



# **NWCG Geospatial Task Group's Geospatial Strategic Plan**

**October 2006**



# Executive Summary

In September 2003, the General Accounting Office (GAO) published the report **GEOSPATIAL INFORMATION; Technologies Hold Promise for Wildland Fire Management, but Challenges Remain** (GAO-03-1047). One of the GAO report's recommendations was to develop an interagency geospatial strategy for effectively using geospatial information technologies in all phases of wildland fire management. The Geospatial Task Group (GTG), a subgroup of the Information Resource Management Working Team (IRMWT), under the National Wildfire Coordinating Group (NWCG) was given the task of developing this interagency geospatial strategic plan.

Geospatial technologies have been used in wildland fire management since the early 1980s. Fuels layers were developed using the Landsat Multispectral Scanner (MSS). Using Map Overlay and Statistical System (MOSS) software developed by the Bureau of Land Management (BLM) and US Fish and Wildlife Service (FWS) in the 1980s, fire planning maps were developed for Resource Management Plans and Environmental Impact Statements. Early in the 1990s, ESRI was awarded the contract as the vendor for GIS software to the USDA Forest Service (USFS) and the BLM. Soon fire occurrence maps and fire risk analyses were being produced throughout the US. By the late 1990s, recreational grade Global Positioning System (GPS) units had become popular with on-the-ground firefighters. Also occurring in the late 1990s was the launch of Quickbird and IKONOS. This made getting high resolution imagery possible for wildland fire incidents. New algorithms were developed for MODIS to detect fires and LANDSAT data was used to create burn severity maps.

During the conflagration of 2000, geospatial technologies became mature enough that wildland fires and satellite data could be portrayed interactively over the internet through the website called GeoMAC ([www.geomac.gov](http://www.geomac.gov)). From 2000-2006, the GTG has worked hard at developing geospatial data standards, converting the GIS Specialist (GISS) position to an ICS position, creating GIS standard operating procedures on incidents and communicating with the wildland fire community. Today, there are over 600 individuals in the Resource Ordering and Status System (ROSS) as GIS Specialists.

The GTG vision is that geospatial technologies are pervasive and transparent in wildland fire management and that the resulting products and services are integral to and enhance decision making in all phases of wildland fire management. The GTG continues to be a coordinated point of contact dedicated to providing high-quality information and expertise on the use of geospatial data, standards, applications, and processes in support of the interagency fire community. This plan will guide the wildland fire community to the ubiquitous use of geospatial technologies. The plan's goals cover geospatial data, systems, infrastructure, staffing, use of new products and communication.

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## Introduction / Background

### ***Intent, Approach Used and Expected Results***

In the strategic plan, the GTG has identified goals in six areas that encompass the major geospatial issues within the interagency wildland fire community. Goals are specific interim or ultimate time-based measurements to be achieved by implementing strategies in pursuit of the strategic plan objectives. The goals were categorized in the following areas:

- ✓ Geospatial data
- ✓ Systems
- ✓ Infrastructure
- ✓ Staffing
- ✓ Use of New Products
- ✓ Communication

Each year the GTG will reevaluate the strategic plan to ensure that it remains relevant. The plan itself is presented in an outline format to enhance readability. Each goal is addressed in separate sections, with the “key objectives”, “critical success factors”, “barriers”, and “strategies” in subsections.

### ***Current Situation***

Developing the Geospatial Strategic Plan was the GTG priority during the February 14-16, 2006 Geospatial Task Group Meeting. The chair of the NWCG Information Resource Management Working Team (IRMWT) guided and facilitated the GTG in creating this strategic plan during three separate meetings in the first half of 2006 (February 14-16, March 7-8 and May 2-4). Initially the GTG started out by creating the vision, mission, and goals for the interagency geospatial strategic plan. After that the GTG began the SWOT (strengths, weaknesses, opportunities, and threats) analysis using the sticky note approach to list strengths, weaknesses, threats, and opportunities for the vision. From the SWOT Analysis, the GTG created goals. Under each goal, objectives, critical success factors, barriers, and strategies were developed. In fiscal year 2007, the GTG will create action plans for the high priority strategies that were identified during a strategy weighting exercise on May 4, 2006. The strategy prioritization was generated by individually ranking each strategy’s impact on the GTG Vision, probability of success, and cost effectiveness.

### ***Decision Making Process***

Consensus is the process that the GTG uses for decision-making. The input and ideas of all GTG members are gathered and synthesized to arrive at a final decision acceptable to all. Through consensus, the GTG is not only working to achieve better solutions, but also to promote interagency cooperation and trust within the wildland fire community.

### ***The Challenge***

Working in an interagency environment continues to be complicated when using geospatial technology because of where geospatial technologies fit into the different organizations. Often this technology is just one part of an agency's information technology (IT) program and the funding is lumped in with the agency's IT investment. Usually no single program champions the use, but all programs depend upon the technology.

A solution to this issue is to have a direct funding source for geospatial technologies within the interagency wildland fire community, a functional up-to-date strategic plan, and support of geospatial technologies by all of the wildland fire directors.

## **Strategic Management**

Strategic management is a comprehensive and iterative process for directing and managing change over the long run. It positions the organization for success by leveraging strengths and opportunities while overcoming weaknesses, problems and threats.

Appendix D: Strategic Management Model, provides a comprehensive overview of the processes of strategic planning and strategic management and illustrates the iterative nature of those processes. The strategic management process is a cycle of thinking, planning, acting, monitoring, and reviewing which feeds back into the beginning of the cycle.

The components of a strategy and its associated plans include:

- ✓ the vision and mission statements
- ✓ guiding principles
- ✓ goals
- ✓ objectives, critical success factors, and barriers
- ✓ action plans (tactical plan for the implementation of the strategic plan)

The vision statement expresses the organization's highest aspirations for its strategic management efforts. The mission statement brings into focus the most important areas of accomplishment. Strategic initiatives identify how to close the "gap" between the organization's current situation and its preferred future. Strategic initiatives link "upward" to the mission and "downward" to strategic objectives.

