National Wildland Fire Enterprise Architecture

NWFEA Blueprint

PART I: Goals and Recommendations

Version 2.9

NWFEA Project Team

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This document is produced and maintained by the NWCG Program Management Office.

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INTRODUCTION

The purpose of the National Wildland Fire Enterprise Architecture (NWFEA) Blueprint is to support the wildland fire community's need to function as a Virtual Single Agency (VSA). The wildland fire community is striving to expand its use of an interagency management structure that allows the disparate members of the wildland fire community both to maintain their independent strong ties to their governing agencies and at the same time take advantage of both the organizational and economic efficiencies of a single agency.

Note: This is NOT a suggestion that Wildland Fire become an agency, only that it organizes its interagency business process AS IF it were a single agency to enable consolidated planning and decision-making to take place in a more coordinated fashion.

The goals of creating the NWFEA Blueprint are to improve the execution of the interagency National Wildland Fire Programs by:

1. Identifying the similarities and differences between wildland fire business processes among the various wildland fire organizations in order to identify potential examples of effective interagency implementation vs. challenges to operating as a virtual single agency,
2. Recommending improvements that will lead to common strategic and business-level management processes that will ultimately lead to safer operations and better service to citizens by providing common business practices, and faster and more accurate information exchanges, and
3. To examine the current and projected technology investments and document findings and to determine their alignment with the NWFEA goals defined herein.

Within this document the term "Wildland Fire", in capital letters, refers to the wildland fire enterprise which encompasses the organizations (both agency and interagency), policies, standards, processes, data, and technology of the national interagency wildland fire community

Scope

The scope of the NWFEA blueprint includes the entire national wildland fire enterprise from a birds-eye perspective. As the NWFEA Program and Blueprint processes mature, more in-depth details will be included in subsequent blueprints.

Mission

The NWFEA Blueprint supports Wildland Fire's mission to provide national leadership and establish, implement, maintain and communicate policy, standards, and guidelines for wildland fire program management. The three largest program activities are preparedness, suppression, and hazardous fuel reduction.

Vision

The NWFEA Blueprint supports Wildland Fire's vision that the Nation's resources and communities are protected and enhanced through safe, comprehensive, and cohesive interagency wildland fire management.

Purpose

The goal of the NWFEA Blueprint is to recommend changes to the wildland fire community that will result in continually improving interagency cooperation, management efficiencies, and support to field operations. The Blueprint enables these improvements by providing focused attention to the four main enterprise architecture components: business, data, applications, and technology.

Background

The NWFEA Blueprint is the result of several reports that promoted the need for an overarching interagency approach to managing wildland fire operations and investments. As a result, in 2002, the Wildland Fire Leadership Council (WFLC) chartered the NWFEA Steering Group to guide the development of the NWFEA Blueprint and supporting program.

SUMMARY OF NWFEA GOALS, RECOMMENDATIONS, AND ACTION ITEMS

The future vision for Wildland Fire includes achievement of the following goals:

1. **Common Governance and Business Activities**
2. **An Integrated Data Environment**
3. **Common Technology Infrastructure and Configuration Standards**
4. **Systems that Increase Efficiencies and Manage Costs and Redundancies**

The achievement of these goals is not a short-term prospect and may take many years. As a first step, the NWFEA Blueprint has identified the following recommendations for each goal:

NWFEA Goals	NWFEA Recommendations
1. Common Governance and Business Activities	1.1 Complete the implementation of a unified governance structure 1.2 Create an interagency information technology (IT) governance framework to guide the management of wildland fire information systems 1.3 Maintain and use the National Wildland Fire Architecture and Blueprint 1.4 Optimize wildland fire's organizational capacity for integrating into its parent agencies' proactive land management activities 1.5 Improve the efficiency of response to and management of wildland fire incidents 1.6 Improve internal and external communications
2. An Integrated Data Environment	2.1 Develop and implement interagency data standards 2.2 Develop consistent data and data interoperability across all systems and business areas
3. Common Technology Infrastructure and Configuration Standards	3.1 Provide a common platform for system interconnection and information sharing 3.2 Develop a common Incident Based Automation infrastructure accepted and used by all partnering agencies 3.3 Have unified acceptance of implemented Information Technology (IT) controls 3.4 Establish a primary core national network of Remote Automatic Weather Stations (RAWS) designed to support point and gridded data applications
4. Systems that Increase Efficiencies and Reduce Costs and Redundancies	4.1 Implement a Wildland Fire interagency strategic approach to systems management 4.2 Develop an End to End Fire Reporting System that provides a single point of access to authoritative Wildland Fire Information. 4.3 Support current and new projects. 4.4 Support and actively integrate the use of geospatial and emerging technology in wildland fire applications.

Table 1 - Summary of NWFEA Goals and Recommendations

Alignment of NWFEA Goals with Mission Objectives and OMB Performance Measurement Categories

The NWFEA Blueprint will be used as a management tool to provide a roadmap to achieve the national interagency wildland fire goals as represented in the Wildland Fire Leadership Council's (WFLC) 10-Year Implementation Strategy, as well as mapping to performance measurement categories established by the Office of Management and Budget (OMB). Wildland Fire leadership sees enterprise architecture as a way to improve its management and business operations through optimization of common services while still maintaining the ability to respond to the individual agencies' land management mission and objectives. The following figure shows that the NWFEA Goals support the OMB Performance Measurement Categories and the WFLC Goals.

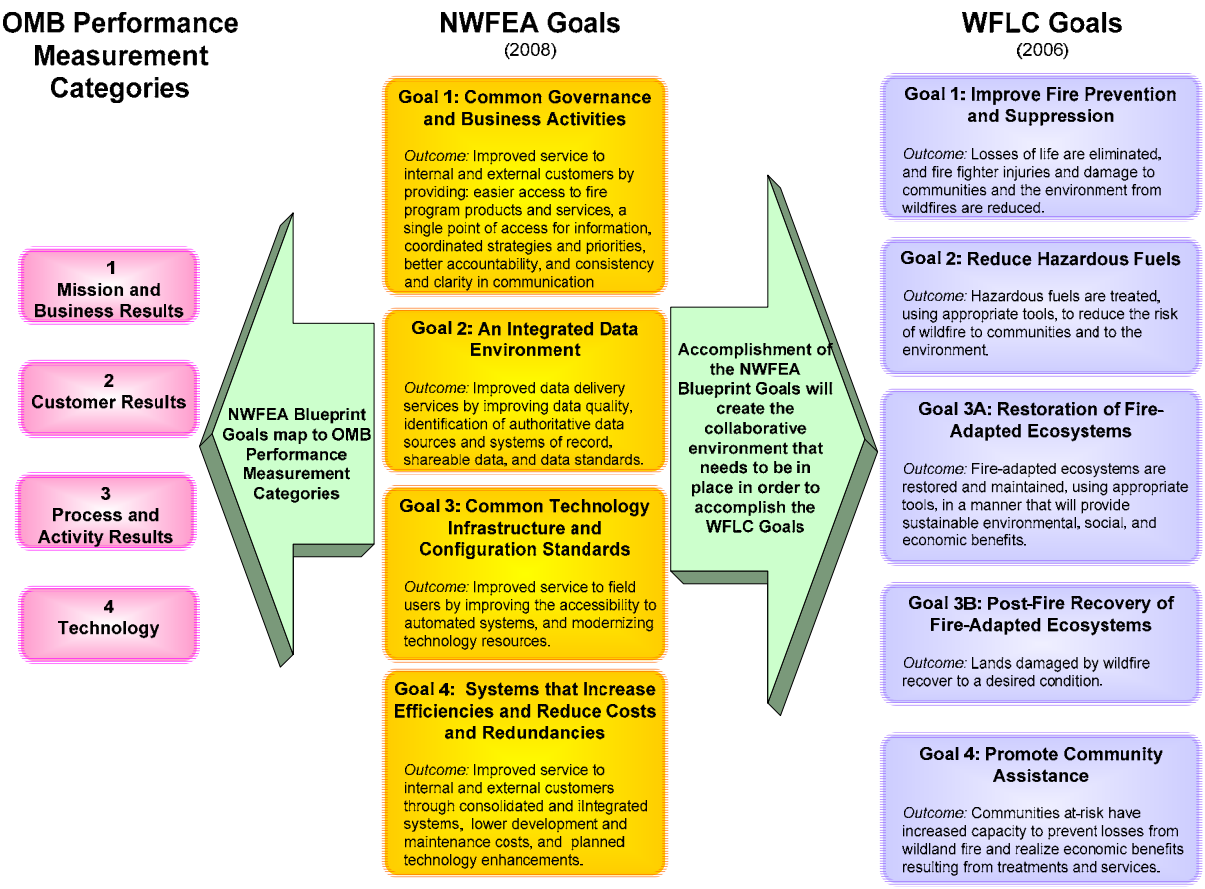

Figure 1 - Relationship of NWFEA Goals to WFLC Goals and OMB Performance Measurement Categories

The first three recommendations NWFEA Goal 1 (in Table 1 - Summary of NWFEA Goals and Recommendations) identify the organizational management, governance, and interagency practices that must first be instituted in order to accomplish the WFLC Goals. The last three recommendations in Goal 1 identify business activities related to the WFLC Goals.

NWFEA Goals 2 through 4 identifies the over-arching data, technology, and application practices that must be implemented in order to implement WFLC Goals effectively and efficiently.

The following table maps the NWFEA Action Items (associated with the Goals and Recommendations identified above) to the WFLC Goals and OMB Performance Measurement Categories:

NWFEA Action Items	Mapping to WFLC Goals	Mapping to OMB Performance Measurement Category
1.1.1 Continuation/ completion of the NWCG reorganization	1, 2, 3A, 3B, 4	1,2,3,4
1.1.2 Integrate interagency strategic planning	1, 2, 3A, 3B, 4	3
1.1.3 Institute a product management discipline	1, 2, 3A, 3B, 4	2
1.1.4 Move toward a "Service First" organizational concept	1, 2, 3A, 3B, 4	2
1.1.5 Establish a budget planning and tracking process for interagency initiatives	1, 2, 3A, 3B, 4	1
1.2.1 Complete development and implementation of the interagency fire IT investment process	1, 2, 3A, 3B, 4	3
1.2.2 Promote the Creation of an Interagency Wildland Fire CIO Council to deal with interagency IT issues	1, 2, 3A, 3B, 4	1
1.3.1 Use the national wildland fire architecture and blueprint as a management tool	1, 2, 3A, 3B, 4	1
1.3.2 Incorporate maintenance of the business architecture and blueprint into the new NWCG organization	1, 2, 3A, 3B, 4	3
1.3.3 Complete the as-is and to-be business analysis and use IT as feeders to the strategic plan	1, 2, 3A, 3B, 4	1
1.4.1 Ensure adequate resources for vegetation management and other proactive land management activities	2,3A, 3B	3
1.4.2 Leverage existing resource funding to maximize coordinated interdisciplinary vegetation management projects	2,3A, 3B	3
1.4.3 Develop adaptive management guidelines that support post-wildfire-recovery decisions on a routine basis	3A, 3B	3
1.4.4 Develop smoke management guidelines that support both air quality and vegetation management objectives	1	1
1.5.1 Standardize accepted appropriate management (AMR) response practices	1	3
1.5.2 Expand, Streamline, and Accelerate the Training and Delivery of Qualified Personnel to the Workforce	1, 2, 3A, 3B, 4	3
1.5.3 Work with DHS to develop common standards and procedures for incident management and emergency response	1	
1.5.4 Investigate lower-cost solutions for aviation	1, 2, 3A, 3B	
1.6.1 Develop and implement a communications plan for interagency inreach and outreach	4	1, 2, 3, 4
1.6.2 Develop communication protocols for elevating issues to and from the interagency wildland fire community	1, 2, 3A, 3B, 4	1, 3, 4
1.6.3 Provide a single point of access to authoritative interagency wildland fire information	1, 2, 3A, 3B, 4	1, 2, 3, 4
2.1.1 Develop a strategy and schedule for development and implementation of data standards, including necessary agreements among partners on interagency standards. (This includes geospatial data standards.)	1, 2, 3A, 3B, 4	2, 3, 4
2.1.2 Create interagency policy to incorporate new and existing NWCG data standards into existing systems' annual operating plans within 1 year of creation of the standard.	1, 2, 3A, 3B, 4	2, 3, 4

NWFEA Action Items	Mapping to WFLC Goals	Mapping to OMB Performance Measurement Category
2.2.1 Maintain, update, and use a single wildland fire logical data model.	1, 2, 3A, 3B, 4	2, 3, 4
2.2.2 Establish authoritative data sources and/or systems of record for identified Information Classes	1, 2, 3A, 3B, 4	2, 3, 4
2.2.3 Establish policies and procedures to standardize the collection of data	1, 2, 3A, 3B, 4	2, 3, 4
3.1.1 Implement a standardized enterprise message model and supporting technology dedicated to wildland fire usage	1, 2, 3A, 3B, 4	2, 4
3.1.2 Use secure wireless network technology to further enhance the wildland firefighter's ability to access incident management support systems in a mobile environment	1	2, 4
3.1.3 Develop an as-is and to-be architecture and transition plan for land-mobile radios	1, 2, 3A, 3B, 4	2, 4
3.2.1 Develop a Wildland Fire Technical Reference Model	1, 2, 3A, 3B, 4	4
3.2.2 Develop a national interagency Incident Based Automation (IBA) infrastructure	1	2, 3, 4
3.3.1 Use a common framework for applying IT policies, standards and guidelines	1, 2, 3A, 3B, 4	4
3.3.2 Partnering agencies collaborate to define a common set of controls for IT systems	1, 2, 3A, 3B, 4	4
3.4.1 Conduct an as-is network analysis of RAWS and other weather stations to determine future resource sharing opportunities	1, 2, 3A, 3B, 4	2, 3, 4
3.4.2 Validate the network analysis and refine station placement through local development of fire danger rating operating plans	1, 2, 3A, 3B, 4	2, 3, 4
4.1.1 Develop a Wildland Fire Interagency IT strategy and Create an Interagency Fire Portfolio Management Function	1, 2, 3A, 3B, 4	1, 4
4.1.2 Complete the Systems Assessment	1, 2, 3A, 3B, 4	2, 4
4.1.3 Reengineer or retire systems or develop new systems in a SOA environment	1, 2, 3A, 3B, 4	1, 2, 3, 4
4.1.4 Promote interagency collaboration on Forest Service initiatives such as the fire data warehouse and the Business Intelligence Tool Advanced Reporting System	1, 2, 3A, 3B, 4	1, 2, 3, 4
4.2.1 Design, develop, and maintain an End to End Fire Reporting System	1, 2, 3A, 3B, 4	1, 2, 3, 4
4.3.1 Continue Incident Base Automation effort	1, 2	1, 2, 3, 4
4.3.2 Coordinate with Joint Fire Sciences Program	1, 2, 3A, 3B, 4	1, 2, 3, 4
4.3.3 Reengineer Fire Environment (including weather) systems and supporting infrastructure	1, 2, 3A, 3B	2, 3, 4
4.3.4 Continue Improvement and Operational Support of existing national interagency Wildland Fire Applications	1, 2, 3A, 3B, 4	1, 2, 3, 4
4.3.5 Integrate with applicable wildland fire applications as appropriate (Administrative (e.g. budget, procurement) systems	1, 2, 3A, 3B	1, 2, 3, 4
4.3.6 Determine how Appropriate Management Response (AMR) requirements can be supported by Decision Support Systems	1, 4	1, 2, 3, 4
4.4.1 Use the Department of the Interior Geospatial Blueprint and USDA Geospatial standard as a guide in geospatial-enabled IT applications.	1, 2, 3A, 3B, 4	2, 3, 4
4.4.2 Engage the interagency fire geospatial community to facilitate the use of geospatial capabilities in Wildland Fire applications	1, 2, 3A, 3B, 4	1, 2, 3, 4

Table 2 - Mapping NWFEA Action Items to WFLC Goals & OMB Performance Measurement Categories

OVERVIEW OF THE NATIONAL WILDLAND FIRE ENTERPRISE

Definition of "Enterprise"

An enterprise is a business area that performs common activities and manages similar assets; often crossing organizational boundaries. Examples of enterprise segments in government include: Education, Contracting, Transportation, and Financial Management. The federal Office of Management and Budget's (OMB) enterprise architecture framework identifies the following as enterprise assets:

Programs	Applications	Personnel
Processes	Technology	Organizations
Information	Investments	Facilities

The Wildland Fire Enterprise

In this Blueprint, the Wildland Fire Enterprise crosses the various governments (federal, state, and local) and tribal organizational boundaries to perform common activities related to the protection of sensitive or burnable wildland values from fire and the use of prescribed fire to meet land management objectives. Organizationally, the National Wildland Fire Enterprise is comprised of: 1) government and tribal wildland fire programs; 2) interagency wildland fire management committees; and 3) the U.S. Fire Administration, as depicted in the following figure:

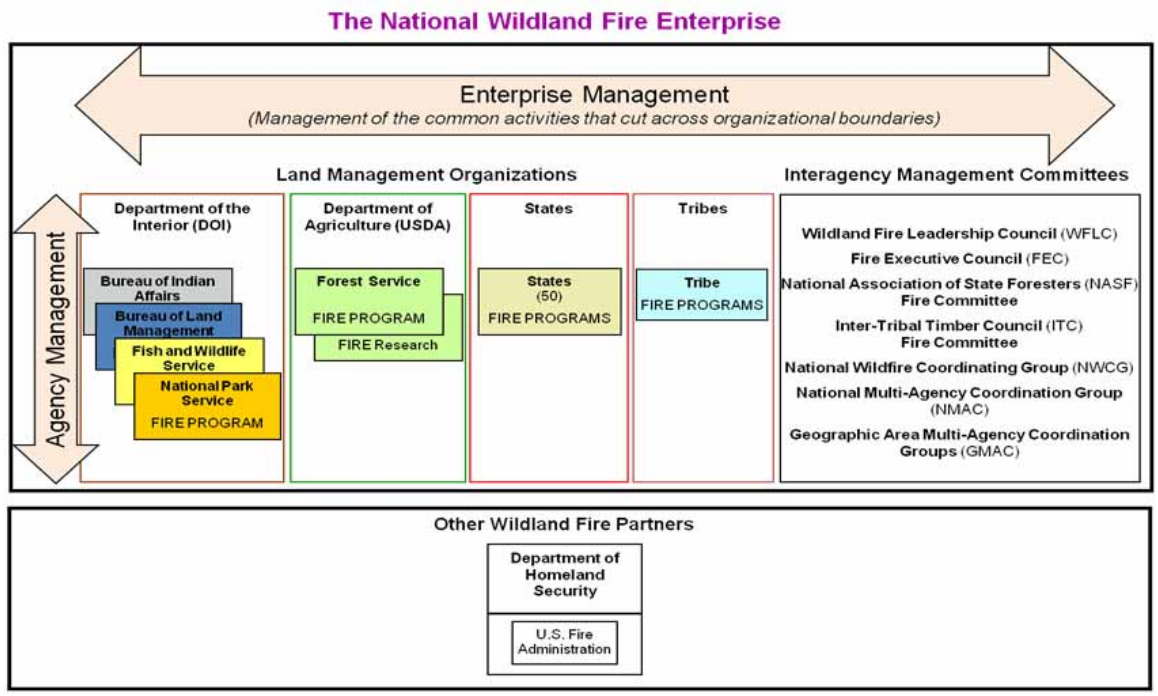

Figure 2 - Wildland Fire Enterprise Organizations

Each constituent member of the wildland fire community is bound by multiple obligations related to their organization's specific mission. For each agency, the fire program represents a relatively small proportion of their overall effort, yet a large portion of their budget. The wildland fire components of the agency need to operate according to the mission and principles of that agency that have been devised in ways that are appropriate for the overall effort of the agency, not necessarily optimized to the needs of the fire community and its customers. Given that agencies have differing responsibilities,

the net result for the wildland fire community is that the different constituent members have inherently different operating principles they must follow. The challenge to creating structures that allow enhanced collaboration, yet respect the inherent differences, is to design those structures at a level of abstraction that captures the similarities while acknowledging and mitigating the differences.

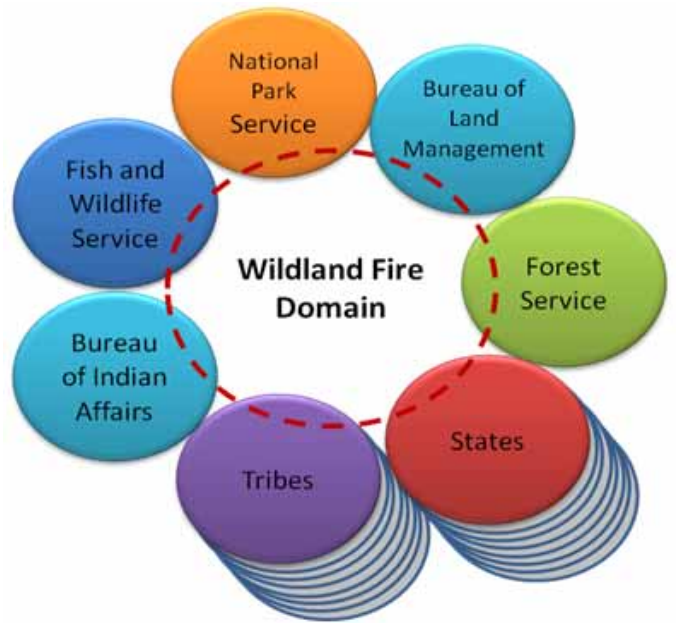

Figure 3 - Wildland Fire Domain

Adding to the complexity are the agency governance structures. Typically the agencies consist of three tiers of management: 1) National Leadership, 2) Regional Management, and 3) Local Operations. Each Region, while operating under the same mission, policies, and objectives, manages its budget autonomously from its counterparts. In many cases, each local office also operates autonomously. This results in the development of solutions, including technology investments, that meet the local customer needs, but not the national, interagency need; and when viewed from the enterprise perspective shows an investment portfolio that is heavy in redundant efforts and costs. Applying these structures across five agencies and 50+ states and tribes creates an interagency governance conundrum.

Definition of "Wildland Fire Program"

Each land management agency has a Wildland Fire Program or equivalent that shares the same or similar responsibilities: managing and extinguishing fires on government-owned lands and on other lands under fire protection agreements. The three largest program activities are preparedness, suppression, and hazardous fuel reduction (such as removal of small trees and brush that exacerbate fire risks). In most of these organizations, the Wildland Fire Program is a small component of the overall organization. However, in most cases, the Wildland Fire Program budget makes up more than 50% of the overall budget. Functionally, the Wildland Fire Domain includes the areas within each of the Fire Programs of the various land management agencies, as well as a larger, interagency domain of common wildland fire principles and practices.

Wildland Fire Functions

The five Wildland Fire functions, as defined by the NWFEA Core Blueprint Team are: 1) Leadership, 2) Fire Program Management, 3) Vegetation Management, 4) Wildland Fire Operations Management, and 5) Business Operations. The following top level of the NWFEA Functional Model depicts a high-level view of the work performed at the national and field levels. Lower tiers of the functional model identify more sub-functions.

Figure 4 – Wildland Fire Functional Model (Tier 1)

Because the functional model defines the role of Wildland Fire, it is used as the anchor point for the NWFEA Architecture. Many NWFEA components, such as organizations, strategies, data, applications, and products are mapped to these functions.

Wildland Fire Leadership

The Wildland Fire Leadership function includes the interagency leadership of the enterprise – all aspects of the direction setting and decision making within the community.

Despite the differences in the various constituents' missions and principles, the wildland fire community has achieved a number of impressive interagency results across the nation that provide a seamless integration of procedures, personnel, equipment and tools at wildland fire incidents, and to reduce the number of redundant operations. In order to support the collaborative environment and to formalize the protocols necessary to implement interagency standards and guidelines, various interagency management committees have been created; for example:

> The **Wildland Fire Leadership Council (WFLC)**, created in 2002, is an intergovernmental committee of Federal, State, tribal, county, and municipal government officials convened by the Secretaries of the Interior and Agriculture dedicated to consistent implementation of wildland fire policies, goals, and management activities. The Council provides strategic oversight to ensure policy coordination, accountability, and effective implementation of Federal Wildland Fire Management Policy and related long-term strategies to address wildfire suppression, assistance to communities, hazardous fuels reduction, habitat restoration, and rehabilitation of the Nation's forests and rangelands.
>
> The **Fire Executive Council (FEC),** created in 2006, provides coordinated interagency federal executive level wildland fire policy leadership, direction, and program oversight.

