

Community-Wide Information Sharing (CWIS) Task SA1-07

Subtask 3 Report

Revision 2

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1. INTRODUCTION

1.1 Purpose and Scope

ITT Corporation conducted the CWIS (Community Wide Information Sharing) study for the Next Generation Air Transportation System (NextGen) Institute, in cooperation with the Joint Planning and Development Office (JPDO), to identify communities of interest (COI) of information sharing for NextGen, results were presented in CWIS subtask 2 report¹.

The mission of NextGen is to increase the safety, security, capacity, and efficiency of air transportation operations through meaningful integration and collaboration among stakeholders from the public and private sectors. As described in the NextGen Concept of Operations² (CONOPS), one of the main enabling concepts for this mission is the information sharing component known as net-centric infrastructure services, or Net Enabled Operations (NEO). It provides the foundation for robust, efficient, secure and timely transport of information to users, thus furnishing participants in planned and ad-hoc COIs across all phases of flight and contingency planning with a common awareness of overall operations and constraints and the impacts of individual and system-wide decisions.

To achieve these benefits however, it is paramount that the adopted information sharing regimes providing the core net-centric functionality are appropriate for the Air Transportation System operational and user environment. This requires understanding of the available information sharing regimes and their applicability to various information sharing environments (e.g. publish and subscribe, database query, collaborative decision making, etc.), the identification of the potential user COI grouping and associated information content and service needs, and finally the identification of information sharing needs, information sharing trust and policy related issues, end-to-end information assurance, and information sharing shortfalls and cost benefits.

The JPDO Net Centric Working Group (NCWG) is designing a *Net-Enabled Information Sharing (NEIS)* environment for NextGen where various stakeholders, including government agencies, aviation operators, and third-parties will benefit from having access to information about the NAS (National Airspace System), airports, airlines, maintenance facilities, environmental factors (including weather), and other supporting services. The general approach for the NCWG is twofold: the first part is to establish processes, methods, policies and organizations to define and manage net-centric information sharing for NextGen; and the second part is to assess requirements for establishing trusted and timely information exchange across disparate infrastructures. The goal of the NCWG is to design an NEIS that maximizes

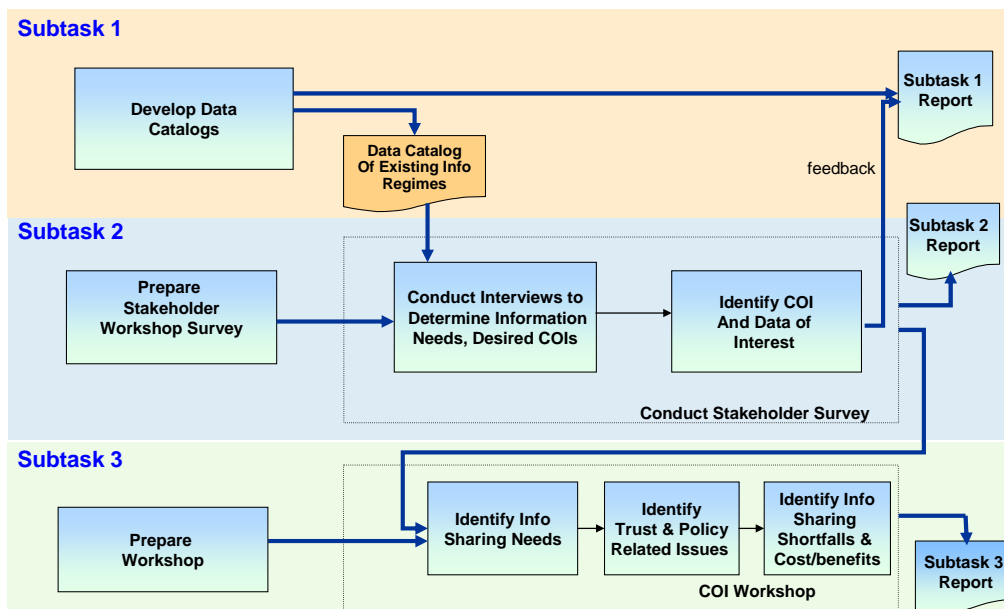
¹ Community-Wide Information Sharing (CWIS) Subtask 2 Report, ITT Technical Report, TR 2410-0002, May 2008

² Concept of Operations for the Next Generation Air Transportation System, v2.0, JPDO report, June 2007

availability of useful information without compromising¹ legitimate national security, homeland security, privacy, and market competition concerns².

The CWIS task was initiated by the NCWG. The overall task included three subtasks. The first subtask was the analysis and cataloging of current information sharing regimes (government only, private sector, and public-private ventures) that may be incorporated into the NextGen NEIS. To achieve this, an understanding of existing information and its providers and consumers is crucial. Six NextGen related information sharing regimes were analyzed and cataloged. The second subtask was the identification of potential NextGen COIs. A COI is “a collaborative group of users who must exchange information in pursuit of their shared goals, interests, missions or business processes and who therefore must have shared vocabulary for the information they exchange”³. Stakeholders can address their valid need for data and list barriers/concerns to information sharing. The third subtask was to gather NextGen representative stakeholder organizations’ views on civil aviation information sharing needs and related issues. The focal interest areas were in high-priority information exchanges, Potential Authoritative Data Sources (ADS), trust issues and requirements, existing gaps and barriers, and potential opportunities and effects.

The overall task flow of the CWIS task is shown in Figure 1-1.



¹ Reviewer comment: Basic legacy challenges: National Security for the public/Nation versus public access and privacy issues. This is well founded in the Markle Reports I and II, the work completed for E.O. 13356, the follow on E.O. 13388 and the resulting ISE-PM activities, etc. Endorse reviewer comment regarding information sharing policy issues, e.g., as identified in Markle Reports and PM-ISE activities. Implied here is significance of *governance process*. Also, Figure 1-1 does not adequately reflect a more broadly-based stakeholder feedback/review process, at least in the future. Recognize it's out of scope for now.

² Reviewer comment: This is not only about privacy....airlines jealously protect schedule information because it has direct impact on competition, and even more so they don't like to share real time aircraft position information, no so much because of terrorism fears, but because they really don't want everyone to have all the delay info for fear passengers will find alternate transportation (i.e. JFK to DC, if the delay is long enough, they can take a bus or the train.)

³ DoD Data Strategy, DoD 8320.02-G, 12 Apr 2006

Figure 1-1: Overall CWIS Task Flow

The data analysis of Subtask 1¹ focused on six key NextGen information sharing regimes: Airline Operations Centers, Airport Security, Aviation Environment Data, NAS Surveillance Data, NAS Aeronautical Information, and NAS Weather Data. The results were documented in the CWIS Subtask 1 report. The Subtask 2 survey helped identify 10 potential NextGen COIs and related issues, these ten potential NextGen COIs are:

1. Airport COI
2. Airline Operations Center (AOC) COI
3. Aviation Environment COI
4. Navigation COI
5. Operational Impact COI
6. Safety COI
7. Security COI
8. Surveillance COI
9. Traffic Management COI
10. Weather COI

Future expanded development of Communities of Interest by the Net-Centric Division and Working Group are in progress, e.g. Contingency Operations COI - think of the totality of Katrina air operations - with different information needs and “vocabulary.”

Subtask 2 results were recorded in the CWIS Subtask 2 report².

