Joint Planning and Development Office
NextGen Air Transportation System

Fiscal Year 2011 Program Plan

March 15, 2011

INTRODUCTION

The Joint Planning and Development Office (JPDO) Fiscal Year 2011 (FY11) Program Plan provides an executive-level overview and project schedule for the major activities the JPDO plans to execute in FY11. This is a top-level planning document, which will feed into more detailed plans and schedules to support each activity's day-to-day execution and tracking.

In this document, the key activities for FY11 are organized under the three JPDO priority areas introduced in the following section. The activities defined within each of these priority areas are addressed at a high level with information on how each one interacts with or feeds other JPDO activities, either past, present, or future. The Program Plan also includes a consolidated Gantt chart that details the high-level project schedule of all the activities. This collective view provides a working knowledge of the JPDO's priorities and the key activities that have been selected to help further them. The supporting information is presented as follows:

- **Responsible JPDO Division**: Designates the JPDO Division primarily responsible for coordinating the activity.
- **Inputs**: Activity inputs are derived from existing work that can or should contribute to the effort. Identifying the inputs will add significant value to the activity's outputs and eliminate any redundant efforts.
- **Informed By**: Concurrent efforts that can benefit from being synchronized.
- **Outputs**: Notes the deliverables and high-level project schedule for the activity. These will be represented in the consolidated Gantt chart.
- **Also Feeds/Supports**: Other work that is either ongoing or planned for the near future that may use the outputs of the activity.

JPDO PRIORITY AREA OVERVIEW

In preparing for FY11, the JPDO considered where its efforts and resources would best support the Next Generation Air Transportation System (NextGen). After some deliberation with respect to past progress and the focus on interagency interests, JPDO leadership defined the following three priority areas:

- **Define the optimal NextGen 2025 given current data/conditions and risk analysis**
  - Prioritize required research and policy analysis to achieve that definition

- **Champion the NextGen vision**
  - Frame the debate and facilitate decision making to achieve advanced NextGen Capabilities beyond 2025
- **Accelerate Net-Enabled Aviation System Operations to achieve greater data-sharing efficiencies**

JPDO activities for FY11 were defined to advance progress in support of each priority area.

JPDO PRIORITY AREAS AND ACTIVITIES

Define the optimal NextGen 2025 given current data/conditions and risk analysis.

Prioritize required research and policy analysis to achieve that definition

Framing an accurate description of what NextGen will look like in 2025 is an essential step in prioritizing the current research and development (R&D) efforts required for airspace modernization. Due to forecasted capacity needs and the costs and risks associated with various capabilities, not all NextGen possibilities are practical to implement. In addition, operating in an environment as complex and dynamic as aviation, modernization efforts must consider both current and future conditions. Therefore, a critical aspect of the JPDO's work will be to determine a realistic suite of capabilities for 2025.

Defining the targeted capabilities for 2025 will help to explain the steps needed to get there. Addressing current policy challenges and R&D gaps allows the JPDO to add value to NextGen for all users and stakeholders of the National Airspace System (NAS). In order to maximize the benefits of modernization, significant work is needed to reach this definition.

In addition to defining the targeted capabilities for 2025, the JPDO will continue its focused efforts on Flight Prioritization (FP), Integrated Surveillance (IS), and Global Harmonization to facilitate progress and success for 2025.

Targeted Capabilities for 2025

This activity summarizes the results of previous analysis and generates a current picture of what can be expected by 2025, along with a set of prioritized research and policy issues that, if resolved, can push the expectations of 2025 a bit further.

The JPDO has conducted extensive analysis on scoping (estimated cost, schedule, and benefit) the NextGen Operational Improvements (OIs) and

capabilities, categorizing necessary policy decisions and determining associated risks over the past few years. That analysis resulted in a determination that the full NextGen vision cannot be accomplished by 2025. This activity will digest that data and generate a definition of the most expected capabilities for 2025, given no concerted effort to push it beyond the norm. It will also determine what can be accomplished through more intensive efforts in specific research and policy areas.

The Interagency Portfolio and System Analysis (IPSA) Division will document the most likely scenario for NextGen 2025 given their analysis to-date. This will include OIs, risks, research, and policy issues, as well as any other assumptions needed to define this set. The Strategic Interagency Initiatives (SII) Division, the Chief Architect's Office (CAO), and the Net-Centric Operations Division (NCOD) will review the assumptions and concur with this set as appropriate.

IPSA will also document their position on the targeted capabilities for 2025. The targeted capabilities for 2025 take the most likely scenario for 2025 and add the capabilities that can be achieved with additional emphasis on research, risk, and policy issues. SII, CAO, and NCOD will confer with IPSA on the effort required to move those research and policy issues forward. The intention is for the JPDO to play a key role in defining and acting on these issues.

This set of activities should be repeated every year or two to determine whether the program is on track with the original plan or if it should be reconsidered. In addition, attention will be given to address any issues that need to be added or closed.

Targeted Capabilities for 2025	
Responsible JPDO Division	Interagency Portfolio and System Analysis (IPSA)
Inputs	- IPSA analysis from 2010 – IPSA - Integrated Work Plan (IWP) elements updated (policy issues) – Strategic Interagency Initiatives (SII) - JPDO Risk Assessment – IPSA/Integration - JPDO Trajectory Based Operations (TBO) Study Team Report, v1.9.1 – Integration - JPDO Flight Prioritization Final Report, v3.0 (Phase I) - JPDO Concept of Operations (ConOps), IWP, and Enterprise Architecture (EA) - JPDO Net-Centric Operations (NCO) ConOps, v1.0
Informed By	- JPDO Avionics Roadmap Version 2 Activity - JPDO Flight Prioritization Phase II Activity - JPDO TBO Safety Case Planning Activity - JPDO TBO Roadmap Activity

Outputs	- Initial Targeted Capabilities for 2025 Report (March 18, 2011) - Updated Targeted Capabilities for 2025 Report (June 30, 2011) - Research Priorities to the Office of Management and Budget (June 30, 2011) - Recommended JPDO ConOps, IWP, and EA updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- JPDO TBO Safety Case Planning Activity - JPDO TBO Roadmap Activity

Integrated Surveillance

The Senior Policy Committee (SPC) has identified IS as a key interagency activity. In FY11, the JPDO will support that initiative by facilitating the creation of the Integrated Surveillance Support Office (ISSO). The ISSO, although independent from the JPDO, will work in close conjunction with the Office and will be led by the Department of Homeland Security (DHS). The ISSO will also have representation from the Federal Aviation Administration (FAA), the Department of Commerce (DOC), the Office of the Director of National Intelligence (ODNI), and the Department of Defense (DOD).