The **National Wildfire Coordinating Group (NWCG)**, created in 1976, comprised of fire program representatives from all the wildland fire entities in the United States, develops interagency wildland fire standards and guidelines and facilitates their implementation. These standards make it possible for various interagency resources to seamlessly merge into an ad hoc organization that erases agency boundaries and hierarchies in order to respond effectively and efficiently in emergency situations. The NWCG oversees a variety of sub-committees and task teams that represent all the functional areas of wildland fire such as: Aviation, Education, Equipment, Fuels, Fire Environment, Incident Management, Planning, Policy, Preparedness, Prevention, Technology, Wildland Urban Interface, and Workforce Management.

The **National Multi-Agency Coordinating (NMAC)** and **Geographic Multi-Agency Coordinating (GMAC)** Group assemble during the fire season to manage and prioritize the utilization of resources at wildland fires from a national perspective.

The following graphic depicts the cross-department and cross-agency nature of these interagency management committees:

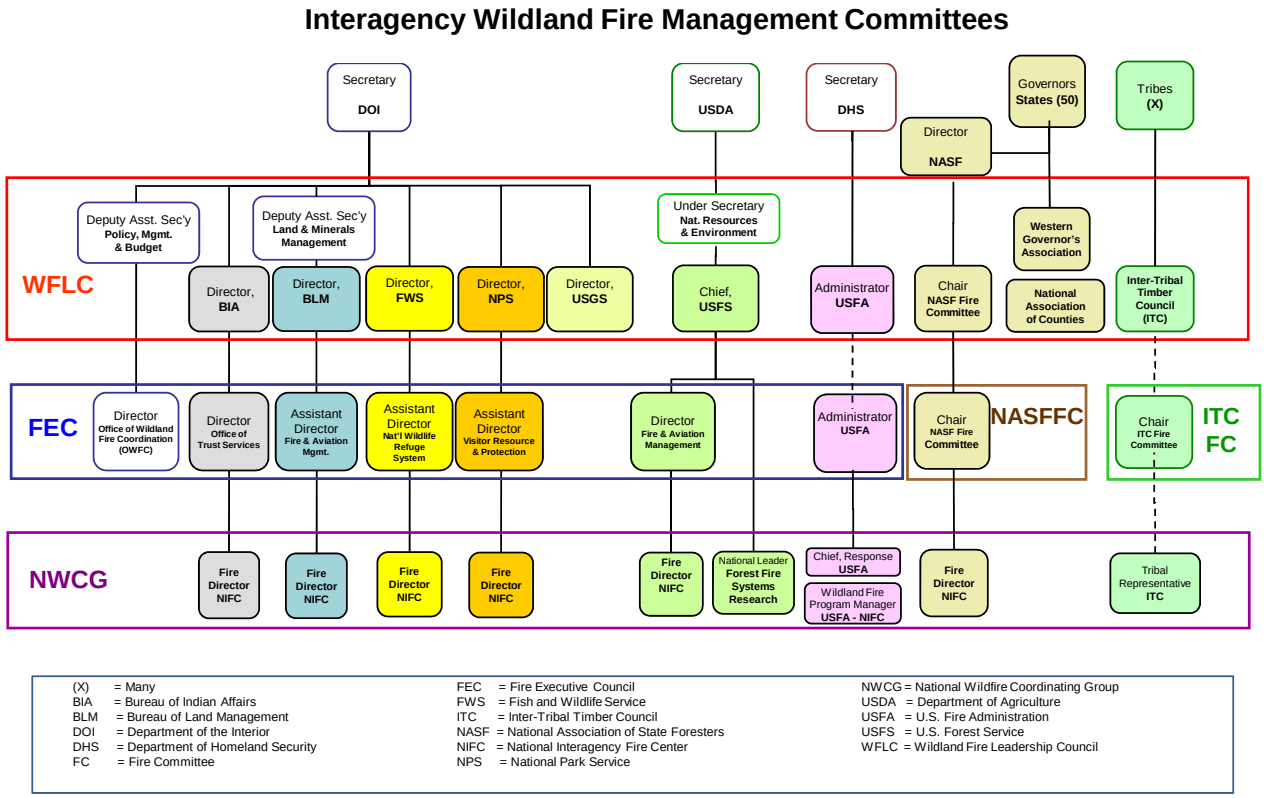

Figure 5 - Interagency Wildland Fire Management Committees

In addition, some interagency coordination and support organizations have been created, such as:

The **National and Geographic Area Coordination Groups** provide coordination and direction to ensure the wildland fire community dispatch offices adhere to the same basic standards, guidelines, and protocols.

The **National Interagency Coordination Center (NICC)** and the eleven **Geographic Area Coordination Centers (GACCs)** consist of staff members from the various federal, state, and sometimes county wildland fire agencies. These organizations support the sharing and distribution of resources by moving inactive resources where they are needed, rather than building up multiple resource inventories throughout the country.

Networks of **fire caches** serve the interagency fire community and have been placed in each of the Geographic Areas. Items from these caches are used and then refurbished for future needs. As the fire season moves around the country, these caches facilitate the movement of stock to ensure that the cache with the heaviest needs has sufficient inventory.

Throughout the nation, many wildland fire organizations have consolidated multiple single-agency offices into a single interagency office such as **interagency dispatch centers** and **emergency response centers**; thus providing more efficient service, reducing operating costs, and eliminating redundant services.

During 2007, Wildland Fire leadership developed an interagency governance structure that clarified the roles and responsibilities of the various department, agency, and interagency organizations.

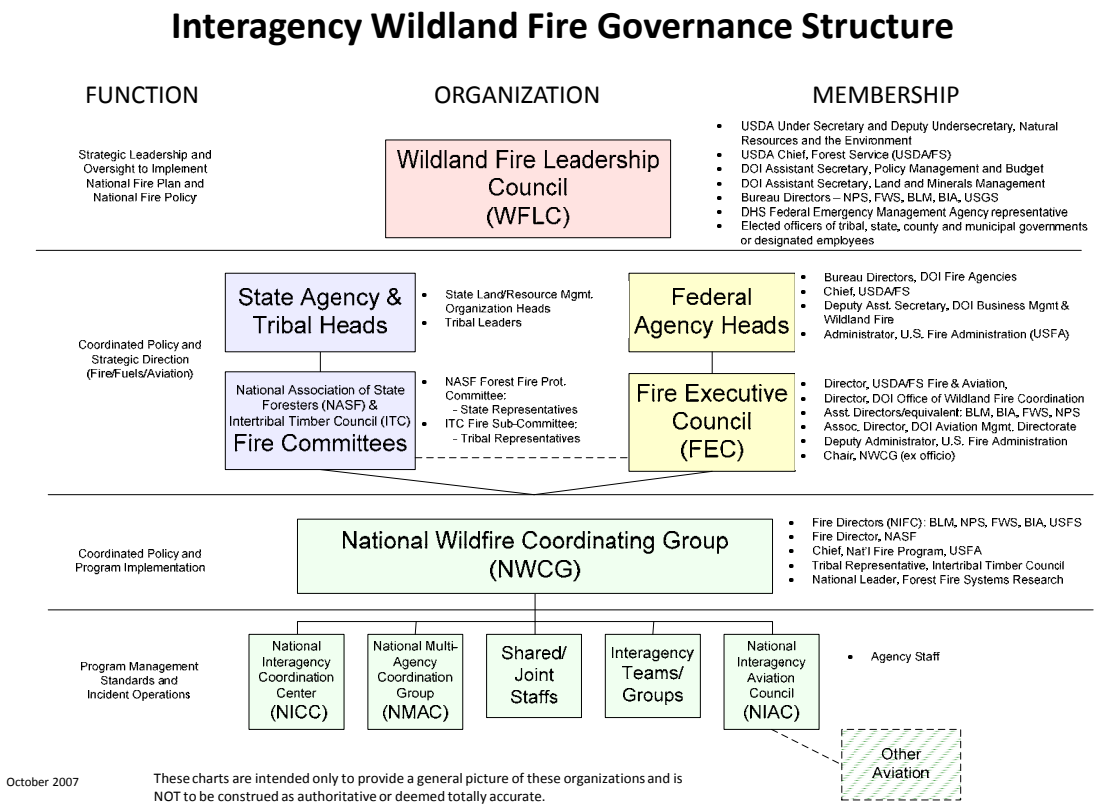

Figure 6 - Interagency Wildland Fire Governance Structure

In January 2008, this new governance structure was formalized with the re-chartering of NWCG. The new NWCG charter resulted in collapsing the previous interagency structure that included 60+ sub-groups, many with overlapping functions into a more manageable interagency organization. This posed an excellent opportunity for Wildland Fire to re-engineer its interagency management structure and procedures to establish a more efficient organization that can respond to a wider array of interagency wildland fire issues.

Wildland Fire Program Management

The Wildland Fire Program Management function creates and disseminates procedures, standards and guidelines for managing Wildland Fire events and resources – activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives through appropriate planning and coordination.

Wildland Fire Vegetation Management

The Wildland Fire Vegetation Management function is responsible for the manipulation or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage from and resistance to control of wildland fires, including ecosystem evaluation and balance. Lopping, chipping, crushing, piling, and burning are examples of fuels treatment.

Wildland Fire Operations Management

The Wildland Fire Operations Management function refers to the planning, preparedness, dispatch, coordination, on-scene management of any unplanned event, investigation of an unplanned wildland fire event, and post-wildfire recovery.

Wildland Fire Operations Management provides an excellent example of enterprise management vs. single-agency management. When wildland fires occur, 90% of the fire suppression activities are managed within the local unit, utilizing their own agency resources. However, once a fire exceeds the local unit's resource capabilities, the interagency fire community joins forces through a network of interagency agreements, standards, and guidelines, and national coordination to provide all the necessary resources to effectively manage the incident. The incident organization on large fires is often times made up of personnel and equipment from multiple federal, state, tribal, and contract organizations. At the incident command post and on the fire scene, the agency uniforms are replaced with yellow fire shirts; and the organization works together as a single incident organization to achieve a single common goal. The wildland fire community has set up a numbering system for accounting purposes (FireCode) that enables the host unit to track the expenditures on a fire across multiple agency accounting systems.

Wildland Fire Operations Management has served as the model for interagency collaboration and cooperation. In the Wildland Fire Operations Management function, there are many successfully implemented coordinated and integrated cross-cutting services, such as:

- The Incident Command System (ICS) developed by the Wildland Fire community offers seamless interagency incident operations organizations, standardized equipment and tools, position standards, interagency information technology (IT) applications, and training
- The national interagency resource coordination system enables efficient resource utilization and mobilization throughout the nation

- The interagency fire cache system provides equipment and supplies for the interagency community nationwide
- The Department of Homeland Security (DHS) is developing all-risk emergency response and incident management policies, standards, and procedures. Collaboration between the DHS and Wildland Fire is imperative. Unless Wildland Fire is actively engaged in these efforts there could be adverse impacts on the effectiveness of these standards and procedures in wildland fire operations

Wildland Business Operations

Business Operations refers to the external support functions required by the Wildland Fire organization. Examples of Business Operations are: Financial Management, Human Resource Management, Contract Management, Information and Technology Management, Asset Management, and Records Management. Within the Wildland Fire organization, these functions exist; however, the policies and regulations are created externally, and Wildland Fire is a consumer of their products and services.

Wildland Fire 10-Year Implementation Plan

In 2006, the WFLC updated their 10-Year Implementation Plan that includes goals, outcomes, and performance measures for Wildland Fire.

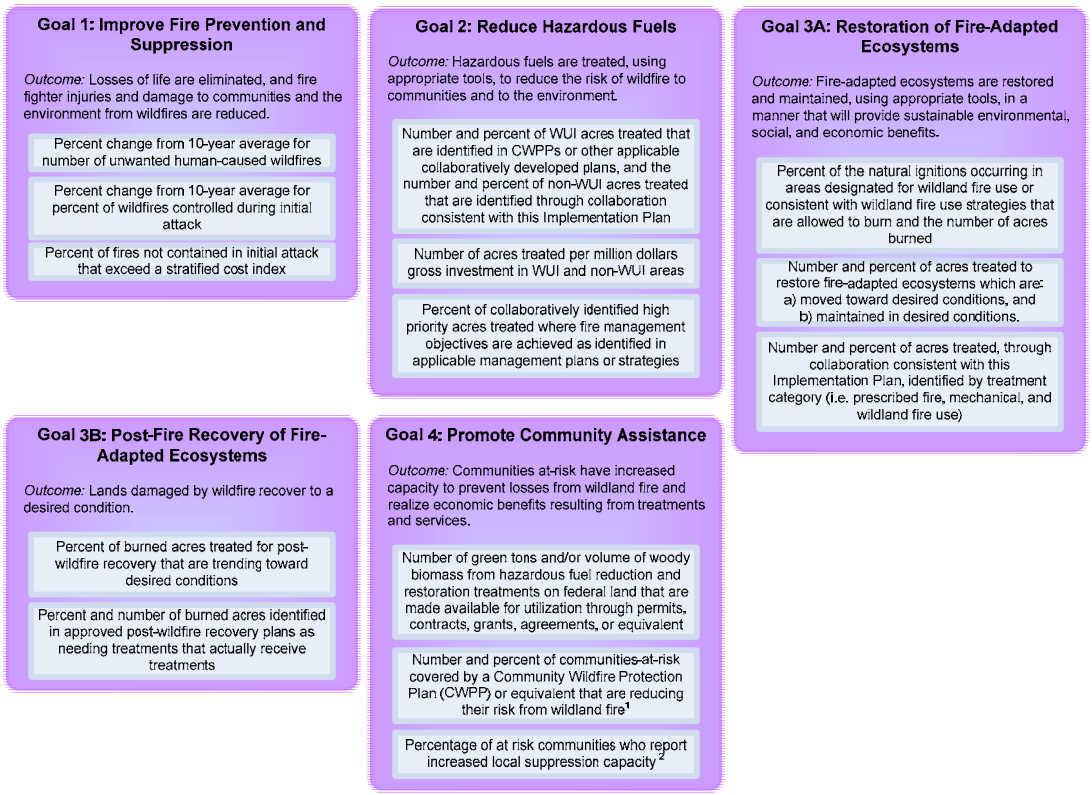

Figure 7 - WFLC 10-Year Implementation Plan

Wildland Fire Products and Services

Wildland Fire produces many products and services for internal and external stakeholders. To support the operational services provided by Wildland Fire, many publications, including information brochures, policies, standards, and guidelines are developed by the agency and interagency staffs and committees.

NWCG interagency standards and guidelines have been developed and adopted by the various federal, state, and tribal organizations. Examples are:

The Incident Command System (ICS) consists of procedures for the management of the overall incident(s) and the mechanism of controlling personnel, facilities, equipment, and communications. ICS is interdisciplinary and organizationally flexible to meet the following management challenges:

- Meet the needs of incidents of any kind or size (expands or contracts)
- Allow personnel from a variety of agencies to meld rapidly into a common management structure with common terminology
- Provide logistical and administrative support to operational staff
- Be cost effective by avoiding duplication of efforts
  The Department of Homeland Security has recently adopted the Incident Command System as the standard for responding to all incidents

National Fire Equipment System (NFES) is an interagency body of principles, regulations, rules, standards, procedures and facilities designed to provide equipment and supplies for wildland fire management activities.

Wildland Fire Systems

Wildland Fire is an information-dependent enterprise that has benefited from the automation of wildland fire processes and data for many years. Since the 1990's, Wildland Fire leadership has promoted the migration from agency-specific, stand-alone systems to interagency, integrated systems.

NWCG-sponsored information systems development has resulted in the consolidation of redundant systems by creating nationally implemented systems such as:

Resource Ordering and Status System (ROSS) – a fire resource dispatching system that has been implemented across the nation in all federal, state, and tribal dispatch and coordination offices.

Interagency Qualifications and Certification System (IQCS) –an information system that tracks training and certifications for wildland firefighters in all federal agencies, the Nature Conservancy, and some state organizations.

Interagency Cache Business System (ICBS) – a national automated cache inventory system designed to assist in inventory control and cost accounting for all equipment and supply items stocked in the National Fire Equipment System (NFES).

ISuite – a suite of applications for incident administrative functions: Incident Resource Status, Cost Accounting and Reporting, and Timekeeping.

Fire Leadership-sponsored information system projects have or will result in interagency standardization of processes and business rules and nationally deployed information systems such as:

Landfire – a national, interagency system that produces consistent and comprehensive maps and data describing vegetation, wildland fuel, and fire regimes across the United States. LANDFIRE data

products include layers of vegetation composition and structure, surface and canopy fuel characteristics, and historical fire regimes.

Fire Program Analysis (FPA) System – a national interagency system that provides managers with a common interagency process for fire management planning and budgeting to evaluate the effectiveness of alternative fire management strategies through time, to meet land management goals and objectives. FPA will reflect fire objectives and performance measures for the full scope of fire management activities.

FireCode System is a system that generates a single code for each major incident. The FireCode is imbedded in the various agency financial code structures to track and compile cost information for fires.

National Fire Plan Operations and Reporting System (NFPORS) - an interagency system designed to assist field personnel in managing and reporting accomplishments for work conducted under the National Fire Plan.

Individual agency-sponsored interagency systems have also improved the information processing across the Wildland Fire enterprise, including:

ICS 209/Sit Report – a reporting system used to record the daily status of individual wildland fire incidents and to consolidate the information into national situation reports. (Forest Service (FS)

Automated Sorting, Conversion and Distribution System (ASCADS) – a system that converts data received via satellite from remote automated weather stations for distribution to systems which display this data. (Bureau of Land Management (BLM)

Wildland Fire Management Information (WFMI) System – Weather, lightning, and fire reporting (Department of the Interior (DOI): BLM, National Park Service (NPS), Bureau of Indian Affairs (BIA)

Weather Information Management System (WIMS) –- Receives observations from remote automated weather stations, allows for user edits, and calculates the National Fire Danger Rating System (NFDRS) information. (FS)

Wildland Fire has also designated certain systems as the designated "system of record" for standard data values that are shared across systems. Examples are:

System Name	Data Subject Area
Unit Identifier System	Unit Identifier Code (for organization identification)
FireCode System	FireCode (for incident cost tracking)
IQCS	Position Code

OVERVIEW OF THE NATIONAL WILDLAND FIRE ENTERPRISE ARCHITECTURE

Definition of "Enterprise Architecture"

The wildland fire enterprise crosses various federal, state, and tribal organizations to perform a common function. The "architecture" is the documented description of the current and future structure and behavior of an organization's functions, processes, products, data, and information systems, aligned with the organization's core goals and strategic direction. The reason for creating an enterprise architecture is to organize and document the enterprise to determine how an organization can most effectively achieve its current and future objectives.

Enterprise Architecture provides a framework that identifies the interconnection of the various components of the organization:

Business – the strategy, functions, organizations, processes, products (including standards, publications, reports, etc.) by which the enterprise operates on a day-to-day basis
Data and information - the definitions and classifications of the data that the enterprise requires in order to efficiently operate
Applications – the systems, internal & external interfaces, control, and data flows of the business
Technology Infrastructure - the hardware, operating systems, programming, and networking solutions used by the organization, including their performance

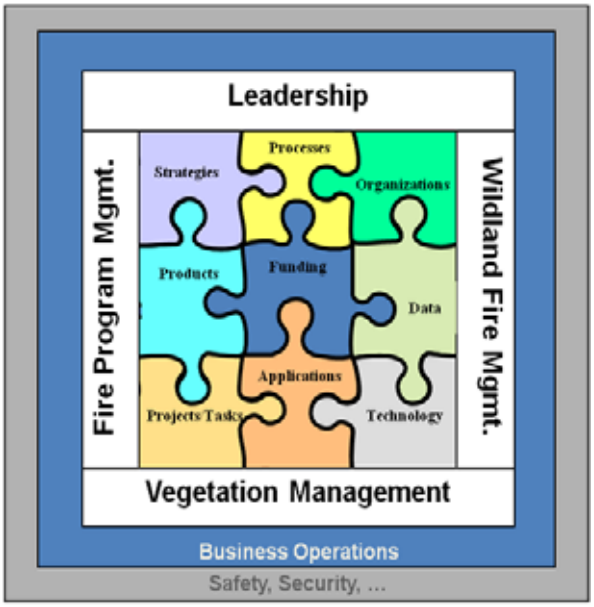

Figure 8 - Components of the National Wildland Fire Architecture

Definition of "Blueprint"

An "Enterprise Architecture Blueprint" is the documentation of a particular organization's:

1. As-is, or current, state of the business and technology solutions that support the business environment,
2. To-be, or desired, state of the business and technology solutions, and
3. Recommendations on how to transition from the as-is to the to-be state of business and technology solutions.

The NWFEA Blueprint defines a roadmap for improving the performance of the wildland fire community that is accomplished in an interagency environment. The goal of the NWFEA Blueprint is to recommend changes to the wildland fire community that will result in continually improving interagency cooperation, management efficiencies, and support to field operations. The Blueprint enables these improvements by providing focused attention to the four main enterprise architecture components: business, data, applications, and technology.

The NWFEA Blueprint recommends actions that will enable Wildland Fire to better function as a Virtual Single Agency (VSA) in the implementation of wildland fire policies, practices, and standards. The recommended actions support the implementation of an enterprise architecture program to drive the transformation process. The Blueprint identifies many business and technical issues that hinder efficient and/or effective operations within the wildland fire community. Some of the recommendations may involve a small investment of time and money while others will involve formal approval for major investments. The Blueprint and the Architecture should be used in management and decision processes such as strategic planning, investment review, data management, business and system reengineering, and product management.

The Blueprint will be used as a management tool to provide a more visible linkage between 1) the strategic goals of agency and fire leadership, 2) a national wildland fire strategic plan, 3) agency strategic plans, 4) an interagency investment management process, 5) product management and business stewardship; and 6) project coordination and oversight; as shown in Figure 9.

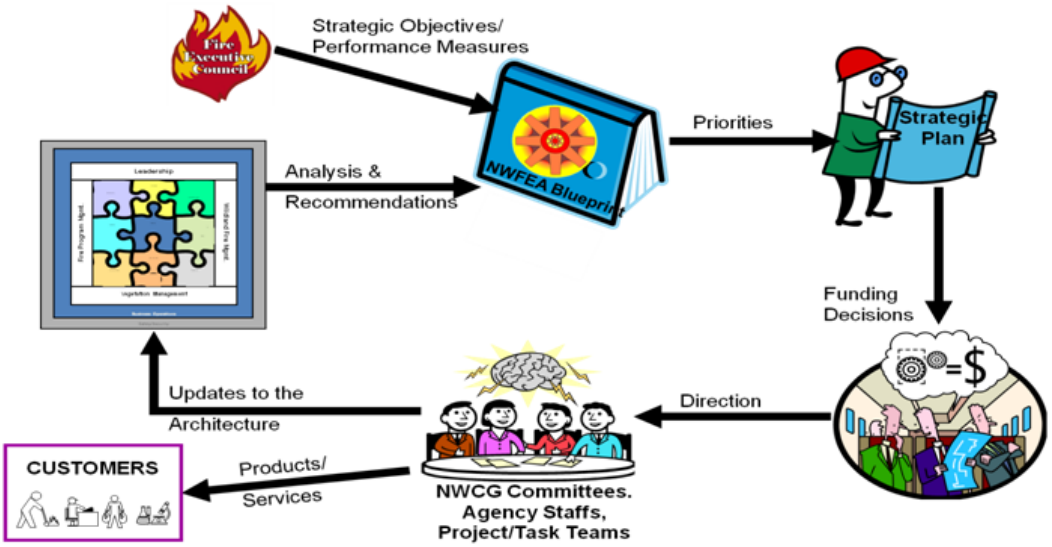

Figure 9 - NWFEA Blueprint as a Management Tool

The Blueprint is a living document that will require continual maintenance. The ongoing development and implementation of the NWFEA Blueprint will contribute to:

- improved decision making
- improved adaptability to changing demands
- elimination of inefficient and redundant processes
- optimization of the use of organizational assets
- alignment of business strategies and technology
- setting of priorities

Critical Success Factors for the Implementation of the NWFEA Blueprint

For successful implementation of the NWFEA Blueprint to occur, the following factors must be addressed:

1. Business operational collaboration and cooperation
    a. Trusted relationships – Wildland Fire organizations must create an environment of trust to support a collaborative environment
    b. Open data sharing – data must be made available to the Wildland Fire community regardless of who created it
    c. Accepting decisions – decisions made within the wildland fire community must be accepted by external business operations such as contracting, human resources, and finance
2. Technology Interoperability - sharing across interagency lines
    a. Standards – standards must be in place and consistently implemented in order to establish continuity across the enterprise
    b. Information Asset Protection (IAP) – IT infrastructure assets and the information they process, store and transmit must be protected in terms of confidentiality, integrity and availability. IAP also includes the handling of information using non-IT means
    c. Access/use – IT security policies must allow non-agency personnel to use computers and to access applications in an interagency environment
    d. Certifications– agencies must trust each other and accept each others' certifications such as IT Security, system certification and accreditation, and qualifications certification
3. Blueprint – internal and external commitments
    a. Authorization – agency and department investment review boards (IRBs) must accept the authenticity of the Blueprint as the source document for Wildland Fire modernization
    b. Policy - Agencies need to commit to the Blueprint in policy language, manage it, and accept joint decisions. This includes the commitment to: 1) accept the recommendations in the blueprint, 2) manage the maintenance of the architecture, and 3) implement the blueprint
4. Funding – surge capital
    a. Funding – funding will be needed in order to implement the blueprint and maintain the architecture. Blueprint implementation requirements need to be identified and appropriately staged and managed

Definition of the "NWFEA Program"

The National Wildland Fire Enterprise Architecture (NWFEA) Program manages four areas:

1. The NWFEA Program Governance & protocol
2. The National Wildland Fire Enterprise Architecture
3. The NWFEA Blueprint
4. Blueprint Implementation

The NWFEA Program is described as the protocols that govern the access, use, and maintenance of the architecture. The NWFEA Program also manages the alignment of the NWFEA to the overarching OMB Federal Enterprise Architecture (FEA) through collaboration with the various land management department and agency enterprise architecture programs. This governance encompasses the processes, policies, structure, roles, responsibilities, investment management, and operations.