This document presents the Subtask 3 approach and workshop results. The initial report was reviewed by two NCWG members (Suzette Matthews and Dale DeKinder), their comments were incorporated in the revision 1 of the report. The updated report was then reviewed and commented by the NCWG industry lead David, the report is updated (rev 2) to incorporate the comments. Some of the reviewers’ comments are included in the footnotes in the report.

¹ Community-Wide Information Sharing (CWIS) Subtask 1 Report: Information Sharing Data Catalogs (draft), ITT Technical Report TR2410-0001, February 2008

² Community-Wide Information Sharing (CWIS) Subtask 2 Report, ITT Technical Report, TR 2410-0002, May 2008

2. WORKSHOP ACTIVITIES

2.1 Workshop Goals and Focal Questions

The goal of the workshop was to gather NextGen views of representative stakeholder organizations on civil aviation information sharing needs and related issues. The NCWG leads addressed specific interest in gathering inputs in areas such as high-priority information exchanges, Potential Authoritative Data Sources (ADS), trust issues and requirements, existing gaps and barriers, and potential opportunities and effects. The twelve focal questions discussed in the workshop are presented in the following sections.

2.1.1 Information Sharing Questions

- FQ.1 Identify high-priority information exchanges for NextGen
- FQ.2 Identify use cases that illustrate the high-priority information exchanges
- FQ.3 What are the Authoritative Data Sources (ADS) for these exchanges?
 - Most accurate, closest to the generation point – all of the data does not need to come from the same ADS

2.1.2 Trust and Policy Related Issues Questions

- FQ.4 What are the issues/rules in establishing trust to share this information (confidentiality, integrity, security, identity, accreditation, etc.)?
- FQ.5 Are there types of information to which access must or should be restricted?
 - For example: proprietary or commercially sensitive, privacy related, etc.
- FQ.6 From whom, and how can sensitive information be protected?
- FQ.7 Can you suggest any techniques for protecting/disguising sensitive information?
- FQ.8 What system restrictions or policy issues make needed data not accessible?

2.1.3 Information Sharing Shortfalls and Cost Benefits Questions

- FQ.9 What are the existing gaps (shortfalls) of information sharing in its availability, timeliness, and/or quality?
- FQ.10 What are the effects of those gaps/shortfalls (e.g., lack of efficiency, safety risk, security risk, etc.)?
- FQ.11 What are the benefits of Net-Enabled Information Sharing on productivity?
- FQ.12 Can you identify other benefits, including cost savings and productivity improvements, resulting from expanded information sharing (quantify if possible)?

note¹:

¹ Reviewer Comment: Above does not adequately touch on importance of *predictive* information.

2.2 Subtask 3 Approach

The general approach of CWIS Subtask 3 consisted of three steps as presented in Figure 2-1. In the plan and preparation step, results from subtask 1 and subtask 2 were used to help identify stakeholders/invitees to attend the workshop. The NextGen Institute and JPDO policy division helped refine the list of invitees and JPDO/NCWG leads reviewed the list and provided further inputs. Invitations/Request for Participation, and the pre-workshop information package were sent to workshop invitees. For Step 2, the JPDO/NCWG provided the focal questions to be addressed in the workshop. The ITT VBSS (Value Based Six Sigma) team provided support in preparing and facilitating the workshop. For Step 3, meeting notes from the workshop were compiled and distributed to workshop participants for review and comments. Unfiltered meeting results were then documented in the subtask 3 report.

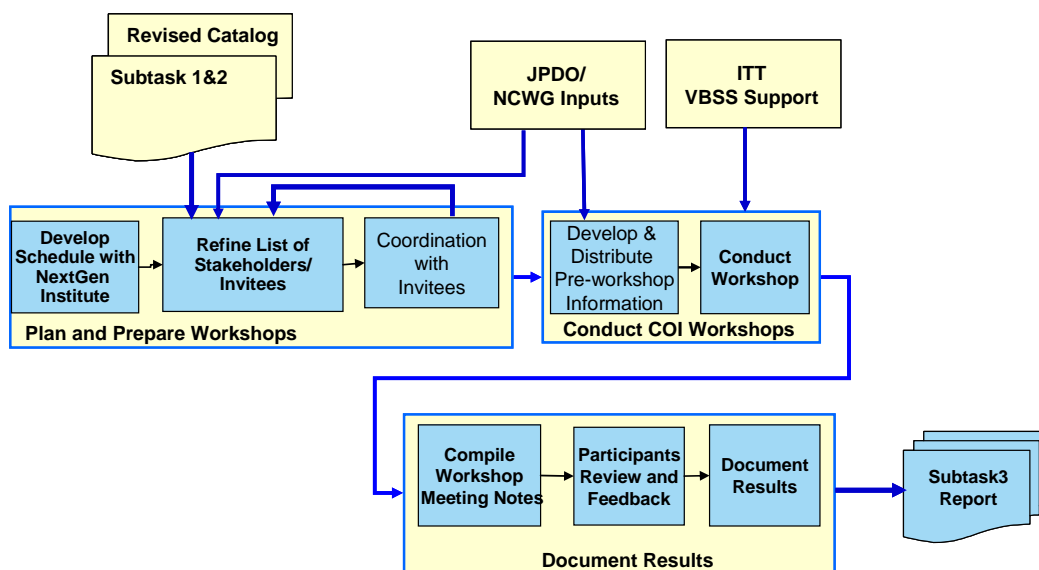


Figure 2-1 Subtask 3 Approach

2.3 Workshop Participants

The mission of NextGen is to increase the safety, security, capacity, and efficiency of air transportation operations through meaningful integration and collaboration among stakeholders from the public and private sectors. The NextGen CONOPS document classifies NextGen stakeholders into different categories as shown in Table 2-1. A workshop goal was to identify invitees from organizations included in the NextGen CONOPS stakeholder classification.

Table 2-1 Stakeholder Categories from NextGen CONOPS

Stakeholder Name	Description
Airport Communities	Cities and towns located in the vicinity of airports that have a vested interest in and are affected by the operation of the airport
Airport Operators	Organizations and people responsible for enabling passenger, flight, and cargo operations conducted within an airport with consideration for safety, efficiency, resource limitations, and local environmental issues
Airport Tenants	Organizations and people who offer services at an airport, such as fueling and maintenance services or catering services
ANSPs	Air Navigation Service Providers. Organizations and people engaged in the provision of Air Traffic Management (ATM) and air traffic control (ATC) services for flight operators for the purpose of safe and efficient flight operations. ATM responsibilities include communications, navigation, and surveillance (CNS); ATM facility planning, investment and implementation; procedure development and training; and ongoing system operation and maintenance of seamless CNS/ATM services. This category includes ANSP personnel and ANSP automation.
Customers	Individuals and organizations, including Government and military, using NextGen for personal or business transportation or to transport cargo
Flight Operators	Individuals and organizations responsible for planning and operating a flight within NextGen, including flight crews (on the aircraft or controlling it remotely) and Flight Operations Center (FOC) personnel. Includes personal, business, commercial aviation, and commercial organizations, as well as government and military organizations.
Manufacturers	Organizations and people who manufacture equipment for flight operators, ANSPs, security and defense providers, and so forth. Includes the manufacture of airframes, aircraft engines, avionics, and other aircraft systems and parts, as well as Decision Support Systems (DSSs) and other systems used in NextGen.
Owners	Organizations and people responsible for making investment decisions related to the development and implementation of NextGen and its associated capabilities
Regulatory Authorities	Organizations and people responsible for certain aspects of the overall performance of the aviation industry, including aviation safety, environmental effects, and international trade. Includes aviation safety regulators, certification authorities, standardization organizations, environmental regulators, and accident/incident authorities.
Researchers	Organizations and people engaged in conducting R&D activities that support the evolution of the air transportation system, including academia and government organizations
Security and Defense Providers	Organizations and people responsible for national and homeland defense, homeland security, law enforcement, information security, and physical and operational security of NextGen
Weather Service Providers	Organizations and people engaged in the provision of aviation weather information products

At the time Subtask 3 was carried out, the JPDO already had nine Working Groups established to solve problems and make fact-based recommendations capable of being integrated into NextGen or changing the course of NextGen in critical ways. These nine Working Groups are Aircraft, Airports, Air Navigation Services, Environment, Global Harmonization, Net Centric, Safety, Security, and Weather.