The JPDO will provide technical support to the ISSO for development of IS products. CAO, NCOD, and SII will provide support to the development of an IS Concept of Operations (ConOps) and Enterprise Architecture (EA). Further, the JPDO will ensure that IS planning is vetted by the JPDO Change Management (CM) Process and is reflected in the Joint Planning Environment (JPE).

In parallel to the IS effort described above, two operational scenarios concerning Secure Aircraft and Secure Airspace will be developed under the leadership of the JPDO Aviation Security Working Group to address NextGen Layered Adaptive Security concepts and their operational relationships with Net-Centric Operations (NCO) and IS concepts. This effort will address one of the key interagency IS tasks of detailing the requirements for integrated flight risk management.

Integrated Surveillance	
Responsible JPDO Division	Strategic Interagency Initiatives (SII)
Inputs	- JPDO Concept of Operations (ConOps), Integrated Work Plan (IWP), and Enterprise Architecture (EA) - Integrated Surveillance (IS) ConOps, v1.3 (June 2009)

Inputs (Cont'd)	- JPDO NextGen EA IS Results and Recommendations Report (Draft), v0.7 - Integrated US Air Surveillance Governance Report (July 2010) - Interagency IS Capability Status and Initial Analysis (September 2010) - Federal Aviation Administration (FAA) Air Traffic Organization (ATO) ConOps for Air Domain Security (2009?) - Command and Control Gap Filler (C2GF) Technical Plan - Memorandum Of Agreement (MOA) for Support of an Interagency IS Governance Organization (December 2010 Draft) - IS Information Exchange artifacts – Net-Centric Operations Division (NCOD) (May 2011) - JPDO IS Net-Centric Information Sharing Architecture Survey (January 2010)
Informed By	- Homeland Air Security IPT Requirements (March 2011) and Analysis of Alternatives (March 2012) - Air Domain Awareness (ADA) Operational Concept and Roadmap - C2GF Demonstrations - National Strategy for Aviation Security (March 2007) - Interagency ADA Summits - JPDO IS One-year Challenge Activity - JPDO Net-Centric Operations (NCO) ConOps, v1.0
Outputs	- ADA Integration Plan (April 2011) - IS ConOps (July 2011) - IS Capabilities Analysis (September 2011) - Signed Integrated Surveillance Support Office (ISSO) MOA (October 2011) - Recommended JPDO ConOps, IWP, and EA updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- ISSO Department of Homeland Security (DHS) stand-up (TBD, 2011) - JPDO IS One-year Challenge Activity - Ongoing JPDO Interagency Portfolio and System Analysis (IPSA) NextGen cost-benefit analyses - North American Aerospace Defense Command (NORAD) and US Northern Command (USNORTHCOM) C2GF Strategy, under ADA - Integrated Communications, Navigation, and Surveillance (ICNS) Requirements (2012)

Integrated Surveillance One-Year Challenge

A net-centric environment that is accepted by all government and industry partners is vital to the future of NAS operations. By 2025, these partners will have access to authoritative data to assist in their respective decision-making

processes. JPDO near-term activities prove the benefits of interagency information sharing and focus on breaking down barriers to effective collaboration. The IS capability offers stakeholders access to a broader set of data to identify threats, evaluate intent, collaborate on courses of action, and execute efficiently in a time-critical environment.

At its August 2010 meeting, the SPC challenged the JPDO to provide operational solutions to surveillance data sharing within a year. To meet this challenge, the NCOD is leveraging active operational systems to demonstrate advanced, real-time information sharing and collaboration capabilities that could be deployed quickly in the IS enterprise. The One-Year Challenge Demonstration will enact an air surveillance scenario in which operators from federal, state, a nd local law enforcement, along with security and defense agencies, collaborate to respond to a cargo jet hijacking event as it unfolds. The demonstration will result in a roadmap, to be developed in FY12, for full operational deployment of the solutions involved.

Integrated Surveillance One-Year Challenge	
Responsible JPDO Division	Net-Centric Operations Division (NCOD)
Inputs	- Lost Cargo Jet Operational Scenario - JPDO Net-Centric Operations (NCO) Concept of Operations (ConOps), v 1.0 - Federal Aviation Administration (FAA) Telecommunications Infrastructure (FTI) Data Exchange (DEX) 6 Release
Informed By	- JPDO Integrated Surveillance (IS) Activity
Outputs	- Demonstration of interagency sharing of surveillance information to improve collaborative decision making in an operational environment (September 2011) - Engineering Report that lists processes, lessons learned, approach, solution, etc., from technical and operational demonstrations (October 2011) - Recommended JPDO ConOps, Integrated Work Plan (IWP), and Enterprise Architecture (EA) updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- JPDO Demonstration Capability (Net-Enabled Test Environment [NETE]) Activity - JPDO IS Activity

Flight Prioritization Phase II

Even with the increased capacity and operating flexibility that NextGen will offer, operators will continue to compete for the same amount of airspace and airport

facilities. Unmanaged demand can degrade system efficiency and cause delays that ripple throughout the entire air transportation system. The common situational awareness and advanced lead time offered under NextGen can provide innovative options for resolving competing needs in airspace, airports, and other areas of required system service. An increased amount of time available for flight planning and a more advanced toolset for controllers to manage traffic can improve operational efficiency and system capacity.

Phase I of the FP Deep Dive Study, performed in FY10, defined FP values and used them to assess several potential FP concepts. This resulted in recommendations for further development of the most viable concepts. Phase II will advance the progress of far-term NextGen FP through further analysis of the most promising concepts and development of a ConOps for an integrated, system-wide FP solution.

This project will move the JPDO closer to its goal of defining the FP requirements that will be incorporated into automation and communication systems. Certain aspects of FP capabilities could begin operation in the near-term, with the full FP capability progressing in parallel to the modernization elements outlined in the NextGen Trajectory Based Operations (TBO) Roadmap.

