presented to the EWG is attached as an Appendix.

- MITRE/CAASD
- Metron Aviation, Inc.
- Boeing ATM
- Airline Dispatchers Federation
- Lockheed Martin
- AUA-200
- AUA-700
- ATCSCC Severe Weather Unit
- ATT-220
- TMOs or their representatives from:
  - ZID
  - ZNY
  - ZDC
  - ZOB
  - ZBW
- CDM Collaborative Routing Group
- Eurocontrol (Technical Information Meeting)
- NBAA
- NCAR
- NASA AMES

Extensive discussions based on the three core areas listed above were held with each of the above. Pertinent information taken from these discussions will be discussed later in this report.

Section 2

Recurring Issues that Impact the NAS

The following concerns were repeatedly voiced by many of those surveyed as impediments to getting business done in the NAS. The EWG recognizes the validity of these concerns and presents them in this report.

2.1 Lack of Architecture

The current Traffic Flow Management infrastructure has evolved over several decades without a central architectural standard. This has resulted in a mix of hardware and software technologies that are essentially "stand-alone" capabilities. This presents an increasingly difficult challenge to train, maintain, and effectively use these piecemeal technologies.

2.2 HOST and ETMS Inflexibility

ETMS lead-time of nine to twelve months is intolerable. ETMS updates twice a year with nine to twelve months lead time required. There is no efficient way to improve the system with a core that does not have more flexibility to perform updates. HOST inflexibility is being addressed through the ERAM process.

2.3 Research Cooperation and Competition

Recent efforts have been made to strike a balance between competition and cooperation in the area of research and development. The future approach should be one that discourages unnecessary overlap, unproductive competition, and over-marketing of "eye candy displays" and stand-alone tools with questionable data verification.

2.4 Lack of System Status Information

Miles-in-trail restrictions, long used as a volume control technique, have increased in recent years. In addition, there is no reference or discipline on route status or capacity. It is not possible to determine the capacity of a particular route or the status of a route. There is immediate need for the ability to provide real time, rapid transmission of system status information to all TFM and AOC personnel. The National Log Program has been identified as the single repository for this information. Automation, training, and procedural issues have caused this product to fall far behind scheduled operational implementation.

2.5 Approach to the NAS

Without a structured process that allows NAS operators maximum access to data, and tools that provide common situational awareness, they are left to their own devises in flight planning forecasting, gaining access to the NAS, and minimizing their own delays, rather than optimizing the system. A structured process of distributed planning and decision-making is the legitimate approach. System responsibility and success is shared among operators and providers alike. Operators share control and responsibility for managing the integrity of the system itself as their priority and competing is done outside the confines of optimizing the system.

2.6 Training and Simulation

There is need for enhanced training and simulation capability that can replicate all NAS environments (ATC, TFM, AOC, etc.) and produce a common training syllabus would be used to meet FAA and Industry training requirements. A direct result of this lack of capability is evidenced by the reluctance of controllers, traffic managers, and dispatchers to embrace new procedures or tools.

2.7 Data Quality

Enroute congestion management is faced with high levels of uncertainty because of data quality. Vendors have to write code to compensate for bad data and TFM personnel, through empirical knowledge of the problem, manipulate tools and initiatives to compensate.

2.8 Playbook

Playbook plays are not comprehensive. Playbook plays do not always consider the impact on departures and the full impact on all enroute facilities. There is still a need to develop plays for meso-scale events and to develop associated actions and initiatives that correspond to many of the existing plays.

2.9 CDM Process

All of the necessary entities (AT, AF, ATCSCC, ATT, NATCA, RAA, NBAA, MIL, ATA, etc.) are not participating in the CDM process. This is manifested in the need for better coordination between AF and AT for issues such as HOST patches and adaptation dates.

2.10 Overall Long Term Approach

In the past, the lack of an overall long-term approach to enroute TFM has led to marginal improvements. The RTCA-FFP1/2- CONOPS, OEP, and this report all call for a comprehensive long-term approach to enroute TFM.