The NWFEA Program develops and maintains the architecture based on three principles: structure, re-use and alignment. The NWFEA Program facilitates the use and re-use of important assets defined at the enterprise level including: data; common business processes and investments; and applications and technologies. The NWFEA Program aligns with elements defined at the enterprise level, such as business strategies, mandates, standards and performance goals.

The NWFEA Program coordinates the development and maintenance of the NWFEA Blueprint. While the Architecture provides the models that describe where we are today and where we want to be in the future, the Blueprint adds the analysis of the architecture plus the sequence and prioritization of how to transition from the "as-is" state to the "to-be" state.

The NWFEA Program facilitates the implementation of the blueprint by providing the necessary services and tools to: 1) assist senior management in their investment decision process; 2) provide enterprise-wide information to business and technology representatives tasked with implementing the blueprint; and 3) tracking and updating the blueprint implementation plan.

The NWFEA program is viewed as an organizational management support function. While technology plays a big role in the Wildland Fire enterprise, the analysis has shown that the barriers to implementing technology are more related to issues around business processes and governance rather than the systems themselves. Therefore, Wildland Fire views enterprise architecture as a way to better organize its management practices as well as its technology components.

Principles of the NWFEA Program

The NWFEA Program operates under the following principles:

Wildland Fire operates as if it were a "Virtual Single Agency" The wildland fire community operates as a single, unified enterprise with decision-making flexibility at the agency level.
NWFEA is mission-driven Wildland Fire core mission needs, principles, and priorities are the primary drivers for architecture.
NWFEA simplifies government operations The NWFEA Program is designed to reduce complexity and enable integration to the maximum extent possible.
NWFEA focuses on efficient and effective delivery of services to Wildland Fire A service-oriented architecture will help Wildland Fire reduce long-term costs, improve quality of service, improve information sharing, and help achieve a vision of flexible business processes supported by customer-focused applications.
Information is a national asset Information is an asset needed by citizens and leveraged across the government to improve performance. Security, privacy and protecting information are integral to government operations, and are part of the architecture. Government must protect the confidentiality, integrity, and availability of its information to ensure public trust and protect its resources.

Table 3 - NWFEA Program Principles

The Wildland Fire Enterprise Architecture Approach

The wildland fire community is taking a business-first approach. While other federal government architectures are primarily focused on the delivery of technology services, the NWFEA focuses on the delivery of wildland fire business and technology products and services to the stakeholders of Wildland Fire. The NWFEA program is viewed as an organizational management function and is not under the direction of any organizations' Office of the Chief Information Officer– it is managed by the interagency wildland fire leadership. While technology plays a big role in the Wildland Fire enterprise, the analysis has shown that the barriers to implementing technology are more related to issues around business processes and governance rather than the systems themselves. Therefore, Wildland Fire views enterprise architecture as a way to better organize its management practices as well as its technology components.

Wildland Fire leadership sees enterprise architecture as a way to improve its management and business operations through optimization of common services while still maintaining the ability to respond to the individual agencies' land management mission and objectives. In order to achieve the wildland fire goals developed by WFLC, the NWFEA goals much also be achieved.

Development of the NWFEA Blueprint

The development of this blueprint is the result of participation from wildland fire leaders and managers; the NWFEA Core Blueprint Team (CBT) comprised of experienced wildland fire professionals drawn from a wide range of disciplines across the agencies; the chairs of the various NWCG sub-groups; the NWCG Program Management Office; and the NWFEA Steering Group. The goal of this blueprint is to recommend changes to the wildland fire community that will result in continually improving interagency cooperation, management efficiencies, and support to field operations.

The approach followed to complete the development of the NWFEA Blueprint began with the need to gain executive buy-in and support for the project. The National Wildfire Coordinating Group (NWCG), through its Program Management Office, initiated discussions with Department and Agency architects which resulted in the formation of the National Wildland Fire Enterprise Architecture Steering Group (NWFEASG). Not only was the NWFEASG and its members instrumental in helping to define the initial direction and scope for the Blueprint, they proved to be crucial in securing adequate resources and funding. Additional oversight for the Blueprint Project was provided by interagency wildland fire executive leadership, through the Fire Executive Council (FEC) and NWCG.

Once scope and depth of the effort was defined by the oversight groups, the Blueprint Project Team began the process of gathering information to document the business of Wildland Fire. A Core Business Team (CBT), comprised of an interagency group of Wildland Fire Subject Matter Experts (selected based on their knowledge of core wildland fire functions) was formed to provide the fundamental underpinnings for the blueprint by identifying the stakeholders, products, services, and supporting infrastructure necessary to conduct Wildland Fire business. Additionally, many members of the IT community participated in detailing information about the various wildland fire applications and system infrastructure. Inputs from various parallel initiatives were also considered, such as:

- The Wildland Fire Governance Alignment effort
- The task to develop an Interagency Wildland Fire IT Investment Process

- The Interagency CIO Wildland Fire IT/Radio Collaborative Sojourn
- NWCG Sub-structure and Strategic Planning Activities
- The Interagency Wildland Fire IT Conference (Las Vegas)
- NWCG and Fire Executive Committee (FEC) Meetings

Building upon the framework of gathered information, additional Wildland Fire Subject Matter Experts were engaged to further detail the work of the CBT. This resulted in the creation of a variety of analytical products such as the NWFEA Functional Model, and an Enterprise Data Model. These SMEs were also valuable in helping to define and map the interconnections between the analytical products. These essential mappings between such things as Wildland Fire's strategies, data, functions, systems, stakeholders, and organizations helped to provide an understanding of the business in perspectives previously unattainable.

The results of all of the above efforts, and insights gained as the process unfolded, lead directly to the recommendations provided in this Blueprint. Many, many group and individual efforts have been essential and are credited in the Acknowledgements in Appendix B.

RECOMMENDATIONS FOR BUSINESS TRANSFORMATION

This section provides an executive summary of the analysis related to the four goals identified in the previous section. Each goal is accompanied with a discussion that describes:

A. The **current (as-is) state** of the enterprise environment related to that particular goal;

B. The **future desired (to-be)** state of the wildland fire enterprise related to the goals;

C. **Objectives** - specific, quantifiable, realistic targets that measure the accomplishment of a goal over a specified period; and

D. **Recommendations** - broad activities required to achieve an objective, control a critical success factor, or overcome a barrier. Each recommendation also includes:

   1. **Objectives that will be met –** a reference to which of the goal's objectives will be met by implementation of the recommendation

   2. **Action Items** - specific tasks that should be accomplished to implement a recommendation. Each Action Item includes the following:

      a. Target Date
      b. Discussion
      c. Expected Value
      d. Expected Risk
      e. Expected Cost

   3. **Outcome(s)** - a bullet statement that describes how the future will look if the recommendation is implemented

Goal 1
Common Wildland Fire Governance and Business Activities

Description of the Current (as-is) State

This section includes a discussion about the current state of Wildland Fire governance and business activities as they relate to the five functions (Leadership, Wildland Fire Operations Management, Fire Program Management, Vegetation Management, and Business Operations) identified in the Wildland Fire Functional Model created by the NWFEA Core Blueprint Team:

A. Leadership

Governance

As illustrated in the previous section, Wildland Fire has accomplished many of the objectives of a successful enterprise architecture. Many of the organizations and functions have been standardized and implemented as policy across federal department and agency, state and local, and tribal boundaries.

Issues that arise in any interagency environment are related to the need to integrate the enterprise- and agency management functions across the wildland fire community. For example:

- The creation of the numerous interagency committees that result in some redundancy and disconnects in the overall enterprise.
- Each wildland fire organization has created its own Fire Program and Fire Policy resulting in conflicts when personnel are expected to work in an interagency environment.
- Once NWCG develops interagency standards and guidelines, the authority to adopt and implement those standards rests with each individual agency. The agency structures include multi-layered and generally autonomous fire management programs that report to their respective agency regional or state land managers. While interagency standards are developed by NWCG, the use and implementation of the standards can vary from agency to agency, or even throughout different parts of the organization.
- The national Fire Program Leaders do not have line authority over the fire operations organizations; therefore the line-of-sight between the wildland fire strategic directions set by agency senior executives to the managers of field operations must be enhanced to provide some level of accountability to the national interagency goals. In addition, the national leaders must be accountable to the field to accommodate local operations' needs.

While the governance structure for the interagency Wildland Fire management organizations has been defined, there continues to be a need to further clarify:

- The roles and responsibilities of each of the groups
- The protocols for engaging with other agency functions (e.g. human resources, contracting, budget, security, procurement, and information technology) when agency policies impact the implementation of the wildland fire mission
- The process for securing and stabilizing the investments in interagency projects and systems

- The implications of implementing interagency wildland fire policies and standards in the midst of competing or sometimes conflicting requirements of other agency-specific or interagency programs

Strategic Direction

The WFLC has developed some strategic objectives and performance measures in their 10-Year Strategy and 10-Year Implementation Plan which in turn are handed off to the agencies for compliance. In early 2007, an analysis of the linkage between the goals and performance measures of the Implementation Plan and existing Department of the Interior (DOI) and U.S. Department of Agriculture (USDA)/FS strategic plans showed varying levels of traceability. (The analysis did not attempt to show linkage to existing bureaus, state and tribal organizations' strategic plans.)

The following graphic illustrates the levels of traceability. The solid lines in Figure 10 show a one-to-one match of performance measures; the dotted lines show performance measures that are similar, but not entirely matched. Although it is not possible to read the smaller text, the diagram illustrates that the alignment between the DOI and FS strategic plans and the WFLC 10-year strategy needs improvement.

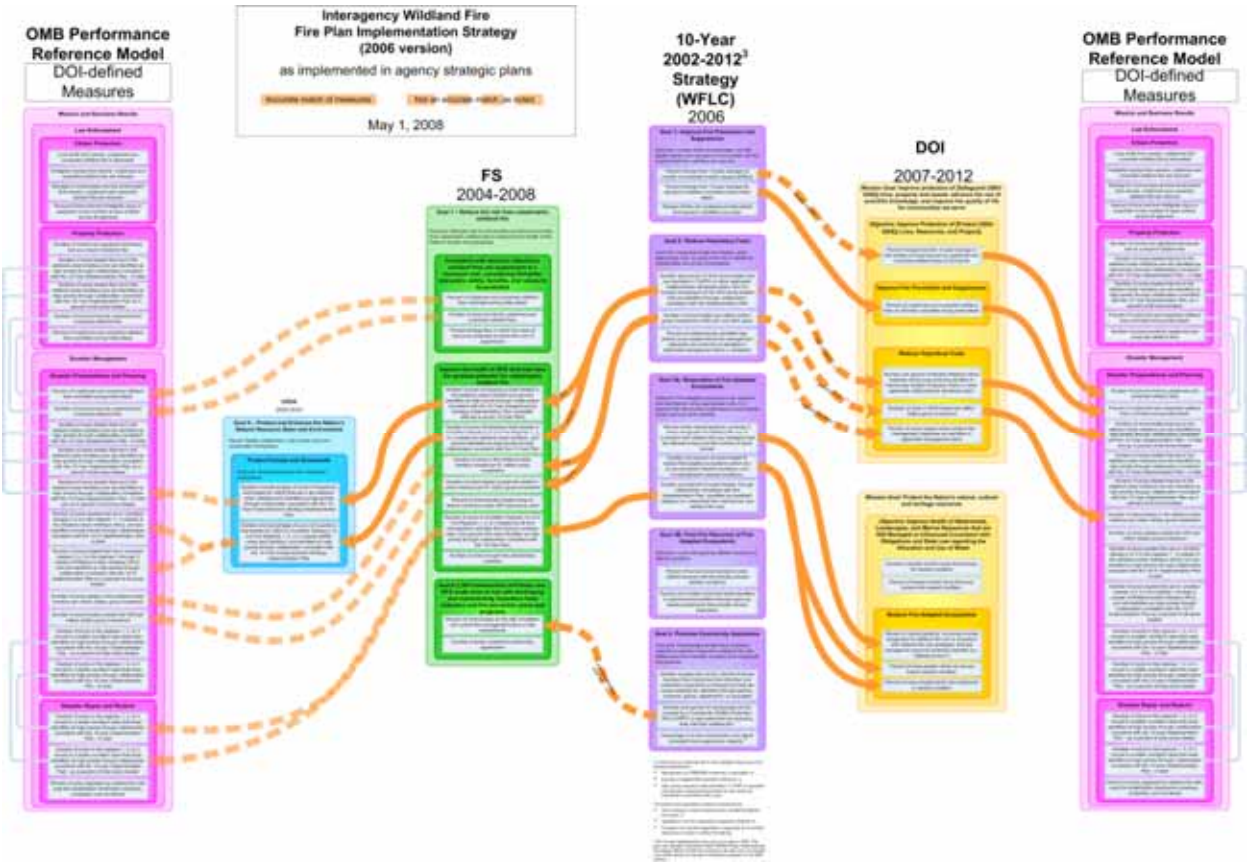

Figure 10 - Wildland Fire Performance Measures

Although the various agencies are working toward similar goals and objectives, the interpretations and priorities of those objectives differ from agency to agency. Since the time this analysis was completed, the Fire Executive Council (FEC) has initiated an activity to align the federal department and agency fire management strategic plans to the WFLC goals and desired outcomes.

Customer Service

Wildland Fire is a service provider that creates many products, mostly information-based, for internal and external stakeholders.

External stakeholders depend on Wildland Fire for near real-time information about fire activity. Currently, via the internet, it is possible to receive different reports, each purporting to be official and accurate, but which deliver inconsistent information in comparison. These inconsistencies result from both different purposes for which the reports were assembled and different criteria of how to collect and portray the information. External customers, who are not part of Wildland Fire, do not have the necessary level of understanding to make sense of the competing versions, and therefore see them only as inconsistent. Internal stakeholders depend on Wildland Fire for strategic objectives, policies, standards, and guidelines, as well as information about ongoing fire program activities, fuels management, wildland fire operations, and business operations. A multitude of Wildland Fire Web sites have been created at the national, regional, local, and incident levels, all of which provide information about the Fire Program and current fire activity. To an external customer or new employee, there often is confusion on which Web site to use for the most reliable information.

Due to extreme fire conditions and the improved communication media available to the public, Wildland Fire has been required to spend more effort educating the public about the objectives of fire management and the role of fire in the environment. Wildland Fire continues to face challenges related to inconsistent and sometimes unrealistic public expectations of fire program.

Internal customers include members of the fire community itself – fire managers, firefighters, dispatchers, and agency executives who depend on the information provided by the various information systems, standards, guidelines, websites, and reports produced by Wildland Fire. Wildland Fire has many of examples of excellent inward facing products and services.

Information Technology Investments

Wildland Fire leadership has reduced the size of the overall Wildland Fire IT Portfolio by reducing the number of redundant systems. However, the lack of interagency-managed control and strategic planning for IT application development has resulted in stove-piped applications that require additional time, money, and effort to share data between systems. Wildland Fire systems are not always designed from a customer perspective. A recent tour of dispatch offices showed that users were manually entering and re-entering the same data into as many as five different IT applications.

Despite the reduction in duplicative systems, the cost of developing and maintaining IT systems is continually increasing. The NWCG fire directors are constantly faced with the need to make decisions on a myriad of requests for funding. The recent trend in budget cuts has placed more emphasis on the need to consolidate single-agency investments into shared interagency investments. The requested budget for FY2007 major IT investments exceeded $50 million which represents a significant portion of the overall wildland fire budget. Funding for Fire IT is typically taken off the top; thus reducing the overall Fire budget used to support critical field operations. IT investment processes are typically governed by the IT organization. Because each agency's IT organization is dependent on program dollars to fund their staff and operations, this could represent a conflict of interest. As fire program budgets shrink, fire leadership sees a need to get more control over the investment decisions related to IT investments. Some funding decisions for IT Systems and Projects are being authorized by the agency IT organizations rather than by interagency Wildland Fire Leadership. Wildland Fire needs to get more control over IT expenditures to ensure the IT budget reflects the appropriate level of support needed by

the interagency wildland fire community. Governance issues that consistently occur in the IT investment decision process include:

- Stand-alone agency-specific system architecture development
- Project or system managers that obtain funding through their agency IRBs without first obtaining concurrence or buy-in from fire leadership
- Agencies that proceed onward with development of a system after fire leadership disapproves the project proposal
- Agencies that fail to phase out legacy systems when an interagency system is deployed
- Systems and tools developed and deployed by the research community and private vendors that do not align with agency architectures and/or management priorities

B. Wildland Fire Operations Management

The high cost of wildland fire operations causes concern for senior executives. Ongoing initiatives to identify mitigating factors may help decrease the cost of large fires; however, most studies have shown that the complexity of wildland urban interface, climate change, and high fuel levels are contributing factors – all of which are outside the control of the wildland fire community. Studies have also shown that there are inherent costs to incident management regardless of the size of the fire once it reaches a certain level due to the cost of setting up an entire incident organization in a wildland environment.

The Department of Homeland Security (DHS) has recently taken a leadership role in all-risk incident operations management. Unless the interagency community takes an active role with DHS in developing the standards, there will be adverse effects on wildland fire operations.

C. Fire Program Management

Wildland Fire has integrated much of its common Fire Program Management through the work of agency and interagency staffs and committees. Challenges identified by the NWFEA Core Blueprint team include:

- Current decision-making process is slow, cumbersome, and somewhat ad hoc, without pre-established priorities
- Difficulty in managing external uncontrollable factors
- Agency procurement, contract, and technology policies create barriers in operating within an interagency environment during critical incident operations
- There are mismatches between the WFLC 10-year Plan and the departments', agencies' and NWCG's strategic plans
- While interagency wildland fire policies, standards and guidelines are adopted by each wildland fire agency, the interpretation and implementation varies across the agencies

D. Vegetation Management

Although Wildland Fire is driven by Land Management plans and the need to protect the watershed, the bulk of its labor and contract costs, as well as the primary thrust of its training, goes to suppression, or reactive responses. Vegetation Management suffers in its ability to perform proactive land treatments owing to the combination of lack of resources (because they are tied up in reactive responses) and

heavily-response-oriented training. By having a larger percentage of people trained in Vegetation Management, and thereby increasing the pool of potential participants, the wildland fire community may be able to redirect more of its effort to proactive management.

One of the issues preventing additional redirection of effort toward proactive activities is that budget allocations emphasize reactive response and they are not defined flexibly enough.

During discussion with the NWFEA Core Blueprint Team, the following observations regarding fuels management were made:

- The focus on Response capability precludes use of resources for other fire management activities (such as prescribed fire)
- Resources for Vegetation Management are not always available owing to their need for response activities
- There is a perceived barrier to full compliance with the National Environmental Policy Act (NEPA), Clean Air Act, Endangered Species Act and other legislation – only go so far in implementation, avoid doing complex projects to avoid doing environmental assessments

E. Business Operations Management

The interagency wildland fire community spends a great deal of time and money developing feasible standards that can be used across the agencies; however, agency policies in some of the organization support organizations such as budget, procurement, contracting, information technology (IT), and human resources can cause a ripple effect that can stall or halt response to emergencies, such as:

- Procurement regulations' fair competition policies that result in multiple make and models of radios used by emergency personnel who may be issued a different radio at each incident. This situation causes a safety risk when the location of the various radios' controls and buttons are mixed
- Agency IT security policies that prevent personnel from accessing vital interagency computer applications; sometimes requiring the organization to purchase and install two or more computer systems on the desks of employees in interagency offices
- Agency downsizing activities that have eliminated the pool of technical resources available to support emergency incidents

The wildland fire community's solution process is to escalate these policy issues through agency channels, often times resulting in conflicting decisions between the agencies or dead-ends because agencies do not have a vehicle for dealing with interagency issues. The IT security policy issues are the biggest problem in the interagency environment.

Description of the Future Desired (to-be) State

The objectives of this goal are:

GOAL 1: Common Wildland Fire Governance and Business Activities
Objectives: *A. To provide clear lines of sight between the national wildland fire interagency organizations, their responsibilities, products, and services by December 2009* *B. To enhance the overall effectiveness of the wildland fire enterprise by maintaining current interagency policies, standards, processes, and guidelines that are adopted by all Wildland Fire entities* *C. To leverage interagency collaboration and cooperation to improve Wildland Fire services and respond to WFLC goals and performance measures by 2010* *D. Establish an interagency IT governance framework that enables wildland fire managers to have more control over IT investments by March 2010* *E. Create the processes and framework to escalate and resolve IT issues with department & agency CIO organizations by March 2009* *F. Have the Enterprise Architecture processes and tools in place that enable the management of the Wildland Fire enterprise from both an agency and interagency perspective by June 2009*

A summary of this goal's Recommendations, associated Objectives that will be met, Action Items, and expected Outcomes are included in the following table. More detailed information is contained in the narratives provided after this table.