Flight Prioritization Phase II	
Responsible JPDO Division	Strategic Interagency Initiatives (SII)
Inputs	- JPDO Flight Prioritization Final Report, v3.0 (Phase I) - JPDO Trajectory-Based Operations (TBO) Study Team Report, v1.9.1 – Integration, specifically recommendation TBO-3, TBO-4, TBO-26, TBO-37, TBO-42 - JPDO Concept of Operations (ConOps), Integrated Work Plan (IWP), and Enterprise Architecture (EA) - JPDO Net-Centric Operations (NCO) ConOps, v1.0 - JPDO and National Aeronautics and Space Administration (NASA) (e.g., Future Air Traffic Management Concepts Evaluation Tool [FACET]) simulation capabilities
Informed By	- JPDO TBO Safety Case Planning Activity - JPDO TBO Roadmap Activity - JPDO Definition of Future Vision for Airline Operations Centers/Flight Operations Centers (AOC/FOC) Activity - JPDO/Federal Aviation Administration (FAA) Operational Incentives

Outputs (ALL OUTPUTS ASSUME ACTIVITY START DATE OF APRIL 1, 2011)	- Draft Flight Prioritization Phase II Report (February 2012) - Final Flight Prioritization Phase II Report (March 2012) - Recommended JPDO ConOps, IWP, and EA updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- JPDO TBO Safety Case Planning Activity - Partner Agency Enterprise Architectures

Global Harmonization Roadmap

NextGen will need to be interoperable with the international community to achieve global aviation objectives and meet the requirements of airspace users around the world. To enable that coordination, the JPDO's Global Harmonization Working Group will develop a robust Global Harmonization Roadmap and executive dashboard to be used as a decision support tool.

Throughout FY11, the Working Group will develop a comprehensive list of harmonization activities necessary for global implementation of various air transportation modernization programs. In doing this, they will identify and integrate the harmonization elements of the following:

- NextGen
- Single European Sky Air Traffic Management (ATM) Research (SESAR)
- International Civil Aviation Organization (ICAO)
- Civil Air Navigation Services Organization (CANSO)
- Various demonstration activities (e.g. Atlantic Interoperability Initiative to Reduce Emissions [AIRE] and Asia & South Pacific Initiative to Reduce Emissions [ASPIRE])
- Modernization activities of other countries

The Working Group will categorize these activities into Functional Areas (e.g., technology, procedures, policy, information management, performance measurement, and demonstrations) and Harmonization Areas (e.g., Communication, Navigation, and Surveillance [CNS], Weather, Safety, Avionics, etc). The group will also leverage previous analyses and propose a scheme to prioritize global harmonization activities. In addition, they will initiate a gap analysis between NextGen, SESAR, and ICAO's harmonization efforts with the goal of scoping activity interdependencies among the user communities and identifying the content, schedule, and capability gaps that need to be addressed. This will all be done while encouraging participation and collaboration with all relevant aviation stakeholders.

This activity will use the JPE toolset and database as its foundation.

Global Harmonization Roadmap	
Responsible JPDO Division	Integration
Inputs	- JPDO NextGen International Strategy (January 7, 2010) - JPDO Concept of Operations (ConOps), Integrated Work Plan (IWP), and Enterprise Architecture (EA)
Informed By	- Harmonization elements in NextGen Single European Sky Air Traffic Management Research (SESAR), International Civil Aviation Organization (ICAO), demonstration activities, and other countries - JPDO Working Group Subject Matter Expert (SME) Support - Net-Centric Operations Division (NCOD)
Outputs (ASSUMING TASK ORDER AWARD DATE)	- Phase 2 Roadmap and Dashboard (March 2011) - Revised List of Harmonization Activities/Elements (June 2011) - Phase 3 Roadmap and Dashboard (September 2011) - Recommended JPDO ConOps, IWP, and EA updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- International Agency Collaboration - Track progress of NextGen International Strategy

Champion the NextGen Vision

Frame the debate and facilitate decision making to achieve advanced NextGen Capabilities beyond 2025

In addition to supporting NextGen through 2025, the JPDO is fundamental in championing NextGen beyond this timeframe. While JPDO analysis to-date has shown that not all NextGen capabilities will be available by 2025, the Office believes that it must continue to pursue these more distant capabilities. The JPDO will frame the debate and facilitate discussions to move NextGen beyond what is currently believed to be possible.

The long-term NextGen architectural goals require a significant shift in operations from the current baseline. This shift is predominantly represented by the OIs offered by the full TBO concept. TBO has large uncertainties and system complexities that carry unaddressed policy issues and high implementation risks. To champion the NextGen vision, the JPDO will need to address these challenges in the near-term in order for TBO to be fully realized. This analysis will allow the aviation community to gain insight into the complexities of the integrated systems that are needed to support full TBO and will provide the preliminary data for the FAA requirements process and gap analysis for National Aeronautics and Space Administration (NASA) R&D.

The FY11 activities currently planned in support of this are centered around TBO, Unmanned Aircraft Systems (UAS) research, a vision of Airline Operations Centers/Flight Operations Centers (AOC/FOC) for the future, and a determination of whether research is focused on the areas needed to support NextGen.

Trajectory-Based Operations Roadmap	
Responsible JPDO Division	Integration
Inputs	- JPDO Trajectory-Based Operations (TBO) Study Team Report, v1.9.1 – Integration - National Aeronautics and Space Administration (NASA) TBO efforts - RTCA Trajectory Operations (TOps) effort - Discovery of other TBO efforts by any other partner agency - JPDO Concept of Operations (ConOps), Integrated Work Plan (IWP), and Enterprise (EA) - JPDO Net-Centric Operations (NCO) ConOps, v1.0
Informed By	- JPDO TBO Safety Case Planning Activity - JPDO Strategic Unmanned Aircraft Systems (UAS) Research, Development and Demonstration (RD&D) Interagency Roadmap Support Activity - JPDO Flight Prioritization Phase II Activity - Net-Enabled Operations (NEO) Spiral 2
Outputs (ALL OUTPUTS ASSUME ACTIVITY START DATE OF APRIL 1, 2011)	- JPDO TBO Roadmap Plan (May 2011) - JPDO TBO Roadmap Framework (TBD, based on TBO Roadmap Plan) - JPDO TBO Roadmap (TBD, based on TBO Roadmap Plan) - Characterization of partial TBO capability for 2025 - Recommended JPDO ConOps, IWP, and EA updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- JPDO TBO Safety Case Planning Activity - JPDO Strategic UAS RD&D Interagency Roadmap Support Activity

TBO Safety Case Planning

With far-term TBO's ability to manage increased traffic with greater automation and reduced separation, the JPDO foresees a need to develop a TBO separation management safety case. During FY11, the JPDO will scope a detailed plan for completing a TBO Safety Case. This effort will be executed by a cross-functional group of Subject Matter Experts (SMEs) from the JPDO Working Groups under

the leadership of the JPDO Safety Working Group. The plan will analyze the multiple evolutionary increments of TBO to ensure acceptable safety.