Their members cover a large portion of the NextGen CONOPS stakeholder classifications and each Working Group has domain experts from both government and industry. Leads or members from these JPDO working groups were contacted and invited to either attend the workshop or to provide appropriate contacts in the corresponding areas. The JPDO Policy Division provided contact information for interested stakeholders and ITT also reached out to organizations considered NextGen stakeholders or

users. The JPDO NCWG leads reviewed and provided feedback on the invitee list. The organizations represented by the actual workshop participants are listed as follows:

Table 2-2 Organizations Represented by Workshop Participants

NextGen CONOPS Stakeholder Category	Workshop Participant Organization
Airport Communities	n/a
Airport Operators	<ul style="list-style-type: none"> – MWAA (Metropolitan Washington Airport Authority) – Manassas Regional Airport
Airport Tenants	n/a
ANSPs	<ul style="list-style-type: none"> – FAA Traffic Manangement – ARINC – AUATAC – Flight Explorer
Customers	<ul style="list-style-type: none"> – Sabre (Travelocity) – AvMet Applications Inc. – QED Consulting – Olive, Edwards & Cooper L.L.C.
Flight Operators	<ul style="list-style-type: none"> – ALPA (Airline Pilots Association) – ATA(Air Transport Association) – Continental Airlines – FedEx – Northwest Airlines
Manufacturers	<ul style="list-style-type: none"> – Boeing – ITT Corp – Rockwell Collins
Owners	– FAA
Regulatory Authorities	<ul style="list-style-type: none"> – JPDO – FAA
Researchers	– MITRE
Security and Defense Providers	<ul style="list-style-type: none"> – JPDO Safety WG Rep, Security WG Rep – Navy – Transecure
Weather Service Providers	<ul style="list-style-type: none"> – DTN/Weather – NOAA – Vaisala – WSI

The list of participants is presented in Appendix A of this document.

3. WORKSHOP RESULTS

3.1 Overview

The workshop was conducted on June 26, 2008 at the JPDO headquarters in Washington D.C. NextGen Institute Deputy Executive Director Dan Cumberland chaired the workshop and presented opening comments and adjourned the meeting. Peggy Gervasi, Director of the JPDO Policy Division, opened the workshop with an introduction to JPDO/NextGen and Net Centric Working Group goals and approaches. Duncan Thomson (MITRE) then introduced the concepts and processes of Communities of Interest, and was followed by Mike Hritz (FAA SWIM Program Office), who described the FAA SWIM COI activities.

Gene Hayman, the previous industry lead of the Net Centric Working Group, provided the NCWG's vision of Net Centric operations and infrastructure in NextGen. Jenny Jin (ITT) then provided contextual information about the CWIS task overall, and provided instructions for the afternoon workshop activities.

For the breakout session of the workshop, participants were grouped into several COI groups so that collaborative groups of users with similar goals, interests, missions, and/or business processes could stay focused on the workshop discussion items. Due to time and space limitations, only five COI groups were selected by the NCWG leads for workshop participation: Airline Operations Center (AOC), Airports, Aviation Safety/Security, Aviation Weather, and Traffic Management. The Airports COI did not have enough participants at the workshop therefore only four COI groups were formed: Airline Operations Center, Aviation Safety/Security, Aviation Weather, and Traffic Management. One participant who could only make time to attend the morning session provided answers to the focal questions; these are recorded in this section. The following sections present summary notes resulting from each of the COI breakout groups.

Summary notes for each of the COI breakout groups presented below correlate to the focal questions in the following order:

- COI participants
- Information Sharing Needs
- Trust and Policy Related Issues
- Information Sharing Shortfalls
- Cost Benefits
- Other General Discussions

3.2 Airline Operations Center (AOC) COI Breakout Meeting Summary/Notes

The AOC COI is a group of users interested in airline operations and related issues. The participants are listed in Table 3-1.

Table 3-1 AOC COI Participants

Name	Organization	Email
Gold, Russell	ALPA	Russell.Gold@alpa.org
Henriksen, Stephen	ITT Advanced Engineering and Sciences	Stephen.Henriksen@itt.com
Ingram, George	ATA	gingram@airlines.org
Jin, Jenny	ITT Advanced Engineering and Sciences	Jenny.Jin@itt.com
Kostov, Ilia	Sabre	Ilia.Kostov@sabre.com
Matthews, Suzette	JPDO Policy	matthe2376@aol.com
McAdoo, Dick	JPDO Safety, security and Wx WGs	P3orion@netscape.com
Stafford, Scott (Facilitator)	ITT Advanced Engineering and Sciences	Scott.Stafford@itt.com

3.2.1 Information Sharing Needs

FQ1: Identify High-priority Information Exchanges

- Existing information
 - NAS status information from FAA (Too many “silos” of NAS data, e.g., NOTAMS, TAFT, etc.)
 - Airports status/outages (not in NOTAMS)
 - NOTAM/NADIN outages (No current way to notify airlines if NOTAMS is out)
- Optimum Flight Route Planning
 - Need real-time weather data assimilated into the process
 - Other flight plans/intents (air traffic management information)
 - Clearing house containing data from all operators
 - Current flight planning in a “vacuum”
 - Necessary information to create flight plans are in different “buckets”
 - When carriers file flight plan, goes to Herndon Center

- Issues with automation forcing non-optimum flight plans, e.g., Dulles RNAV procedures may be sub-optimal, e.g., in winter it gets 100 knot tail wind that makes it difficult to follow filed flight plan based on A/C being RNAV capable
- Aspects of a single authoritative Weather Source
 - Accountable
 - Responsive to users
 - Liable
- Real-time Flight Delay/schedule Information
 - From passengers perspective¹
 - Information currently exists, but not fully disseminated or fully used
- Airport Partnership Information (operations)
 - ATC, airlines and airports all have different incentives/views of flexible gate management
 - Currently airlines lease gates; gate assignment is not efficient²
- Critical info – FAA NPRM (Notice of Proposed Rulemaking)
 - NPRM are draft Rules that may potentially change the official Federal Aviation Regulation (FAR) Rules. NPRM are published in the Federal Register for public comment
- Groups that share airline info
 - Government (TSA)
 - TSA data –impacts on airlines , e.g., if TSA is short staffed
 - Flight Operators
 - CBP (US Customer and Border Protection)
 - Passengers
 - ATC
 - Airports
 - Cargo carriers
 - Airlines
 - Establish trusted sources of information

FQ2: Identify use cases that illustrate the high-priority information exchanges

¹ Reviewer comment: passengers and shippers have information that the NAS needs also, for example, for security screening their personal information is valuable to TSA for pre-screening. The NextGen information sharing system could be authorized by some passengers to search their personal and financial records if that would mean giving them expedited check in, or clearance if TSA unnecessarily detains them. Passenger personal information would also be useful if a passenger got ill on a flight and you had to contact next of kin. Or there was a problem with their passport at a foreign exit point and the State Department in the US is closed for the night. We shouldn't assume that these guys (passengers) are necessarily only customers of "by-product" info—I think that's too limiting. And the internet shows that individuals are VERY creative about using information (their own included) for a variety of purposes (e.g. Face Book, or Craig's list). Concur; but not an element identified by Workshop participants – how to handle? Likewise current, accurate Civil Aircraft Registry is a critical piece of information.

