

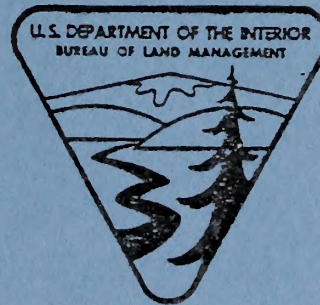
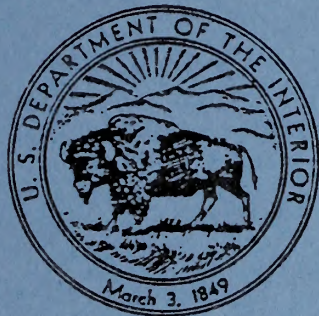


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LAND INFORMATION SYSTEM (LIS) REQUIREMENTS STUDY

VOLUME I

TECHNICAL REPORT



National Systems & Research Co.

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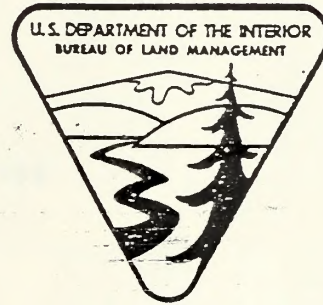
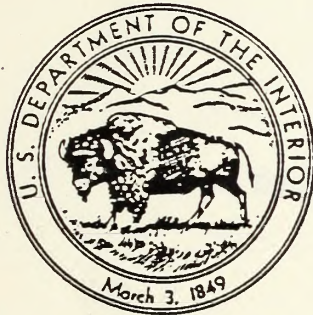
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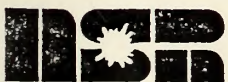


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LAND INFORMATION SYSTEM (LIS)

REQUIREMENTS STUDY

VOLUME I: TECHNICAL REPORT

Contract Number YA-551-CT7-440025

December 22, 1988

Prepared For

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
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P.O. Box 25047
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1 INTRODUCTION

1.1 Purpose

The purpose of this four-volume document is to establish and define the functional requirements of the Land Information System (LIS) for the Bureau of Land Management (BLM). The LIS requirements identified herein are based on a comprehensive analysis of the Bureau's Land and Minerals and Technical Activities programs. Upon verification and final approval by the Bureau, the requirements will be incorporated into the LIS Functional Specification as part of the Request for Proposal (RFP) solicitation package.

1.2 Scope

This four-volume document focuses on the automation of the Bureau's Land and Minerals Records functions and Technical Activities functions, including spatial processing. Figure 1-1, Scope of the LIS for the Requirements Study, identifies the case types and programs which were the basis for this study.

1.3 Background

The following paragraphs of this section provide background information relating to the history, philosophy, and role of the Bureau of Land Management as well as its future directions and goals. This information sets the stage for the automation of the Bureau's work and the requirement study necessary to determine what functions of the Bureau are to be automated.

1.3.1 BLM Mission Concept

The Bureau of Land Management (BLM) and its predecessors, the General Land Office and the Grazing Service, have performed an important function in the implementation of the nation's land policy. This policy has evolved over the past two hundred years from acquisition, through disposal, reservation and custodial management, and finally to the present intensive land, minerals, and resource management. The vital role of land in the economic, social, and political concerns of the United States has molded and refined the Bureau's applications and mission objectives.