Trajectory-Based Operations Safety Case Planning	
Responsible JPDO Division	Integration
Inputs	- JPDO Trajectory-Based Operations (TBO) Study Team Report, v1.9.1 – Integration - JPDO Safety Working Group Assessment Prototype - RTCA Trajectory Operations (TOps) effort - JPDO Concept of Operations (ConOps), Integrated Work Plan (IWP), and Enterprise Architecture (EA) - JPDO Net-Centric Operations (NCO) ConOps, v1.0
Informed By	- JPDO TBO Roadmap Activity
Outputs	- Agree on Safety Case Planning Approach (June 2011) - TBO Safety Case Plan (December 2011) - Recommended JPDO ConOps, IWP, and EA updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- Future JPDO TBO Safety Case Execution

Strategic Unmanned Aircraft Systems Research, Development, and Demonstration Interagency Roadmap Support

With a modernization project as large and complex as NextGen, there is a strong need to ensure that R&D is coordinated among its government partners. By facilitating agreements between organizations, the JPDO can ensure efficient coordination and use of available and future UAS research, development, and demonstrations (RD&D). During FY11, the JPDO will facilitate the development of a Strategic UAS RD&D Interagency Roadmap.

Strategic Unmanned Aircraft Systems Research, Development, and Demonstration Interagency Roadmap Support	
Responsible JPDO Division	Strategic Interagency Initiatives (SII)
Inputs	- Existing NextGen Partner Agencies' Unmanned Aircraft Systems (UAS) research plans - JPDO UAS October 2010 Workshop findings - JPDO Concept of Operations (ConOps), Integrated Work Plan (IWP), and Enterprise Architecture (EA)

Informed By	- Series of FY11 JPDO UAS Workshops - JPDO Targeted Capabilities for 2025 Activity - JPDO Trajectory-Based Operations (TBO) Roadmap Activity - JPDO TBO Safety Case Planning Activity
Outputs	- Agreement of Approach (March 2011) - Facilitated Strategic UAS RD&D Interagency Roadmap (September 2011) - Recommended JPDO ConOps, IWP, and EA updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- Follow on NextGen UAS Interagency Research Plans Development

Definition of Future Vision for Airline Operations Centers/Flight Operations Centers

In FY11, the JPDO will begin to develop a detailed concept for how the AOC/FOC and their military and business aviation equivalents will interface with the Air Navigation Service Provider (ANSP) and aircraft in the NextGen end-state. The role of AOC/FOC needs to be matured to keep up with the substantial work that is in progress or planned for far-term NextGen ANSP and aircraft concepts. The role of the Airport Operations Centers in participating with the NextGen ATM concepts will also be addressed. The JPDO will also define the role of the AOC/FOC in Flow Contingency Management and Trajectory Management Capabilities, including trajectory negotiation and approval in the TBO environment. A cross-functional Study Team of SMEs from JPDO Working Groups will execute this effort.

Definition of Future Vision for Airline Operations Centers/Flight Operations Centers	
Responsible JPDO Division	Integration
Inputs	- Guidance on the Evolution of NextGen from the Perspective of Airline and Flight Operations Centers (AOC/FOC) – Integration (July 28, 2010) - JPDO Trajectory-Based Operation (TBO) Study Team Report, v1.2.1 – Integration - JPDO Airport Working Group Airport Airside Operations Concept of Operations (ConOps) - JPDO ConOps, Integrated Work Plan (IWP), and Enterprise Architecture (EA)

Informed By	- JPDO TBO Roadmap Activity - JPDO Flight Prioritization Phase II Activity - JPDO Net-Centric Operations (NCO) Airports/Airlines Information Exchange
Outputs (ASSUMED TO START IN MAY GIVEN APPROPRIATE VOLUNTEERS)	- Define the Scope of the Initial Activity (June 2011) - Stand-up Study Team (July 2011) - Draft Scenarios and Use Cases (Date TBD) - Final Scenarios and Use Cases (Date TBD) - Recommended JPDO ConOps, IWP, and EA updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- JPDO TBO Safety Case Planning Activity - JPDO TBO Roadmap Activity

Avionics Roadmap Version 2.0

The Avionics Roadmap provides NextGen planners and stakeholders with a view of the avionics-related capabilities required for the different types of operations envisioned for NextGen. The Avionics Roadmap focuses the discussion and debate needed to build consensus in the aviation community and facilitates subsequent NextGen planning as it relates to improved aircraft capabilities and corresponding avionics requirements.

In September 2010, the JPDO released the NextGen Avionics Roadmap Version 1.2 to address aircraft research, design, integration, certification, operation, and support issues required to achieve the NextGen vision. This version includes avionics information regarding General Aviation (GA), UAS, and Aircraft Ground Movement through the mid-term. Version 2.0 expands the roadmap beyond the mid-term.