Section 3

Action Summary

This section outlines the key problems and decisions identified as critical to enroute congestion management. Section 3.1 addresses long-term issues for 2002 and beyond. Section 3.2 addresses the near-term recommendations for 2002.

3.1 Long-term Recommendations for 2002 and Beyond

3.1.1 Processes

3.1.1.1 S2K Process

Problem: The success of the S2K group in supporting year over year incremental improvement is now compromised by long lead times. The following processes cause these long lead times:

R & D conceptual development	Up to several years
HITL testing and verification	1-6 months
Budget process	Up to one year
S2K process	Two weeks +
HOST software code changes	Up to two years after approval
ETMS code changes	9-12 months after approval
NATCA I & I for TFM	2-6 months
Procedural development	1-6 months
Training development	3-6 months

Example: FCA development. Thought to be in operational plans for past years, this important tool has been delayed by long lead times and slips in implementation dates.

Scope: All FAA associated development and implementation.

EWG Recommendation: Move enroute planning to a three-year window with direction from the FFPO and OEP, and insist on reasonable lead-times. The immediate 12-month period should concentrate on modifications, recurrent training, updates, etc. The longer range planning (24 to 36 months), should concentrate on R&D, development, simulation, testing, and implementation of new tools, processes and procedures.

OEP/FFP References: None identified.

Decision: Redefine the way business is conducted year over year and break out of the urgency mode of "what's possible next spring" to achieve greater effectiveness in the coming years. Breaking the long lead times into more manageable time frames is essential to gain benefits. Unless major adjustments are made in these times, the window for achieving meaningful results

for 2003 may already be closing (ETMS is now working 9-12 months in advance on what can be included).

3.1.1.2 The Collaborative Decision Making (CDM) Process

Problem: CDM participation as a process for developing and delivering the chosen capabilities concerning TFM has been diminished. The creation of endless groups (including the EWG), by FAA and industry, without the definitive identification of responsibilities and authority, dilutes the message, strains limited resources and confuses if not discourages key participants.

Example: Lack of participation by Air Traffic Procedures, Airways Facilities, airlines, and other organizations has impeded the process. Additionally, the formation of new and overlapping groups (CRCT core team, TFM User Team or TUT) leads to the formation of too many confusing and competing groups.

Scope: CDM, its related subgroups, and other groups working related issues.

EWG Recommendations: Reaffirm CDM process as the legitimate authority for innovation, development, and implementation of collaboratively designed TFM systems. Additionally, every effort must be made to simplify, combine, and limit the groups involved in enroute congestion management.

OEP/FFP References: FAA OEP V 2.0-ER 2.1, 2.2, 2.3, 2.4 and EW-2, RTCA NAS CONOPS-addendum 4, FFP2-Section 6

Decision: It must be made clear what process or group bears responsibility for outcomes. It must also be made clear to the industry that participation is critical to achieve results.

3.1.2 Procedures

3.1.2.1 FCA capability for collaborative TFM

Problem: FCA capabilities are important to enroute TFM because they allow the traffic manager or AOC coordinator to capture the flights that are actually impacted by an enroute constraint with far more precision than present tools. These capabilities were expected last year, but many will not be ready until 2003 via the present path of development.

Example: While CRCT core capability to produce FCAs was integrated into ETMS in 2001, the efforts failed to produce any operational capability in TFM at the facility or AOC level. Long lead times and delayed procedural development will limit meaningful FCA-based operational use in 2002 as well.

Scope: This activity should include any FCA capable tool that will provide common situational awareness.

EWG Recommendation: Work plans of AUA, VOLPE, NASA, and MITRE should be examined carefully to ensure full FCA capabilities are deployed no later than March 2003.

OEP/FFP References: RTCA NAS CONOPS-Addendum 4: FFP2-Section 3.4.4 and FAA OEP V 2.0, ER 2.1 and 2.3

Decision: S2K must lock in FCA deployment in TSD/CCSD for TFM purposes by Spring 2003, including deployment, testing, I&I, and training. No further delays should be accepted.