² Reviewer comment: This top-level policy issue on gate ownership doesn't really belong in section on priority information exchanges.

A Flight planning use case was identified to illustrate this high-priority information exchange; this is shown in Figure 3-1.

- Flight planning has a nine month scheduling cycle; OAG compiles information, protects information and reports to DOT. Some data could be used for flight planning. Flight Planning details are not published to all the parties because of anti-trust and competitiveness concerns.
- FAA Traffic Flow Management System has the real-time flight information; OAG must provide to travel agent within certain time frame
- Scheduling up to 1 day before, then CDM (Collaborative Decision Making) participating airlines schedule for the day with FAA; the information is available to CDM participants who signed NDAs (non-disclosure agreement)

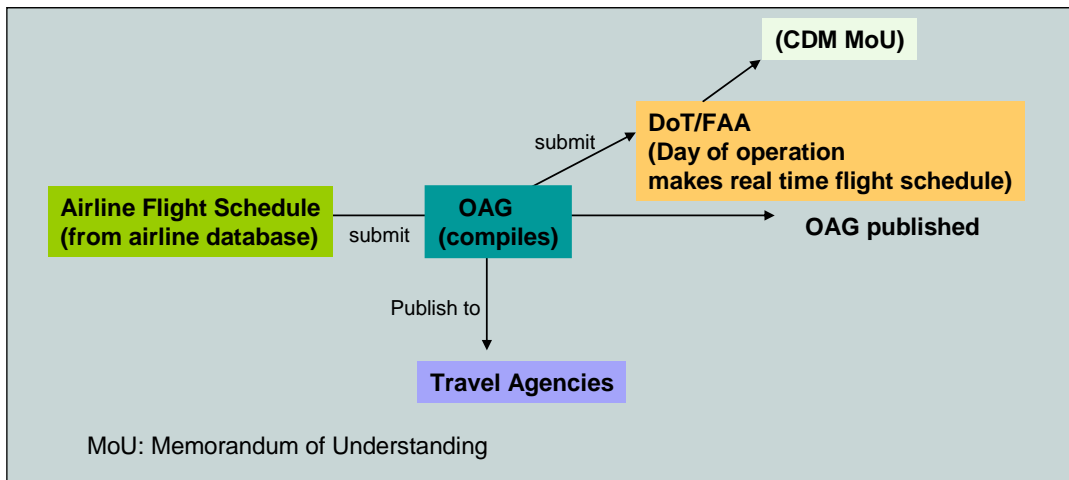


Figure 3-1 A Flight Planning Use Case

FQ3: Authoritative Data Sources (ADS)

- Need Authoritative ATC data/info
- Need Single weather source/authority
 - Who is the weather authority?
 - Accountability
 - Responsiveness and potential liability of sources
 - Carriers as users
 - Business Jets (Part 91) as users
- Weather policy for airports by forecasters located remotely
- Choosing weather/forecast sources
 - E.g. NWS forecast vs. ASOS on airport
- Aviation weather center is only connected to FSS network, which is not used by airlines
- Because of lessons learned from previous weather-related accidents, Congress mandated that NWS must staff every ARTCC (but there is a lack of detailed job description)

- AWOS, ASOS etc. must remain and feed into single authoritative data source

3.2.2 Trust and Policy Issues

FQ4: Issues in establishing trust to share information

- Carrier to carrier (alliance, agreements)
 - Perception of collusion/regulatory constraints
 - Does an automated system eliminate this anti-trust issue?
 - Anti-trust only for scheduling and pricing
 - Many agreements already in place – MoUs
- Carrier to government
 - Barriers – carriers do not want to share everything
 - Airline to FAA
 - Should airline share all airline data with FAA?
 - Allows FAA to discuss violations
 - Anything you give to the government is discoverable
 - FOIA
 - Press concerns
 - Litigation/liability concerns
 - Airline data to traffic controller
 - Airlines responsible for providing trusted-information
 - Economic penalty if not compliant
- Carrier to customer
 - Competitive business
 - Liability
 - Passenger bill of rights
- Role of the media, i.e., availability of information to the media
- When NOTAMS system went down, issues with currency (timeliness), validity of NOTAMs
- Pilots need Authoritative ATC data/info
- *Information assurance* requirements apply to all of these information sharing needs

FQ5: Types of information to which access must be or should be restricted

- Security of ADS-B data
 - Everyone can “see” airplanes
 - Need to protect ADS-B data¹
- CDTI (Cockpit Display of Traffic Information)

¹ Reviewer comment: Real time flight position information, including data tags is already being shared on the internet. Click on <http://flightaware.com/>.

- Is CDTI unfiltered?
- No (cockpit only)
- Very sensitive
- ASD (Aircraft Situational Display) vs. CDTI -- need based
- Need to be sure of integrity and validity of sources
- Need to design protocols to determine who gets what

FQ5 to FQ7 were not specifically discussed in the meeting

FQ8: System restrictions or policy issues make needed data not accessible

- Anti-trust (in scheduling and pricing)
- Aircraft certifications
- Decisions based on weather forecasts
- ATC requirements/policies (e.g., responding to weather requests)
- FAR Part 91 exchange
 - Liability
- Policies to protect ADS-B data
- Weather policy for airports by forecasters located remotely
- Airline Delay/cancellation Status to stranded passengers: When does it end with regard to passengers pushing too hard for compensation based on cancellation

3.2.3 Information Sharing Shortfalls

FQ9-FQ10: Existing Gaps (shortfalls) of information sharing and associated effects

- Airlines and airports have need for increased information exchanges (with improved timeliness)
 - ETMS – real-time info
 - Airports runway availability information
 - Airline Delay/cancellation Status to stranded passengers
 - Airlines delay information needs to be shared with airports so they can adjust staff/services; also share with passengers/travel agents
 - Economic issues, e.g., if failure is due to weather vs. due to mechanical makes financial difference
 - Some airlines are more forthcoming than others
- Gate assignment (lack of efficiency)
 - New information sharing needs if gates are owned by airports
 - “Ownership” of gates -- by airlines instead of airports, needs better management
 - Just-in-time operation for selection of gates
 - Airlines airports and ATC sharing data among the three entities
- Airlines can swap their own flight time slot. But not with other airlines’ time slots (lack of efficiency)

- Aircraft Situational Display (ASD) data; ASD used to have controlled distribution (safety and security)
 - ASD data were used/monitored to influence operation of FedEx & UPS, which led to the development of encryption, filtering of ASD data
 - FAA/ATA has no incentive for sharing ASD data; Airlines think ASD is their own data
 - There are incentives to get the information from passenger's side, e.g., Flight Explorer web site (flightexplorer.com) and many other internet websites that contain similar information
 - Incentive vs. business, "ownership" of data
- Flight plan
 - Competitiveness concerns on the amount of detail in flight plans, nobody wants to share information, e.g. fuel burn, alternate routes
- Policy of regulation may determine sharing protocol/procedure, need to worry about business impacts when designing the protocols
- Security info – screening backups
- Information Sharing Barriers
 - Competition, agreements
 - Airline liability concerns
 - Government legislation
 - Should provide benefit incentives to information providers