Avionics Roadmap Version 2.0	
Responsible JPDO Division	Integration
Inputs	- JPDO Avionics Roadmap, v1.2 - Federal Aviation Administration (FAA) Midterm Concept of Operations (ConOps) - JPDO Trajectory-Based Operations (TBO) Study Team Report, v1.9.1 - JPDO ConOps, Integrated Work Plan (IWP), and Enterprise Architecture (EA)
Informed By	- FAA NextGen Segment Implementation Plan - JPDO TBO Safety Case Planning Activity - JPDO TBO Roadmap Activity

Outputs	- Draft Avionics Roadmap, v2.0 for comment (May 2011) - Final Avionics Roadmap, v2.0 (September 2011) - Recommended JPDO ConOps, IWP, and EA updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- FAA Aviation Roadmap

Accelerate Net-Enabled Aviation System Operations to Achieve Greater Data-Sharing Efficiencies

Information is the backbone of NextGen. The capabilities detailed in the NextGen ConOps will not be successful without ensuring that the right parties have the right information at the right time. Net-enabled solutions also require divergent sets of expertise, particularly in the early stages of the development lifecycle, in order to be accepted by the user community.

The increasingly short product lifecycle, coupled with the long development process, requires data-sharing expertise to be blended with aviation-systems expertise to maximize the value added to modernization efforts. In addition, the traditional solution development timeframe can run 5-10 years, which leaves little opportunity to revise requirements without significant increases in costs. Ensuring that the proper knowledge is incorporated into the early stages will increase the total system benefit while limiting unnecessary costs.

With expertise from various communities of interest such as the weather and IS communities, the JPDO can coordinate with these stakeholders to develop net-centric solutions. During FY11, the NCOD will not only work to develop system and information exchange requirements, but also determine the physical infrastructure required to operate these complex systems. Testing and evaluation of these systems will also be facilitated by the JPDO. Throughout the entire process, a coordinated interagency cyber-security process will be utilized to ensure the safe and secure exchange of information.

Information Exchange Architecture and Process

An Information Exchange Architecture analyzes information exchanges and determines the common standards, infrastructure, and governance needed to realize a specific capability (or NextGen functional area). While EA work is used to define the constraints, methods, and boundaries of a particular decision, the analysis of the information needed, the related business rules about it, and the impact on the infrastructure help to fill in many of the views that are, as yet, undeveloped in the EA. This activity can be viewed as a deep dive into information sharing.

During FY11, the following NextGen functional areas will be analyzed:

- Weather (Working in FY11)
- Integrated Surveillance (Working in FY11)
- Flight and Flow (Start in FY11)
- Unmanned Aircraft Systems (Working in FY11)
- Airports (Possible Start in FY11)
- Airlines (Possible Start in FY11)

Information Exchange Architecture and Process	
Responsible JPDO Division	Net-Centric Operations Division (NCOD)
Inputs	- JPDO Integrated Surveillance (IS) One-Year Challenge Activity - JPDO Concept of Operations (ConOps), Integrated Work Plan (IWP), and Enterprise Architecture (EA) - JPDO Net-Centric Operations (NCO) ConOps, v1.0
Informed By	- JPDO NCOD Cyber-security ConOps - Communities of Interest (COIs) Information and Perspective - Business Process Information - Systems and Infrastructure Information

Outputs	- Design, Implement, & Document Semantic Registry (May 2011)
	- Information Exchange Process Products (JPDO IWP and EA updates through JPDO Change Management [CM] process, COI Business Process Model, Domain-specific architectures, Defined information exchanges, Infrastructure Model, Vocabulary and Ontology Data Model)
	  - Weather (April 2011)
	  - Integrated Surveillance (May 2011)
	  - Unmanned Aircraft Systems (September 2011)
	  - Flight and Flow (November 2011)
	- Recommended JPDO ConOps, IWP, and EA updates submitted through JPDO CM process

Also Feeds/Supports	- JPDO Demonstration Capability (Net-Enabled Test Environment [NETE]) Activity

Demonstration Capability (Net-Enabled Test Environment)

Previous United States Air Force (USAF) and commercial efforts to create a net-centric environment have demonstrated the value of collaboration among the participants testing and evaluating planned services as they come online. Individual testing requires frequent effort to establish connectivity, obtain appropriate security approvals, and establish communication/collaboration tools

among participants. An established collaborative testing environment eliminates the need for those individual and repeated efforts, providing a more effective and efficient way to determine service maturity. To support NextGen, the NCOD intends to establish a NextGen Net-Enabled Test Environment (NETE). The NETE should enable the following objectives:

- Provide an evolutionary facility for the agile development of information-sharing services and applications
- Permit access of information services to entities such as developers of client applications so they can begin creating the decision support tools, displays, and office automation tools needed to use the information services in an evolving business environment
- Play a key role in the transition from research to operations by evaluating services and client applications and assessing the impact on infrastructure
- Assess mission scenarios to demonstrate the value of new capabilities

Recognizing that NCO is an emerging way of conducting business, the NCOD plans to create cultural change through the NextGen NETE by conducting demonstrations of information, reusing information, and identifying how it can make operations more effective in the following NextGen functional areas:

- Weather
- Integrated Surveillance
- Flight and Flow
- Unmanned Aircraft Systems
- Airports
- Airlines

Demonstration Capability (Net-Enabled Test Environment)	
Responsible JPDO Division	Net-Centric Operations Division (NCOD)
Inputs	- JPDO Net-Centric Operations (NCO) Concept of Operations (ConOps) - JPDO ConOps, Integrated Work Plan (IWP), and Enterprise Architecture (EA)
Informed By	- JPDO Integrated Surveillance (IS) One-Year Challenge Activity - Interagency Agreements - Data Sharing Policy

Outputs	- Mission operational threads per business topic area (April 2011) - Demonstration and test plans (May 11, 2011) - Net-Enabled Test Environment (NETE) architecture compliant with the Department of Defense (DOD) Information EA and the Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6212 (June 2011) - Demonstrated information exchanges (August 2011) - Recommended JPDO ConOps, IWP, and EA updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- Support to Enterprise Architecture - Verification and Validation of models and simulations - Federal Aviation Administration (FAA) and DOD Programs of Records in Business Topic Areas

Experimentation and Measurement of the Net-Enabled Test Environment

An overall NETE Interagency Validation Strategy was developed to integrate the different testing methods and activities used by NETE participants. It provides a reusable set of processes and concepts that will guide future use and testing using the NETE. This strategy was complemented by a NETE Establishment and Validation (E&V) Plan to define the processes, roles and responsibilities, and resources needed to successfully execute the validation strategy and activities associated with establishing and validating the NETE.