3.1.3 Research and Development

3.1.3.1 Data Quality Analysis

Problem: The quality of input data for strategic planning is identified as a key risk in the OEP (ER-2.3). In order to expand the event horizon for strategic TFM to be effective, higher levels of data integrity will be required.

Example: Metron POET study of unscheduled demand for ZOB sectors 48/49 showed high percentages of unpredicted demand and high percentages of false demand

Scope: This study should cover all aspects of NAS data that is used to drive decision support tools

EWG Recommendations: The industry should enlist the support of a major integrator or contractor with a proven record of accomplishment of addressing this scale of complex data analysis challenge. We also recommend assistance from a vendor or government entity with a proven record of CDM participation and understanding. CDM should be used to the fullest extent in establishing near-term recommendations for data quality improvement.

OEP/FFP References: Though FAA OEP and RTCA documents refer to CRCT and FCA for improved airspace density prediction (OEP, ER-2.3 and RTCA NAS CONOPS-addendum 4: FFP2-appendix B-24 4.1.2), they fail to address inherent data quality issues.

Decision: Launch an analysis of the inherent frailties of data architecture, source data, data fusion, current probabilistic capabilities and overall sources of error.

3.1.3.2 Simulation Lab Capability

Problem: There is currently no capability to simulate processes, procedures, or tools in one lab that allows for the interaction of all entities of the NAS. It is imperative that users become part of the solution to the problems of the NAS. The impacts of traffic management initiatives must be understood by the user before a process/procedure is implemented or a tool is deployed. The S2K Training for 2001 identified a void of understanding between the controller work force, Traffic Flow Management and AOCs. A comprehensive lab could greatly reduce this void.

Example: FCAs can be defined by TFM but preemptive planning cannot be simulated to ascertain the impact of dealing with FCAs and allowing the User to minimize that impact. Simulation of the FP3 (Flight Plan Pre Processor) tool in conjunction with the National Log would allow bugs to be identified during concept development and prototyping. This process

would reduce much of the reluctance of controllers and dispatchers to accept a new procedure or tool and allow the user to determine what software or hardware is needed to deploy the procedure or tool.

Scope: Comprehensive training program that includes full dynamic NAS simulation, including AOC that develops a common training syllabus used to meet FAA training objectives as well as AOC, Business, General Aviation and Military requirements.

EWG Recommendation: Develop or enlist the expertise of a major contractor familiar with the interaction of the ATC system and the users to develop a dynamic simulation lab that can simulate or test all traffic flow functions of the NAS. By having a comprehensive lab, the system would gain the following capabilities:

- Centralized training location that would support local simulation capabilities
- All the right people at the right time
- Capability to write scripts based on what is to be simulated
- Immediate results and documentation of simulation
- CDM process would have the capability to do "what if scenarios" during concept exploration
- ATCSCC design and development of play books to test preemptive interaction of AOCs
- Description of the test
- Test traffic flow management concepts
- Support concept and development of CDM tools
- Conclusion and recommendations

OEP/FFP References: While the OEP references simulation exercises, it leaves out the AOC component.

Decision: **S**olicit design input from potential contractors immediately and plan initial use of lab no later than June 2002.

3.1.4 Tools and Technology

3.1.4.1 TFM Tool Integration Plan

Problem: The complex and multi-dimensional problem of enroute congestion management requires large expenditures on research and development. Unfortunately, and despite efforts to curtail the problem, overlap and competition among government entities and private vendors remains a challenge. The proliferation of stand-alone decision support tools, all of which have merit, has reached a space limitation if not a training limitation. The TFM community lacks a coherent plan and transition strategy to integrate the wide range of tools that apply to enroute congestion management.

Examples: Playbook, TSD/CCSD, DSP, and RMT are all useful tools but are not connected by common data, are not resident on a common platform, and do not share their data across platforms.

Scope: This study should cover all enroute TFM systems and address various integration architectures and options with a focus on the creation of common situational awareness and system predictability.

EWG Recommendation: Enlist the support of a major integrator or contractor, with a proven record of accomplishment of addressing this scale of integration problem, to lead a multi-disciplined approach to develop an architecture and standards. See Appendix 8, TFM Integration.