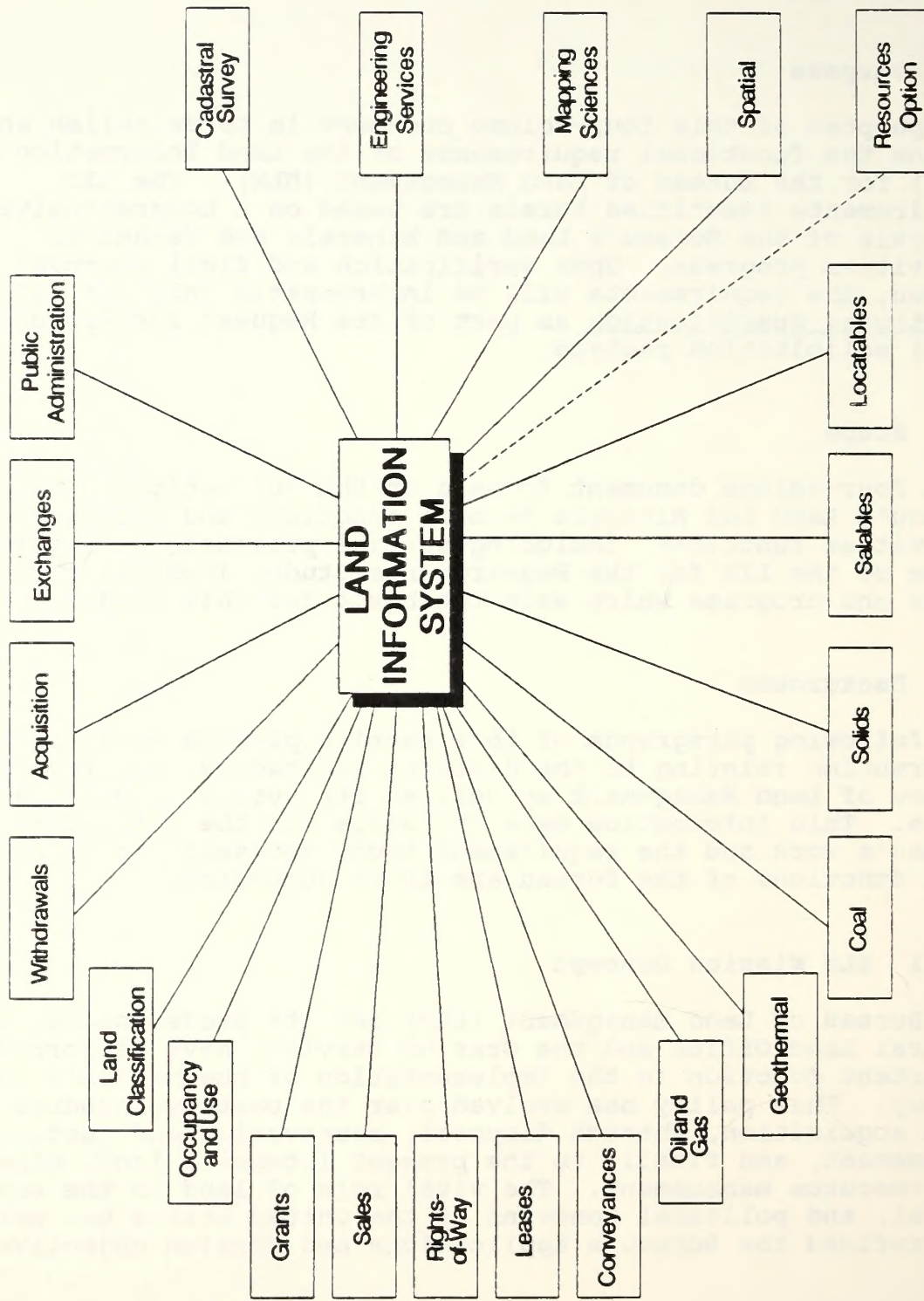


Figure 1-1. Scope of the LIS for the Requirements Study

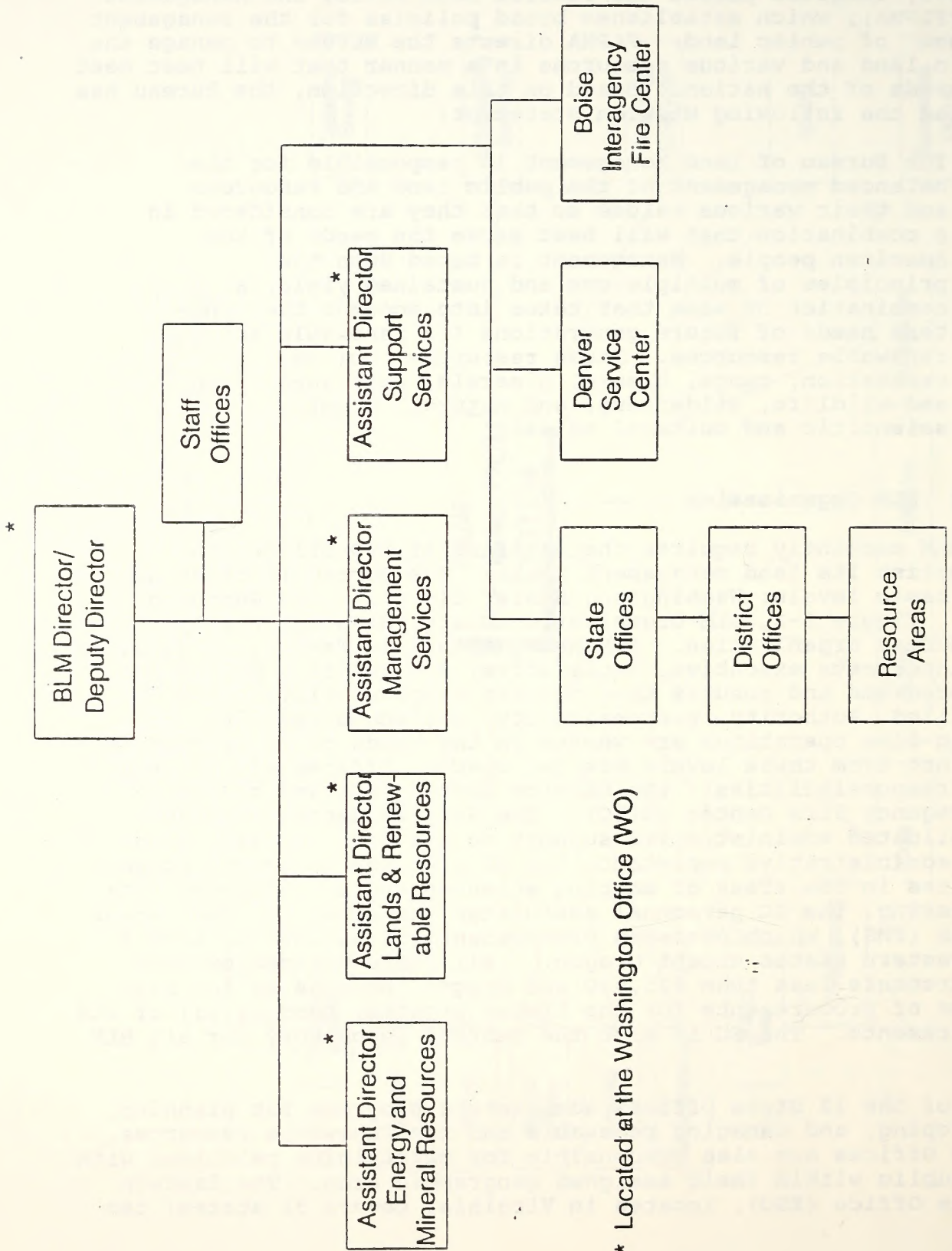
In 1976, Congress passed the Federal Land Policy and Management Act (FLPMA), which establishes broad policies for the management and use of public land. FLPMA directs the Bureau to manage the public land and various resources in a manner that will best meet the needs of the nation. Based on this direction, the Bureau has adopted the following Mission Statement:

The Bureau of Land Management is responsible for the balanced management of the public land and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple-use and sustained yield, a combination of uses that takes into account the long-term needs of future generations for renewable and non-renewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness, and natural, scenic, scientific and cultural values.

1.3.2 BLM Organization

The BLM currently requires the staffing of 220 offices to accomplish its land management tasks. The Bureau is organized at four basic levels: Washington, State, District, and Resource Area. Figure 1-2, BLM Organization Chart, displays the levels of the Bureau organization. BLM Headquarters in Washington develops and interprets executive, legislative, and judicial policy for BLM programs and ensures that program responsibilities are fulfilled. Authority, responsibility, and accountability for Bureau line operations are vested in the heads of these offices. Distinct from these levels are two special offices with Bureau-wide responsibilities: the Service Center (SC) and the Boise Interagency Fire Center (BIFC). The Service Center provides consolidated administrative support to all BLM offices. Along with administrative assistance the SC provides technical support services in the areas of mapping sciences and in Automated Data Processing. The SC personnel administer the Financial Management System (FMS), which oversees procurements of \$25,000 or more for all western states except Oregon. All State Offices oversee procurements less than \$25,000 and Oregon, because of the high volume of procurements for the timber program, handles all of its procurements. The SC is also the central repository for all BLM data.