The NETE E&V Plan describes the process for establishing the NETE and performing an initial round of functional tests to demonstrate its capabilities. The objectives of the E&V activities include:

- Establish and demonstrate a set of services that will serve as examples for government and industry partners to experiment, test, and demonstrate interoperable solutions
- Coordinate the establishment of data communications among the participating centers
- Develop, install, and demonstrate appropriate applications for demonstrating weather and IS information exchanges
- Document processes and lessons learned for integrating partners and their solutions into the NETE

Experimentation and Measurement of the Net-Enabled Test Environment

Responsible JPDO Division	Net-Centric Operations Division (NCOD)
Inputs	- Net-Centric Operations (NCO) Demonstration Capability (Net-Enabled Test Environment [NETE]) Activity - Mission Scenario(s)
Informed By	- JPDO Integrated Surveillance One-Year Challenge Activity - JPDO Information Exchange Architecture and Process Activity - Business Process Models - Vocabulary and Ontology Data Model
Outputs	- NETE Interagency Validation Strategy (approved by March 2011) - NETE Establishment and Validation (E&V) Plan (approved by March 2011) - Demonstration performance reports (August 8, 2011) - Demonstration test statistics (August 8, 2011) - Full test report (August 2011) - Recommended JPDO Concept of Operations (ConOps), Integrated Work Plan (IWP), and Enterprise Architecture (EA) updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- JPDO Information Exchange Architecture and Process Activity - Infrastructure Services - JPDO Cyber-Security Activity - JPDO NCO ConOps - NCES Metadata Registry

Cyber-Security

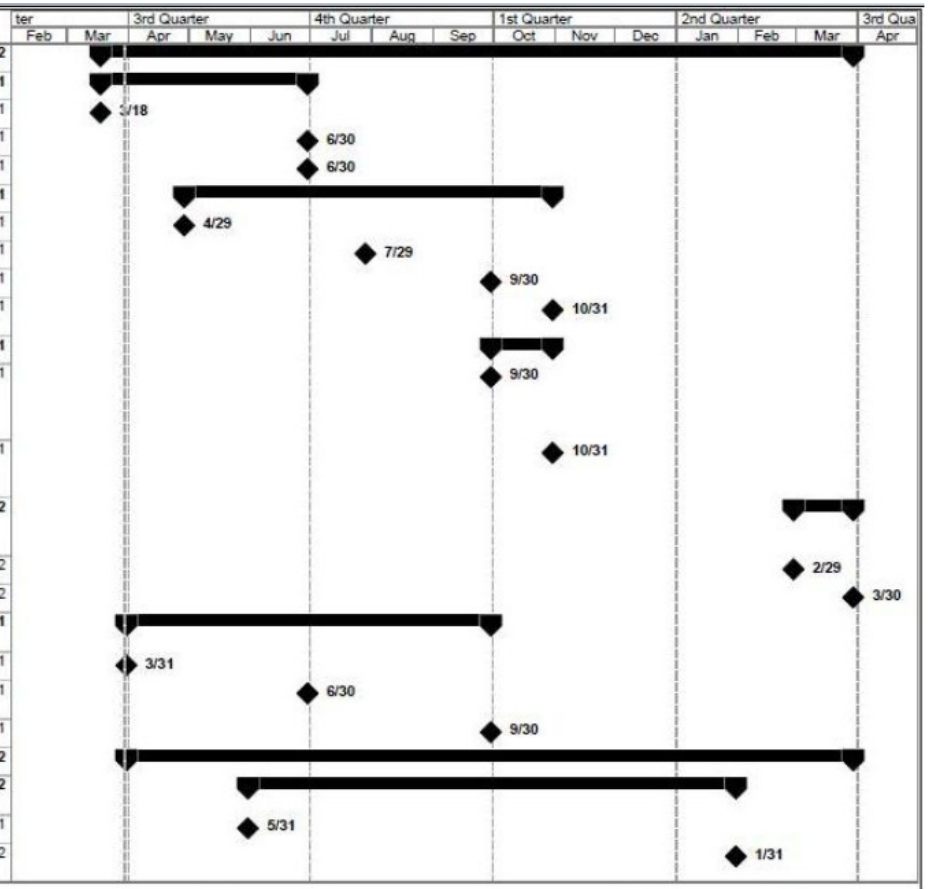
The NAS network is an enterprise of enterprises. The security of each individual enterprise will be maintained at the agency level. NCOD is developing a cyber-security questionnaire and matrix to distribute to the government partners that will provide information on their basic security posture and methodologies. NCOD will compile the inputs and publish a baseline NextGen NAS security document to enhance interoperability and information exchanges. In coordination with the Federal Chief Information Officer (CIO) Council's Federal Interoperability Working Group, the NCOD is researching and developing Identity, Credentialing, and Account Management (ICAM) procedures for use by the partner agencies. The NCOD will host a Federated Identity Credentialing Conference/Workshop and demonstration. It is also consolidating the government partners' security concerns in regards to NextGen system upgrades and development.

Cyber-Security

Responsible JPDO Division	Net-Centric Operations Division (NCOD)
Inputs	- Stakeholder agencies'/Communities of Interest (COIs) cyber-security postures (including governance, oversight, and policy) and technical implementation for the systems of record
Informed By	- JPDO Integrated Surveillance One-Year Challenge Activity - Federal and industry entities, such as the Federal Chief Information Officer (CIO) Council's Federal Interoperability Working Group (boards, working groups, etc.) regarding cyber-security policy, oversight and governance and emerging technologies supporting secure information exchanges.
Outputs	- NCOD Cyber-Security Concept of Operations (ConOps) (March 2011) - NextGen Stakeholder Interoperability Cyber-Security Baseline (May 2011) - NextGen Federated Identity Credentialing Recommendations (June 2011) - NextGen Federated Identity Credentialing Demonstration (November 2011) - Recommended JPDO ConOps, Integrated Work Plan (IWP), and Enterprise Architecture (EA) updates submitted through JPDO Change Management (CM) process
Also Feeds/Supports	- JPDO Demonstration Capability (Net-Enabled Test \ Environment [NETE] Activity - JPDO Information Exchange Architecture and Process Activity - EA