Goal 1 Recommendations	Objective(s) that will be met	Action Items	Outcomes
1.1 Complete the implementation of a unified governance structure	A,D	1.1.1 Continuation/ completion of the NWCG reorganization 1.1.2 Integrate interagency strategic planning 1.1.3 Institute a product management discipline 1.1.4 Move toward a "Service First" organizational concept 1.1.5 Establish a budget planning and tracking process for interagency initiatives	• Consistency/ clarity of communication • Standardization • Efficiency • Common priorities • Better informed decisions • Customer-focused products • Strategically planned decisions

Goal 1 Recommendations	Objective(s) that will be met	Action Items	Outcomes
1.2 Create an interagency information technology (IT) governance framework to guide the management of wildland fire information systems	B, C	1.2.1 Complete development and implementation of the interagency fire IT investment process 1.2.2 Promote the creation of an interagency wildland fire CIO council to deal with interagency IT issues	• Strategic decision-making regarding IT investments • Resolution to IT issues that encumber wildland fire operations • Reduced IT development and maintenance costs
1.3 Maintain and use the National Wildland Fire Architecture and Blueprint	A,B,C,D	1.3.1 Use the national wildland fire architecture and blueprint as a management tool 1.3.2 Incorporate maintenance of the business architecture and blueprint into the new NWCG organization 1.3.3 Complete the as-is and to-be business analysis and use it as feeders to the strategic plan	• Consolidated interagency logical views of business, data, applications, and IT infrastructure • Business-driven strategies • Organized management tools
1.4 Optimize wildland fire's organizational capacity for integrating into its parent agencies' proactive land management activities	A	1.4.1 Ensure adequate resources for vegetation management and other proactive land management activities 1.4.2 Leverage existing resource funding to maximize coordinated interdisciplinary vegetation management projects 1.4.3 Develop adaptive management guidelines that support post-wildfire-recovery decisions on a routine basis 1.4.4 Develop smoke management guidelines that support both air quality and vegetation management objectives	• Proactive Planning vs. Reactive Response • More Resources Available to support proactive activities • Lower response costs

Goal 1 Recommendations	Objective(s) that will be met	Action Items	Outcomes
1.5 Improve the efficiency of response to and management of wildland Fire incidents	A	1.5.1 Standardize accepted appropriate management response practices(AMR) 1.5.2 Expand, Streamline, and Accelerate the Training and Delivery of Qualified Personnel to the Workforce 1.5.3 Work with DHS to develop common standards and procedures for incident management and emergency response. 1.5.4 Investigate lower-cost solutions for aviation	• Improved cost accountability • Lower suppression costs • Increased resource pool • Continuing support for all-risk incidents
1.6 Improve internal and external communications	A	1.6.1 Develop and implement a communications plan for interagency inreach and outreach 1.6.2 Develop communication protocols for elevating issues to and from the interagency wildland fire community 1.6.3 Provide a single point of access to authoritative interagency wildland fire information	• Improved understanding of wildland fire's role, objectives, and activities • Easier access to wildland fire information by external and internal stakeholders

Table 4 - Goal 1 Recommendations, Action Items & Outcomes

Recommendations to Achieve the Future desired (to-be) State for Goal 1: Common Wildland Fire Governance and Business Activities

Recommendation 1.1: *Complete the Implementation of a Unified Governance Structure*

Action Item 1.1.1: *Continuation/Completion of the NWCG Reorganization*

Target Date: 06/01/2009

Discussion: In the new Wildland Fire governance structure, the re-chartered NWCG organization has a broader scope that includes interagency management of all wildland fire functions. In January 2008, the sub-groups of the WFLC, National Fire and Aviation Executive Board (NFAEB), NMAC, and other committees were placed under the direction of the NWCG. The 60+ sub-groups, many with overlapping functions pose a perplexing management issue for the NWCG who is taking this opportunity to revise its interagency management structure and procedures to establish a more efficient organization that can respond to a wider array of interagency wildland fire issues. The ongoing work to reorganize the NWCG should be considered a high priority.

Ideas to consider in the new organization structure include:

- Realignment of the National Interagency Fire Center (NIFC) and NWCG staffs that address the interagency vs. agency-specific requirements
- Establish a product management discipline that focuses on services provided to Wildland Fire stakeholders
- Joint staffs where feasible
- Opportunities to develop single interagency product vs. multiple agency-specific products (e.g. policies, standards, and guidelines)
- Delegation to groups for program implementation
- NWCG operating guidelines that:
    - Streamline the budget process for NWCG activities
    - Improve the management of NWCG records, documents, and products
    - Enhance internal and external communication processes
- The need to address the interfaces between Wildland Fire, Department of Homeland Security, and other national emergency service operations
- Representation on NWCG Sub-groups to address field needs (e.g. needs of the fire management officers, incident commanders, area commanders)
- Business stewardship and ownership roles and responsibilities in the development, implementation, and update of products, including IT systems
- Incorporate the maintenance of the NWFEA Blueprint and Architecture into the new organization structure and processes

Expected Value: By designing the new organization based on the NWFEA architecture, it is expected that the organization framework will be able to support all functional areas of Wildland Fire. The reduction of the number of sub-groups means Wildland Fire will save money in time and travel; plus

the efficiencies of consolidating functions under a single group will result in increased collaboration and a decrease in redundant activities. From the customer perspective, the consolidation of multiple agency-specific products into single interagency products will decrease confusion and eliminate conflicting agency views.

Expected Risk: The challenge in completing this action item is the inherent disruption that occurs with any change. There will be cultural resistance to change that will need to be addressed. Most of the products (e.g. publications, Web sites, brochures, etc.) will need to be modified to update the new organization and sub-group names. It is expected that the new NWCG organization will not be stabilized until mid-2009.

Expected Cost: It is anticipated that any costs incurred during the reorganization will be less than the cost of maintaining the status quo. Some additional, temporary manpower (contractors, detailers, temporary hires) may be needed to transition to the new organization, but these costs should be minimal.

Action Item 1.1.2: *Integrate Interagency Strategic Planning*

Target Date: 06/01/2009

Discussion: Future strategic planning and implementation plan development efforts should be a collaborative process that involves WFLC, FEC, and NWCG input. The strategic plan should cover the primary objectives for each of the five NWFEA functional areas (leadership, fire program management, vegetation management, wildland fire management, and business operations) of Wildland Fire, with a focus on the quality of the resulting products and services. Contents of the strategic plan should address direction from executive leadership as well as issues raised by the national, regional, and local tiers of enterprise through the blueprint process. The related performance measures should be agreed upon by the three interagency wildland fire management committees as meaningful and achievable; and the feedback related to the performance measures should be consistent. A clear line of sight from the WFLC goals to the NWCG and agency strategic plans should be incorporated into the development process.

Expected Value: The alignment of the various wildland fire organizations' strategic plans and performance measures will improve accountability by enabling consistent feedback to Congress and the OMB and eliminate confusion caused by differing or conflicting priorities between the agencies. This alignment will also promote more interagency collaboration, resulting in improved efficiency and cost savings. It will also set in motion coordinated program management, planning, and prioritized decision-making. The alignment will also provide more consistent and achievable direction to field units who often work in an interagency environment

Expected Risk: None identified.

Expected Cost: No additional costs outside normal operating budget are anticipated

Action Item 1.1.3: *Institute a Product Management Discipline*

Target Date: 10/01/2010

Discussion: Wildland Fire needs to initiate a product management discipline that focuses on 1) services provided to Wildland Fire stakeholders and 2) strategic objectives. Wildland Fire needs to improve the delivery of information and products for fire leadership, wildland fire operations,

vegetation management, and wildland fire program management products. As competition for funding increases and available funds decrease, it will become more necessary to manage awareness of Wildland Fire's needs and abilities, and to better manage the funds spent on product delivery. Concepts to consider are:

- Expansion of the Interagency IT Investment Process (discussed in Recommendation 3 below) to include ALL investments; managing all products, including IT systems in a single product portfolio
- Cross-coordination in the development of products (e.g. common interpretation of policy and consistent terminology)
- A single inventory and catalog containing all (agency and interagency) Wildland Fire products
- Implementation of an Interagency Wildland Fire portal that provides a single authoritative source for information about Wildland Fire activities and products for both external and internal stakeholders
- Re-engineering of the training processes to gain efficiencies in delivering training coursework and materials
- Improvements in product life-cycle management (current schedules are not being met)

Expected Value: By creating a product management discipline in Wildland Fire, the following values will be seen:

- Increase awareness of the products and services Wildland Fire offers, and what it takes to offer and maintain them
- More management decision-space on product investments
- A single authoritative source where stakeholders can be assured that the correct versions of publications are available
- Elimination of duplicative publications
- Uniform display of current fire information for public and internal stakeholders

Expected Risk: Risks are primarily cultural. Some product developers may feel threatened by the application of strategic management oversight of the Wildland Fire product portfolio.

Expected Cost: There will be some up-front costs, such as procurement and implementation of a document management system and development of an interagency Wildland Fire Web portal. Since many of the product management functions are already being done throughout the Wildland Fire community, there shouldn't be a long-term increase in costs. By consolidating the product management functions, a cost savings should be achieved.

Action Item 1.1.4: ***Move Toward a "Service First" Organizational Concept***

Target Date: 10/01/2009

Discussion: Like the National Interagency Coordination Center (NICC) at NIFC, many wildland fire staffs are service organizations that provide a common service to the Wildland Fire community. At NIFC, each federal agency has fire program and business support staffs responsible for supporting

national-agency and national-interagency management and operations functions. Much of the cost in Wildland Fire services is related to high overhead costs in both personnel and ongoing operations and maintenance. Efficiencies can be gained by creating joint interagency staffs whose mission is to meet both agency and interagency needs. In some cases, it may be possible to reduce the overall staffing requirements by consolidated common functions. Wildland Fire should move toward a service first organizational concept that focuses on the needs of the customer, evaluates the organizational needs, and identifies prime candidates for consolidation and/or resource sharing.

Due to the high costs of IT development and maintenance, Wildland Fire should first focus on analyzing ways to improve the Wildland Fire information technology services from the customer perspective. In the national Fire IT organizations at NIFC, there are potential opportunities to reduce redundancy and increase efficiency amongst the individual Fire-IT organizations. While there is some collaboration via the NWCG Information Resource Management (IRM) Working Team, they still operate autonomously. The various IT organizations are jointly responsible for working toward a service-oriented technical and application architecture, resolving interconnectivity issues between applications, adhering to NWCG and agency standards, and working together to achieve objectives defined by fire leadership and their member CIO-organizations.

Expected Value: Candidate organizations for consolidation and/or resource sharing are: Contracting, Fire IT Staffs, Fire Planning, Fire Policy, Fuels Management, DHS vs. Wildland Fire Incident Management, Public Information, Human Resource Management, Training, and Safety. By creating joint interagency organizations, the Wildland Fire community and its external stakeholders could benefit by:

- Better, less confusing service to external customers who view Wildland Fire as a single service provider, not by individual agency
- Potential for lower staffing and operational costs
- Consistent interpretation and implementation of NWCG policies and standards

Expected Risk: There is a risk that an analysis focused on interagency wildland fire customer needs may not provide an accurate assessment of agency and interagency workload, which may result in an organization that is not responsive to agency-specific needs.

Expected Cost: There may be costs & disruption associated with conducting the analysis and implementing alternative organizational structure(s).

Action Item 1.1.5: *Establish a Budget Planning and Tracking Process for Interagency Initiatives*

Target Date: December 2009

Discussion: Within the various interagency committees and sub-groups, there are many projects and initiatives whose funding comes from a variety of agency and interagency sources. With the individual agency budget systems, it is extremely difficult to trace and track the funding mechanisms; and equally difficult to establish accountability and value for these activities. Wildland Fire needs to develop the processes and tools to effectively track these interagency projects and initiatives.

Expected Value: Fire leadership will be able to see the true cost of these interagency projects and initiatives. They will also be able to better track the funding that has been delegated to the various

interagency committees, and to assess if those funds are being used appropriately and with the committees' authority.

Expected Risk: No risks have been identified; however, there will be challenges in sorting through the various agency budgets to actually get the information.

Expected Cost: Costs associated with implementing this action item are primarily staffing costs. No new FTE or staffing costs are anticipated.

Recommendation 1.2: *Create an Interagency IT Governance Framework to Manage Wildland Fire Information Systems*

Action Item 1.2.1: *Complete Development and Implementation of the Interagency Fire Investment Process*

Target Date: 10/01/2009

Discussion: The NWCG IRM Working Team has initiated the development of an interagency Information Technology (IT) Investment Process. The goal is to develop a repeatable business process integrating a fire IT portfolio management process, a project approval and funding process, and the fire IT budget management process. Success of the Fire IT Investment Process will require coordination and integration with the fire agencies, and the Department-level investment management and budget management processes. The Fire IT Investment Process also includes a requirement for creation of an interagency Fire Investment Review Board (IRB) to manage all the wildland fire IT investments in a single IT Portfolio. Wildland Fire needs to charter an Interagency Fire IRB that interfaces with agency IRBs to ensure that Wildland Fire's interests are appropriately represented when funding decisions are made.

This IT Investment Process recommends a method of IT investment management that includes technical reviews, technical and business process impact assessments, determination of realistic life cycle costs, approval processes and prioritizing new systems or major changes to existing systems, and ensuring proper closure methods terminating obsolete systems.

By including NWFEA Blueprint, Architecture, and technical and data architects, the Fire IT Process will provide the vehicle to promote adherence to standards and alignment to the to-be architecture and strategic priorities of Wildland Fire leadership.

Expected Value: The Fire IT Investment Process will provide the needed structure and protocol to enable wildland fire leadership to set the priorities and direction of IT investments across the wildland fire enterprise. By creating a consolidated interagency wildland fire portfolio and aligning it to the Blueprint, Wildland Fire will be able to identify redundancies and gaps in the portfolio. The interagency management of the IT investment process will prevent unnecessary expenditures on non-priority, redundant, and obsolete efforts. By reducing or eliminating redundant systems, there will be tangible and intangible benefits. With an interagency portfolio that exceeds $50 million, there will be significant savings.

Expected Risk: The risks or barriers to successfully implementing the Fire IT Investment Process are primarily political and cultural. Agency IT organizations may not want to acknowledge the decisions of the interagency wildland fire community if it adversely affects their funding or staff. The creation of an interagency Fire IRB may create some discomfort with department and/or agency

IRBs who may see it as in conflict with their power and authority. The differences in interpretation of OMB capital planning and investment control (CPIC) regulations create different rules between the agencies. The role and authority of the managing partner agency's fire IT organization to make decisions on behalf of the fire community is in constant dispute.

Expected Cost: The cost for developing and completing the Fire IT Investment Process are minimal. The current draft process is still at a conceptual stage. The needed follow-on work consists of meetings with Chief Information Officers (CIOs), IRBs, Fire IT managers, and Budget staffs. Since this is a high priority for wildland fire leadership, it is anticipated that the benefits will out-weight the costs.

Action Item 1.2.2: ***Promote the Creation of an Interagency Wildland Fire CIO Council to deal with interagency IT issues***

Target Date: 10/01/2009

Discussion: An Interagency CIO Wildland Fire IT/Radio Collaborative Sojourn was convened in August of 2007. Attendees included department and agency CIOs, executive level management, project managers, radio program managers, security managers, fire directors, and IT specialists to discuss Wildland Fire's IT needs and issues. The following issues were identified:

- IT Security policies hamper the ability for interagency and emergency response personnel to operate effectively in an interagency environment
- Better communications interoperability between radios is needed to perform common missions and share facilities
- Radio repeater frequencies are in short supply
- Multiple make and models of radios causes confusion and possible safety issues for users who are trying to function in emergency situations

The group suggested than an Interagency CIO Council – a group of Interagency Fire CIO Council made up of the CIOs from the DOI, USDA, FS, BLM, NPS, BIA, and Fish and Wildlife Service (FWS) – be created to deal with interagency wildland fire IT issues. The attending CIOs agreed to follow-up on this suggestion. While the Wildland Fire community acknowledges that it does not have the authority to create this group, senior fire leadership (WFLC and FEC) should facilitate the necessary action to address this need.

Expected Value: By forming an interagency CIO council, Wildland Fire would have a single body where IT issues can be escalated. The interagency CIO Council could then address these issues together and agree at one time on how to resolve them from an interagency perspective. Rather than attempting to solve problems by visiting each CIO individually and possible deriving different and/or conflicting solutions, the agency CIOs could collaborate in a joint forum. This will result in faster reaction to problems and ensure the solution is acceptable to all agencies.

Expected Risk: Unless the scope of responsibility and authority are clearly defined and chartered, the council will face challenges in being effective. Adding this responsibility to the already-full plates of the CIOs may be difficult.

Expected Cost: Since the CIOs are located in the Washington DC area, the costs (other than time commitments) of creating a council would be minimal. Any costs associated with reconciling

issues would be no more than those costs that would be spend resolving the issues in a stand-alone agency-specific arena.

Recommendation 1.3: *Maintain and Use the National Wildland Fire Architecture and Blueprint*

Action Item 1.3.1: *Use the National Wildland Fire Architecture and Blueprint as a Management Tool*

Target Date: Ongoing

Discussion: The NWFEA Blueprint is the result of a high-level analysis of the complex interagency organization that makes up the Wildland Fire enterprise. As a living document that will evolve over time, the Blueprint should serve as the launch pad for implementing change across the Wildland Fire enterprise. Wildland Fire needs to institutionalize the acceptance and use of the NWFEA Architecture and Blueprint in its management practices. In addition, the continued update and maintenance of the Architecture and the Blueprint is important in order to offer continued support in management's decision-making processes. The Architecture should be continually updated with business, data, applications, and technology information so that it can be used to modify the Blueprint. NWFEA Program Guidelines should be developed that identify the roles and responsibilities of the people or groups responsible for maintaining the Architecture, creating the Blueprint, and managing change across the enterprise.

Expected Value: The NWFEA Blueprint and Architecture will provide the necessary framework to better manage the interagency Wildland Fire activities. The Architecture provides a clear picture of all the components of the Wildland Fire Enterprise and their relationship to each other. The NWFEA Blueprint recommends actions that will enable Wildland Fire to better function as if it were a Virtual Single Agency (VSA) in the implementation of wildland fire policies, practices, and standards. The recommended actions support the implementation of an enterprise architecture program to support the transformation process. The Blueprint will be used in management and decision processes such as strategic planning, investment review, data management, business and system reengineering, and product management.

The ongoing development and implementation of the NWFEA Blueprint will contribute to:

- improved decision making
- improved adaptability to changing demands
- elimination of inefficient and redundant processes
- optimization of the use of organizational assets
- alignment of business strategies and technology services
- achievement of strategic objectives

Expected Risk: The risks for NWFEA, as with any program, are cuts in funding or loss of executive leadership support. As long as the NWFEA Program, through the Blueprint activities, are perceived as value-added and result in a reasonable return on investment, the program can and should be successful.

Expected Cost: There are two cost categories related to the NWFEA Blueprint:

1) The costs of maintaining the NWFEA Blueprint and supporting architecture are estimated at approximately $700,000 per year, which is the current operating cost for the NWCG Program Management Office, plus the Repository maintenance budget.
2) The cost for implementation of the Blueprint is dependent upon the decisions and priorities set by fire leadership related to the recommendations in the Blueprint. A Blueprint recommendation can only be implemented if it is ranked as priority, and funding is available.

Action Item 1.3.2: ***Incorporate Maintenance of the Business Architecture and Blueprint into the New NWCG Organization***

Target Date: 10/01/2009

Discussion: In order to sustain its continued usefulness, Wildland Fire needs to incorporate the maintenance of the NWFEA Blueprint and Architecture into the new NWCG organization. The Architecture is the documentation of the business of Wildland Fire. The three Branch Coordinators should be designated as the content managers for the Business Architecture, and should be in the driver's seat in setting the direction for the next version of the Blueprint based on strategic direction from executive leaders and issues raised from the national, regional, and field tiers of the wildland fire community. The Branch Coordinators should also serve as the business representatives on the NWFEA Change Management Board.

Expected Value: The maintenance of the Business Architecture will ensure that the focus of NWFEA is business-driven.

Expected Risk: None identified.

Expected Cost: None.

Action Item 1.3.3: ***Complete the As-Is and To-Be Business Analysis and Use it as feeders to the Strategic Plan***

Target Date: 10/01/2009

Discussion: Wildland Fire needs to incorporate an enterprise management approach to run the strategic and business aspects of Wildland Fire. The current NWFEA Architecture includes an initial analysis of the business of Wildland Fire; however, additional work needs to be done to complete the Architecture and to enhance subsequent versions of the Blueprint. Add-on work includes:

- Validation of the NWFEA Functional Model by a wider range of business experts
- Development of a business process model
- Formalization of business stewardship roles for all products
- Analysis of the Business Architecture to determine the future desired state, by functional and/or sub-functional areas

Once the Business Architecture is complete, the next version of the Blueprint should include prioritized business goals and objectives. This will set the stage for creating the interagency IT strategy – the IT strategy should be based on the priorities set by the business community.

Expected Value: The alignment of the Architecture, Blueprint, and Strategic Plan will provide the necessary framework to establish and implement strategic priorities from an interagency perspective.

Expected Risk: The unavailability of business subject matter experts has prevented completion of the business and data models in the past. This continues to be a risk for future analysis efforts.

Expected Cost: Costs will be minimal. Analysis services for the coming year will be performed by existing staff and through agreements with other enterprise architecture organizations.

Recommendation 1.4: *Optimize Wildland Fire's Organizational Capacity for Integrating into its Parent Agencies' Proactive Land Management Activities*

Action Item 1.4.1: *Ensure adequate resources for vegetation management and other proactive land management activities*

Target Date: Ongoing

Discussion: Government land managers are moving toward a proactive land management approach by treating vegetation before it becomes a hazardous condition. Wildland Fire treats 3.1 million acres annually. Adequate vegetation management resources will be required over an extended period of time to attain desired vegetative conditions. Wildland Fire should:

- Strive to increase the number of qualified participants to support all phases of this effort, thus better enabling the fire community to redirect more of its effort to proactive management
- Promote coordination and collaboration between all agencies that do vegetation management treatments in order to limit redundant planning and execution

Expected Value: An emphasis on proactive planning and implementation will reduce the risk of wildfire to landowners, firefighters, and the public and provide benefits to ecosystem function.

Expected Risk: None identified. It must be acknowledged that it will take an extended period of time to see actual positive results. Because fuels treatment projects utilize many of the same resources as are used for suppression activities, there may continue to be a shortage of available resources.

Expected Cost: Additional funding will be needed if Wildland Fire is expected to treat larger areas of land in the future.

Action Item 1.4.2: *Leverage existing resource funding to maximize coordinated interdisciplinary vegetation management projects*

Target Date: December 2010

Discussion: In Fiscal Year 2008, approximately 80% of the Wildland Fire budget was allocated for preparedness and suppression activities. While this allocation is necessary for the current conditions and environment, it left only 20% of the budget to perform fuels and vegetation management activities. Wildland Fire needs to:

- Work with Congress to provide more funding for fuels and vegetation management treatments.
- Change the performance metric from gross acres treated to a measure that would take into account the change in risk from wildfire and overall ecosystem health.
- Increase proficiency of fire management staff working in vegetation management with National Environmental Policy Act (NEPA), Clean Air Act, Endangered Species Act and other legislation, not just Land and Resource Management Plans
- Provide incentives for agencies to take on complex vegetation management projects even though it will require environmental assessments and environmental impact statements to comply with NEPA, etc.
- Work with other agency vegetation management efforts to take advantage of cost-sharing opportunities.

Expected Value: A change in funding priorities can result in the following:

- healthier ecosystems
- less negative impact from wildland fires
- higher incidence of land meeting land management objectives following a wildland fire
- reduced wildfire risk to land and resource owners

Expected Risk: None identified.

Expected Cost: Since we are looking at the existing federal wildland fire budget, an increase in the fuels/vegetation management budget may be needed at the expense of the preparedness/suppression budget. Actual costs will need to be identified following a more detailed analysis.

Action Item 1.4.3: ***Develop adaptive management guidelines that support post-wildfire-recovery decisions on a routine basis***

Target Date: December 2010

Discussion: The primary objective of post-fire activities is to determine the need for emergency treatments to minimize threats to life or property or to stabilize and prevent unacceptable degradation to natural and cultural resources resulting from the effects of a fire. Wildland Fire should:

- Redefine closure of wildfire emergency to include implementation of all effective emergency stabilization treatments
- Develop performance measures of the environmental and cost-effectiveness of common emergency stabilization treatments at reducing risks to human safety
- Create an inter-agency mechanism for archiving and retrieving post wildfire recovery information, including sections addressing planning, budgeting, implementation, monitoring, and maintenance
- Create a generally accepted and accurate cost risk analysis

Expected Value: Some of the benefits of implementing this action item are:

- Improved public safety
- Protection of natural resources
- Protection of improvements of the agencies and the public

Expected Risk: The risks associated with this action are only relevant if this action item is not implemented; and they are:

- Potential loss of life
- Additional loss of natural resources

Expected Cost: Increased fire severity will increase costs to post-fire recover and emergency stabilization treatments.

Action Item 1.4.4: ***Develop smoke management guidelines that support both air quality and vegetation management objectives***

Target Date: On-going

Discussion: Wildland Fire develops and implements policies that minimize impacts of smoke to populated areas and sensitive sites, avoids significant deterioration of air quality and violations of air quality standards, and mitigates human-caused visibility impacts. The NWFEA CBT also indicated the following requirements:

- Smoke Management will need to become integral part of the AMR implementation
- Smoke managers need to be at the table with the EPA as they write the rules and standards, and with the States as they begin development of the implementation plans
- Continue to explore and refine emission reduction techniques
- Smoke management needs to fit into both air quality objectives and vegetation objectives

Expected Value: Implementing this action item will result in benefits related to:

- Supporting public health and safety
- Reduced risk of additional regulations being placed on Wildland Fire

Expected Risk: Benefits must be realized within a framework of increased fuels treatments to reduce risk of wildfire. The potential tradeoff presents the greatest risk: if fuels treatments through prescribed fire, which produce relatively limited smoke, are reduced in order to minimize impacts to an extreme, the same fuels will eventually be consumed by wildfire, which produces relatively substantial and significant amounts of smoke.