3.2.4 Benefits and Cost of Net-Enabled Information Sharing

FQ11-12: Benefits and Cost resulting from expanded information sharing

- What equipment needs to be put into aircraft and IT on the ground?
- Costs/architecture to share information, including security, governance and quality (integrity of information)
- Cost of Equipments for dispatch/cockpit in NextGen
 - How much does it cost, what is the benefit of having additional equipment
- Costs of services to airlines, e.g., ARINC, SITA, Weather services
 - FedEx used to spend a significant amount of money for communication services
 - NOAA port– fixed cost
- How much does it cost for airlines to have 4D Trajectory capabilities? (user equipage issue)
- How much does it cost to get key weather data?
- How to quantify cost?
 - Equipment costs – cockpit/dispatch
 - IT backbone
 - Benefit – post operative data when there is an incident

3.2.5 Other General Discussions

- Sabre Flight planning service /software to file flight plans
- Relations between Sabre and Airlines are “fairly open”
- Airlines to FAA relations are fairly open, Airline to airline are not open because of competitiveness concern
- Sabre shares some of its available information from airlines with passengers
- For detailed information such as cancellation reasons, if not available to travel agencies, then is not available to passengers
- Role of travel agents in NextGen environment
 - Role will not go away; business travel agencies are thriving (want/need service)
 - Anti-trust potential collusion issue
 - No anti-trust if FAA runs the computer
- Will ATA become business broker? (maybe not because they only serve their members)
- Flight plan algorithm changes – who pays the most gets priority? Depends on values/policies for use of airspace
- Rules changing of FAA Aviation Regulations (FAR) Part 121 vs. Part 99
 - Notes: Part 121: Operating Requirements: Domestic, Flag, and Supplemental Operations, part 121 is for scheduled air carrier (commercial aviation)
 - Part 91: General Operating and Flight Rules, Part 91 is general operating rules for all aircraft
- Role of controllers will change from controlling to managing to monitoring in the NextGen environment
- Controllers used to have to be able to toggle weather on and off
- ASD (Aircraft Situational Display) with data tags
 - Airlines can get what the FAA has, with some exceptions e.g., President’s planes, specific corporate planes; some military missions

3.3 Aviation Safety/Security COI Meeting Results

The Safety COI is a group of users who are interested in aviation safety and related issues. The participants list is shown in Table 3-2.

Table 3-2 Safety/Security COI Participants

Name	Organization	email
Fong, Vanessa	MITRE	cvfong@mitre.org
Kosatka, Art	TranSecure, Inc.	akosatka@transecure.us
McGuire, James	Applied Systems International, Inc.	jmcg2@cox.net
Olive, David	Olive, Edwards, & Cooper, L.L.C. (representing Sabre)	dolive@olive-edwards.com

Randolph, Warren	FAA Safety Office	warren.randolph@faa.gov
Ulliman, Curtis (Facilitator)	ITT Advanced Engineering and Sciences	curt.ulliman@itt.com

3.3.1 Information Sharing Needs

- Discussion of “Information sharing”, which in the security context was about what kinds of data, its accuracy and relevance, from whom/where, shared with whom, with what permissions, for what purposes, by what methods, etc.
- Some of the graphics offered in the earlier full committee session were without lines of communication - or in some cases, were arrows in only one direction, or suggested certain hierarchies that did not reflect reality -- or equally important, the fact that reality is different at every airport.
- There are many situations where even though the technological capability for information sharing may be present, there are political, cultural and jurisdictional / turf realities that often make it almost impossible... and that's in the regulated commercial world – the GA community will have even less incentive to share.
- Information generation and sharing possibilities influenced by DHS threat level and organizations. E.g., for an elevated threat level, San Diego HPD would perform vehicle inspections before vehicles are allowed into the public terminal roads.
- Watch lists and license plate recognition data could augment airport security regarding warning of possible threats, especially if correlated with USG Immigration data and State data related to felonies and auto thefts. Airports may be reluctant to get involved because of perceived liabilities, limits to jurisdiction.
- Discussion of various threat scenarios; need better needs assessments from operators
- TSA Administrator Kip Hawley has pledged to consider security measures in a threat-driven environment, but information sharing out to data-users, stakeholders, does not occur in many TSA/DHS mandates, so users tend to discount its relevance and need for action. Threat-driven selection should also apply to establishing COIs... more users, less theoreticians.

3.3.2 Trust and Policy Issues

- Protecting sensitive data – also “De-Identification” to obscure the origin; render carrier data anonymous – but not without risk (Kentucky Court re NWA data).
 - Some judges are breaching the firewall for legal purposes, not for safety reasons

3.3.3 Information Sharing Shortfalls

- Some safety info is hard to access – DoD privileged data may be protected¹ by UCMJ (The Uniform Code of Military Justice); not available to FAA¹

¹ Reviewer comment: Criminal prosecution data is law enforcement information that is sensitive for prosecution; this applies to all law enforcement efforts. Every FAM, Coast Guardsmen, Customs & Border Protection, or LEO in the air transportation system encounters this dilemma Concur; handling of law enforcement sensitive data is a key information sharing policy issue

- Security means operational and physical security
 - Security still looking at technology perspective; failure to recognize the extreme complexity of the stakeholder community, multiple layers of jurisdiction, information cultures, for both commercial and GA.
 - Issues of cost, liability, insurability, privacy, need to know, potential for regulation, inter-agency conflicts, operational consequences
- NextGen does not address recovery
- ConOps layers of security - does NOT include IT security, which is the NetCentric WG
- Integrated Risk management – considers:
 - Secure People - passengers, SSCPs, ID credentials for employees and tenants – and public access
 - Secure Airport
 - Secured Checked Baggage
 - Secured Cargo / Mail
 - Secured Airspace
 - Secured Aircraft
- Is ConOps at DHS level, to include FEMA for responders?
- Information for public – who needs to know what? Boemer example. Need to focus on priorities.
- Incidents off airport property, MANPADS found 2 miles away – who gets notified and by whom?
- Impact on arriving and departing flights? Off-airport jurisdiction?
- Stakeholders issues and who makes decisions?
- Data originators/sources and users: TSA local (FSD) and national; LEO, Feds such as FBI, CBP, DoD, USSS, ICE, first responders, military, GA/FBO, commercial tenants, public pax, others
- Recognition that the system is immature for data sharing purposes, and is inherently difficult due to diversity of local systems. No good foundation for national ConOps.
- ICAO, EU requirements are vague at best: must “have a plan” but no guidance on “how” things are to be done. Security issues and new requirements are highly political, with reciprocal international demands threatened, and the length of time necessary for international approvals, and lack of enforcement capability other than political pressure, are impediments to consistency
- National Transportation ConOps? Need for Info exchange vs appropriate info for multi-level decision making (command & control)

¹ Reviewer comment: interagency safety information sharing is in fact favored. Section E4.15.1.3, "Cross Feed of Accident Data," of DOD Instruction No. 6055.7, Re: Accident Investigation, Reporting and Record Keeping (October 3, 2000) authorizes military organizations to provide non-privileged safety information to other federal agencies for the promotion of safety. The DHS Information Sharing Strategy (dated April 18, 2008), released by Secretary Chertoff May 21, 2008, designates sharing of security and terrorism information with other federal agencies, state and local governments, and the private sector as a mission of DHS. Although the DHS Strategy is focused on security information, it sets the stage for interagency cooperation on information sharing.