JPDO PROGRAM PLAN GANTT CHART

ID	Task Name	Duration	Start	Finish
1	**Define the Optimal NextGen 2025**	**270 days**	**Fri 3/18/11**	**Fri 3/30/12**
2	**Targeted Capabilities for 2025**	**74 days**	**Fri 3/18/11**	**Thu 6/30/11**
3	Initial Targeted Capabilities for 2025 Report	0 days	Fri 3/18/11	Fri 3/18/11
4	Updated Targeted Capabilities for 2025 Report	0 days	Thu 6/30/11	Thu 6/30/11
5	Research Priorities to OMB	0 days	Thu 6/30/11	Thu 6/30/11
6	**Integrated Surveillance**	**131 days**	**Fri 4/29/11**	**Mon 10/31/11**
7	ADA Integration Plan	0 days	Fri 4/29/11	Fri 4/29/11
8	Integrated Surveillance ConOps	0 days	Fri 7/29/11	Fri 7/29/11
9	Integrated Surveillance Capabilities Analysis	0 days	Fri 9/30/11	Fri 9/30/11
10	Signed Integrated Surveillance Support Office Memorandum of Agreement	0 days	Mon 10/31/11	Mon 10/31/11
11	**Integrated Surveillance One Year Challenge**	**21 days**	**Fri 9/30/11**	**Mon 10/31/11**
12	Demonstration of interagency sharing of surveillance information to improve collaborative decision making in an operational environment	0 days	Fri 9/30/11	Fri 9/30/11
13	Engineering Report that lists processes, lessons learned, approach, solution, etc., from technical and operational demonstrations	0 days	Mon 10/31/11	Mon 10/31/11
14	**Flight Prioritization Phase II (ALL OUTPUTS ASSUME ACTIVITY START DATE OF APRIL 1, 2011)**	**22 days**	**Wed 2/29/12**	**Fri 3/30/12**
15	Draft Flight Prioritization Phase II Report	0 days	Wed 2/29/12	Wed 2/29/12
16	Final Flight Prioritization Phase II Report	0 days	Fri 3/30/12	Fri 3/30/12
17	**Global Harmonization Roadmap (ASSUMING TASK ORDER AWARD DATE)**	**131 days**	**Thu 3/31/11**	**Fri 9/30/11**
18	Phase 2 Roadmap and Dashboard	0 days	Thu 3/31/11	Thu 3/31/11
19	Revised List of Harmonization Activities/Elements	0 days	Thu 6/30/11	Thu 6/30/11
20	Phase 3 Roadmap and Dashboard	0 days	Fri 9/30/11	Fri 9/30/11
21	**Champion the NextGen Vision**	**261 days**	**Thu 3/31/11**	**Fri 3/30/12**
22	**TBO Roadmap (ALL OUTPUTS ASSUME ACTIVITY START DATE OF APRIL 1, 2011)**	**175 days**	**Tue 5/31/11**	**Tue 1/31/12**
23	TBO Roadmap Plan	0 days	Tue 5/31/11	Tue 5/31/11
24	JPDO TBO Roadmap Framework (TBD, based on TBO Roadmap Plan)	0 days	Tue 1/31/12	Tue 1/31/12



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Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

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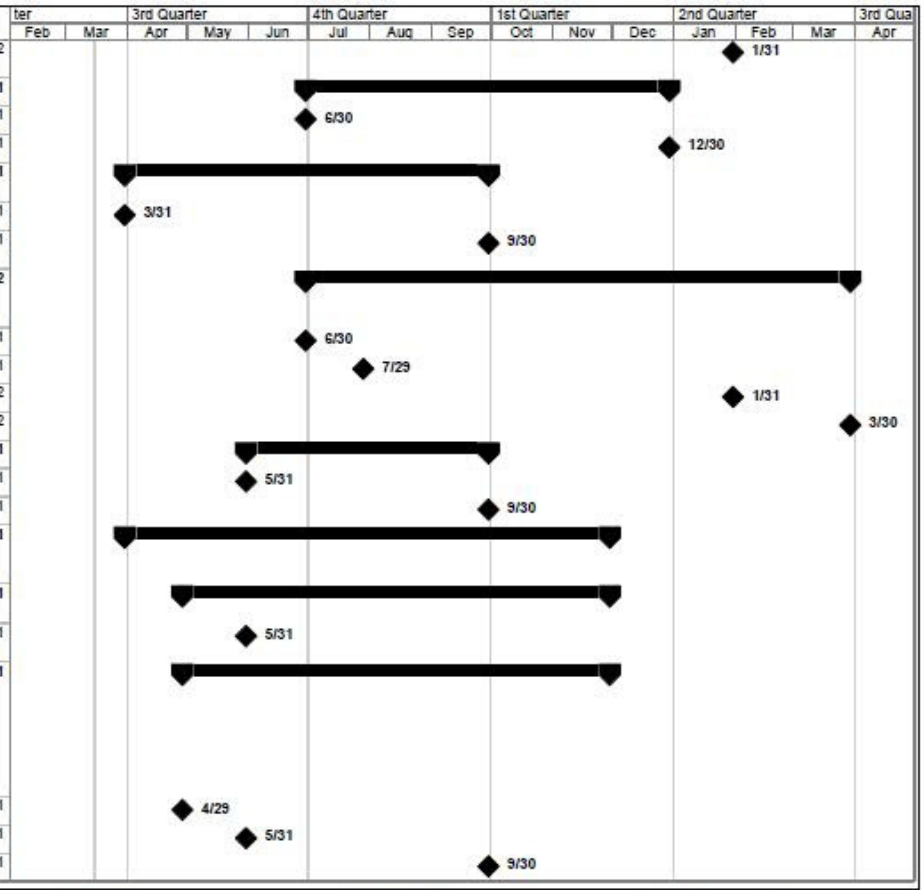
ID	Task Name	Duration	Start	Finish
25	Characterization of partial TBO capability for 2025 (TBD, based on TBO Roadmap Plan)	0 days	Tue 1/31/12	Tue 1/31/12
26	**TBO Safety Case Planning**	**131 days**	**Thu 6/30/11**	**Fri 12/30/11**
27	Agree on Safety Case Planning Approach	0 days	Thu 6/30/11	Thu 6/30/11
28	TBO Safety Case Plan	0 days	Fri 12/30/11	Fri 12/30/11
29	**Strategic UAS Research, Development, and Demonstration Interagency Roadmap Support**	**131 days**	**Thu 3/31/11**	**Fri 9/30/11**
30	Agreement of Approach	0 days	Thu 3/31/11	Thu 3/31/11
31	Facilitated Strategic UAS RD&D Interagency Roadmap	0 days	Fri 9/30/11	Fri 9/30/11
32	**Definition of Future Vision for AOC/FOC (ASSUMED TO START IN MAY GIVEN APPROPRIATE VOLUNTEERS)**	**196 days**	**Thu 6/30/11**	**Fri 3/30/12**
33	Define the Scope of the Initial Activity	0 days	Thu 6/30/11	Thu 6/30/11
34	Stand-up Study Team	0 days	Fri 7/29/11	Fri 7/29/11
35	Draft Scenarios and Use Cases (Date TBD)	0 days	Tue 1/31/12	Tue 1/31/12
36	Final Scenarios and Use Cases (Date TBD)	0 days	Fri 3/30/12	Fri 3/30/12
37	**Avionics Roadmap Version 2.0**	**88 days**	**Tue 5/31/11**	**Fri 9/30/11**
38	Draft Avionics Roadmap, v2.0 for comment	0 days	Tue 5/31/11	Tue 5/31/11
39	Final Avionics Roadmap, v2.0	0 days	Fri 9/30/11	Fri 9/30/11
40	**Accelerate Net-Enabled Aviation System Operations to Achieve Greater Data Sharing Efficiencies**	**174 days**	**Thu 3/31/11**	**Wed 11/30/11**
41	**Information Exchange Architecture and Process**	**153 days**	**Fri 4/29/11**	**Wed 11/30/11**
42	Design, Implement, & Document Semantic Registry	0 days	Tue 5/31/11	Tue 5/31/11
43	**Information Exchange Process Products (JPDO IWP and EA updates through JPDO CM process, COI Business Process Model, Domain-specific architectures, Defined Information exchanges, Infrastructure Model, Vocabulary and Ontology Data Model**	**153 days**	**Fri 4/29/11**	**Wed 11/30/11**
44	Weather	0 days	Fri 4/29/11	Fri 4/29/11
45	Integrated Surveillance	0 days	Tue 5/31/11	Tue 5/31/11
46	Unmanned Aircraft Systems	0 days	Fri 9/30/11	Fri 9/30/11