Expected Cost: With the onset of increased air quality regulations, it will be necessary to increase smoke management staffing in order to continue to address this on-going workload.

Recommendation 1.5: *Improve the Efficiency of Response to and Management of Wildland Fire Incidents*

Action Item 1.5.1: *Standardize accepted appropriate management response (AMR) practices*

Target Date: December 2009

Discussion: The understanding of AMR by those stakeholders external to the fire community needs to be improved. Some people erroneously compare it to the former "let it burn" practice. Wildland Fire needs to develop AMR standards and guidelines as well as communication tools to improve the understanding and implementation of AMR so that:

- AMR includes cost as well as environment as a factor
- Responses are as cost-effective as it is possible
- AMR is implemented consistently and across the board
- Land and resource management plans enable AMR
- Fire management plans are designed to address AMR strategies

Wildland Fire should:

- Develop common performance measures for cost-effective use of resources in wildland firefighting activities
- Continue investigating and implementing more cost-effective responses
- Develop a process to monitor and evaluate the effectiveness and efficiencies in mobilization and incident operations at all levels

Expected Value: The expected benefits of implementing this action item are:

- Improvement in fire suppression efficiencies
- Lower overall costs
- Increased firefighter safety

Expected Risk: The risks of implementing this action item are related to public perceptions. The public and cooperators may not accept practices that do not lead to full suppression strategies.

Expected Cost: With or without implementation of AMR practices, the cost of suppression will continue to rise. This is due to the effects of drought, global warming, past aggressive suppression strategies, and WUI development.

Action Item 1.5.2: *Expand, Streamline, and Accelerate the Training and Delivery of Qualified Personnel to the Workforce*

Target Date: Ongoing

Discussion: Wildland Fire continues to suffer from a shortage of qualified wildland fire personnel. The current training development and delivery system is considered slow in reacting to

change. Many training course updates are several years behind schedule. Wildland Fire stakeholders have needs for training beyond the existing curriculum, including prescribed fire, monitoring, and hazardous materials. Wildland Fire should:

- Include non-fire-specific training in its overall training strategy
- Continue to improve training development and delivery processes with the goal of decreasing the amount of time it takes to become qualified for wildland fire positions
- Target specific individuals to fill shortage positions

Expected Value:

- Increased number of qualified personnel
- Lower training costs by decreasing time to become qualified

Expected Risk: None identified.

Expected Cost: There may be up-front costs to implement new technologies, such as distance learning. In the long-run, training delivery costs should decrease.

Action Item 1.5.3: ***Work with the Department of Homeland Security (DHS) to develop common standards and procedures for incident management and emergency response.***

Target Date: March 2009

Discussion: The DHS is developing new all-risk standards such as the National Incident Management System (NIMS) and the Federal Response Framework, patterned after NWCG's National Interagency Incident Management System (NIIMS). NWCG needs to work with DHS to provide:

- Lessons learned, and assist where appropriate to avoid repeating past mistakes
- Determine types and severity of emergency response that involve the wildland fire community
- Input on a universal catalog of standards and qualifications
- Common vocabulary and meaning of incident response terms

Expected Value: The benefit of implementing this action item will be a common response framework and resource standards for all types of emergency responders regardless of the type of incident. By participating in the development of NIMS, Wildland Fire can assure the resulting framework and standards will meet the needs of wildland fire community.

Expected Risk: None identified.

Expected Cost: Costs will be minimal. Wildland Fire will need to provide wildland fire subject matter experts to work with DHS.

Action Item 1.5.4: ***Investigate lower-cost solutions for aviation***

Target Date: Ongoing

Discussion: Aviation is a major success factor in managing fires. It is also a major expense. For example, creating more flexible contract specifications that allow 365-day use could help defray some of the costs.

Expected Value: Implementation of this action item may result in:

- lower suppression costs
- improved contracting mechanisms

Expected Risk: None identified.

Expected Cost: Implementation of this action item should result in cost reductions.

Recommendation 1.6: ***Improve Internal and External Communications***

Action Item 1.6.1: ***Develop and implement a communications plan for interagency inreach and outreach***

Target Date: December 2009

Discussion: Wildland Fire needs to improve the way information is relayed to internal and external stakeholders. An interagency wildland fire communication plan should be developed that addresses these needs.

The communication to external stakeholders needs to be viewed from the customer perspective instead of provider perspective. To the general public, Wildland Fire is a single entity; therefore, they shouldn't be required to go to several different places to get information about Wildland Fire. There is also a continuing need to educate the public on the role and objectives of Wildland Fire

Internal stakeholders would like a steady stream of information between leadership and their teams and staffs.

Expected Value: Implementing this action item will result in the following benefits:

- Improved understanding Wildland Fire's role, objectives, and activities
- Better access to and more consistent information delivered to internal and external stakeholders

Expected Risk: None identified.

Expected Cost: No new costs. It is expected that the development and implementation of the communication plan can be done with existing resources.

Action Item 1.6.2: ***Develop communication protocols for elevating issues to and from the interagency Wildland Fire community***

Target Date: September 2009

Discussion: Wildland Fire interfaces with many other business support organizations, such as budget, procurement, human resources, information technology, and contracting all of which are duplicated within each agency structure. Policy made by these organizations from the agency perspective often times do not consider the impact on interagency operations. When interagency issues arise, Wildland Fire needs to be able to escalate these issues to the appropriate organizations for resolution. Rather than approaching these organizations individually, Wildland Fire needs to develop communication protocols that allow them to present these issues in a unified way so that the resolution is structured and complete.

Expected Value: The expected benefits are:

- A single interagency communication process, rather than multiple agency-specific processes
- Improved communication between Wildland Fire and business support organizations

Expected Risk: None identified.

Expected Cost: None Identified.

Action Item 1.6.3: ***Provide a single point of access to authoritative interagency Wildland Fire information.***

Target Date: September 2009

Discussion: Wildland Fire information available to the general public is found on multiple web sites that often provide contradicting information. Wildland Fire needs to establish interagency wildland fire policy that designates official sites for current wildland fire information so that the public can be assured that all .gov websites provide consistent information.

Expected Value: By designating official wildland fire websites, the Wildland Fire community will save money through the elimination of redundant websites and extraneous maintenance costs. The public will be able to get consistent fire information.
Expected Risk: Agency policies regarding websites will cause some conflicts that will need to be resolved. Typically, the agency's public affairs office, which is external to the fire program, is responsible for outward facing communication. Each agency has its own web policy, and web formats.

Expected Cost: Costs have not been identified. The initial cost in time and money for analysis, design, and implementation is expected to be substantial.

Sequencing Plan

ID	Action Item No.	Task Name	Start	Finish
1	**Goal 1**	**Common Wildland Fire Governance and Business Activities**		
2	**1.1**	**Complete the Implementation of a Unified Governance Structure**		
3	1.1.1	Continuation/Completion of the NWCG Reorganization		6/1/2009
4	1.1.2	Integrate Interagency Strategic Planning		6/1/2009
5	1.1.3	Institute a Product Management Discipline		10/1/2010
6	1.1.4	Move Toward a "Service-First" Organizational Concept		10/1/2009
7	1.1.5	Establish a Budget Planning and Tracking Process for Interagency Initiatives		12/2009
8	**1.2**	**Create an Interagency Information Technology (IT) Governance Framework to Guide the Management of Wildland Fire Information Systems**		
9	1.2.1	Complete Development and Implementation of the Interagency Fire (IT) Investment Process		10/1/2009
10	1.2.2	Promote the Creation of an Interagency Wildland Fire CIO Council to deal with Interagency IT Issues		10/1/2009
11	**1.3**	**Maintain and Use the National Wildland Fire Architecture and Blueprint**		
12	1.3.1	Use the National Wildland Fire Architecture and Blueprint as a Management Tool		On-going
13	1.3.2	Incorporate Maintenance of the Business Architecture and Blueprint into the New NWCG Organization		10/1/2009
14	1.3.3	Complete the As-Is and To-Be Business Analysis and use it as feeders to the Strategic Plan		10/1/2009
15	**1.4**	**Optimize Wildland Fire's Organizational Capacity for integrating into its parent agencies' proactive land management activities**		
16	1.4.1	Ensure adequate resources for vegetation management and other proactive land management activities		On-going
17	1.4.2	Leverage existing resource funding to maximize coordinated interdisciplinary vegetation management projects		12/2010
18	1.4.3	Develop adaptive management guidelines that support post-wildfire-recovery decisions on a routine basis		12/2010
19	1.4.4	Develop smoke management guidelines that support both air quality and vegetation management objectives		On-going
20	**1.5**	**Improve the efficiency of response to and management of wildland Fire incidents**		
21	1.5.1	Standardize accepted appropriate management response practices(AMR)		12/2009
22	1.5.2	Expand, Streamline, and Accelerate the Training and Delivery of Qualified Personnel to the Workforce		On-going
23	1.5.3	Work with DHS to develop common standards and procedures for incident management and emergency response		3/2009
24	1.5.4	Investigate lower-cost solutions for aviation		On-going
25	**1.6**	**Improve internal and external communications**		
26	1.6.1	Develop and implement a communications plan for interagency inreach and outreach		12/2009
27	1.6.2	Develop communication protocols for elevating issues to and from the interagency wildland fire community		9/2009
28	1.6.3	Provide a single point of access to authoritative interagency wildland fire information		9/2009

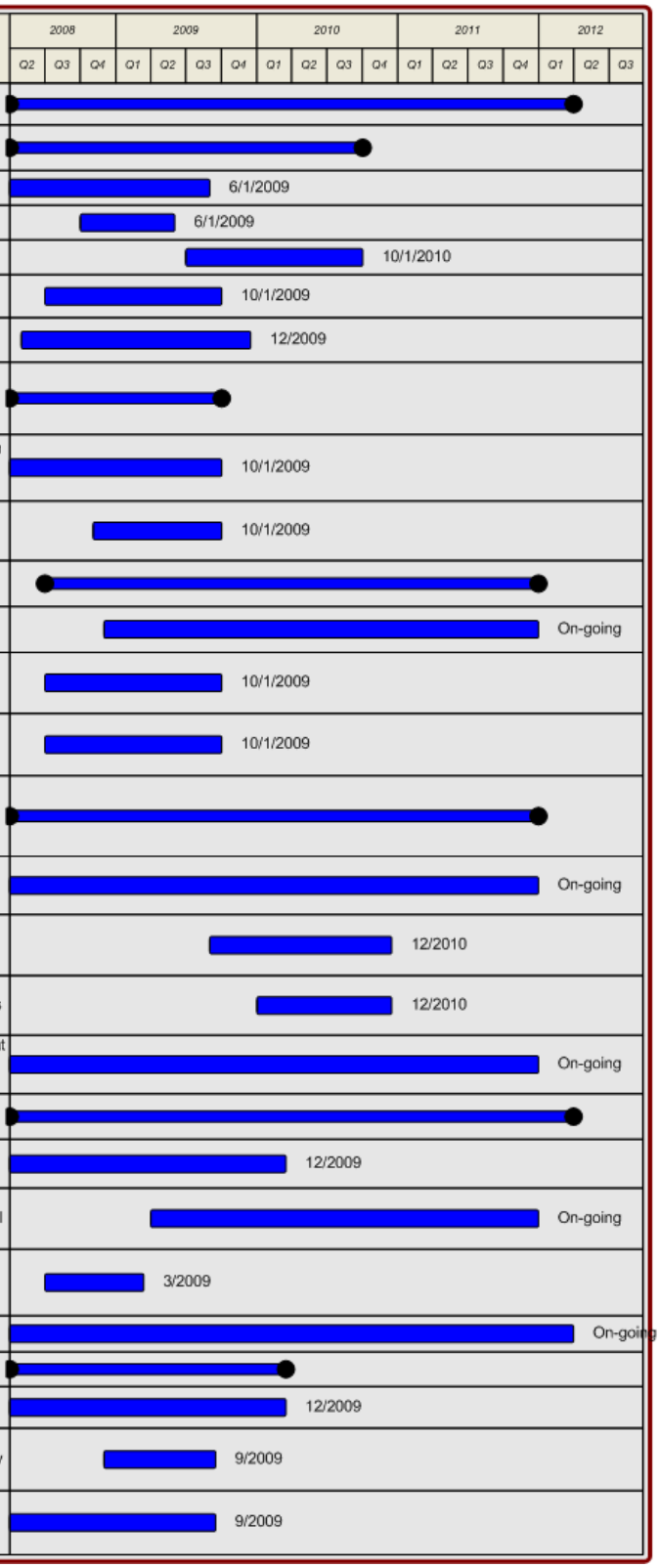

Figure 11 - Goal 1 Action Item Sequencing Plan

Goal 2
An Integrated Data Environment

Description of the Current (as-is) State

In Wildland Fire, data is scattered throughout a variety of manual and automated systems. As the use of computers expanded from the 1980's to the present time, multiple applications were independently developed by individual organizations and vendors without adequate regard to the need for integration, coordination, or standardization. Often, agencies have tailored their data collection and reporting criteria to best fit the internal agency needs. While such tailoring may be effective and efficient for the individual agency, it results in difficult and unreliable cross-agency data use. To maximize the usefulness of interagency data, the collection frequencies, granularity, and other thresholds must be consistent.

In the Wildland Fire information environment, data is often passed through a series of manual and automated systems. Frequently this involves retrieving the data from one system and manually entering it into the next system – each time this occurs, the opportunity to introduce errors arises. A user of the information, at any step along the way, is unsure of where the data originated and cannot check to ensure it is error-free; likewise, if the user recognizes an error, there is usually no good way to determine where to correct the error.

In 2004, NWCG created the Data Administration Working Group (DAWG). The DAWG consists of representatives from each of the NWCG committees who serve as data stewards for specified data subject areas. The DAWG and the NWCG Program Management Office (PMO) have been working with Wildland Fire business stewardship groups to develop data standards and geographic information system (GIS) data layer standards for wildland fire information. These standards are the result of collaboration among business and technical groups and extensive reviews across the Wildland Fire enterprise, from headquarters to field level organizations.

While the DAWG has successfully created data standards that have been accepted across the Wildland Fire enterprise, the number of approved data standards only represents a handful of all the data used by the Wildland Fire community. To date, the determination of which data standards to develop has been haphazard. The DAWG targets are not always met by the business and technical stewardship communities. The NWCG PMO has recommended targets based on projected system interoperability which the responsible projects have ignored. The NWCG has targeted data standards based on a fire occurrence reporting study report, but has targeted an incomplete set of report data. The NWCG Geospatial Task Group (GTG) has targeted the development of various data layer standards, but without sufficient involvement of the business stewards.

Within wildland fire organizations, it has generally been understood that, while establishing a new NWCG data standard does not mandate existing systems to immediately retrofit their data to the new standard, the system managers will make plans to incorporate the standard into subsequent versions. To date, there are very few systems that have included the new data standards into their latest version. It is also generally understood, but not enforced, that new NWCG-sponsored systems will conform to any NWCG data standards existing at the time the new system is developed.

While NWCG has taken positive steps toward better data management, there is a lot of room for improvement. The current Wildland Fire data architecture includes redundant data stores, mismatched data across systems, few data standards, and little data sharing between systems.

Description of the Future Desired (to-be) State

The objective of this goal is:

GOAL 2: ***Information Sharing Environment***
Objective: *A. Establish a working environment for consistent standardized data use in core fire information (e.g. incident/occurrence, fire qualifications, fire personnel, fire organizational unit) systems by 2010*

A summary of this goal's Recommendations, associated Objectives that will be met, Action Items, and expected Outcomes are included in the following table. More detailed information is contained in the follow-on narratives provided after this table.

Goal 2 Recommendations	Objective(s) that will be met	Action Items	Outcomes
2.1 Develop and implement interagency data standards	A	2.1.1 Develop a strategy and schedule for development and implementation of data standards, including necessary agreements among partners on interagency standards. (This includes geospatial data standards.) 2.1.2 Create interagency policy to incorporate new and existing NWCG data standards into existing systems' annual operating plans within 1 year of creation of the standard.	• Consistent data meaning and interpretation • Increased reliability of data

Goal 2 Recommendations	Objective(s) that will be met	Action Items	Outcomes
2.2 Develop consistent data and data interoperability across all systems and business areas	A	2.2.1 Maintain, update, and use a single wildland fire logical data model. 2.2.2 Establish authoritative data sources and/or systems of record for identified Information Classes 2.2.3 Establish policies and procedures to standardize the collection of data	• Shared data • Reliable data • Consistent data (semantically, granularly, temporally, organizationally) • Increased accessibility to data • Reduced data entry redundancy

Table 5 - Goal 2 Recommendations, Action Items & Outcomes

Recommendations to Achieve the Future Desired (to-be) State for Goal 2: Information Sharing Environment

Recommendation 2.1: ***Develop and implement interagency data standards***

Action Item 2.1.1: ***Develop a strategy and schedule for development and implementation of data standards, including necessary agreements among partners on interagency standards.***

Target Date: 6/01/2009

Discussion: Data standards must form the basis of understanding to exchange data between systems. To facilitate the establishment of interoperability between systems, data standards should be developed before, or at least in conjunction with, the development and integration of information systems. To ensure data standards are available when needed, standards development should be scheduled in conjunction with, or based upon, relevant investment strategies and project schedules.

An enterprise-wide strategy will establish a common and visible, agreed-upon plan by which data standards can be developed and implemented in a coordinated and orderly fashion.

Simply developing data standards is not sufficient. Common understanding and agreement must also exist on the purpose and intended use of the standards. Data administration concepts and principles based on effective use of data standards have been accepted by the NWCG. Procedures have been established by the DAWG and implemented among the NWCG subgroups for developing and approving data standards. While the concepts and principles were being formulated and discussed within the NWCG, discussions also took place with various partner agency data personnel. Although there is general understanding and agreement on the concepts and principles, no formal agreements have been established with partner agencies regarding the expected use and enforcement of the data standards.

Consensus among partner agencies and between the partner agencies and the NWCG on the concepts and principles of interagency data standards is essential to the successful establishment and use of such standards. Agency-specific and interagency standards must be consistent and agreements must exist to ensure they stay consistent as necessary changes are made through coordinated change management. Formal agreements must be established between NWCG and partner agencies to ensure data standards are developed and used in a consistent and acceptable manner.

Action Item 2.1.2: ***Create interagency policy to incorporate new and existing NWCG data standards into existing systems' annual operating plans within 1 year of creation or modification of the standard.***

Target Date: 7/01/2009

Discussion: New understandings and expectations are needed on the use and implementation of standards into wildland fire systems. Interagency policy should be developed requiring the implementation of NWCG data standards into wildland fire systems within two years of the creation or modification of the standards.

The scope of these understandings and policy needs to be broadened to include all wildland fire information systems – agency and interagency, NWCG-sponsored and agency-sponsored. Formal agreements must be established between NWCG and partner agencies to ensure information systems are developed and maintained in a consistent and acceptable manner compliant to NWCG and agency data standards. These agreements must include when, and under what conditions, existing systems will be modified to support new or updated data standards. The agreements must also define conditions for exemptions or extensions to the expected compliance.

Recommendation 2.2: ***Develop consistent data and data interoperability across all systems and business areas***

Action Item 2.2.1: ***Maintain, update, and use a single wildland fire logical data model.***

Target Date: on-going

Discussion: The NWCG PMO has reconciled the Business Subject Areas and subordinate Information Classes defined by the departments of Agriculture and the Interior. A subset of wildland fire-relevant areas and classes forms the foundation of the NWFEA data model. This model still needs to be evaluated against, and reconciled with, the comparable data models of other wildland fire organizations such as the Department of Homeland Security and the National Association of State Chief Information Officers (NASCIO).

Within the information classes, the NWCG PMO has begun documenting the major data entities used by the various business functions of wildland fire. Activity should continue with SME interviews to finish this first level of effort across the scope of the data model. Subsequent efforts will be needed to further document the data entities and the data attributes within each entity.

The data model should be used as a framework to identify needed data standards and established standards should be reflected in the model.

Action Item 2.2.2: ***Establish authoritative data sources and/or systems of record for identified Information Classes.***

Target Date: 1/1/2009

Discussion: An authoritative data source (ADS) is an officially recognized data production source that produces or publishes reliable and accurate data for subsequent use by customers. An authoritative data source may be the functional combination of multiple, separate data sources.

A system of record (SOR) is an information storage system (usually automated on a computer system), which is the authoritative data source for a given data element or piece of information.

The need to identify systems of record can become acute in organizations where management information systems have been built by taking output data from multiple source systems, re-processing this data, and then re-presenting the result for a new business use. Where the integrity of the data is vital, a data element must either be linked to, or extracted directly from its system of record. The integrity and validity of any data set is open to question when there is no traceable connection with a known system of record.

Common and critical information classes must be identified for the wildland fire enterprise; ADS's should be targeted for these information classes. A targeted ADS may be a single SOR, or may be an

aggregated interagency collection of data from one or more agency-specific SORs. Publishing officially designated authoritative data sources enables system designers and users to retrieve data from the reliable data source, rather than relying on second-hand sources.

Action Item 2.2.3: ***Establish policies and procedures to standardize the collection of data.***

Target Date: 1/01/2010

Discussion: Interagency data standards, if used consistently, can help solve the inconsistent data issue. However, collaboratively produced data collection policies and procedures are also needed to ensure consistent data collection. Likewise, collaboratively produced data reporting policies and procedures can help ensure consistent reporting. Interagency management procedures must also be put in place to ensure the effective maintenance, implementation, monitoring and enforcement of standards, policies, and procedures.

Expected Value

As data is made more consistent across wildland fire systems and business areas, it will inherently be more accurate and reliable. This will increase efficiency by eliminating much of the repetitive data validation and correction that is needed today. Sharing the data among systems will reduce and eliminate the duplication of data entry that occurs today. Finally, the data becomes more accessible to internal and external users with increased credibility and reliability.

Cost savings will be realized as data becomes more accurate and reliable, requiring fewer resources for repetitive data correction. Eliminating redundant data entry will reduce the overall data entry costs. More consistent data across agencies will also result in more consistent reporting with a corresponding reduction in the need for manual reconciliation of data.

Expected Risk

Various risks accompany the efforts involved in planning and implementing the many changes that will be needed to establish an integrated data environment within the wildland fire enterprise. Partner agencies may be resistant to investing in necessary changes to manual and automated agency systems in order to meet interagency data needs. And budgetary constraints may delay or otherwise preclude the ability to pay for retrofitting legacy systems to conform to established data standards.

An inconsistent implementation of standards, or an implementation of ambiguous standards that allow various interpretations, could lead to a perception of compliance with an underlying but unknown inconsistency or inaccuracy of data.

It is very likely that lag times between expected or planned compliance and actual compliance and interoperability will lengthen beyond expectations. This could result in a gradual loss of commitment and support from stakeholders.

Expected Cost

Up-front costs could be significant if all systems were to retrofit to all standards as the standards are approved. However, this likely would not be necessary for most of the data standards. As standards are approved and implemented, each standard and system must be individually evaluated to determine the necessity and benefit of retrofitting the system. Often, changing the system can wait until the system reaches its normal, or otherwise appropriate, reengineering or update point in its lifecycle, at which

time it would be appropriate to accommodate data standards that have been established since its last update.

Designing and building or acquiring new systems compliant to implemented data standards should not significantly affect the acquisition cost. However, there should be a reduction in future maintenance costs for new compliant systems and for retrofitted systems when establishing interoperability between systems.