- Big communications interoperability problems exist across agency lines – DHS is working this problem but it will take years to fix
- Role of DHS Freedom Center (TSA Operations Center) – what info should it get and from whom

3.3.4 Benefits and Cost of Net-Enabled Information Sharing

- FAA is studying SMS benefits to justify cost of the program, but still “don’t know what we don’t know”
- Very limited business case for safety and security – all overhead, and like safety, in security it is difficult to justify the negative; i.e. success is judged by something not happening.

3.3.5 Other General Discussions

- FAA Aviation Safety – COIs explained by Warren Randolph
 - Per the NGATS IP (December 2004) the Safety WG is responsible for identifying a path for transforming the way the Nation manages aviation safety
 - Safety management systems (SMS) – policy oriented. 4 principles of SMS include the following:
 - Safety Risk Management – information sharing requirements underway
 - Safety Assurance – includes data for audits and progress
 - Safety Promotion – cultural, understanding why things happen
 - Safety Policy
- FAA AVS information sharing and analysis (ASIAS) program expected to expand to all JPDO partner agencies. ASIAS is a way to meet SMS inter-operability requirements.
- ASIAS directly supports SMS safety risk management and safety assurance requirements
- ASIAS began as a NASA R&D program known as VASIP– some needs analysis may exist (sink-source)
- Phase 1 Aviation Safety Information Analysis & Sharing (ASIAS) COI – priority – info exchanges underway.
- Phase 1 fuses publicly available safety data with proprietary commercial flight operator data.
 - Key players include FAA AVS and 11 volunteer commercial flight operators. Publicly available data includes NASA ASRS, NTSB Accident/Incident Data, and Air Traffic Activity information. Proprietary private sector data includes flight data and aviation safety action program (ASAP) data.
 - Has prioritized data needs – effectiveness, feasibility and cost – some readily accessible by public (no firewall), other data require permissions
 - Commercial Flight Ops data – only 2 flight data analysis vendors; file formats are easy to standardize – we could not add costs to carriers
- Phase 2 ConOps being developed – expand on Phase One with remainder of parties
- SMS to be mandatory agency participation in 2009, but possibly remain voluntary for non-government

- 1 of 4 components. Assumes monitoring, reporting, data sharing: all part of “assurance”
- FAA doing research in data-rich commercial aviation environment, but limited data for General Aviation, e.g., flying into weather.
- Have to prioritize what is “nice to know”, vs. what is necessary
- Commercial flight operators have entered into bilateral info sharing agreements with MITRE (not FAA) – many parties – airlines, agencies, including FBI
- Exchanges to be managed by MITRE – acting as FOIA firewall (used to be NASA) to insulate parties from their regulator – MITRE to write info exchange agreements
- MITRE to data QC – data fitness for use 9- accuracy, validity, currency, etc.
- Recognize the different organizational models for airports in structuring security COIs, since their capabilities, motivations, governance, and cultures can be quite different, even within the same model.
 - Authority model, e.g., PANYNJ and MWA
 - State model, e.g., BWI
 - Municipal model, e.g., LAX, ORD, ATL
 - GA model – unregulated, for now. Can be private or local government
 - How information is generated and who might need it vary widely with the organizational structure
- Organize COIs from the bottom, i.e., the airport level, and not from the top (DHS or TSA)
 - Most airport security information is local and should stay local.
 - Who needs to know about a gate alarm outside of the SOC?

3.4 Traffic Management COI Breakout Meeting Summary/Notes

The Traffic Management COI is a group of users interested in aviation traffic management and related issues. Participants list is shown in Table 3-3 .

Table 3-3 Traffic Management COI Participants

Name	Organization	Email
Adams, Carleen	FAA TFM	Carleen.Adams@faa.gov
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Lambert, Bruce	NOAA Office of Military	bruce.lambert@noaa.gov

	Affairs -- USAF	
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Wollard, Gregg	Metropolitan Washington Airports Authority	Gregg.Wollard@mwa.com

3.4.1 Information Sharing Needs

FQ1: Identify High-priority Information Exchanges

- Sources currently available
 - CDM Net
 - TMFDI
 - ASDI
 - Fly.gov
 - NOTAM Sources
- Information not available but should be
 - Fidelity
 - FAA and user need to set a data standard
 - Agreement to meet “x” standards
 - Granularity
 - Service provider – greater update rates
 - Completeness
 - 100% participation to provide data
 - Information exchange between DoD and FAA¹

¹ Reviewer Comment: Section E4.15.1.3, "Cross Feed of Accident Data," of DOD Instruction No. 6055.7, Re: Accident Investigation, Reporting and Record Keeping (October 3, 2000) authorizes military organizations to provide non-privileged safety information to other federal agencies for the promotion of safety. The DHS Information Sharing Strategy (dated April 18,

- Common Real-Time weather information
 - Government/National weather services/DoD/Commercial providers
- Airport Status
 - Airport authority
 - Service provider/ATC
- Operating Intent & Constraint (Non FAA)-- Operators
- Historical data
 - Weather, ATC, FAA, Operators
- Stochastic (weather, capacity, demand, some as historical)
- Surface surveillance
 - Multiple sources

FQ2: Identify use cases that illustrate the high-priority information exchanges

- Track information with ID status in real-time to DoD/DHS/First responders¹
- For currently used information exchanges use cases already exist

FQ3: Authoritative Data Sources (ADS)

- Demand information comes from operators
- Capacity figures come from service providers
- Constraints come from operators, service providers, government agencies, and natural phenomenon

3.4.2 Trust and Policy Issues

FQ4: Issues in establishing trust to share information

- Need to ensure that info provided does not get sold back to the provider
- Service provider concern is that data provided may be used to get customers to go to their competition so there must be controls in place to protect business decisions information that is provided to the FAA
- How can you avoid Anti-trust situations and avoid service provider filtering of info being shared?
- Airlines, FAA, airport authority and all others need the net-centric access.
 - Use & distribution
 - Confidence factor based on authorization & need-to-know
 - Access based on attributes rather than roles

2008), released by Secretary Chertoff May 21, 2008, designates sharing of security and terrorism information with other federal agencies, state and local governments, and the private sector as a mission of DHS. Although the DHS Strategy is focused on security information, it sets the stage for interagency cooperation on information sharing. Concur

¹ Reviewer Comment: See www.flightaware.com. Already happening on the internet for commercial flights,

FQ5: Types of info to which access must or should be restricted

- Fuel on board – legal liability is on the dispatcher
- Licensing
- Regulatory oversight
- Anti-trust
- Competitive sensitivity
 - Market forces
- Passenger privacy

FQ6: Protecting sensitive information

- Remove accessibility of those who intentionally input incorrect/inaccurate data (How?)