The strategic objectives within each strategic initiative state the specific outcomes expected to be accomplished. They provide an overall sense of what exactly is desired without outlining the specific steps necessary to achieve that end. They are specific and measurable targets for accomplishment. Objectives link "upward" to strategic initiatives, link "downward" to goals, and they also link directly to outcome/effectiveness measures.

### ***NWCG Strategic Management***

The NWCG strategy incorporates a series of overarching layers which address such things as fire business, stakeholders, communications, information resources, budget, and standards (see Figure 1). A strategic plan is developed for each of these layers. The responsibility for executing the plan, for achieving the objectives and goals, and for performing the actions is shared by the NWCG members, working teams and other NWCG organizational components.

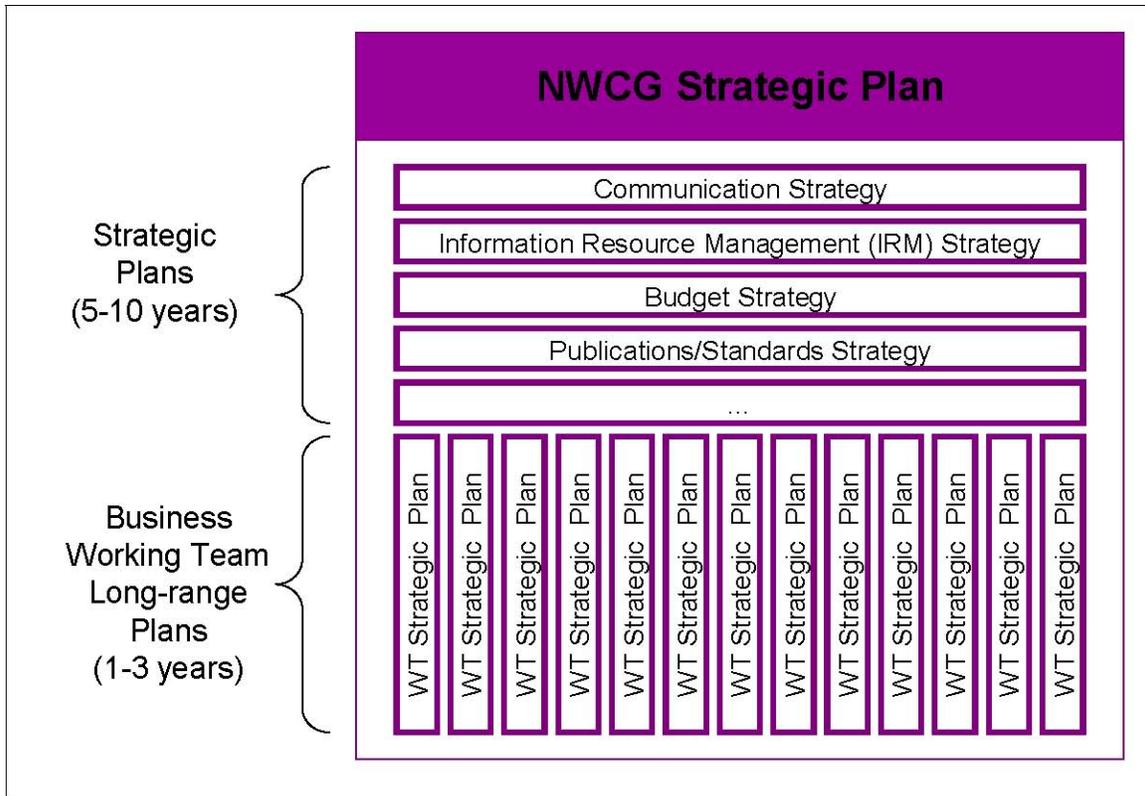


Figure 1: NWCG Strategy

Each working team, when developing their long range plan (“strategic” working team plan) to achieve their mission, must also address the overarching strategic plans.

For NWCG to be successful, all of these strategic plans need to be executed through collaboration among the entire NWCG organization and the stakeholders, both internal and external.

## **Geospatial Strategic Plan**

### ***The Geospatial Task Group Vision***

Geospatial technologies are pervasive and transparent in wildland fire management. The resulting products and services are integral to and enhance decision making in all phases of wildland fire management.

### ***The Geospatial Task Group Mission***

The Geospatial Task Group strategically facilitates and coordinates processes and communications necessary to ensure the integration, implementation and efficient use of geospatial components and technologies for the interagency wildland fire management program.

### ***The Geospatial Task Group Guiding Principles***

**Efficiency** – We believe in efficient use of resources, therefore we will evaluate processes and procedures and strive to identify, reduce and eliminate redundancies for the successful use of geospatial technologies.

**Technical Excellence** – We believe technical excellence is critical for protecting lives, property, and natural resources, therefore we will identify new and existing technologies and their effective uses within all phases of wildland fire management and maintain technical excellence within the workforce through training and experience.

**Respect** – We believe in respect, therefore we value the differences in responsibilities, mission, and capability between the participating wildland fire management agencies.