Each of the 12 State Offices administers programs for planning, developing, and managing renewable and non-renewable resources. State Offices are also responsible for maintaining relations with the public within their assigned geographic area. The Eastern States Office (ESO), located in Virginia, covers 31 states; ten



* Located at the Washington Office (WO)

Figure 1-2. BLM Organization Chart

State Offices cover states west of, and not adjacent to, the Mississippi River; and the twelfth State Office is in Alaska.

There are 58 District Offices that report to State Offices and are responsible for administering resource management programs for land and minerals resources within their jurisdiction. There are 143 Resource Area Offices (called Area Offices) that carry out the day-to-day management of Federal land and report to District Offices. In addition to these offices, the BLM organization includes the Alaska Fire Service (AFS) and three field stations (FSS) in Alaska.

1.4 BLM Automation Strategy

The Bureau's overall automation strategy started in 1967 when the IBM Corporation completed a preliminary strategic plan identifying Bureau work functions that could be accomplished more efficiently through automation. Since then, the Bureau has taken a very cautious approach to undertaking automation. The functional requirements of the current acquisition programs are the result of years of analysis performed to ensure that only those activities which will generate the most savings or improved capabilities are automated. Overly elaborate capabilities have been avoided to save system cost and ensure a truly user oriented design.

1.4.1 ADP/Data Communications Project

In 1983, the BLM's Automated Data Processing (ADP) and Data Communications Equipment Modernization Project (ADEMP) was initiated to achieve an integrated long range strategy for meeting the Bureau's automation needs through the 1990s. This project was directed to: identify and replace obsolete or outdated equipment; acquire additional resources (e.g., staffing, funding) needed to support new automation workloads targeted for the 1990s; evaluate current automated systems against current and projected needs and develop action plans for redesigning or replacing those systems that are not cost effective; and, integrate the Bureau's automated systems, where feasible, to achieve greater standardization.

1.4.2 ALMRS Program Evolution

The Bureau initiated the Automated Land and Minerals Record System (ALMRS) program to meet the needs for its future automated capability. This, in turn, led to the formation of the ALMRS Project Office at the Denver Service Center. The organization was chartered to develop and implement an effective system for recording, maintaining, and retrieving land description,

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ownership, status, and title information in support of Federal programs and public users of such records.

As the ALMRS concept evolved, the ALMRS staff studied management concerns, feasibility, and benefit/cost ratios and published the following support documentation:

ALMRS System Description (June 1982)
Initiation Phase Documentation (August 1983)
ALMRS Program Description (March 1984)
User Requirements Document (May 1984)
Draft ALMRS Feasibility Study (June 1984)
ALMRS Concept Document (October 1984)

At the request of the BLM, the Federal Computer Performance Evaluation and Simulation Center (FEDSIM) conducted an ALMRS feasibility study, documented in the ALMRS Alternatives Analysis (December 1985). This study concluded that development of the proposed ALMRS alternative is technically feasible and that the most cost effective alternative for ALMRS is a distributed configuration, placing computers and disk storage at the Service Center and independently located Area, District, and State Offices, and connecting Washington Headquarters to the Service Center with telecommunications.

In late 1986, BLM and National Systems & Research Co. personnel began the ALMRS requirements analysis, which involved modeling the current system, modeling the proposed future system, and defining the future system. The current system was modeled using structured system analysis techniques to analyze the current method of processing case types. Analysts met with field personnel at various State, District, and Resource Area Offices who had the requisite expertise to describe specific case processing for the selected land and minerals cases, baseline records, and a series of global processes. The twenty-two volumes documenting the results of this analysis comprise the ALMRS Current System Description. After completing the current system description, the next step was to identify the future automated capabilities. This identification process is discussed in this document.

1.4.3 Land Information System Concept

The LIS concept was established by the Bureau and became a basis for determining the requirements and specifications essential to support the Bureau's mission in recording, maintaining, and retrieving land description, ownership, land use, and resource information.

The LIS concept goes back to 1986 when the BLM, in recognition of the problems associated with the existing land information

systems, decided to develop the basic components of a multipurpose cadastre applicable on a national basis. The basic components of this cadastre are geographic coordinates, ownership of land, survey, land description, and public records.