OEP/FFP References: FAA OEP V 2.0- ER 2.3, RTCA NAS CONOPS – Addendum 4: FFP2 – Section 4.1

Decision: Authorize an industry wide TFM Tool Integration analysis study with the final goal of an architecture based on open-standards (e.g., XML, ODBC/JDBC, SQL, CORBA, SOAP, J2E, EJB, etc.) widely used in commercial development that would allow FAA systems to benefit from the technological advances being made in the commercial sector

3.1.4.2 Enroute Impact Assessment Tools

Problem: Enroute TFM lacks the analogue to FSM and enroute congestion management tools do not yet exist with sufficient capability to model NAS impacts and TFM alternatives before they occur.

Example: Using FSM, users and ATCSCC TMSs alike can model the complete implications of a ground delay program at a major airport terminal before, during, and after the actual event. This provides an open, "no excuses" environment for collaborative input and optimization of NAS resources. Examples of this type of tool are:

- C FLOW-under development by METRON.
- FACET-under development by NASA.
- Interactive Impact Assessment Capability-under development by MITRE.

Scope: This item covers the advanced development, war-gaming and eventual deployment (2003 and beyond) of enroute impact assessment tools (EIATs).

EWG Recommendation: It is not believed that any of these tools can reach a state of usability with the exception of a limited role for FACET in 2002 (see item 3.2.2.2). These tools should be war-gamed and developed by the CDM group under direction and guidance of AUA-700 and the developers.

OEP/FFP References: RTCA NAS CONOPS – Addendum 4: FFP2 – Section 2.1.5

Decision: While no decision for implementation in 2002 may be possible, it is vitally important that a suite of capabilities be developed for 2003 and beyond.

3.2 Near-term Recommendations for 2002

3.2.1 Policy

3.2.1.1 Incentives For User Participation In System Needs And Solutions.

Problem: Agency policies directly influence the operator community against effective participation in enroute system solutions.

Example: Carriers who help the NAS by filing around severe weather are often penalized by multiple reroutes when other operators who file through the weather, are rerouted by controllers around the weather, causing a ripple effect of rerouting other flights properly routed to avoid the weather. This results in a minimal impact to those flights routed into the weather.

Scope: These incentives should apply to early notification of intent (data integrity), route selection, slot substitution, and off-loading process for enroute congestion,

EWG recommendations: Air Traffic amend it policies to reward the actions of operators that assist in the optimization of the NAS during severe weather. EWG specifically recommends:

- The elimination of double penalties imposed in the enroute environment by the collective actions of controllers and air traffic managers rerouting flights already routed outside of the areas impacted by weather.
- Priority for carriers who participate in SPT and other collaborative TFM approaches. A precedent for such participation in enroute slots is already in place at ZOA in the long established Oakland Center Track Advisory.
- Establishment of incentives for expressing early intent, which improves demand predictions and predictability.
- Disincentives for operators to "game the system".

OEP/FFP Reference: RTCA NAS CONOPS – addendum 4: FFP2 2.10 and FAA OEP V 2.0-ER 2.1 and 2.3

Decision: Establish incentives for carriers who follow the regulations, participate in the strategic planning process and assist in the creation of system solutions for the NAS.

3.2.1.2 Flexible Rules For Operation Of The NAS During Severe Weather.

Problem: Rules for operation of the NAS are still too generic and do not account for the very real constraints that are caused by the severe convective weather season. During severe weather outbreaks, controllers, pilots, dispatchers, and traffic managers must all change their approach to adjust the levels of freedom and structure in operating a predictable NAS. It is not possible to manage enroute congestion when thousands of individual and unaccountable actions are changing trajectories with no regard to systemic impact.

Examples: ATC Preferred routes, which may aid flow on good weather days, are not suspended during periods of severe weather, and drive flights directly into flow constrained areas and

hazardous weather. NRP, which also has large clear air benefits, is rarely suspended when severe weather impacts the system. Use of longer direct clearances not filed or known to ETMS is allowed to destabilize the predictability of the NAS during severe weather when that predictability is needed most. These decisions are made by pilots and controllers with little or no knowledge of down-line or systemic impacts.