**Quality** – We believe in quality, therefore we will strive for excellence in all GTG activities.

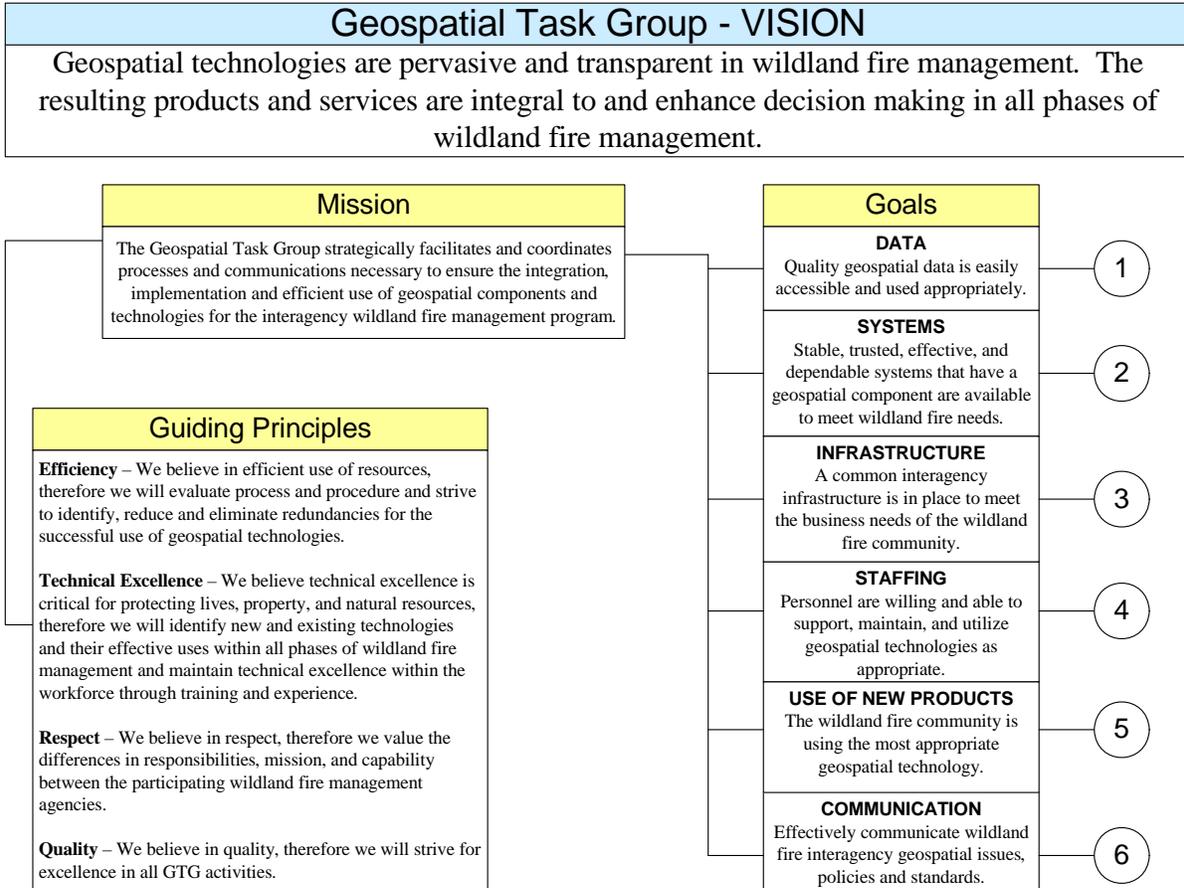


Figure 2: Vision, Mission, Guiding Principles and Goals

## **Goal 1 – Data**

Quality geospatial data is easily accessible and used appropriately.

### **Objectives**

1. Standards – Have data standards available and used for all geospatial data created by wildland fire management by 2010
2. Metadata Compliance – Achieve metadata compliance with FGDC standards on all wildland fire geospatial data by 2010
3. Existence – Maintain currency of data required to support wildland fire management geospatial decision making
4. Existence – Have current seamless data layers for fire planning and budgeting (e.g., large fire polygons, fuel characteristics, wildland urban interface, etc.) by 2015
5. Accessibility – Data for which NWCG data layer standards exist and class A GSTOP Minimum Essential Data Sets can be accessed/downloaded by 2010
6. Timeliness – Data will be available for management and public use as the needs demand as determined by the data life cycle
7. Utilization – Increase the use of consistent national interagency standard quality geospatial data every year.

### **Critical Success Factors**

1. Breaking down agency walls
2. Support from Data Administration Working Group (DAWG)
3. Field compliance – culture – policy
4. Need to know business requirements for decision making
5. Data standards in place
6. Open, collaboration between projects/business community and the geospatial community
7. Need appropriate access to data that is already collected – including non fire base data
8. Need business representation for all geospatial data
9. Need consistent message to the field – what exists

### **Barriers**

1. Not enough resources (infrastructure)
2. Concern that the geospatial products do not show what the business community wants it to show. Does not support their success stories.
3. Data is not kept current – tedious but necessary work

4. Lack of recognition by management of how difficult and expensive it is to acquire and maintain data

## Strategies

1. Develop and implement an interagency data acquisition, evaluation and distribution process
2. Initiate a project to create large fire polygon history data and coordinate with the Fire Atlas Burn Severity Project and National Archives and Records Administration (NARA)
3. Monitor and facilitate a process to maintain seamless national fuels characteristics data layers
4. Initiate a study to determine what common/core wildland fire geospatial base layers are needed at the field level for wildland fire management
5. Develop a geospatial data life cycle plan and facilitate the implementation of the plan with all wildland fire related development projects
6. Develop, implement, and maintain interagency wildland fire geospatial data standards
7. Identify a business area steward for each data layer standard