In March of 1986, the Bureau, with support and concurrence of the BLM Field Committee (the associate state directors), made a series of decisions addressing the integration of the following three areas of data into the Land Information System: (1) Land and Minerals Records (i.e., the ALMRS concept); (2) Resource information (i.e., the inclusion of Geographic Information System (GIS) capabilities and resource management requirements); and, (3) Geographic coordinates.

The LIS concept was defined initially as the integration of these elements. After further consideration by the Bureau, the LIS concept evolved to include an emphasis on management of the land and the resources associated with the land. The fundamental principles for the LIS reflect this emphasis:

- a. Land is the common base upon which sets of information are required to manage the resources associated with the land.
- b. The location of the land is one of the fundamental sets of information necessary for land management.
- c. The location of the land means not only the general geographic location but also the legal parcel description of the land.
- d. Other sets of information are necessary for land management including land ownership, land titles (e.g., color of title), easements, leases, permits, licenses, privileges, and rights-of-way, in addition to both surface and subsurface renewable and non-renewable resources.

Based on these principles, the Bureau plans to automate processes with current and/or developing technology to improve use of the BLM data assets in management of public land and resources. The deployment of a fully operational LIS by 1993 will provide the foundation for future system acquisitions. The LIS will functionally link on a national basis the three major elements for which the BLM is responsible: geographic coordinates, records, and resource data. This linkage may occur through manual procedures, through automation, or by a combination of automated and manual processes.

The LIS will be the backbone for the Bureau's fully automated modernization effort, which will also encompass administrative processes and office automation support systems. The Target

System will be designed to support and meet the workloads of the Bureau via a distributed network configuration of software, hardware, and the requisite communications components. This system will be designed to reduce overall operational cost and to support the Bureau's decentralized organizational policy.

1.4.4 Land Information System Objectives

The automation of land and minerals records as well as the resource management functions will make it possible for the BLM to achieve the objectives as stated in the ALMRS Concept Document (1985). These objectives are:

- a. Queries. Answer managerial, Congressional, Governmental, and public information queries rapidly, accurately, and comprehensively; i.e., streamline responses to Government and public inquiries.
- b. Applications and Permits. Facilitate processing of applications and permits for land and resource use.
- c. Information. Provide essential land title and resource information to industry and the public efficiently, accurately, and at low cost. In addition, provide the BLM users with responsive and manageable ADP resources to retrieve and record mission essential information (i.e., improve access to ownership and use records).
- d. Security. Improve physical and administrative security of all records, specifically protecting proprietary and confidential information.
- e. Data Accuracy. Ensure accuracy and consistency of information contained in public land and resource records.
- f. Decision Process. Expedite and improve the quality of public land program decision making by providing rapid and comprehensive resource impact and trade-off analysis; (i.e., improve the Bureau's-planning, tracking, and evaluation of its programs).
- g. Operational Costs. Reduce the costs of managing the public land and resource records.

1.5 Document Overview

The LIS Requirements Study consists of four volumes:

- a. Volume I, Technical Report contains the following Sections:
 1. Introduction provides background information and identifies the objectives of the Land Information System.
 2. BLM Mission Programs contains a brief description of current BLM programs.
 3. LIS Mission Elements describes the current work functions performed to achieve the objectives of the programs described in section 2.
 4. Methodology describes the structured analysis approach applied to develop functional requirements.
 5. Conclusions and Recommendations contains NSR's advice to the BLM concerning the results of the analysis included in this study.
- b. Volume II, User Requirements, documents the analysis performed on the case type processes and global processes of the ALMRS Current System Description and the Land Information System Technical Activities to derive LIS user requirements. Volume II describes the matrices used to conduct the candidate selection analysis and Appendix B of Volume II contains the actual matrices. Volume II concludes with a complete description of each LIS user requirement.
- c. Volume III, Functional Requirements, documents the decomposition, grouping, and allocation of the user requirements into software functional areas and subsequent functional requirements. Volume III contains descriptions of each functional requirement (i.e., the ADP software requirements for the design and development specification of the Target System). Volume III describes the worksheets used to conduct the system requirements analysis and contains the actual worksheets.
- d. Volume IV, Requirements Traceability, traces the user requirements as well as the applicable hardware and communications requirements to their respective paragraphs in the LIS Functional Specification.