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Task | Progress | Summary | External Tasks | Deadline
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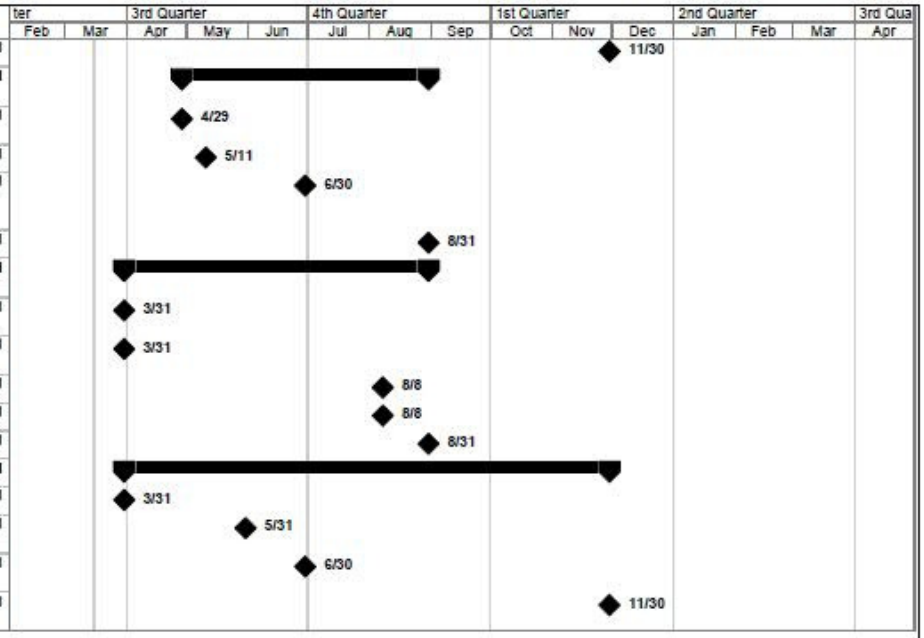
ID	Task Name	Duration	Start	Finish
47	Flight & Flow	0 days	Wed 11/30/11	Wed 11/30/11
48	**Demonstration Capability (Net-Enable Test Environment)**	**88 days**	**Fri 4/29/11**	**Wed 8/31/11**
49	Mission operational threads per business topic area	0 days	Fri 4/29/11	Fri 4/29/11
50	Demonstration and test plans	0 days	Wed 5/11/11	Wed 5/11/11
51	NETE architecture compliant with the DoD Information Enterprise Architecture and the CJCSI 6212	0 days	Thu 6/30/11	Thu 6/30/11
52	Demonstrated information exchanges	0 days	Wed 8/31/11	Wed 8/31/11
53	**Experimentation and Measurement of the Net-Enabled Test Environment**	**109 days**	**Thu 3/31/11**	**Wed 8/31/11**
54	NETE Interagency Validation Strategy (Approved)	0 days	Thu 3/31/11	Thu 3/31/11
55	NETE Establishment and Validation (E&V) Plan (Approved)	0 days	Thu 3/31/11	Thu 3/31/11
56	Demonstration performance reports	0 days	Mon 8/8/11	Mon 8/8/11
57	Demonstration test Statistics	0 days	Mon 8/8/11	Mon 8/8/11
58	Full test report	0 days	Wed 8/31/11	Wed 8/31/11
59	**Cyber Security**	**174 days**	**Thu 3/31/11**	**Wed 11/30/11**
60	NCOD Cyber Security ConOps	0 days	Thu 3/31/11	Thu 3/31/11
61	NextGen Stakeholder Interoperability Cyber Security Baseline	0 days	Tue 5/31/11	Tue 5/31/11
62	NextGen Federated Identity Credentialing Recommendations	0 days	Thu 6/30/11	Thu 6/30/11
63	NextGen Federated Identity Credentialing Demonstration	0 days	Wed 11/30/11	Wed 11/30/11



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