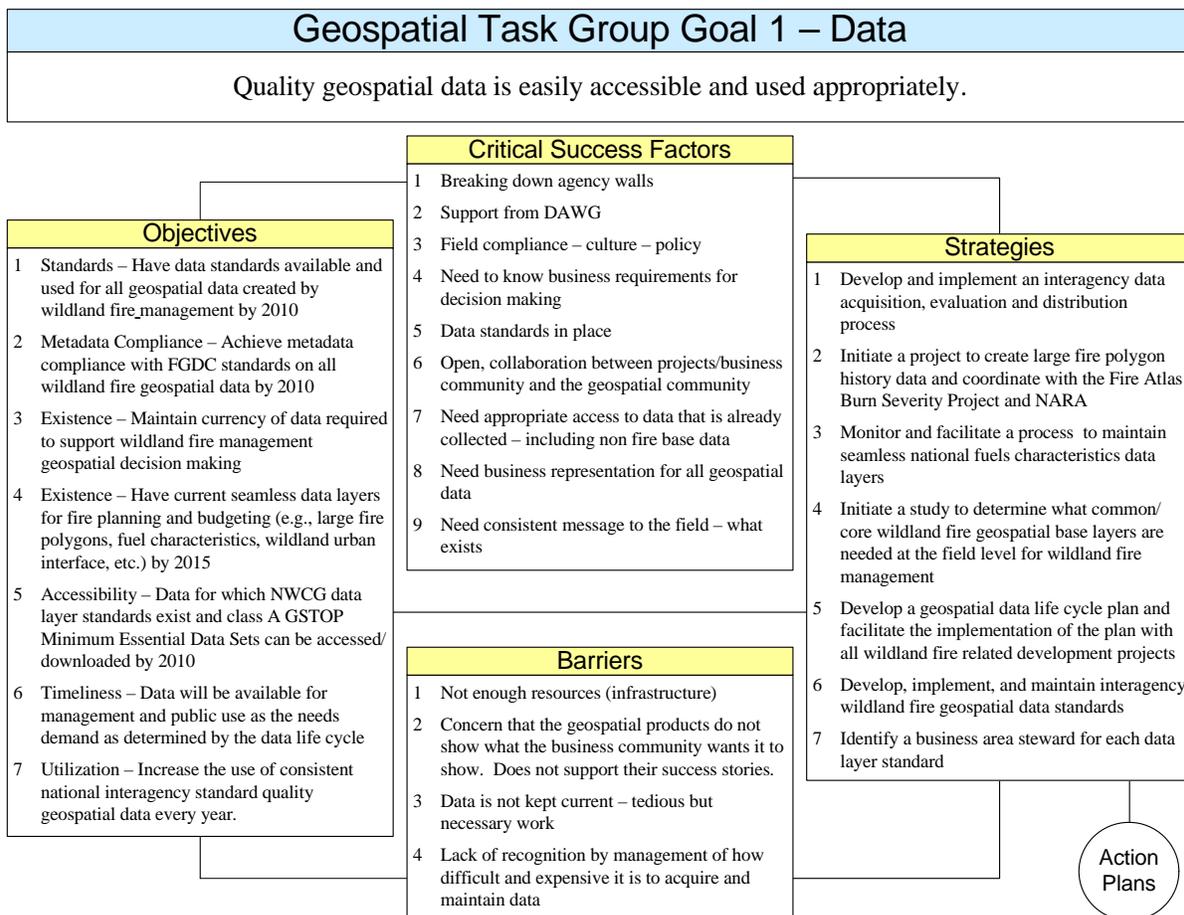


Figure 3: Goal 1 - Data

## **Goal 2 – Systems**

Stable, trusted, effective, and dependable systems that have a geospatial component are available to meet wildland fire needs.

### **Objectives**

1. Eliminate duplicate systems and applications that have a geospatial component by 2020
2. Achieve one consistent interagency methodology for configuration management (e.g. – testing, secure, stable and acceptance) by 2010
3. Availability – Have systems available when needed by 2010 (24/7)
4. Have a holistic approach to capturing and using geospatial data in systems by 2008
5. Achieve enter once use many by 2015

### **Critical Success Factors**

1. Communication and awareness of available systems
2. Coordination with EA efforts
3. Support from the business areas
4. Ability to streamline agency test/release procedures
5. Projects that create systems of record must ensure accessibility of that data to all users

### **Barriers**

1. Lack of one common Capital Planning Investment Control (CPIC) process
2. Conflicting agency security and configuration management policies
3. Resistance to change because of current investments, culture, and willingness to admit that you made a mistake

### **Strategies**

1. Develop a project, integrated with the EA, to identify systems that should have a geospatial component, ones that should not have a geospatial component, and systems that provide duplicate data to the end user.
2. Develop a project in coordination with the IRMWT that creates one consistent configuration management process
3. Identify data needs of systems and where enter once/use many is appropriate.
4. Ensure that a system of record is identified for each data type
5. Assign a GTG member as a liaison to IRM projects with a potential GIS component

- Develop and implement a two way communication plan between the GTG and projects with a geospatial component.