Scope: These rules should be applied to specific impacted airspace and should cover the spectrum from free routing of flights to highly restricted operations to achieve maximum possible throughput in areas impacted by severe weather and in saturated adjacent airspace.

EWG Recommendation: S2K+2 Training should include the latest version of the NASCON proposal put before the S2K and that the SPT be the specific vehicle for implementation.

OEP/FFP References: FAA OEP V 2.0- ER 2.1, RTCA NAS CONOPS – Addendum 4: FFP2 – Section 6

Decision: Ensure that the NAS rules of the road change with the weather if NAS predictability and stability are to be protected. Adoption of the " NASCON" approach or similar procedures is required to alert all parties to change their mode of TFM participation and inputs as weather changes.

3.2.2 Procedures

3.2.2.1 GDPs in Support of SWAP

Problem: GDPs in support of SWAP have been roundly criticized by users because it is felt that many flights that do not need to be controlled are given delays while many other flights that should be controlled are allowed to exacerbate the existing impacted area. This historically results in ground stops on top of the GDPs, further compromising the system.

Examples: Repeated shift comments and SPT debate bog down in unproductive banter about this TMI that abuses a legitimate airport congestion management tool (FSM) and tries to make use of it for an enroute problem.

Scope: This is not considered a new tool or new technology but simply the delivery of a software enhancement to better refine or re-define the use of FSM as it can be applied to sever weather events.

EWG Recommendation: Dual track development of FSM capabilities for the enroute environment for Spring 2002. This involves no change in the AUA-200 or VOLPE work plan or ETMS releases.

OEP/FFP References: FAA OEP V 2.0- ER 2.3

Decision: Two important decisions must be made to evolve this TMI into a more accepted and effective approach to enroute congestion during severe weather. Support a parallel FSM

development providing new GDP functionality for spring 2002 including (See Appendix 24, Procedures and Guidelines, M. Libby):

- Multi-Airport GDPs (Fuses multiple airports into a single GDP)
- Multi Airport / selected fix GDPs (exemption of specific fixes in a multi-airport GDP)
- Playbook fix GDPs (Also called Playbook Spacing Program, or PSP)
- Multi-fix GDPs (variable rate by select fix [fix load] GDP)
- Distance-based GDPs (replacing tier-based GDPs)

3.2.2.2 Pre-emptive TFM by User Preferred Trajectories

Problem: The overwhelming success of the "midnight test" and occasional use during spring 2001 has not expanded into regular use nor have the limits of such an approach been proven or defined.

Example: Each night during the convective weather season, the "box haulers" consult with ATCSCC and other facilities to arrive at an approach for convective weather avoidance and there were several successful tests of the approach during the early part of spring 2001.

Scope: While the pre-emptive approach to traffic management remains mostly unexplored territory, the need for real time situational awareness of all NAS users requires development of tools where by industry is looking at the same constraint, options, and capacity as the ATCSCC. By providing a reliable forecast of traffic flow conditions to all users and decision makers, proactive measures can be taken in a preemptive measure to mitigate or eliminate the impact of the constraint.

EWG Recommendations: Immediate deployment of the Future ATM Concepts Evaluation Tool (FACET) to the AOCs for rapid prototyping into an AOC-based Pre-emptive TFM tool. The concept of operations is described in the Nextor Framework Document and the CDM Collaborative Routing –" Team A Proposal". A future study should be planned to explore the limits of pre-emptive TFM in the 2-6 hour event horizon before flight and event. One might be done by MITRE or NASA and the other by a private contractor.

OEP/FFP References: FAA OEP V 2.0- EW 2, RTCA NAS CONOPS – Addendum 4: FFP2 – Section 6

Decision: Task the CDM group to develop procedures and capabilities for the FACET for expanded use outside of the current CRCT core development.