FQ7: Techniques for protecting/disguising sensitive information

- Protect by technology and procedures.
- A technology that allows user to see calculated models (i.e., airport congestion), but does not allow human viewing of all the input data.
- The providers determine which data is proprietary & who can have access to it

3.4.3 Information Sharing Shortfalls**FQ9-FQ10: Existing Gaps (shortfalls) of information sharing and the effects**

- Most are captured in information exchange question (fidelity, granularity, completeness)
- Shortfall in real-time special use airspace (SUA) availability (government-to-government and government-to-commercial)
 - Efficiency
 - Emissions
- Ref SC-169
 - Safety
 - Responsibility of dispatcher
- ATC tower & ramp control coordination (i.e. gate assignment)
 - Tower has no access to ACARS data
 - Efficiency
 - Emissions
- Interaction between air traffic (TMI)
 - Efficiency
 - Emissions
- Real-time aircraft location and ID full data set not shared between DoD, FAA, DHS, FBI/DOJ
 - Security
- Delay casual data
 - Efficiency

3.4.4 Benefits and Cost of Net-Enabled Information Sharing

FQ11: Benefits resulting from expanded information sharing

- Solutions to gap/shortfalls
- Cost savings (reduce automation development cost)
- Safety/security improved
- Standard interface specifications
- Increased efficiency
- Reduced emissions
- Improved predictability
- Increased productivity for our economy
- Increased throughput goal achievement success increased by net-centricity
- Economic growth by increase in business models
- Ability to collect metrics on the information being shared to develop better programs and effective evolution of the system

FQ12: Cost issues were not specifically discussed

3.4.5 Other General Discussions

- Potential COI
 - Funding aggregator
 - Surveillance commercial providers
- Need to survey ATC coordinator on gaps of information sharing for Traffic Management
- How can the FAA understand the value of the information that is being shared
- Need an understanding of who owns specific information and where to get that information (understanding that the owner may not be the authority to provide it.)

3.5 Weather COI Breakout Meeting Summary/Notes

The Weather COI is a group of users interested in aviation weather and related issues. The participants list is shown in Table 3-4.

Table 3-4 Weather COI Participants

Name	Organization	Email
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Freeman, Paul	ITT Advanced Engineering	Paul.freeman@itt.com

	and Sciences	
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Zimmerman, Jeff	Northwest Airlines (NWA)	Jeff.zimmerman@nwa.com

3.5.1 Information Sharing Needs

FQ1: Identify High-priority Information Exchanges

- What are the priorities in the weather business
 - Need to distinguish different types of data to identify what we are sharing
 - Weather that goes into operational decision making
- What level of sharing needs to exist/be defined?
 - Data to users
 - Observations from system
 - Privately provided
 - Government provided
 - Current situational awareness or future decision related data (forecast)
 - Derivation of impact on operations, data that goes to decision support tools
 - SIPOC (Suppliers, Inputs, Process, Outputs and Customers)
- High-level General List (output) (for the following weather data, information sources change)
 - Forecast
 - Hazards (hazards depend on customer definition/threshold)
 - Winds/temperature aloft
 - Terminal weather
 - Nowcast
 - Hazards
 - Winds/temp aloft
 - Terminal weather
 - Observed
 - Hazards
 - Winds/temperature aloft
 - Terminal weather
 - Archived Data

- Hazards
- Winds/temperature aloft
- Terminal weather
- Discussion regarding the role of this COI with respect to the weather WG. Is it duplicative effort? Where should the focus be?
- What does the Net Centric WG need from this COI to be effective?
- The JPDO weather working group should refer to the Weather WG weather ConOps document and the 4D Cube Functional Requirements document; also reference the JPDO Integrated Work Plan (IWP)
- The JPDO weather working group should provide inputs to the JPDO Integrated Work Plan (IWP) weather sections and inputs to the NextGen ConOps weather & net-centric sections

3.5.2 Trust and Policy Issues

FQ4: Issues in establishing trust to share information

- Data needs to be tracked/certified for accountability (QICP, EWIN) if a user requests information, we need a record (data integrity)
- Existing requirements need to be maintained and expanded
- Standards for interoperability between all JPDO agencies (NOAA, DOD, FAA, NASA, etc.) and within agencies
- Authorized users
- Requirements will be different in each of the agencies
- Majority of weather data/info is already widely available to the public, proprietary data needs to be protected
- There are existing international data sharing restrictions that need to be considered (to be protected) eventually
- System capability: sharing all information will make the system unwieldy and less helpful to stakeholders/users
- General consensus that system needs to be restricted to stakeholders

FQ5: Types of info to which access must or should be restricted

- Proprietary and commercially sensitive

FQ6: Protecting sensitive information

- Access to system restricted to stakeholders
 - Some DoD data will be restricted (DoD will have its own system for those issues¹)

¹ Reviewer comment: Section E4.15.1.3, "Cross Feed of Accident Data," of DOD Instruction No. 6055.7, Re: Accident Investigation, Reporting and Record Keeping (October 3, 2000) authorizes military organizations to provide non-privileged safety information to other federal agencies for the promotion of safety. The DHS Information Sharing Strategy (dated April 18, 2008), released by Secretary Chertoff May 21, 2008, designates sharing of security and terrorism information with other federal agencies, state and local governments, and the private sector as a mission of DHS. Although the DHS Strategy is focused on security information, it sets the stage for interagency cooperation on information sharing. **Concur**

- DoD Classified information will stay within DOD (SIPR)
- DOD unclassified fed into NextGen
 - (How? Policy and IT infrastructure)
- DoD “de-classified” for NextGen consumption

FQ7: Techniques for protecting/disguising sensitive information

- DoD shares de-identified, processed output rather than specific data +sources (“dumbed down”) or de-classified information for NextGen consumption
- Processes to remove sensitivity from the data (E.g., stripping, combining)
 - Don’t share source information, strip parts out, combine/blend
- AIDAP example from FAA
 - Permission “key or code”, authorization and validation
- Central management of web/users access

FQ8-1: System restrictions make needed data not accessible

- Non industry standard data types
- Non standard exchange formats (policy)
- Lack of consistent metadata or metadata standard
 - Will these be global standards? Whose standards? (policy)
- FOQA (flight operational quality assurance) sharing, punitive policy issues
 - Policies created by agencies to protect this kind of data
- Inter and intra agency stove pipes from both policy and system perspective
- Lack of common taxonomies

FQ8-2 What policy issues make needed data not accessible?

- Who sets standards (data, metadata, exchange formats, etc.)
- Policy created by a certain agency to restrict data accessibility and data could be useful to other agencies

3.5.3 Information Sharing Shortfalls

FQ9: What are existing gaps/shortfalls of information sharing and effects of the shortfalls?

- Net Centric should reference FAA REDAC (Research, Engineering and Development Advisory Committee) report of the Weather/ATM integration Working Group (oct. 3, 2007). References shortfalls and makes recommendations (see also references this document makes)
- Existing Gaps
 - 1 min AWOS (not disseminated)
 - PIREPS (Pilot Report) (not shared)
 - MDCRS (not widely available)
 - FAA censored data and products (e.g., ITWS) (not available)

- Military censored data (not shared)
- Lack of aircraft as a net centric node and no plan to implement this, do they have information management capability? Limited bandwidth between aircraft and ground
- Lack of a plan to “get-there” – implement/address issue
-

3.5.4 Benefits and Cost of Net-Enabled Information Sharing

FQ11-12: Benefits of NEIS on Productivity

- Safer and more efficient operations
- Reduced latency of information (improves decision making speed)
- Reduced fuel consumption/environmental impact
- Increased capacity capabilities
- Fewer flight cancellations
- Other benefits
- Reduced communications costs
- Reduced IT costs
- Pooled resources
- Reduced irregular operations
- Reduced variability in operations
- Eliminate duplicity
- More efficient routes

Cost issues: need to quantify implementation costs with respect to Net Centricity

3.5.5 Other General Discussions

N/A

3.6 Manufacturer’s Perspective

One manufacturer representative provided his response after the workshop as he did not attend the afternoon session of the workshop due to a time conflict.