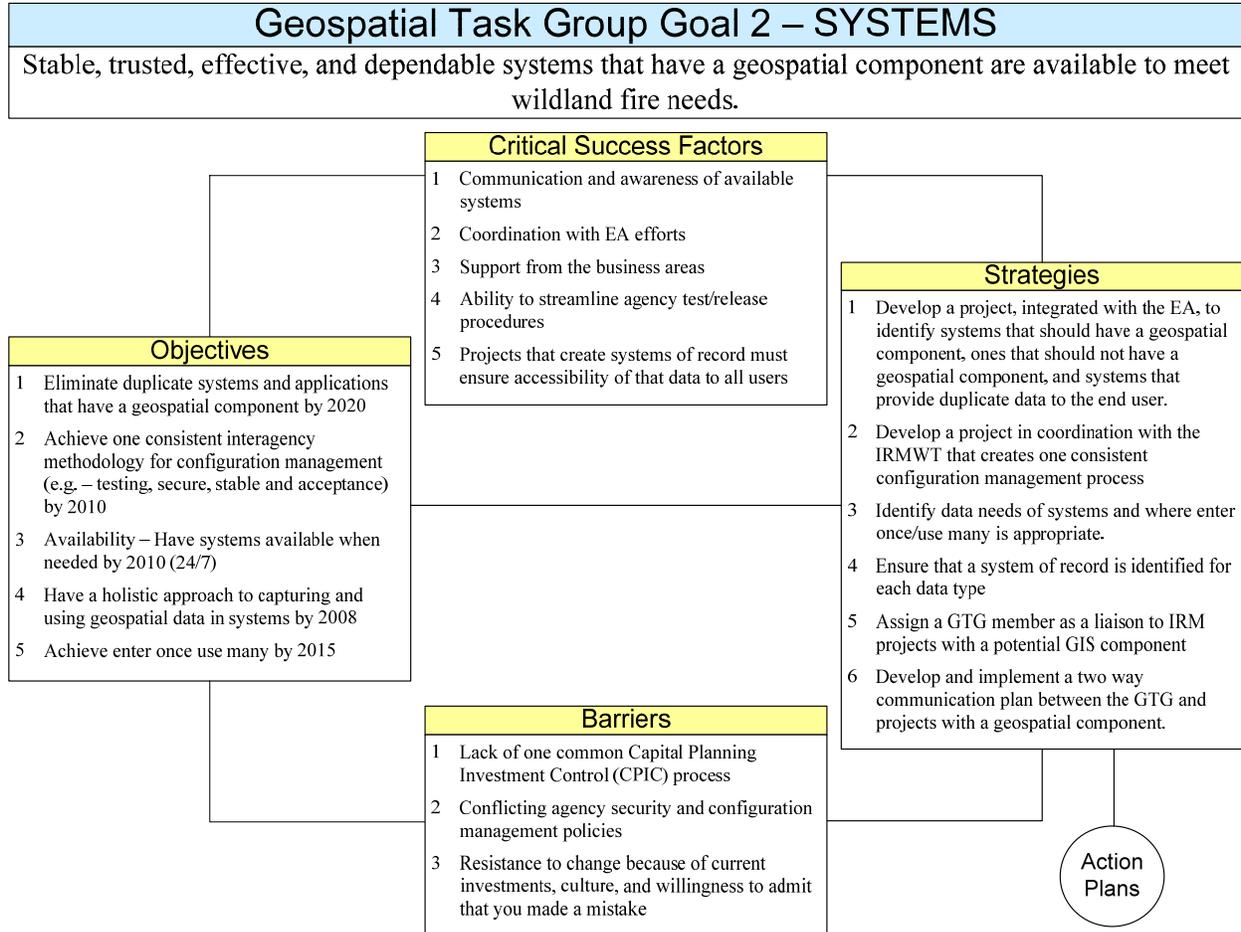


Figure 4: Goal 2 - Systems

### **Goal 3 – Infrastructure**

A common interagency infrastructure is in place to meet the business needs of the wildland fire community.

#### **Objectives**

1. Achieve a standard incident management network that facilitates both internal (incident base) and external (i.e. NMAC, ftp) communications by 2016
2. Increase the efficiencies and effectiveness of the hardware, software, and networks that support geospatial services (within and between agencies) evaluated on an annual basis.
3. Achieve the standardized implementation of off the shelf geospatial hardware and software by 2008
4. Have effective telecommunication services in place to facilitate the use of geospatial technology in all aspects of Wildland Fire Management by 2010
5. Have coordinated infrastructure support and maintenance needed to facilitate the use of geospatial technologies by 2010

#### **Critical Success Factors**

1. Acceptance of technology by Incident Management Teams (IMT)
2. Support of agency IRM organization
3. Priority/Funding to support implementation
4. Keeping “up” with new technologies

#### **Barriers**

1. Fire systems need to be an IT priority
2. Departmental differences between Department of Interior and Agriculture (DOI/AG)

#### **Strategies**

1. Participate in the NWFEA project with respect to infrastructure and systems planning
2. Propose through white papers etc. the implementation of “Improved” Technology
3. Coordinate with Computer Technical Specialist Task Group on incident infrastructure issues
4. Inform IRMWT of expected infrastructure geospatial needs on regular basis
5. Design standard wildland fire incident management team digital communications network using off-the shelf hardware and software

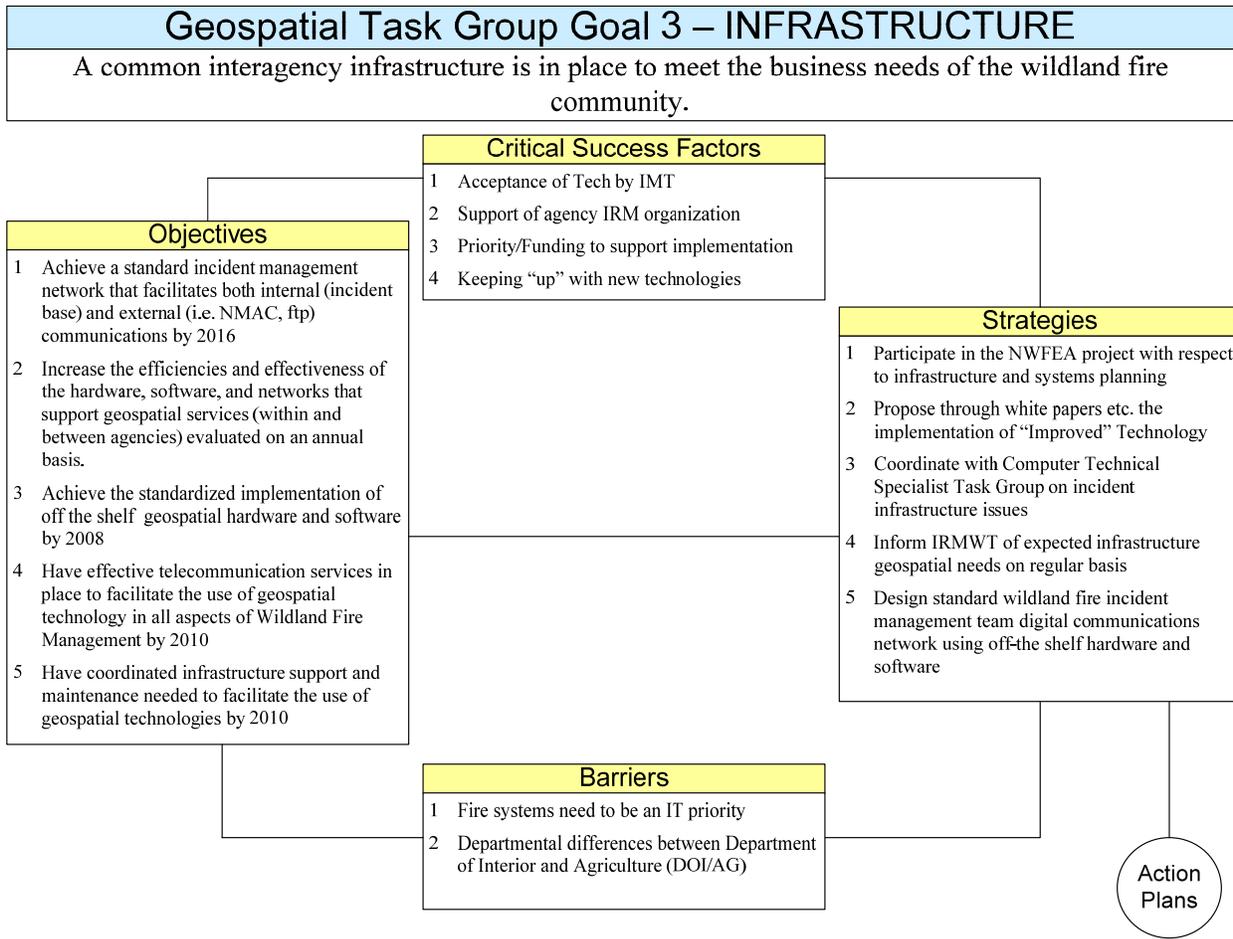


Figure 5: Goal 3 - Infrastructure

## **Goal 4 – Staffing**

Personnel are willing and able to support, maintain, and utilize geospatial technologies as appropriate.