3.2.2.3 Tactical Action Team

Problem: While the SPT has found a niche in the enroute TFM process, tactical TFM is often uncoordinated or disconnected from user actions and strategic process. This represents a lost opportunity for better management of the NAS.

Example: Users and field facilities often complain that ATCSCC Severe weather initiatives contradict the SPT process.

Scope: While the tactical methods and processes will be different from the SPT, advances in weather products and other CDM methods have opened a tactical window of new opportunities. These opportunities should be leveraged in 2002.

EWG Recommendations: A Short, tactical update (limited to five minutes) at the beginning of each SPT and as needed in between, to be led by the ATCSCC severe weather unit beginning next Spring. New weather and TFM tools (CIWS, NCWF, etc.) should be utilized in collaboration with carriers in innovative ways as determined by the CDM group. Severe weather needs to be reorganized to work in a close fit with the SPT process. (See 2000 review matrix from Xerox, which promised a re-engineering of the severe weather unit but was never, implemented.)

OEP/FFP References: RTCA NAS CONOPS – FFP2: addendum 4 4.1, 4.2 and FAA OEP V 2.0- ER 2.2.

Decision: Require that the ATCSCC severe weather unit and user community counterparts be as disciplined, collaborative and methodical as the SPT process.

3.2.2.4 Military Coordination

Problem: The events of September 11 have changed the very nature of enroute congestion management. Military involvement, especially near large metropolitan areas, adds an additional, unpredictable congestion factor. A thorough understanding of the constraints by the military, FAA, and operators is necessary to develop a comprehensive approach to managing the NAS.

Example: While disruptions this fall have been minor, weather has been ideal. No one should draw optimistic conclusions about next year's enroute congestion challenge because it is not known what additional events may occur, nor when the reduced level of operations give way to growth.

Scope: This item covers all impact from enhanced military operations and security measures as a result of the September 11 attacks.

EWG Recommendation: Hold meetings with the military and operational personnel such as the CDM group to discuss and recommend specific procedures to better manage SUAs in the enroute NAS with a greater military presence.

OEP/FFP References: FAA OEP V2.0 ER-8 and RTCA NAS CONOPS, Addendum 4: FFP2 – Section 4.1

Decision: It is prudent in this case to preplan for the worst scenarios and be prepared to manage them if they occur. If conditions improve, then results will as well but the system will be prepared for the worst.

3.2.3 Tools and Technology

3.2.3.1 Reroute Advisory Team (RAT) Recommendations

Problem: The current use of ATCSCC advisories has inherent problems in interpretation and use that results in non-compliance of up to 70 %. Despite repeated calls for implementation, the RAT team recommendations could not be implemented in 2001 and will have limited implementation in 2002.

Example: Machine-readable list of impacted flights with routes to be flown appended to each advisory.

Scope: These are relatively basic changes to ETMS that cannot get around the long lead times (almost one year). See RAT Documents.

EWG Recommendations: ATCSCC interventions by advisory only should be minimized until the full RAT capabilities are implemented and the ATCSCC can expect compliance levels in excess of 50 %.

OEP/FFP References: FAA OEP V 2.0- ER 2.1, 2.2.

Decision: The decision must be made as to whether further slips in this capability are in fact warranted and prudent. Without these changes, the effectiveness of most TFM initiatives in 2002 may be less than 50 %. (See RAT team study) Under no circumstances should the full machine-readable capability proposed for implementation be slipped beyond Spring 2003.

3.2.3.2 EnRoute Automation Modernization (ERAM)

Problem: Limitations, long lead times for updates, and non-standard use of the ARTCC HOST computers stifles TFM evolution, and limits the ability of the service provider to meet system goals and accommodate user requests.

Example: Inability of coded departure routes to tie into the original route causing lengthy process for manually input of “6/7/10” amendments of the complete route.

Scope: This is a major effort outlined in the Appendix but value of the TFM related work is very high.

EWG Recommendations: The entire ERAM effort be supported but special emphasis should be given to the following:

- Continuing work plans for the Flight Plan Preprocessor Prototype (FP3).
- Early deployment of ERIDS in the Northeast Corridor, specifically ZBW, ZNY, ZDC, ZID, ZOB, ZMP, ZTL and ZAU
- An AOC interface to the ERIDS portion of ERAM.