Sequencing Plan

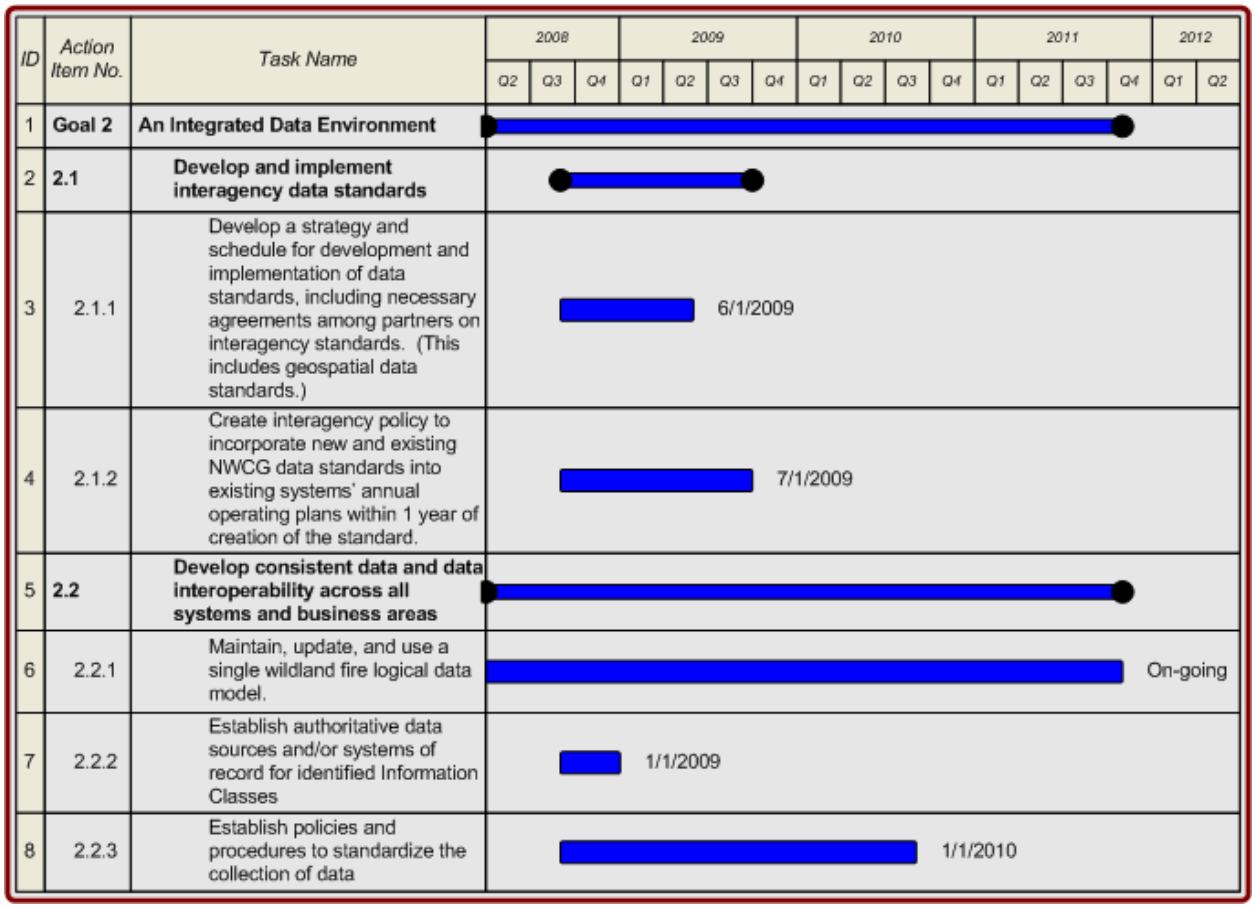

Figure 12 - Goal 2 Action Item Sequencing Plan

Goal 3
Common Technology Infrastructure and Configuration Standards

Description of the Current (as-is) State

Since the late 1970s, information technology has been used by the Wildland Fire community in processing information in order to assist their decision making and to support operations. Technology has evolved tremendously since that time, but most of the evolution occurred within the agency boundaries without giving the needed attention to operations on an interagency level. To compound this situation, numerous requirements have been instituted that have a direct impact on the use and handling of information technology (IT) systems. These requirements increased on an expediential level shortly after September 11, 2001. Most of the requirements imposed were IT security controls. Agencies attempting to implement these controls did so in a stove pipe manner, and soon discovered that cross-platform integration of systems and data sharing was impeded.

The need to interconnect systems has grown as well over recent years. Wildland Fire communities have recognized the advantages of linking diverse systems together in order to exchange data and operate in a more cohesive manner. Despite recent efforts to take system integration into consideration when developing new systems, dissimilar IT infrastructures among agencies, and the policies that govern the use of individual agency infrastructures has added complexity to interconnecting systems. A common, interagency-wide strategy for interconnecting systems is lacking.

Past efforts at standardizing automated systems used for incident support have failed. Several attempts were made at designing a system for use by all Wildland Fire agency partners. However, individual agency requirements or preferences trumped interagency efforts. The need is greater than ever for agencies to use a common platform for Incident Based Automation.

Remote Automatic Weather Stations (RAWS) have been in place since the early 1980's. Since then, the network of RAWS has grown incrementally in the face of long-term declines in program budgets. Funding is a mixture of local offices purchasing RAWS and central funding for RAWS maintenance. The decline in funding will eventually impact fire and resource management programs. Therefore, it's imperative that the RAWS network is configured in the most efficient manner possible in order to provide optimal service and maximize available resources.

Description of the Future Desired (to-be) State

To achieve the vision of providing a unified "plug-and-play" infrastructure for Wildland Fire use, several commitments are needed by the governing bodies. Mainly, the commitment is needed to dedicate the resources for developing short-term and long-term strategies, and the additional resources to implement these strategies. The technology exists today to integrate our IT systems. Budgetary constraints require agencies to take a "do more with less" approach when planning on the most efficient use of available resources. The primary challenge is to overcome agency sideboards and to formulate solutions that can benefit all partnering agencies, establish a common infrastructure framework, and commit to adopting this framework.

The objectives of this goal are:

GOAL 3: Common Technology Infrastructure and Configuration Standards
Objectives: *A. Adopt an enterprise-wide IT infrastructure used to integrate interagency Wildland Fire business services and information by 2011* *B. Produce a consolidated Wildland Fire technical reference model and the regulatory controls governing the use of these technologies by 2010*

A summary of this goal's Recommendations, associated Objectives that will be met, Action Items, and expected Outcomes are included in the following table. More detailed information is contained in the follow-on narratives provided after this table.

Goal 3 Recommendations	Objective(s) that will be met	Action Items	Outcomes
3.1 Provide a common platform for system interconnection and information sharing	A	3.1.1 Implement a standardized enterprise message model and supporting technology dedicated to wildland fire usage 3.1.2 Use secure wireless network technology to further enhance the wildland firefighter's ability to access incident management support systems in a mobile environment 3.1.3 Develop an as-is and to-be architecture and transition plan for land-mobile radios.	• Standardized IT interconnection • Efficient use of resources • Business oriented • Supports Service-oriented Architecture • Facilitates IT systems reuse

Goal 3 Recommendations	Objective(s) that will be met	Action Items	Outcomes
3.2 Develop a common Incident Based Automation infrastructure accepted and used by all partnering agencies	A	3.2.1 Develop a Wildland Fire Technical Reference Model 3.2.2 Develop a national interagency Incident Based Automation (IBA) infrastructure	• Standardized catalog of IT resources • Promotes enterprise-wide acceptance • Common Wildland Fire support infrastructure
3.3 Have unified acceptance of implemented Information Technology (IT) controls	B	3.3.1 Use a common framework for applying IT policies, standards and guidelines 3.3.2 Partnering agencies collaborate to define a common set of controls for IT systems	• Consistent IT standards and Government compliancy • Enhanced infrastructure security • Risk-based business-driven solutions • Interagency applicability
3.4 Establish a primary core national network of Remote Automatic Weather Stations (RAWS) designed to support point and gridded data applications	A	3.4.1 Conduct an as-is network analysis of RAWS and other weather stations to determine future resource sharing opportunities 3.4.2 Validate the network analysis and refine station placement through local development of fire danger rating operating plans	• Most efficient use of available funding • Better aligns itself to the users' needs • Work towards defining the to-be national RAWS network • Provides field-level input for placement of RAWS units

Table 6 - Goal 3 Recommendations, Action Items & Outcomes

Agencies should recognize the need for resolving conflicting business policies and agency-specific requirements which interfere with the Wildland Fire community's efforts at integrating IT systems. This effort should be approached from a unified front.

Recommendations to Achieve the Future Desired (to-be) State for Goal 3: Common Technology Infrastructure and Configuration Standards

Recommendation 3.1:	***Provide a common platform for system interconnection and information sharing.***

Action Item 3.1.1: ***Implement a standardized enterprise message model and supporting technology dedicated to wildland fire usage.***

Target Date: 4/1/2011

Discussion: Historically, interconnecting interagency and intra-agency systems has always been a challenge. Enterprise-wide messaging standards between these systems haven't been clearly defined and universally accepted. Policies dictating access controls, transmission protocols, and perimeter protection vary between agencies, non-Federal partners, and contracted services. Many times systems are designed to serve a specific service without consideration for cross-platform interconnections. If a system's interface requirements change, the source and destination systems may need to be retrofitted to meet the new interconnection requirements.

To facilitate system-to-system communications, a model of published messaging standards must first be adopted by the wildland fire community. A messaging model essentially defines the format on how information will be packaged before transmitting to other systems. The supporting technology for brokering and transporting these messages between systems is a key component to an enterprise message model. Using a standard middleware infrastructure is an efficient and flexible method to accomplish this. Software architecture constructs are typically implemented by technologies found in middleware infrastructure products.

There are several middleware architectural designs used to broker messages between systems. An Enterprise Service Bus (ESB) is common technology used today. Two NWCG sponsored systems (ROSS and IQCS) were recently interconnected to exchange information using an ESB. In an enterprise architecture making use of an ESB, an application will communicate via the bus, which acts as the message broker between disparate applications. See Figure 13 for a conceptual illustration of ESB interconnections performing as a message broker between system types.

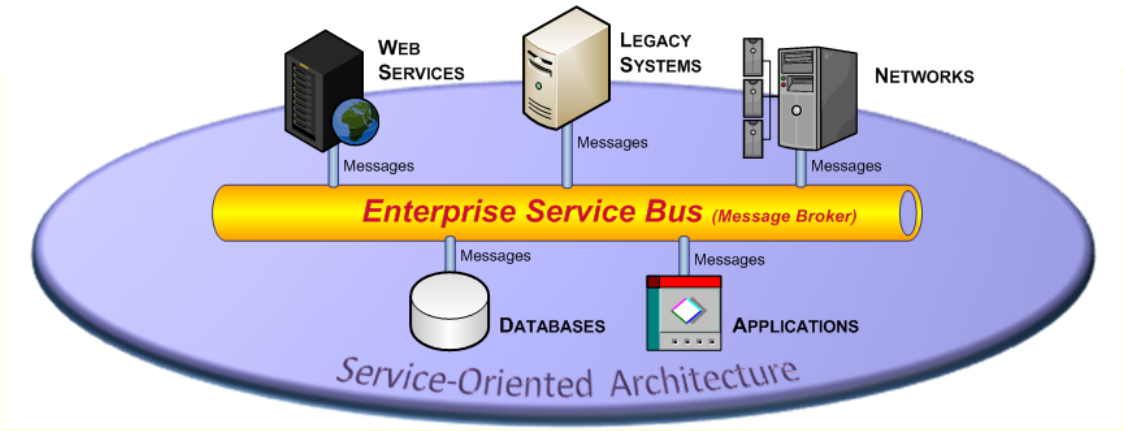

Figure 13 - Enterprise Message Model Construct

The primary advantage of such an approach is that it reduces the number of point-to-point connections required to allow applications to communicate. This, in turn, makes impact analysis for major software changes simpler and more straightforward. By reducing the number of points-of-contact to a particular application, the process of adapting a system to changes in one of its components becomes easier. This strategy can serve as a global model among the wildland fire community for interconnecting legacy systems and new systems in the future.

A number of factors need to be considered as part of an implementation strategy. These include:

1. Define and adopt an enterprise message model
2. Defining message broker connection standards and rules of engagement
3. Incorporating Service-oriented Architecture (SOA) principles into the implementation strategy in order to access authoritative data repositories and other IT resources
4. Memoranda of Understanding (MOU), Memoranda of Agreement (MOA), Interconnection Security Agreements, and Data Exchange Agreements may be required depending on the system connection needs
5. The enterprise message model and supporting technology will need to be owned, operated and managed by a lead agency
6. The message broker should have a fail-over system for network redundancy

Expected Value: Providing point-to-point interconnection between two systems presents several challenges. This is due to the lack of standards for exchanging information between systems. It's further complicated by the varying IT policies and standards employed by partnering agencies. Using an enterprise message model and a common message broker such as an ESB helps mitigate this challenge by providing a common infrastructure. Partnering agencies will only need to be concerned with interconnecting to a single architecture provided by the ESB. Consequently, an ESB will help foster "trust" among agencies in terms of security controls, including data integrity and availability.

***Expected Risk*:** There are some potential barriers that may interfere with developing a successful strategy such as: 1) considering the adoption of an enterprise message model and message broker a low priority; 2) non-participation from partnering agencies; 3) failing to design a standards-based messaging system flexible enough to support the varied transport mediums used by the partnering agencies, including legacy systems. Successful implementation depends upon ongoing management of an enterprise message model, including the supporting technology, to ensure the intended benefit of loose coupling[1]. Incorrect, insufficient, or incomplete management of an enterprise message model can result in tight coupling instead of the intended loose coupling.

Expected Cost: Resources are required to deploy and maintain the enterprise message model and supporting technology, including manpower and IT costs.

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[1] Coupling or dependency is the degree to which each program module relies on each one of the other modules. Loosely coupled systems are considered useful when either the source or the destination computer systems are subject to frequent changes or developed by multiple parties.

Action Item 3.1.2: ***Use secure wireless network technology to further enhance the wildland firefighter's ability to access incident management support systems in a mobile environment.***

Target Date: 4/01/2010

Discussion: The increased dependency on the use of Wildland Fire systems has a commensurate need to access these systems in a mobile environment. There are two basic requirement categories; wireless local area network access for Incident Based Automation (IBA) support; and portable wide-area network Internet access. Corporate email access for both categories may also be desirable.

Using wireless local area networks for IBA support is becoming more popular due to the flexibility and the quicker setup time it offers over using hardwire network connections. There are a number of pending issues regarding wireless protocol standardization and IT security concerns that need to be addressed in order for users to seamlessly connect to the IBA network.

Portable wide-area network access is typically accomplished using Personal Digital Assistants (PDAs) or similar devices, or by using a network interface card in portable computers which make use of the cellular communications network. The use of propriety wireless networks may be used as well, however, access to these networks are typically restricted to metropolitan areas. Many of today's cell phones incorporate Internet browsing capability. Blackberries are one example of a common communication device incorporating cell phone, Internet browsing, and email capability. Several agencies have standardized on Blackberries for providing cell phone communications and for accessing corporate email. However, due to security concerns, some agencies have disabled Internet browsing.

Expected Value: By implementing this action item, Wildland Fire will have mobile access to information not currently available while in route to an incident, while performing field work, or when performing presuppression activities which aren't limited or provincial in terms of access requirements to IT systems. The timely access to these systems provides the user with a greater range of information, thereby giving them the ability to make more informed decisions.

Expected Risk: The risks are minimal. Security issues associated with wireless networks are manageable if deployed correctly. Dependency on information available through mobile devices represents a huge advantage, but can also present some degree of risk if decisions are dependent on accessibility to this information, but access is unavailable if located in a cellular dead-spot. Business contingency plans should be developed in the event access is unavailable. Agencies that disable Internet browsing access on corporate provided devices limit their use for wildland fire support. These agencies should evaluate the possibility of mitigating IT security issues to an acceptable risk value.

Expected Cost: The costs are minimal since much of this technology is already in place. Resources are needed to develop standards for IBA wireless networks.

Action Item 3.1.3: ***Develop an as-is and to-be architecture and transition plan for land-mobile radios.***

Target Date: 10/1/2009

Discussion: This action item is included as a placeholder to ensure subsequent updates to the Blueprint include a discussion about land-mobile radios. Topics for consideration are:

1. Architecture (e.g., trunking, RoIP)
2. Standards
3. Procurement
4. Frequency Management

Recommendation 3.2: ***Develop a common Incident Based Automation infrastructure accepted and used by all partnering agencies.***

Action Item 3.2.1: ***Develop a Wildland Fire Technical Reference Model (TRM).***

Target Date: 5/1/2010

Discussion: By definition, a TRM is a component-driven, technical framework used to categorize the standards, specifications, and technologies that support and enable the delivery of service components and capabilities. In this case, the service components and capabilities define underlying foundation and technical elements surrounding the IT infrastructure used for Incident Based Automation. The TRM provides a foundation to categorize the standards, specifications, and technologies to support the construction, delivery, and exchange of business and application components (Service Components) that may be used and leveraged in a Component-Based or Service-Oriented Architecture. The TRM unifies existing agency TRMs and E-Gov guidance by providing a foundation to advance the re-use of technology and component services from a government-wide perspective.

The Wildland Fire TRM would define components for hardware (computers and peripherals), operating systems, commercial software, internally developed applications, the network architecture, and interface standards.

Expected Value: Providing a standardized blueprint of systems to be used for IBA provides a consistent infrastructure and continuity in terms of supporting this infrastructure. IBA systems based on a TRM will facilitate system integration and will expedite deployment due to the common foundation and technical elements defining the infrastructure. Presuppression activities will also benefit from the TRM because of the pre-defined architecture it presents to the partnering agencies, thereby facilitating the interoperability between agency-owned IBA systems and their supporting applications.

Expected Risk: Partnering agencies that do not conform to the TRM risk the ability to integrate and interoperate their systems and applications with IBA systems which do follow the TRM.

Expected Cost: Although there are some costs in developing and maintaining the TRM, the realized savings would off-set these costs and represent an additional cost savings. This savings is achieved

by providing a common model agencies can use to procure or develop systems that will integrate with a defined standard, thereby avoiding investment in incompatible resources.

Action Item 3.2.2: ***Develop a national interagency Incident Based Automation (IBA) infrastructure.***

Target Date: 5/1/2011

Discussion: There have been numerous past attempts to develop a common automated system used by Wildland Fire partnering agencies. To date, none of these have been accepted as an interagency platform to support incident management. Individual agencies have developed their own systems, many of which are not based on any single standard. Even within agencies there is a diversity of system configurations used by teams for IBA support. Depending on the system, controls vary as to its ability to protect sensitive information, including Personally Identifiable Information (PII), and to ensure the integrity and availability of the information is intact. Team IBA systems are sometimes supplemented with contracted systems or systems used by single resource personnel. There is no assurance that outside systems will interconnect with the team's IBA system, or that it doesn't introduce security threats.

Today, the need is greater than ever to define a single interagency IBA system used to support incidents. Having an interagency IBA system provides numerous benefits, including:

1. A more efficient utilization of limited resources by combining efforts to develop a single, interagency IBA system, thereby avoiding wasting resources on independent attempts
2. A common service-oriented architecture for developing wildland fire applications such as I-Suite
3. The ability to apply Federally mandated IT security controls to a single environment that can be certified and accredited
4. Consistent access and protection of valuable information
5. A single platform that is familiar to incident support personnel
6. Consistent system administration requirements for Computer Technical Specialists
7. Standardized IBA kits that can be cached as NFES catalog items to facilitate ordering
8. Formalized changes to the system using a Configuration Management process

Teams will continue to have a need for their own systems. These systems are used for accessing and processing information while in route to the incident; however, if configured to meet accepted standards, these systems can interface with an IBA kit upon arrival.

Expected Value: Having a single standardized configuration for IBA provides similar benefits realized by having a National Incident Radio Support Cache. The expected value includes interagency standardization, improved reliance and efficiency, and significant cost savings.

Expected Risk: Past attempts to develop an interagency IBA system failed because agency partners could not fully agree upon configuration standards, and individual agency policies precluded full IT system integration. Agencies will need to work together and within their own departments to overcome these challenges.

Expected Cost: Unknown at this time.

Recommendation 3.3: ***Have unified acceptance of implemented IT controls.***

Action Item 3.3.1: ***Use a common framework for applying IT policies, standards and guidelines.***

Target Date: On-going

Discussion: All Federal agencies are mandated to follow policies, standards and guidelines issued by various hierarchies of the Government. These range from Presidential Directives and Congressional Acts to agency specific requirements. The agency specific requirements consist of the agency's interpretation of the higher-level mandate, or supplemental requirements to that mandate. This is where similarities between the Wildland Fire partnering agencies end, and cross-platform integration of IT systems become a challenge.

The higher-level mandates are common to all Federal agencies, and as such provide an opportunity to bridge the differences governing IT controls. Examples of these common mandates and guidance affecting IT systems include:

- Homeland Security Presidential Directive-12 (HSPD-12)
- Federal Information Security Management Act of 2002 (FISMA), Title III of Public Law 107-347
- Government Accountability Office (GAO) governance for securing financial systems
- Various OMB Circulars, Bulletins, Memorandums, and other guidance such as;
    - OMB Circular A-130, App. III
    - National Institute of Standards and Technology (NIST) Special Publications
    - Federal Information Processing Standards (FIPS)
    - Federal Desktop Core Configuration (FDCC)

Although agency-specific requirements may provide additional policies for managing IT systems, representatives of the NWCG can ensure that Wildland Fire IT systems meet the high-level mandates, and employ compensating controls to meet the intent of agency-specific requirements. Risk-based acceptance of compensating controls can be negotiated on a case-by-case basis.

Expected Value: By implementing this action item, Wildland Fire will significantly reduce the complexity of integrating systems across agencies and will better support the mission by modifying or eliminating controls that impede incident support activities.

Expected Risk: Many of the IT controls in place today are controls intended for internal agency use. These controls were devised with little or no consideration to an interagency environment. Substituting the agency's original IT controls with compensating controls usually introduces an increased risk to the IT system. However, this risk needs to be balanced with the impact on the mission if the original controls are retained.

Expected Cost: The cost is unknown at this time. To develop a framework for interagency IT controls will require manpower to develop and maintain as new controls are introduced.

Action Item 3.3.2: ***Partnering agencies collaborate to define a common set of controls for IT systems***

Target Date: 4/1/2010

Discussion: The ever increasing number of IT controls required by Federal mandates has a direct impact on the ability for Wildland Fire support personnel to meet their mission objectives. These controls are designed to protect data confidentiality, availability and integrity, and to protect the IT systems which store and process this information. The consequence of these controls, in some cases, can actually have an opposite effect. Accessibility to IT systems is sometimes restricted due to these controls, which has a direct correlation to data availability. A short list of controls which impact access follows:

Background checks: HSPD-12 requires an initial background check before an individual can use Federal government-owned IT systems. The use of smart cards for IT system authentication is also mandated under HSPD-12

Data encryption: OMB requires that all systems store, process or transmit Personally Identifiable Information (PII) must encrypt the data. If the encryption schema is not properly managed in a shared environment, data may not be accessible to all parties requiring this information

Training requirements: Individuals that use Federal government-owned IT systems, handle official records, and/or handle Privacy Act information must receive training in these areas

Workstation security controls: Under the Federal Desktop Core Configuration mandate, certain security controls are required for all workstations. Notable controls that may impact access include workstation screen lock requirements and restricting elevated privileges

These controls are important for information asset protection, and it's not suggested that the intent of these controls be disregarded. However, it is possible to meet the intent of the controls without significantly increasing the risk by using compensating controls. Compensating controls use an alternate methodology to protect the information by employing other management, operational or technical controls. For example, employing a thin-client infrastructure to meet Incident Based Automation needs greatly simplifies the security controls protecting data by centrally storing and managing the information. Background check mandates can be satisfied by adding this requirement as a competency into IQCS or employing supervised logical access procedures in the IT environment.

Creative problem solving can address most, if not all of the issues impacting Wildland Fire support operations.

Expected Value: Remediating many of the IT-related barriers that obstruct Wildland Fire support operations.

***Expected Risk*:** Compensating controls may need to be accepted at an inter-departmental level before they can be applied. For Incident Based Automation (IBA), there is no one system unanimously accepted by the Wildland Fire community. Compensating controls cannot be applied in a uniform manner until a single IBA system is implemented.

Expected Cost: No costs identified at this time.

Recommendation 3.4: ***Establish a primary core national network of RAWS designed to support point and gridded data applications.***

Action Item 3.4.1: ***Conduct an as-is network analysis of RAWS and other weather stations to determine future resource sharing opportunities.***

Target Date: 4/1/2010

Discussion: Remote Automated Weather Stations (RAWS) were first implemented in the 1980's. Prior to RAWS, fire weather stations were all manual-observation. Some of these stations remain, but automation has enabled observation locations to be more remote.