### **Objectives**

1. Have a current training program that provides for geospatial core competencies in place each year
2. Have geospatial skills incorporated into all appropriate fire training curriculum
3. Have sufficient support staff to maintain the geospatial infrastructure
4. Increase the awareness of appropriate geospatial technologies within the wildland fire community
5. Have standard procedures and policies in place
6. Have a workforce with appropriate geospatial skills by 2010

### **Critical Success Factors**

1. Hiring correct technical skills to support infrastructure
2. Communication of geospatial technologies used/planned on being used/look forward
3. Management has an awareness of what GIS is/does

### **Barriers**

1. Hiring freeze
2. Budgets
3. Attitude/culture
4. Combining skills GIS/systems when hiring / part of another job
5. Current policies/or lack of policies

### **Strategies**

1. Support agency and interagency (intergovernmental) GIS training, workshops, and conferences
2. Work with Geospatial Training Advisory Group (GTAG) and NWCG's Training Working Team (TWT) to develop and maintain courses and taskbooks
3. Develop and propose standard procedures and policies that increase the willingness to use geospatial technology.
4. Define geospatial skills (i.e., what I can do for you) for managers/business leads
5. Develop GIS wildland fire Knowledge Skills and Abilities

6. Develop a project that analyzes geospatial skill set and geospatial positions that are needed for the wildland fire organization of the future
  - a. Develop a staffing model for interagency GIS wildland fire business
7. Develop a process to ensure non GIS fire staff have access to appropriate GIS training to do their job.
8. Develop and implement a geospatial mentoring program

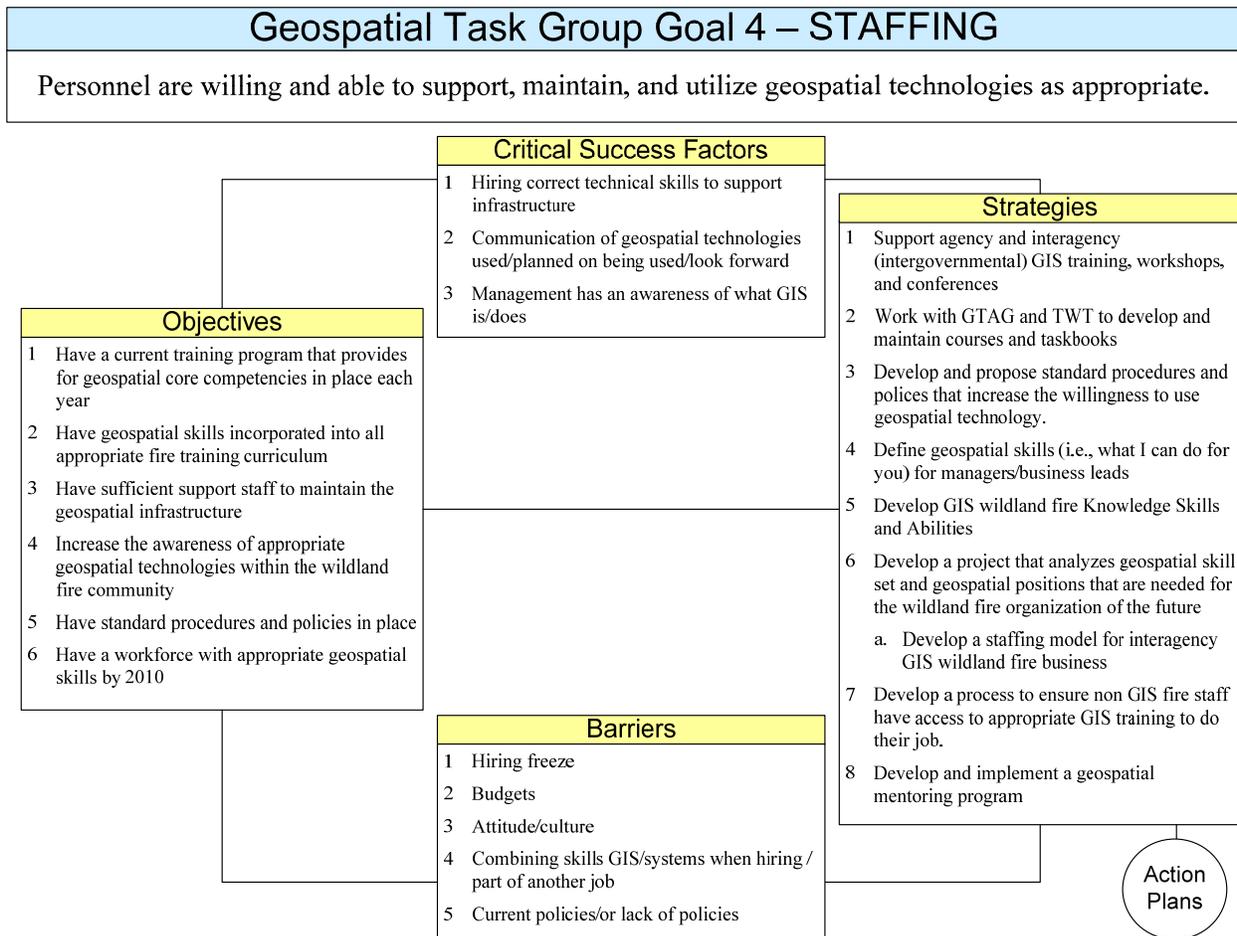


Figure 6: Goal 4 - Staffing

## **Goal 5 – Use of New Products**

The wildland fire community is using the most appropriate geospatial technology.