OEP/FFP References: FAA OEP V 2.0-ER 2.1 and 2.3

Decision: Support the continued efforts of ERAM to evolve the HOST computer capabilities.

3.2.3.3 Incorporation of NAS Status Information

Problem: DSP and other existing tools are needlessly isolated from users. Practical use of DSP departure predictions by flight number was proven in 2001 to be a value to AOC personnel. There are numerous other examples of useful NAS status data elements ripe for data exchange.

Examples: DSP departure queue information is often useful to operators, but because there was no defined AOC interface, AOC personnel must call facilities, interrupt traffic management specialists during severe weather, and manually transfer the data over the telephone.

Scope: This recommendation applies to a variety of useful NAS status data previously identified by CDM, OEP, and FFP.

EWG Recommendation: Establishment of simple interfaces and porting of data to support common situational awareness among all TFM personnel including AOCs

OEP/FFP References: FAA OEP V 2.0- ER 2.1 and RTCA NAS CONOPS – Addendum 4: FFP2 – Section 4.1

Decision: Require AUA, ATT, and VOLPE work plans for 2002 and 2003 provide access or interfaces to systems such as DSP, URET, Direct to, ERIDS and IDS4 where NAS status data remain confined to stand alone systems thus preventing common situational awareness.

3.2.3.4 Near-Real-Time POET

Problem: The POET system was designed to be a common tool leading to a more scientific review of NAS performance. Access to near real time POET has been denied to the user community.

Example: FAA facilities now have real-time access while users do not.

Scope: The conditions and agreements that applied to present POET access should apply.

EWG Recommendations: POET access should be near real time for all participants, including users. Further implementation of synchronous and asynchronous communications and conferencing should be explored.

OEP/FFP References: RTCA NAS CONOPS – Addendum 4: FFP2 – Section 2.1.4

Decision: Support the mutual use of POET for NAS performance review to minimize arguments and differing views of post event reviews.

3.2.3.5 Traffic Management National Log (TMNL)

Problem: The TMNL effort is key to many improvements in NAS Congestion Management. Unfortunately, automation, procedural, and training, issues have jeopardized its implementation in time for 2002. This uncertainty has spread to restrict follow-on efforts that will utilize the data

gathered to improve NAS status information and to feed decision support systems primarily through ETMS.

Examples: C Flow Impact assessment Tool, Electronic Status Information System (ESIS), ATCSCC Operational Information System (OIS)

Scope: All aspects of the National Log effort at all levels.

EWG Recommendations: TMNL deployment must be put on a fast track. Obstacles to progress should be identified and overcome. Additional resources should be considered if properly identified. The EWG was not given any alternatives to fast track the National Log development. ATT-200 and the region should update S2K monthly on its progress.

OEP/FFP References: RTCA NAS CONOPS – Addendum 4: FFP2 – Section(s) 3.1.1, 4.1, and 4.2

Decision: The industry should keep a sharp focus on this effort and realize that any slippage will result in lost NAS benefits.

3.2.3.6 Weather Depiction And Forecast Products

Problem: Weather remains a primary destabilizing force in the NAS. Without improvements in forecast accuracy and innovative new products, proper TFM responses to weather phenomena are difficult if not impossible.

Example: Although the CCFP is still an imprecise weather forecast tool, it enabled the SPT process, which brought greater coordination and predictability to the NAS. Several airlines credit SPT with large user benefits.

Scope: Forecasting and depiction of convective weather.