3.6.1 Information Sharing

FQ1: Identify high-priority information exchanges for NextGen

Without a clear understanding of the "consumers" of the information and what they will do with that information, it is very difficult to prioritize the information. For example, will the information be used for tactical separation of aircraft? Will it be used for strategic planning? What performance will be required of that information? Will the performance be different for the same information content if the user or decision is different?

NextGen goals are to enhance the system safety, security, capacity, and efficiency. Recommend focusing on airspace operations and how to optimize those operations. The fragmentation of all the Communities of Interest without knowing how the information will be used will slow down the process.

FQ2: Identify use cases that illustrate the high-priority information exchanges

Start with the Trajectory Based Operations (TBO) use case. It embodies all of the strategic and tactical information exchanges needed for airspace change. We can also look at the increments of TBO as it transitions from 2D to 3D to 4D (predictive) with established performance agreements at each stage.

FQ3: What are the Authoritative Data Sources (ADS) for these exchanges?

As this position develops, ensure that the aircraft is seen as more than just a sensor, but also seen as a decision support node. The aircraft represents one of the best, most timely information sources for real time decision making regarding what is happening "right now". Ground automation relies on the aircraft to provide real time updates to the plan. (There are other sensors as well, but work has already begun in those areas.) The aircraft appears to have been left till last. We can no longer afford to let the aircraft capabilities be ignored.

3.6.2 Trust and Policy Related Issues

FQ4: What are the issues/rules in establishing trust to share this information (confidentiality, integrity, security, identity, accreditation, etc.)?

As discussed during the morning sessions, until some of the policy issues are resolved (e.g. intellectual property, collaboration vs. collusion, liability, etc.) it will be difficult to answer this question. Many of these historical perspectives need to be worked through ICAO which is a long term process and we must start now!

FQ5: Are there types of information to which access must or should be restricted?

Once the necessary information has been identified then the various consumers of that information can decide what their performance requirements will be. Then a "quality of service" environment can be defined. How this is done has already been assessed by today's internet that provides critical banking services and protection of medical records that still transit a common network. The use of firewalls, authentication processes, etc. is already in place.

FQ7: Can you suggest any techniques for protecting/disguising sensitive information?

I would consider that the application is where the protection and security is best applied. To place it deeper into the distribution network places a high cost on the infrastructure. Further as time is applied and the information ages, the sensitivity changes.

FQ8: What system restrictions or policy issues make needed data not accessible?

We should not overburden the system with "artificial" restrictions or policies. The consumers should set the performance thresholds.

3.6.3 Information Sharing Shortfalls

FQ9: What are the existing gaps (shortfalls) of information sharing in its availability, timeliness, and/or quality?

Today we exclude the aircraft and its performance information from the pool of available information that is available for decision support. This is a flaw in the system. We need to resolve this gap quickly since many of the aircraft that will live until 2035 are already being delivered!

FQ10: What are the effects of those gaps/shortfalls (e.g., lack of efficiency, safety risk, security risk, etc.)?

By not including the aircraft with its near real time performance information, you are limiting the decisions that can be made and ultimately have compromised the available capacity and flexibility of the system.

3.6.4 Benefits and Cost of Net-Enabled Information Sharing

FQ11: What are the benefits of Net-Enabled Information Sharing on productivity?

Better, more timely information - available to all decision makers is the only way that the system of the future can work. Fragmented, not time aligned information will hinder system optimization.

FQ12: Can you identify other benefits, including cost savings and productivity improvements, resulting from expanded information sharing (quantify if possible)?

We have already stated that the system is information centric. The cost and benefit will rely on the performance and how we choose to build an infrastructure around that information. Done incorrectly, the cost will be high and the benefit low.

3.6.5 Other General Discussions

N/A

APPENDIX A: PARTICIPANTS

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APPENDIX B: ACRONYMS

ACARS	Aircraft Communications Addressing and Reporting System
ADS-B	Automatic Dependent Surveillance - Broadcast
ADS	Authoritative Data Sources
AIDAP	Aeronautical Information Data Access Portal
ALPA	Airline Pilots Association
AOC	Airline Operations Center
AOPA	Aircraft Owners and Pilots Association
ANSP	Air Navigation Service Provider
ARTCC	Air Route Traffic Control Center
ASD	Aircraft Situational Display
ASDI	Aircraft Situation Display to Industry
ASIA	Aviation Safety Information Analysis and Sharing
ASOS	Automated Surface Observing System
ATL	Atlanta William B Hartsfield International Airport
AWOS	Automated Weather Observing System
ATA	Air Transport Association
ATC	Air Traffic Control
ATM	Air Traffic Management
BWI	Baltimore-Washington International Airport
CBP	Customs and Border Protection
CDM	Collaborative Decision Making
CDTI	Cockpit Display of Traffic Information
COI	Communities of Interest
CONOPS	Concept of Operations
CWIS	Community Wide Information Sharing
DHS	Department of Homeland Security
DOC/NOAA	Department of Commerce/ National Oceanic and Atmospheric Administration
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DOT	Department of Transportation
DSS	Decision Support Systems
EMOCS	Emergency Management Operations Control System
EPA	US Environmental Protection Agency
ETMS	Enhanced Traffic Management System
EU	European Union
EWIN	The ERF Weather Information Network
FAA	Federal Aviation Administration
FAA/AEE	Federal Aviation Administration/Aviation Environment and Energy
FAA/AVS	Federal Aviation Administration/Aviation Safety
FAASTeam	FAA Safety Team
FAR	Federal Aviation Regulation
FBO	Fixed Base of Operation
FOC	Flight Operations Center
FOIA	Freedom of Information Act
FOQA	Flight Operational Quality Assurance

GA	General Aviation
ICAO/CAEP	International Civil Aviation Organization/Committee on Aviation Environmental Protection
ITWS	Integrated Terminal Weather System
IWP	Integrated Work Plan
JPDO	Joint Planning and Development Office
LAX	Los Angeles International Airport
MDCRS	Meteorological Data Collection and Reporting System
MoU	Memorandum of Understanding
MWAA	Metropolitan Washington Airports Authority
NAS	National Air Space
NASA	National Aeronautics and Space Administration
NBAA	National Business Aviation Association
NCWG	Net Centric Working Group
NDA	Non-Disclosure Agreement
NEIS	Net-Enabled Information Sharing
NextGen	Next Generation Air Transportation System
NOTAM	Notice to Airman
NPRM	Notice of Proposed Rulemaking
NTSB	National Transportation Safety Board
NWS	National Weather Services
OAG	Official Airline Guide
ORD	Chicago O'Hare International Airport
PANYNJ	The Port Authority of New York and New Jersey
PIREP	Pilot Reports
QICP	Qualified Internet Communications Provider
SIPR	Secret Internet Protocol Router Network (DOD)
SMS	Safety Management Systems
SOC	Service Operations Center
SWIM	System Wide Information Management
TBO	Time Between Overhaul
TFM	Traffic Flow Management
TFMDI	TFM Data to Industry
TMI	Traffic Management Initiatives
TSA	Transportation Security Administration
USAF	US Air Force
VBSS	Value Based Six Sigma
VLJ	Very Light Jet
WG	JPDO working group