### **Objectives**

1. Have a process to evaluate and recommend existing, new and emerging technologies and products for possible use in wildland fire management by 2009
2. Have policies and processes in place to determine what technologies best meet wildland fire business needs
3. Appropriate new technology is used

### **Critical Success Factors**

1. Technology Transfer process in place
2. Need seed money to fund resources needed to evaluate technology
3. Coordinate with existing Enterprise Architecture
4. Have a common definition of “Appropriate”

### **Barriers**

1. Lack of a documented/accessible Enterprise Architecture
2. Lack of communications/creativity

### **Strategies**

1. Develop a process to:
  - a. Identify useful technologies
  - b. Research new products
  - c. Avoid duplication (gap analysis)
  - d. Communicate findings (to the field and management)
2. Establish evaluation criteria (e.g., Return On Investment)
3. Develop and implement a mechanism for the field to forward to the GTG information about successful use of new products
4. Ensure that presentations to the GTG of new technologies are a regular part of GTG Meetings
5. Develop an intergovernmental/departmental contact for new product development

- Develop go-no-go matrices on what new technology should be integrated into the wildland fire program.

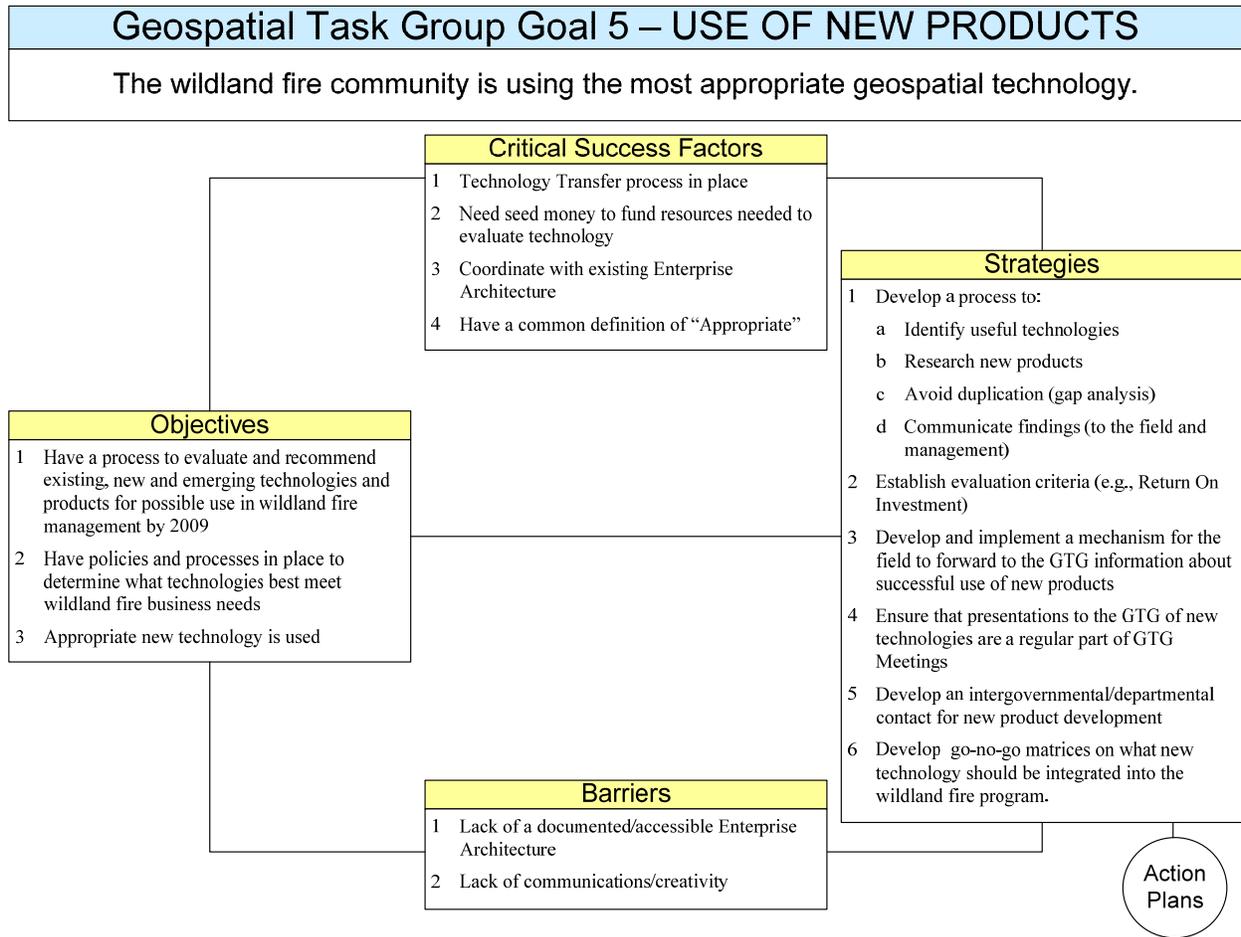


Figure 7: Goal 5 - Use of New Products

## **Goal 6 – Communication**

Effectively communicate wildland fire interagency geospatial issues, policies and standards.

### **Objectives**

1. Have a communication framework in place by 2008.
2. Have new standards communicated to the field within 60 days.
3. Have a process in place to identify and resolve interagency geospatial issues by 2008.
4. Have communication tools, processes and procedures maintained continually and evaluated on an annual basis.
5. Champion new technology that meets business needs

### **Critical Success Factors**

1. Trust among and between wildland fire geospatial personnel and the business community
2. NWCG IRMWT and GTG is recognized as the authoritative source of wildland fire geospatial information technology
3. Need to comply with each agency's communication protocol

### **Barriers**

1. Information sharing is a low priority for agency wildland fire geospatial information technology personnel.
2. Information proliferation and overload
3. Political pressure for “success stories”
4. Rumor is quicker than official channels and may be biased

### **Strategies**

1. Develop and implement a communications plan to facilitate the exchange of new and existing interagency wildland fire geospatial information technologies and standards.
2. Create and maintain a website on wildland fire geospatial information technologies including a full list of all standard interagency geospatial data sets and how to access them
3. Coordinate wildland fire geospatial information technology workshops and seminars.
4. Assure GTG communication products are accurate, fair and unbiased



### ***Next Steps***

The next step is to create action plans for the high priority strategies under each goal. It is estimated that this work will start in fiscal year 2007.