The RAWS network (Figure 14) is the primary source of weather observations used for fire management applications. Stations are located in remote areas to represent "near-worst case weather conditions."

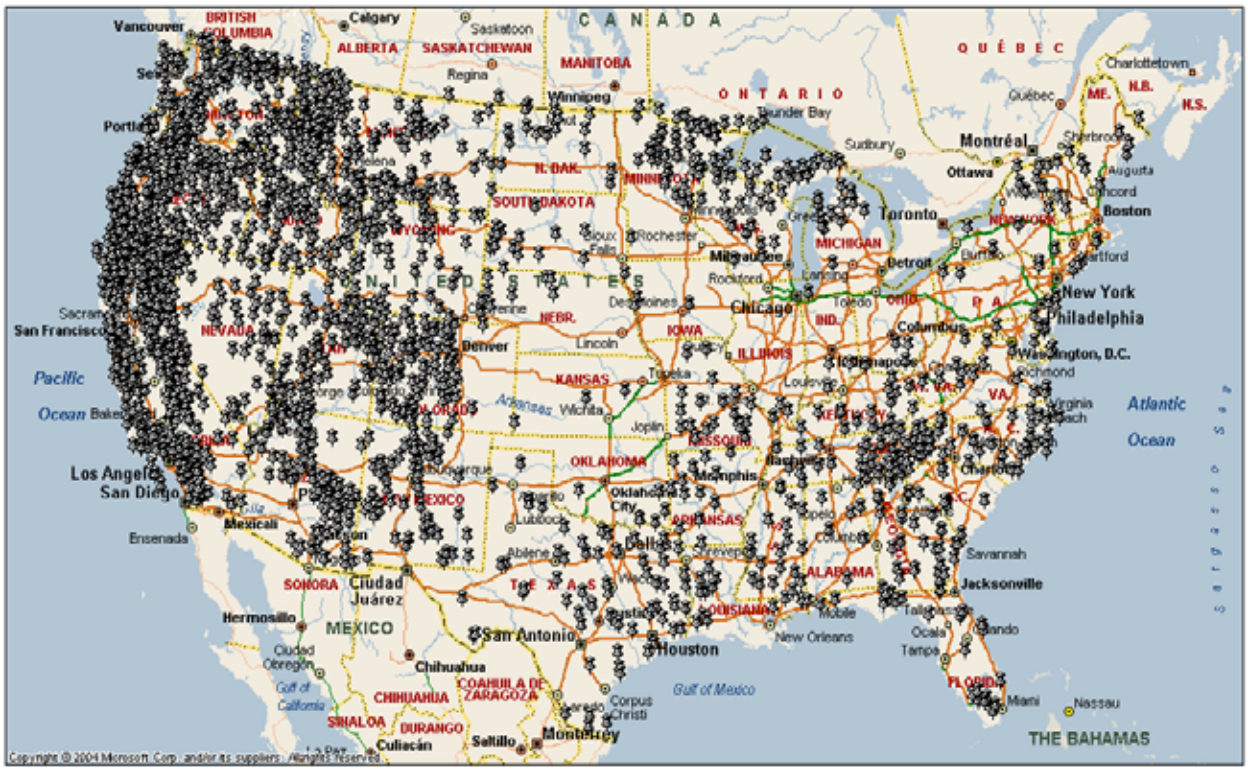

Figure 14 - RAWS active in ASCADS in the continental United States

There are 2400 stations registered of which approximately 2000 are active. There are approximately 1600 stations that maintain National Fire Danger Rating (NFDRS) Standards; which implies an active maintenance program, not just having the equipment to measure the required parameters. In addition there are the Project RAWS and Fire RAWS which use radio alerts to pass information to the Incident Management Teams. In the future this information will pass digitally.

Stations meeting NFDRS standards measure wind speed and direction, air temperature, humidity, precipitation, and solar radiation.

RAWS data directly supports the following fire management programs:

- Planning: Fire management plans; Fire Planning Analysis (FPA)
- Preparedness: Fire danger ratings
- Wildland Fire Operations: Fire behavior analysis, fire weather forecasts
- All-Risk Management: Non-fire emergency support
- Resource Management: most programs

NWCG Directors tasked the Fire Environment Working Team (FENWT) with recommending solutions to the incremental growth of the network in the face of long-term decline in program budgets. RAWS network growth is a mix of local control using local funding in the acquisition of RAWS to meet local needs and central funding for RAWS maintenance.

Expected Value: The analysis will provide the information needed to understand how the existing RAWS network measures up to meeting the user's needs for gridded weather products and to begin to identify the size and general location of a national RAWS network. The value of identifying a national network in this manner is the ability to manage the size of the network into the future without weakening the capability of a critical fire management tool (which would happen if stations were removed without analysis of their value).

Expected Risk: Risks involved include:

- Prolonged analysis
- Disenfranchisement of the field units who rely on the existing network, if decisions about station placement are left solely to a top-down approach. Action Item 3.4.2 is critical to gaining local support for the results of Action Item 3.4.1
- Continued impact to national RAWS maintenance program if national RAWS maintenance units end up performing maintenance on any potential non-national (locally supported) stations

Expected Costs:

2200 stations x $12,000/station = $24.6M capital investment

Yearly (depot) maintenance costs

2200 stations x $1,100/year = $2.42M/year

With field maintenance of $5-6M/year

FENWT examined current and future needs of the fire weather user community. Along with conventional point data applications, users need the RAWS network to support gridded applications of fire weather at multiple temporal and spatial scales.

When the agencies began to use RAWS, communication technology did not facilitate access to other observation networks. Today, many other networks' data are readily available through Web sources.

The recommended course of action was to conduct a RAWS network analysis to inform the determination of a national network of RAWS as recommended by the FENWT. This recommendation was agreed to by NWCG on January 28, 2008. The proposed analysis will:

1. Determine the appropriate mix of RAWS to support fine and coarse-scale applications of point and gridded weather data
2. Assess the applicability of other observation networks to fire management and explicitly include appropriate networks to minimize duplication with RAWS
3. Examine the importance of the RAWS network to informing high spatial resolution gridded fire weather products in concert with the contributions of other networks

This analysis will suggest a network size that supports all the above mentioned fire management programs that rely on fire weather (and many resource management programs as well)

Action Item 3.4.2: ***Validate the network analysis and refine station placement through local development of fire danger rating operating plans.***

Target Date: 4/1/2012

Discussion: Top-down approaches to reducing the RAWS network have very little support at the field level where the data is primarily used. Previous attempts with this approach have not met the objective of reducing the size of the network.

Whether or not the analysis in Action Item 3.4.1: supports a network reduction, the field unit level should be part of the process to decide on final placement of stations. Placement of station is a local decision. A nationally accepted process to determine station placement exists and is supported through the Advanced National Fire Danger Rating System training course held at the National Advanced Fire and Resource Institute. This process is called the development of a fire danger rating operating plan. These plans are described and prescribed in the Red Book and FS Manual.

Expected Value: Local development of fire danger operating plans to validate the analysis results and determine station placement will provide a local, interagency process to promote field unit buy-in of the general network size decisions.

Use of fire danger operating plans will provide an interagency process to validate or determine actual station sitting.

Expected Risk: A prolonged validation phase as local units prepared fire danger operating plans. Possible uncertainty of final RAWS network size in the interim.

Sequencing Plan

ID	Action Item No.	Task Name	2008			2009				2010				2011				2012		
			Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
1	**Goal 3**	**Common Technology Infrastructure and Configuration Standards**																		
2	**3.1**	**Provide a common platform for system interconnection and information sharing**																		
3	3.1.1	Implement a standardized enterprise message model and supporting technology dedicated to wildland fire usage															4/1/2011			
4	3.1.2	Use secure wireless network technology to further enhance the wildland firefighter's ability to access incident management support systems in a mobile environment									4/1/2010									
5	3.1.3	Develop an as-is and to-be architecture and transition plan for land-mobile radios.							10/1/2009											
6	**3.2**	**Develop a common Incident Based Automation infrastructure accepted and used by all partnering agencies**																		
7	3.2.1	Develop a Wildland Fire Technical Reference Model							5/1/2010											
8	3.2.2	Develop a national interagency Incident Based Automation (IBA) infrastructure														5/1/2011				
9	**3.3**	**Have unified acceptance of implemented Information Technology (IT) controls**																		
10	3.3.1	Use a common framework for applying IT policies, standards and guidelines																On-going		
11	3.3.2	Partnering agencies collaborate to define a common set of controls for IT systems									4/1/2010									
12	**3.4**	**Establish a primary core national network of Remote Automatic Weather Stations RAWS designed to support point and gridded data applications**																		
13	3.4.1	Conduct a network analysis of RAWS and other weather stations to determine future resource sharing opportunities									4/1/2010									
14	3.4.2	Validate the network analysis and refine station placement through local development of fire danger rating operating plans																	4/1/2012	

Figure 15 - Goal 3 Action Item Sequencing Plan

Goal 4
Systems that increase efficiencies and reduce costs and redundancies

Description of the Current (as-is) State

Wildland Fire has long worked in an interagency environment, but information technology has varied in its capability depending on agency preferences. Sharing and collaboration in support of an incident must have an underlying infrastructure standard that is publicized and adhered to. This problem was recognized by NWCG early on, when standards for supplies, personnel, catering, and aircraft were needed to coordinate the firefighting effort with adequate resources that could be expected to arrive at the incident.

Wildland Fire agencies have done an excellent job at creating applications that meet a specific need. Each agency may have produced more than one application for a functional area, depending on the complexity of the functions. More often, we are seeing the sharing of these applications across the Wildland Fire enterprise, with greater emphasis on producing applications with functionality for all federal Wildland Fire agencies.

Information technology for support of fire has been managed by the individual agencies, states, tribes, etc. Incompatibility with e-mail, word processing files, Web browsers and operating systems has created more work for the personnel involved. Duplicative data entry occurs often between systems of different agencies, because an automated process to store data has not been developed. Although the gap has narrowed in recent years, security policy has added a complexity to sharing of computer resources between agencies.

Security policies between the federal agencies are not in sync with one another, due to various reasons. It is imperative that policies between the federal Wildland Fire Agencies find ways to ensure security while standardizing security policy for Wildland Fire. This alliance would make solutions to many of the problems facing IT in the Wildland Fire Enterprise much more feasible.

Many legacy applications still remain which are used in purely an agency context. These applications and their functional areas need to be analyzed to ensure that any new initiatives take into account existing functionality that may be combined into the new system, with the objective of reducing or eliminating redundant and outdated applications.

An examination of the Wildland Fire As-is Application Architecture information flows show that there are many applications in the same functional area. These applications are stove-pipe systems without automated interfaces to related applications. In some instances, each agency has more than one system for a functional area. An added complexity to the wildland fire Line of Business (LOB) is the existence of applications in each agency. Nearly all applications maintain their own password / IDs, and their own separate and partially redundant data stores. As shown in the diagram below, users often have to enter the same data into multiple systems, wasting valuable time and leading to the possibility of errors.

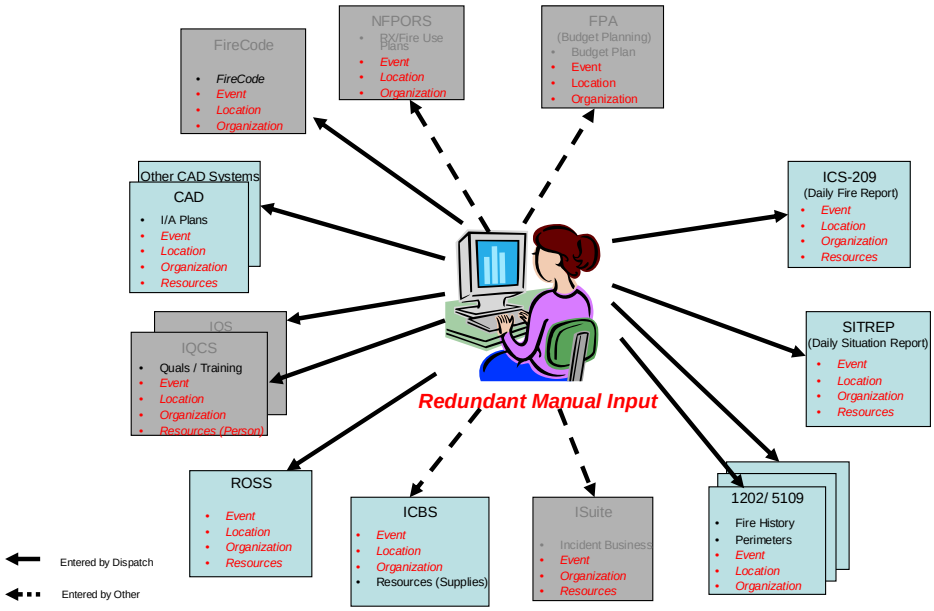

Figure 16 - Example of Redundant Data Entry

Currently, NWCG Interagency Stewardship Groups have been formed for some NWCG projects. These Stewardship groups are comprised of business-area subject matter experts (SMEs) who are able to advise the project Steering Committee regarding the business needs for the projects. This model needs to be adopted for all interagency projects to ensure that projects do not exceed their authority and develop modules that are not needed by the business community.

Description of the Future Desired (to-be) State

Wildland fire needs to implement a service-oriented architecture that focuses on shared information services (such as fire environment, fire reporting, resource management services, and dispatch services) that support wildland fire operations. Rather than individual system development efforts, Wildland Fire needs to create an environment where core data is created and maintained in a single place and re-use by other applications. An interagency strategy will be developed which will guide the wildland fire enterprise in attaining this goal. As priorities are identified, systems will be re-engineered to meet the strategic objectives.

Continued effort to create an interagency investment process will put in place the discipline for guiding investments from the initial stage of an idea to the retirement of the system. Subject matter experts will be relied upon to ensure the approved solutions are in line with the needs of the business. Enterprise architecture principles will be an integral part of the process to guarantee concurrence with the NWFEA blueprint. A key element of the to-be architect is deployment of an enterprise bus solution. This technology, controlled by NWCG, will provide the tie needed for services to interface. This will allow the varied solutions that will be deployed after re-engineering to serve each other in an efficient and cost-effective manner.

The objectives for this goal are:

GOAL 4: Systems that Increase Efficiencies and Reduce Costs and Redundancies
Objectives: *A. Manage Wildland Fire systems in a single interagency portfolio by 2010* *B. Have clearly identified authoritative systems for core fire information (e.g. incident/occurrence, fire qualifications, fire personnel, fire organizational unit) by 2010* *C. Consolidate duplicative Wildland Fire Systems into single-service-oriented modules and systems by 2014* *D. Reduce the amount of redundant data entry by users in Wildland Fire systems by 30% by 2012*

A summary of this goal's Recommendations, associated Objectives that will be met, Action Items, and expected Outcomes are included in the following table. More detailed information is contained in the follow-on narratives provided after this table.

Goal 4 Recommendations	Objective(s) that will be met	Action Items	Outcomes
4.1 Develop an Interagency Fire IT strategy and Create an Interagency Fire Portfolio Management Function	A, C	4.1.1 Develop a Wildland Fire Interagency IT strategy and Create an Interagency Fire Portfolio Management Function 4.1.2 Complete the Systems Assessment 4.1.3 Reengineer or retire systems or develop new systems in a SOA environment 4.1.4 Promote interagency collaboration on Forest Service initiatives such as the fire data warehouse and the Business Intelligence Tool Advanced Reporting System	• Better business solutions • Common priorities • Reduce redundant data entry • Reduce costs

Goal 4 Recommendations	Objective(s) that will be met	Action Items	Outcomes
4.2 Develop an End to End Fire Reporting System that provides a single point of access to authoritative Wildland Fire Information.	B, D	4.2.1 Design, develop, and maintain an End to End Fire Reporting System	• Reduced data entry • More efficient workflow • Reliable data • Shareable data • Designated 'systems of record' for core fire data
4.3 Support current and new projects.	C, D	4.3.1 Continue Incident Base Automation effort 4.3.2 Coordinate with Joint Fire Sciences Program 4.3.3 Reengineer Fire Environment (including weather) systems and supporting infrastructure 4.3.4 Continue Improvement and Operational Support of existing national interagency Wildland Fire Applications 4.3.5 Integrate with applicable wildland fire applications as appropriate (Administrative, e.g. budget, procurement) systems 4.3.6 Determine how Appropriate Management Response (AMR) requirements can be supported by Decision Support Systems	• More efficient workflow • Reduce multiple processes • Reduce Operations and Maintenance costs • Better business solutions • Shareable data • Consistency
4.4 Support and actively integrate the use of geospatial and emerging technology in wildland fire applications.	C, D	4.4.1 Use the Department of the Interior Geospatial Blueprint and USDA Geospatial standard as a guide in geospatial-enabled IT applications. 4.4.2 Engage the interagency fire geospatial community to facilitate the use of geospatial capabilities in Wildland Fire applications	• Better business solutions • Consistency

Table 7 - Goal 4 Recommendations, Action Items & Outcomes

Recommendations to Achieve the Future Desired (to-be) State for Goal 4: Systems that Increase Efficiencies and Reduce Costs and Redundancies

Recommendation 4.1: *Implement a Wildland Fire interagency strategic approach to systems management*

Action Item 4.1.1: *Develop an Interagency Fire IT strategy and Create an Interagency Fire Portfolio Management Function*

Target Date: 1/1/10

Discussion: The agency fire directors are continually approached with proposals for new IT application or enhancements to existing applications. Currently, decisions to approve or disapprove these IT initiatives are ad hoc in nature. The NWFEA Blueprint's Inventory of wildland fire applications shows the overlaps, redundancies, and gaps in the wildland fire portfolio; however, the next step that analyzes the portfolio and creates an enterprise IT strategy has not yet been completed. An interagency IT strategy should identify the priority and criteria for automating and modernizing wildland fire functions and IT infrastructure. The interagency Fire IT Investment Process indicates a need to review the proposals from an overall interagency portfolio perspective; however, the details of how this will actually occur have not been defined, plus an interagency fire portfolio function does not exist.

Expected Value: With a clearly identified set of priorities, the steady stream of funding requests would be reduced to those that are identified as priorities in the interagency IT strategy. Managers of wildland fire functional areas will be able to review the strategy to determine where their business needs fit in the overall strategy, and whether it is feasible to promote other IT initiatives. With an interagency Fire Portfolio Manager, wildland fire managers will have a single point of contact to review the existing portfolio and to obtain information about the sequence or priority of future IT initiatives.

***Expected Risk*:** There are no identified risks to having an interagency fire IT strategy; however, there are some potential threats that may interfere with the smooth implementation of the strategy such as: 1) mandates from higher authority to develop and implement a system that is not a high priority in the strategy; 2) loss of funding from one of the partnering agencies; 3) the possibility of department or agency IRBs failing to honor the priorities established by the interagency fire community.

Expected Cost: Some additional, temporary manpower (contractors, detailers, temporary hires) may be needed to develop the strategy; however, these costs should be minimal.

Action Item 4.1.2: *Complete the Systems Assessment*

Target Date: 08/01/09

Discussion: In order to create a to-be application architecture that identifies candidate systems for elimination, combining multiple systems into one system, or modification of specific systems so that they better support the future architecture the NWFEA System Assessment efforts must continue. The initial system assessment of Wildland Fire systems was limited to system owners. Their perspective is extremely valuable in the rating of systems and where they are in regards to enterprise architecture. An additional perspective which is needed is that of the stakeholders and

users of the systems which would concentrate on the value to the end user of the system, any redundancies they perceive, lack of functionality, and quality of data.

Expected Value: By implementing this action item, Wildland Fire will obtain the data necessary for complete analysis of systems and their usage by the Wildland Fire Community, including redundancies, areas for reuse, and systems for retirement. This information will influence the creation of the to-be architecture, which is a roadmap to the future of Wildland Fire systems.

Expected Risk: Some risk exists that information needed to perform the assessment will not be available (stakeholders). Lack of participation due to time constraints, other duties, or fire assignments may impact the level of questionnaires returned.

***Expected Cost*:** Some costs would be incurred by the users to complete the questionnaire, but these are minimal. Cost of the Enterprise Architecture Team or contractors for the analysis would be moderate.

Action Item 4.1.3: ***Reengineer or retire systems or develop new systems in a SOA environment***

Target Date: On-going

Discussion: Systems which are identified as candidates for reengineering would be prioritized for appropriate action, whether that be retirement, reengineering, or development of a new system. Because NWFEA recommends a Service-Oriented Architecture (SOA), any new or reengineered systems would be developed with an SOA environment as a guiding principle.

Expected Value: By implementing this action item, cost savings and other efficiencies would be realized through the retirement of systems which are no longer providing worth to the enterprise, reengineering of systems which are currently providing functional worth but may need added functionality or modifications to perform in an SOA, and new development undertaken when needed business functionality is not being met, or is being met by a system identified for retirement.

Expected Risk: No risks identified at this time. All risks would be identified in the Exhibit 300 for the investment.

Expected Cost: No costs identified at this time. All costs would be identified at the Investment Proposal stage for each system.

Action Item 4.1.4: ***Promote interagency collaboration on Forest Service initiatives such as the fire data warehouse and the Business Intelligence Tool Advanced Reporting System***

Target Date: On-going

Discussion: Forest Service has created and is continuing to populate an interagency fire data warehouse which contains information from many sources regarding fire business. Coupled with a Business Intelligence Tool and Advanced Reporting system, information can be retrieved to answer any number of queries regarding multi-agency fire activities.

Expected Value: By implementing this action item, cost savings and other efficiencies would be realized through the retirement of reporting systems which are agency or bureau specific. Robust reporting for the fire enterprise would be possible.

Expected Risk: No risks identified at this time.

Expected Cost: No costs identified at this time.

Recommendation 4.2:	***Develop an End to End Fire Reporting System that provides a single point of access to authoritative Wildland Fire Information***

Action Item 4.2.1: ***Design, develop, and maintain an End to End Fire Reporting System***

Target Date: 2011

Discussion: The previous recommendation discusses the need to complete the overall system assessment, which will take some time to complete. So that improvements to Wildland Fire systems are not stalled while the assessment is being completed, work that supports the community needs to continue. One of the pain points for Wildland Fire stakeholders is related to base fire information. Internal and external stakeholders constantly complain that there is not a single authoritative source to obtain reliable and timely fire information that begins with the ignition of a fire and follows through to the end of the incident. Wildland Fire needs to take an integrated service-oriented approach to developing an “end-to-end” fire reporting system that provides an integrated and coordinated process for collecting and reporting on incident/event data. Fire reporting is a key function of Wildland Fire, and any errors in that data can impact many other processes and systems of the Wildland Fire Enterprise.

The existing environment of wildland fire reporting was created by various wildland fire business functions with differing objectives and requirements. Each system, on its own, meets the needs of its target audience; however, when the data is consolidated for upward reporting, there is a mismatch of data. Rather than independent databases, core incident information should be stored in a single database that is used as the ADS by other applications. As the incident progresses, different processes or applications (e.g. situation reporting, 209, fire history, etc.) add data to the incident record. When the incident is closed-out, a report of all activities and resources can be generated. By creating this incident database and utilizing the "write once, read many" concept, the amount of redundant data entry would be reduced, and all fire applications could be linked to a single incident record, from which data calls could be referenced.

The following figure shows the concept for an integrated and coordinated end-to-end reporting system.