EWG Recommendations: While depiction and forecast of other weather phenomena may be beneficial, nothing impacts the throughput of the NAS like convection. New products should be made available as overlays in TSD, CCSD, FACET, POET, and other TFM tools by spring 2002. These products should include at least the following:

- Mosaic weather radar imagery for common situational awareness of current convection. (About $18K per year as quoted by VOLPE).
- Corridor Integrated Weather System (CIWS) – driven by Lincoln Labs this product is of greater current state precision than the radar mosaics but also contains a projection of growth and decay for one hour.
- The NCAR developed National Convective Weather Forecast (NCWF) – A two hour "Nowcast" projection with growth and decay but lacking "initiation" forecast information
- The NCAR developed one hour THOR "Nowcast". This innovative product is really the first attempt to tackle convective initiation. This product attempts to answer where new thunderstorms will appear and when. If successful, this product has broad implication for tactical TFM and how it is conducted.

While these products are in some cases unproven, they are cutting-edge technology and as such deserve the attention of the ATM community for making assessment and use of them in 2002.

OEP/FFP References: RTCA NAS CONOPS – Addendum 4: FFP2 – Section 4.2

Decision: Its is imperative that traffic managers and AOC professionals be given the very latest in technological weather advances.

3.2.4 Training

3.2.4.1 S2K+2 Training

Problem: Training is a key to success in any organization or endeavor. The 2001 S2K training program was a huge success last year because it addressed a void of understanding in the controller and TFM workforce. Unfortunately, training on the specific tools, technology, policies, and procedures was not accomplished.

Example: CCFP training for the ATCSCC and field TMCs. While some carriers trained virtually all their personnel, key ATCSCC and field personnel were never trained in the specific CCFP product and often misinterpreted what the product offered causing the effectiveness of the SPT planning process and Strategic Plan of Operation to be minimized.

Scope: All S2K+2 Training.

EWG Recommendations: S2K+2 training should be modeled on last year's efforts but move from the general to the specific. Joint training by air traffic and airline personnel was a great success and should be repeated. Policies, tools, procedures and technology and should all be covered.

OEP/FFP References: FAA OEP V 2.0- ER 2.1

Decision: Insist on another strong training program this year that moves beyond generalities and teaches specifics.

Section 4

Related Collaborative Routing Work Plan Items

Many of the items described in the Action Summary of this report are already being worked in the Collaborative Routing process. Appendix 27 describes all associated work items along with their current status and project leads.

Section 5

Appendices

Section 6

Glossary

ARTCC	Air Route Traffic Control Center. Regional FAA en-route control centers.
ATC	Air Traffic Control
ATCSCC	Air Traffic Control System Command Center.
CCFP	Collaborative Convective Forecast Product
CDR	Coded Departure Route
CONOPS	Concept of Operations
CRCT	Collaborative Routing Coordination Tool
CTAS	Center TRACON Automation Sequencing
DSP	Departure Spacing Program
DSS	Decision Support System
ESIS	Enhanced Status Information System
ETMS	Enhanced Traffic Management System
ERAM	Enroute Automation Modernization
FAA	Federal Aviation Administration
FCA	Flow Constrained Area. An FEA published by the ATCSCC
FEA	Flow Evaluation Area - A flexible defined area of airspace potentially subject to Traffic Flow Management initiatives
FP^3	Flight Plan Preprocessor Prototype
FSM	Flight Schedule Monitor
GDP	Ground Delay Program
HOST	ATC Host Computer
MIT	Mile in Trail
N90	New York TRACON
NAS	National Airspace System
NATCA	National Air Traffic Controller's Association
NBAA	National Business Aviation Association
NCAR	National Center Atmospheric Research
NDB	Non-directional Beacon
NOM	National Operations Manager
NOTAM	Notice to Airmen
POET	Post Operational Evaluation Tool
SOP	Standard Operating Procedure
SPO	Strategic Plan of Operations
SPT	Strategic Planning Team
SWAP	Severe Weather Avoidance Plan
TMC	Traffic Management Coordinator
TMO	Traffic Management Officer
TMU	Traffic Management Unit
TRACON	Terminal Radar Approach Control
ZBW	Boston ARTCC
ZDC	District of Columbia ARTCC

ZID	Indianapolis ARTCC
ZJX	Jacksonville ARTCC
ZKC	Kansas City ARTCC
ZMA	Miami ARTCC
ZMP	Minneapolis ARTCC
ZNY	New York ARTCC
ZOB	Cleveland ARTC