## Appendices

### ***Appendix A – Acronyms***

CPIC – Capital Planning Investment Control

DAWG – NWCG Data Administration Working Group

EA – Enterprise Architecture (<http://www.nwcg.gov/nwfea/index.html>)

FGDC – Federal Geographic Data Committee ([www.fgdc.gov](http://www.fgdc.gov))

FPA – Fire Program Analysis ([www.fpa.nifc.gov](http://www.fpa.nifc.gov))

FTP – File Transfer Protocol

GIS – Geographic Information Systems

GSTOP – GIS Standard Operating Procedures Project ([gis.nwcg.gov](http://gis.nwcg.gov))

GTAG – Geospatial Training Advisory Group (<http://www.odf.state.or.us/gis/gtag/gtag.html>)

IRM – Information Resource Management

IRMWT – NWCG Information Resource Management Working Team  
(<http://www.nwcg.gov/teams/irmwt/irm.htm>)

KSA – Knowledge, Skills, and Abilities

NARA – National Archives and Records Administration ([www.archives.gov](http://www.archives.gov))

NMAC – National Multi-Agency Coordinating Group  
(<http://www.nifc.gov/nicc/administrative/nmac/index.html>)

NWCG – National Wildfire Coordinating Group ([www.nwcg.gov](http://www.nwcg.gov))

ROI – Return on Investment

TWT – NWCG Training Working Team (<http://www.fire.blm.gov/training/twt/>)

## **Appendix B – Glossary**

**FTP** - Acronym for *File Transfer Protocol*. A protocol that allows the transmission of files between computers over a network.

**Geospatial Technology** - A set of technological approaches, such as GIS, photogrammetry, and remote sensing, for acquiring and manipulating geographic data.

**GIS** - Acronym for geographic information system. An integrated collection of computer software and data used to view and manage information about geographic places, analyze spatial relationships, and model spatial processes. A GIS provides a framework for gathering and organizing spatial data and related information so that it can be displayed and analyzed.

## ***Appendix C – References***

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**Appendix D – Strategic Planning Model**

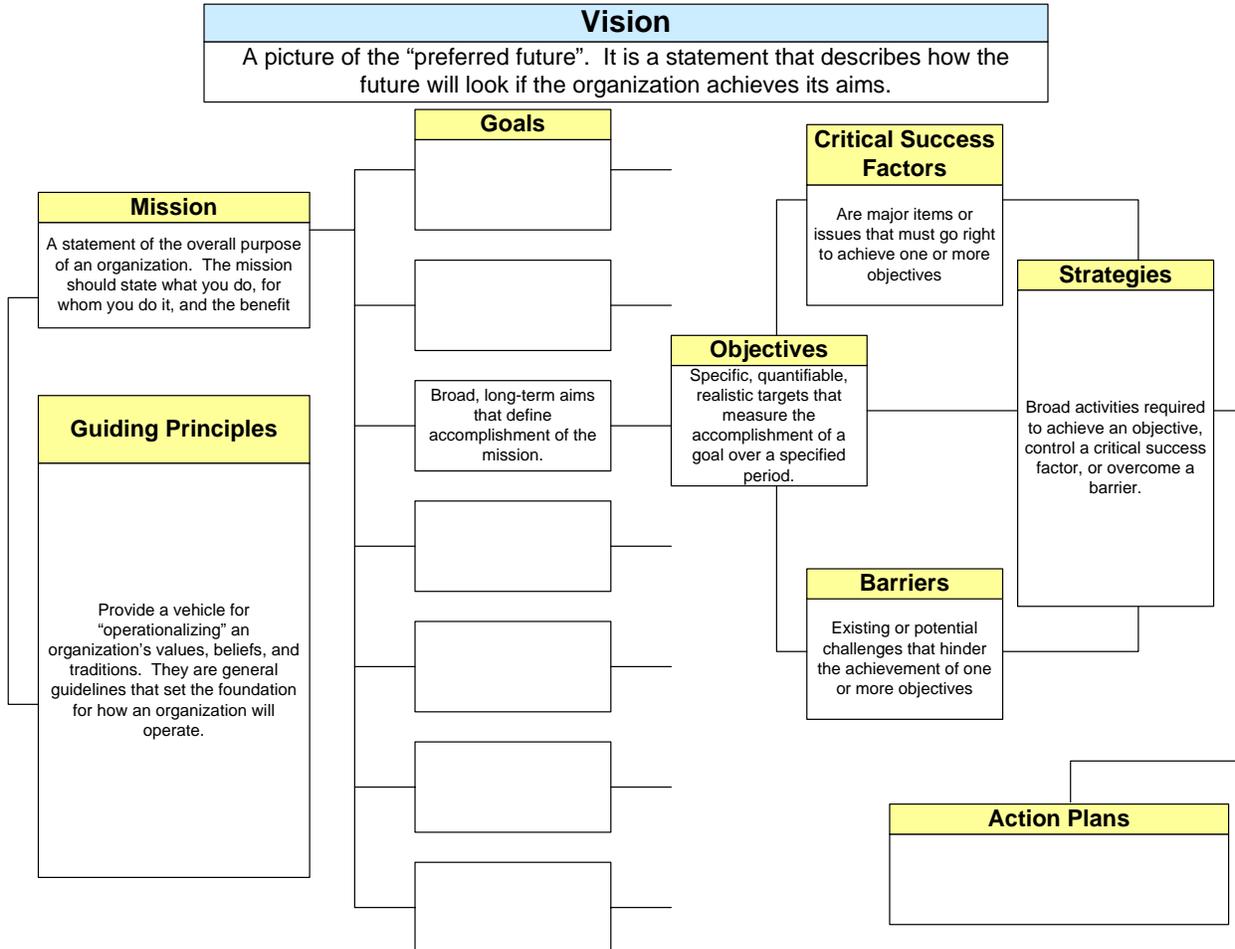


Figure 9: Strategic Planning Model

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