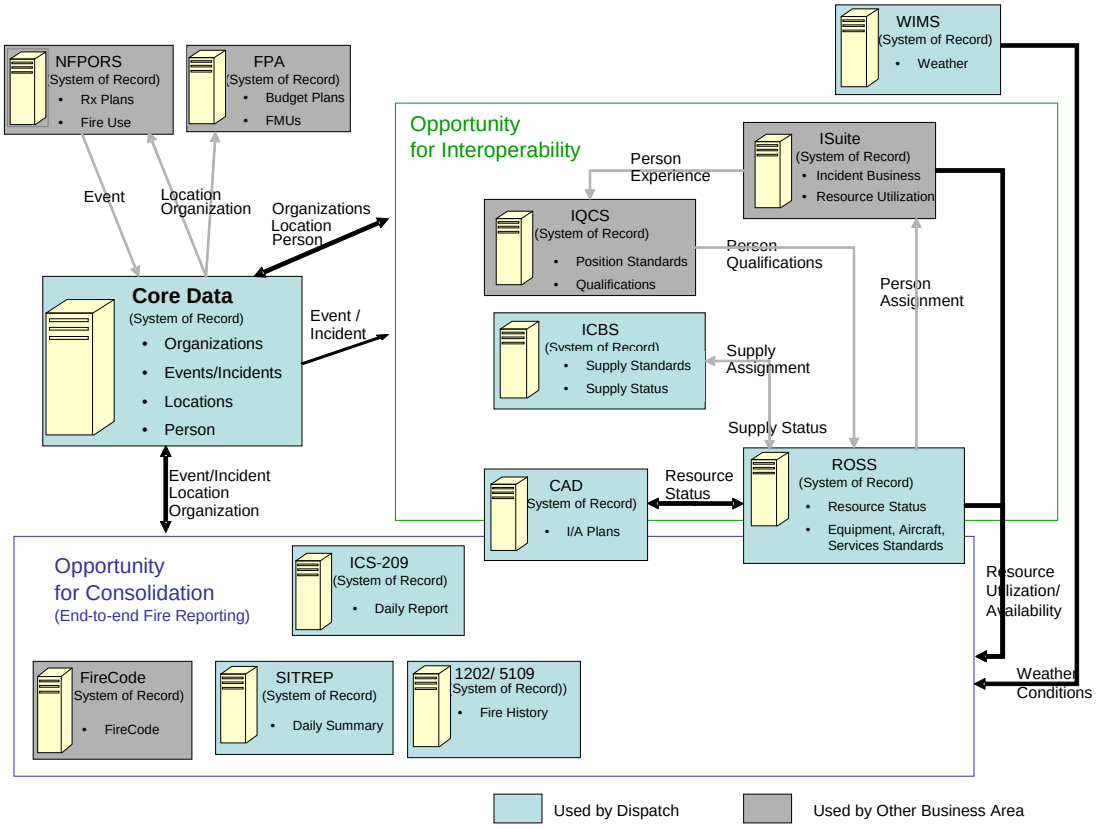

Figure 17 - Concept for End-to-End Fire Reporting

Under this approach a new system of record for standardized core incident data common to all information collection systems would be created and used by such applications as ROSS and IQCS. ROSS would serve as the system of record for core resource data used by the fire reporting, Computer-aided Dispatch (CAD), and incident business applications. A single interagency CAD application would be used to initiate an event record for all incidents.

Data from the system would be used to produce situation reports, analysis, notifications, and official (historical) fire reports. In contrast to the current approach, each of those uses of data would be based on consistent data.

The End to End Fire Reporting System project will need to develop data standard proposals that resolve the discrepancies in fire reporting data. For example, Wildland Fire needs a single incident identifier that is used to identify a fire across agency boundaries and in the various automated systems that use fire information. The fire identifier information is used in many functional areas of the enterprise, and has been manually re-input in the past.

Expected Value: By implementing this action item, entry of fire identification data would be minimize to one service, with that service available to all other applications to be integrated to accept the original base fire data. The resulting analysis will identify systems that can consolidated and/or retired, thus saving maintenance costs and reducing the amount of time spent translating

and re-keying data . Candidate systems for potential consolidation or retirement include: FireCode, 209, SitRep, and the various systems that produce 1202 and 5109 fire reports.

Benefits include:

- Standardized core incident data
- A single system of record and authoritative data source for core incident data gathered from inception to close out
- Consistent report information
- Migration to service-oriented architecture
- Decrease the amount of time currently needed to re-key data
- Decrease in system personnel time to correct erroneous data
- Decrease in fire reporting due to increase in data validity
- Elimination of stand-alone and redundant systems

***Expected Risk*:** Due to the scope of this action item, strict project management principles will be applied to ensure success and minimize scope creep. Modular project development would alleviate many of the problems associated with a large scope system.

Expected Cost: $25 million (rough estimate).

Recommendation 4.3: ***Support current and new projects.***

Action Item 4.3.1: ***Continue Incident Base Automation effort***

Target Date: On-going

Discussion: An integral part of the Wildland Fire Operations Management function is being addressed by the Incident Base Automation project. Incident business applications support the Resource, Cost, Time, Incident Action Plan, and Supply Unit functions. Automation at the incident base camp needs to support the administrative needs of interagency personnel from both an incident and an agency perspective. The IBA project needs to ensure that fire data from other systems are re-used, rather than re-created in order to ensure the integrity of fire data throughout the life of the incident. The IBA project also needs to plan for interoperability with existing interagency systems such as ROSS, End-to-End Fire Reporting, etc.

Expected Value: An immeasurable value has already been achieved through the implementation of the I-Suite application. Phase 3 of IBA look at ways to modernize and streamline incident business operations and by evaluating the use of newer technologies such as card readers, thin-client technologies, and wireless capabilities in the future applications.

Expected Risk: One of the major risks with a project of this size is project scope creep. An interagency steering committee would be necessary to guarantee that milestones are met and efforts are within the scope of the project.

Expected Cost: $10 million, Phase 3

Action Item 4.3.2: ***Coordinate with the Joint Fire Sciences Program***

Target Date: On-going

Discussion: The Joint Fire Sciences Program (JFSP) is currently involved in identification of best-of-breed science applications to reduce redundancy and overlap of current systems. Work will be done with research providers to evaluate the scientific validity of software systems, prototype and test collaborative platforms supporting interconnectivity of function and data.

Expected Value: JFSP has developed many fire environment applications that are being used on a daily basis. Reducing the redundancy of these systems and identifying best-of-breed will ensure users receive a consistent product, along with reducing costs.

Expected Risk: No risks have been identified.

Expected Cost: Moderate.

Action Item 4.3.3: ***Reengineer Fire Environment (including weather) systems and supporting infrastructure***

Target Date: Business Case by 10/1/2009

Discussion: Wildland Fire has increasingly turned to automated environmental reports for fire planning, vegetation management, and incident management. Many fire environment applications have been developed by agencies and the Joint Fire Science Program. The various agencies have developed an array of applications, models, and tools that monitor weather, assess fire effects, predict fire behavior, etc. Many of these applications are redundant and actually rely on the same input data. Analysis of the applications and the infrastructure which collects the data would lead to the discovery of redundancies, gaps, and opportunities for shared services.

Expected Value: Significant cost savings could be realized by sharing infrastructure between cooperating agencies. Candidate systems for potential consolidation or retirement include: Real-time Observation Monitor and Analysis Network (ROMAN), WIMS, WFMI Lightning and Weather, WXFire, Behave, Fire Weather Systems, ASCADS, and the various systems that produce 1202 and 5109 fire reports.

Help desks could be consolidated.

Expected Risk: No risks identified at this time.

Expected Cost: Costs will be identified by 10/1/2009.

Action Item 4.3.4: ***Continue Improvement and Operational Support of existing national interagency Wildland Fire Applications, such as:***

Target Date: On-going

Fire Plan Analysis (FPA)

LandFire System

Resource Ordering and Status System (ROSS)

Interagency Qualification and Certification System (IQCS)

Interagency Cache Business System Reengineering (ICBS-R)

Discussion: Major investment in interagency systems need to be protected by following proper product management techniques. Life cycle management, maintenance, and upgrading of hardware and software are all requirements to support existing national applications. Without continued improvement and support, systems risk obsolescence and loss of the monies invested in them.

Expected Value: By implementing this action, Wildland Fire will protect its investment in national systems and extend their lifetime through judicial updates. New analysis and development will not be required to replace the system before the end of its lifecycle.

***Expected Risk*:** No risks identified at this time.

***Expected Cost*:** Costs for ongoing maintenance and support are contained within the Exhibit-300 for each application.

Action Item 4.3.5: ***Integrate with Administrative (e.g. budget, procurement) systems***

Target Date: On-going

Discussion: Currently, much of the double entry by fire personnel comes from entering data into agency procurement, budget, and personnel records. By integrating fire services which create this data and the receiving system, less data entry would be required and quality of data would be preserved.

Expected Value: Decrease in personnel costs for entry and verification of data.

Expected Risk: No risks identified at this time.

***Expected Cost*:** No cost identified at this time.

Action Item 4.3.6: ***Determine how Appropriate Management Response (AMR) requirements can be supported by Decision Support Systems***

Target Date: 1/1/11

Discussion: Wildland Fire AMR concept allows agency administrators the ability to choose from a full spectrum of tactical actions suitable to meet fire management unit objectives. Public lands are classified through Phase One Fire Management Planning into categories for which different wildland fire management techniques are appropriate. Decision support systems would be created to quickly present the fire personnel with scenarios to help in their decision-making regarding the correct AMR, along with the appropriate response for the incident based on many different factors.

Expected Value: By implementing this action item, Wildland Fire will more efficiently use scarce resources and improve responsiveness of incident resources to emergency situations. This technology has the potential to assist the fire manager in making more informed decisions based on all factors available to the incident personnel.

Expected Risk: AMR is a relatively new approach to management of wildland fires. The inability of stakeholders to accurately define project requirements is a risk when automating a concept that has not been historically tested and refined.

Expected Cost: Significant cost is expected for this action item.

Recommendation 4.4:	***Support and actively integrate the use of geospatial and emerging technology in wildland fire applications.***

Action Item 4.4.1: ***Use the Department of the Interior Geospatial Blueprint and USDA Geospatial standards as a guide in geospatial-enabled IT applications***

Target Date: On-going

Discussion: The Department of the Interior has created a Geospatial Blueprint outlining many of the core values to be applied when using Geospatial technology. In today's world, a large number of applications have a geospatial component. By leveraging the information in the DOI Geospatial Blueprint and USDA Geospatial standards, consistency and rigor will be applied to development efforts.

Expected Value: By implementing this action item, Wildland Fire will more efficiently develop systems that are smaller in scope, re-usable, and more responsive to changes.

Expected Risk: One risk associated with this action item is the incomplete identification of services for Wildland Fire.

Expected Cost: This recommendation would be an ongoing endeavor of the Wildland Fire Investment Process.

Action Item 4.4.2: ***Engage the interagency fire geospatial community to facilitate the use of geospatial capabilities in Wildland Fire applications.***

Target Date: On-going

Discussion: Geospatial technologies enhance the textual display of information in a form that is readily understood by the human brain. When developing new systems, geospatial components are not always considered, usually due to a lack of input from geospatial experts or knowledgeable users. Many applications would benefit from the infusion of geospatial technology where warranted.

Expected Value: Improved applications that are more intuitive.

Expected Risk: No risks identified at this time.

Expected Cost: Minimal cost would be in the form of geospatial technical specialist to participate in systems analysis. Other costs would depend on the extent and platform for the geospatial interface.

Sequencing Plan

ID	Action Item No.	Task Name	2008 Q2	2008 Q3	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3
1	**Goal 4**	**Systems that Increase Efficiencies and Reduce Costs and Redundancies**																		
2	**4.1**	**Develop an Interagency Fire IT strategy and Create an Interagency Fire Portfolio Management Function**																		
3	4.1.1	Develop a Wildland Fire Interagency IT strategy and Create an Interagency Fire Portfolio Management Function																		
4	4.1.2	Complete the Systems Assessment																		
5	4.1.3	Reengineer or retire systems or develop new systems in a SOA environment																		
6	4.1.4	Promote interagency collaboration on Forest Service initiatives such as the fire data warehouse and the Business Intelligence Tool Advanced Reporting System																		
7	**4.2**	**Develop an End to End Fire Reporting System that provides a single point of access to authoritative Wildland Fire Information.**																		
8	4.2.1	Design, develop, and maintain an End to End Fire Reporting System																		
9	**4.3**	**Support current and new projects.**																		
10	4.3.1	Continue Incident Base Automation effort.																		
11	4.3.2	Coordinate with Joint Fire Sciences Program																		
12	4.3.3	Reengineer Fire Environment (including weather) systems and supporting infrastructure																		
13	4.3.4	Continue Improvement and Operational Support of existing national interagency Wildland Fire Applications																		
14	4.3.5	Integrate with applicable wildland fire applications as appropriate (Administrative, e.g. budget, procurement) systems																		
15	4.3.6	Determine how Appropriate Management Response (AMR) requirements can be supported by Decision Support Systems																		
16	**4.4**	**Support and actively integrate the use of geospatial and emerging technology in wildland fire applications.**																		
17	4.4.1	Use the Department of the Interior Geospatial Blueprint and USDA Geospatial standards as a guide in geospatial-enabled IT applications.																		
18	4.4.2	Engage the interagency fire geospatial community to facilitate the use of geospatial capabilities in Wildland Fire applications																		

Figure 18 - Goal 4 Action Item Sequencing Plan

Appendix A: Sequencing Plan for All Action Items

The following table provides the sequencing plan for all the NWFEA Action Items. This page is intended to be printed on 11 x 17-inch paper.

ID	Action Item No.	Task Name	2008 Q2	2008 Q3	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3
1	**Goal 1**	**Common Wildland Fire Governance and Business Activities**																		
2	**1.1**	**Complete the Implementation of a Unified Governance Structure**																		
3	1.1.1	Continuation/Completion of the NWCG Reorganization																		
4	1.1.2	Integrate Interagency Strategic Planning																		
5	1.1.3	Institute a Product Management Discipline																		
6	1.1.4	Move Toward a "Service-First" Organizational Concept																		
7	1.1.5	Establish a Budget Planning and Tracking Process for Interagency Initiatives																		
8	**1.2**	**Create an Interagency Information Technology (IT) Governance Framework to Guide the Management of Wildland Fire Information Systems**																		
9	1.2.1	Complete Development and Implementation of the Interagency Fire (IT) Investment Process																		
10	1.2.2	Promote the Creation of an Interagency Wildland Fire CIO Council to deal with Interagency IT Issues																		
11	**1.3**	**Maintain and Use the National Wildland Fire Architecture and Blueprint**																		
12	1.3.1	Use the National Wildland Fire Architecture and Blueprint as a Management Tool																		
13	1.3.2	Incorporate Maintenance of the Business Architecture and Blueprint into the New NWCG Organization																		
14	1.3.3	Complete the As-Is and To-Be Business Analysis and use it as feeders to the Strategic Plan																		
15	**1.4**	**Optimize Wildland Fire's Organizational Capacity for integrating into its parent agencies' proactive land management activities**																		
16	1.4.1	Ensure adequate resources for vegetation management and other proactive land management activities																		
17	1.4.2	Leverage existing resource funding to maximize coordinated interdisciplinary vegetation management projects																		
18	1.4.3	Develop adaptive management guidelines that support post-wildfire-recovery decisions on a routine basis																		
19	1.4.4	Develop smoke management guidelines that support both air quality and vegetation management objectives																		
20	**1.5**	**Improve the efficiency of response to and management of wildland Fire incidents**																		
21	1.5.1	Standardize accepted appropriate management response practices(AMR)																		
22	1.5.2	Expand, Streamline, and Accelerate the Training and Delivery of Qualified Personnel to the Workforce																		
23	1.5.3	Work with DHS to develop common standards and procedures for incident management and emergency response																		
24	1.5.4	Investigate lower-cost solutions for aviation																		
25	**1.6**	**Improve internal and external communications**																		
26	1.6.1	Develop and implement a communications plan for interagency inreach and outreach																		
27	1.6.2	Develop communication protocols for elevating issues to and from the interagency wildland fire community																		
28	1.6.3	Provide a single point of access to authoritative interagency wildland fire information																		
29	**Goal 2**	**An Integrated Data Environment**																		
30	**2.1**	**Develop and implement interagency data standards**																		
31	2.1.1	Develop a strategy and schedule for development and implementation of data standards, including necessary agreements among partners on interagency standards. (This includes geospatial data standards.)																		
32	2.1.2	Create interagency policy to incorporate new and existing NWCG data standards into existing systems' annual operating plans within 1 year of creation of the standard.																		
33	**2.2**	**Develop consistent data and data interoperability across all systems and business areas**																		
34	2.2.1	Maintain, update, and use a single wildland fire logical data model.																		
35	2.2.2	Establish authoritative data sources and/or systems of record for identified Information Classes																		
36	2.2.3	Establish policies and procedures to standardize the collection of data																		
37	**Goal 3**	**Common Technology Infrastructure and Configuration Standards**																		
38	**3.1**	**Provide a common platform for system interconnection and information sharing**																		
39	3.1.1	Implement a standardized enterprise message model and supporting technology dedicated to wildland fire usage																		
40	3.1.2	Use secure wireless network technology to further enhance the wildland firefighter's ability to access incident management support systems in a mobile environment																		
41	3.1.3	Develop an as-is and to-be architecture and transition plan for land-mobile radios.																		
42	**3.2**	**Develop a common Incident Based Automation infrastructure accepted and used by all partnering agencies**																		
43	3.2.1	Develop a Wildland Fire Technical Reference Model																		
44	3.2.2	Develop a national interagency Incident Based Automation (IBA) infrastructure																		
45	**3.3**	**Have unified acceptance of implemented Information Technology (IT) controls**																		
46	3.3.1	Use a common framework for applying IT policies, standards and guidelines																		
47	3.3.2	Partnering agencies collaborate to define a common set of controls for IT systems																		
48	**3.4**	**Establish a primary core national network of Remote Automatic Weather Stations RAWS designed to support point and gridded data applications**																		
49	3.4.1	Conduct a network analysis of RAWS and other weather stations to determine future resource sharing opportunities																		
50	3.4.2	Validate the network analysis and refine station placement through local development of fire danger rating operating plans																		
51	**Goal 4**	**Systems that Increase Efficiencies and Reduce Costs and Redundancies**																		
52	**4.1**	**Develop an Interagency Fire IT strategy and Create an Interagency Fire Portfolio Management Function**																		
53	4.1.1	Develop a Wildland Fire Interagency IT strategy and Create an Interagency Fire Portfolio Management Function																		
54	4.1.2	Complete the Systems Assessment																		
55	4.1.3	Reengineer or retire systems or develop new systems in a SOA environment																		
56	4.1.4	Promote interagency collaboration on Forest Service initiatives such as the fire data warehouse and the Business Intelligence Tool Advanced Reporting System																		
57	**4.2**	**Develop an End to End Fire Reporting System that provides a single point of access to authoritative Wildland Fire Information.**																		
58	4.2.1	Design, develop, and maintain an End to End Fire Reporting System																		
59	**4.3**	**Support current and new projects.**																		
60	4.3.1	Continue Incident Base Automation effort.																		
61	4.3.2	Coordinate with Joint Fire Sciences Program																		
62	4.3.3	Reengineer Fire Environment (including weather) systems and supporting infrastructure																		
63	4.3.4	Continue Improvement and Operational Support of existing national interagency Wildland Fire Applications																		
64	4.3.5	Integrate with applicable wildland fire applications as appropriate (Administrative, e.g. budget, procurement) systems																		
65	4.3.6	Determine how Appropriate Management Response (AMR) requirements can be supported by Decision Support Systems																		
66	**4.4**	**Support and actively integrate the use of geospatial and emerging technology in wildland fire applications.**																		
67	4.4.1	Use the Department of the Interior Geospatial Blueprint and USDA Geospatial standards as a guide in geospatial-enabled IT applications.																		
68	4.4.2	Engage the interagency fire geospatial community to facilitate the use of geospatial capabilities in Wildland Fire applications																		

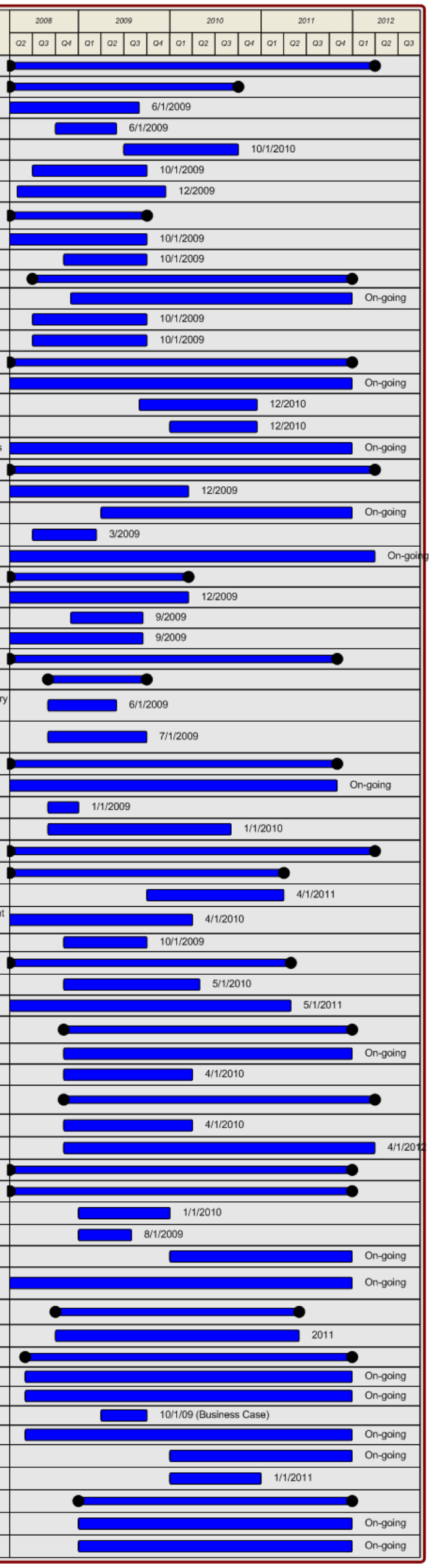

Figure 19 - Sequencing Plan for All Action Items

Appendix B: Acknowledgements

Many groups and individuals have helped to make the NWFEA Blueprint a worthy document for use by the wildland fire community for years to come. With sincere gratitude we thank the National Wildfire Coordinating Group (NWCG), the Core Blueprint Team (CBT), the NWFEA Steering Group, the NWCG Program Management Office (PMO), the contractors, and the participants of the Interagency CIO Wildland Fire IT/Radio Collaborative Sojourn.

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Appendix C: Acronyms

ADS	authoritative data source
AMR	Appropriate Management Response
ASCADS	Automated Sorting, Conversion and Distribution System
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CAD	Computer-aided Dispatch
CIO	Chief Information Officer
CPIC	capital planning and investment control
DAWG	Data Administration Working Group
DHS	Department of Homeland Security
DOI	Department of the Interior
ESB	Enterprise Service Bus
FDCC	Federal Desktop Core Configuration
FEA	Federal Enterprise Architecture
FEC	Fire Executive Council
FENWT	Fire Environment Working Team
FIPS	Federal Information Processing Standards
FISMA	Federal Information Security Management Act
FPA	Fire Plan Analysis system
FS	Forest Service
FWS	Fish and Wildlife Service
GACC	Geographic Area Coordination Center
GAO	Government Accountability Office
GIS	geographic information system
GMAC	Geographic Multi-Agency Coordinating
GTG	Geospatial Task Group
HSPD-12	Homeland Security Presidential Directive-12
IAP	Information Asset Protection
IBA	Incident Based Automation
ICBS	Interagency Cache Business System
ICBS-R	Interagency Cache Business System Reengineering
ICS	Incident Command System
IQCS	Interagency Qualifications and Certification System
IRB	Investment Review Board
IRM	Information Resource Management
IT	information technology
JFSP	Joint Fire Sciences Program
LOB	Line of Business
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NASCIO	National Association of State Chief Information Officers
NEPA	National Environmental Policy Act
NFAEB	National Fire and Aviation Executive Board
NFDRS	National Fire Danger Rating System
NFES	National Fire Equipment System
NFPORS	National Fire Plan Operations and Reporting System
NICC	National Interagency Coordination Center
NIFC	National Interagency Fire Center
NIST	National Institute of Standards and Technology
NMAC	National Multi-Agency Coordinating
NPS	National Park Service
NWCG	National Wildfire Coordinating Group
NWFEA	National Wildland Fire Enterprise Architecture
OMB	Office of Management and Budget
PDA	Personal Digital Assistant
PII	Personally Identifiable Information
PMO	Program Management Office
RAWS	Remote Automatic Weather Station
ROMAN	Real-time Observation Monitor and Analysis Network
ROSS	Resource Ordering and Status System
SME	subject matter expert
SOA	Service-oriented Architecture
SOR	system of record
TRM	Technical Reference Model
USDA	U.S. Department of Agriculture
VSA	Virtual Single Agency
WFLC	Wildland Fire Leadership Council
WFMI	Wildland Fire Management Information system
WIMS	Weather Information Management System