2 BLM MISSION PROGRAMS

The Bureau of Land Management is an agency in the U.S. Department of the Interior with a congressional mandate to manage public land and their resources to benefit the nation and its citizens. The Bureau accomplishes its mission by managing and performing the programs currently mandated and required to support the overall Bureau objectives and goals. National Systems & Research Co. (NSR) had determined that an identification of these mission programs should be provided to establish the boundaries, scope, and direction for the requirements definition effort. The programs are grouped into Land and Minerals Cases, Resource Management Programs and Technical Support Programs. A brief description of the purpose of each program is provided in the following paragraphs. The descriptive information is based on various BLM publications such as annual activity summaries, 43 Code of Federal Regulations (CFR), and Congressional acts such as FLPMA. Figure 2-1, BLM Mission Programs, contains the list of all case types and programs that were used in this analysis or which were envisioned for future enhancement development of the Target System.

2.1 Land Cases

Under the public land laws, the Bureau processes requests for land uses from agencies and individuals both external and internal to BLM. Each of these requests, or applications, is handled as a "case." These programs are covered in various sections of the 43 Code of Federal Regulations (CFR). Not all CFR case types were included in the analysis for the LIS. The Project Office decided to exclude those cases (e.g., 43 CFR 2625, Swamp-land Grants) that are processed infrequently or not at all. Also, Alaska Conveyances, under Grants, was made a separate case type.

2.1.1 Public Administration

Public Administration includes two procedures requiring case processing: the issuance of recordable disclaimers of interest in land, and the correction of conveyance documents. The BLM issues recordable disclaimers of interests in land to help remove ambiguous titles to lands. This eliminates the necessity for court action or private legislation in those instances where the U.S. asserts no ownership or record interest. The correction of conveyance documents remedies defects or corrects errors in patents and other documents of conveyance pertaining to the disposal of public lands.

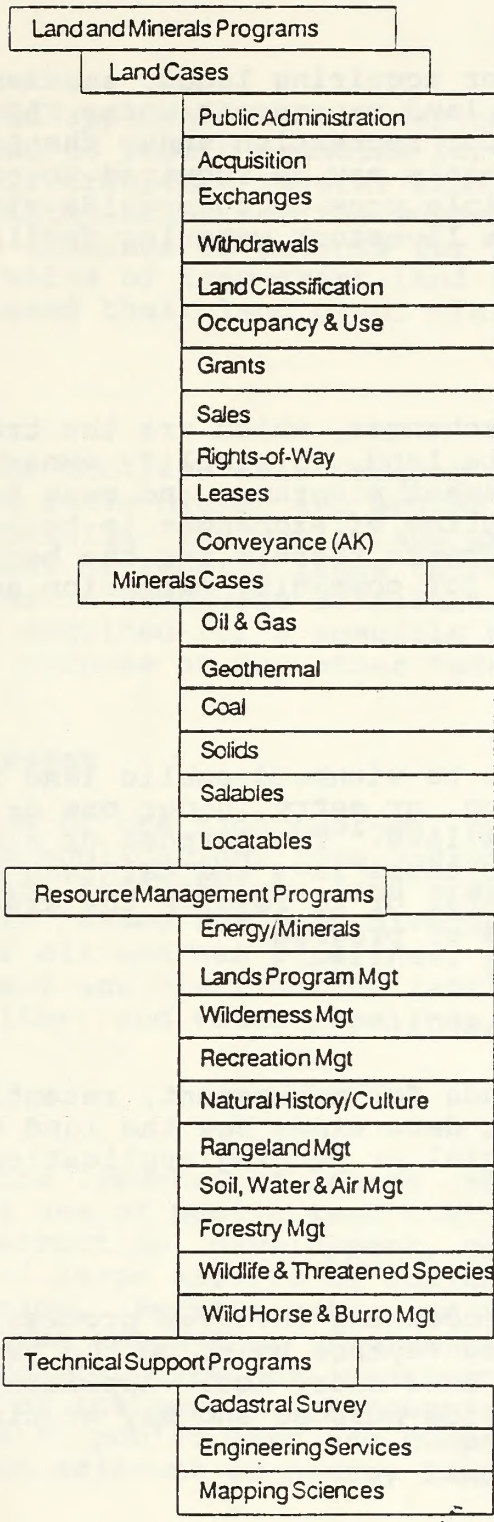


Figure 2-1. BLM Mission Programs

2.1.2 Acquisition

The BLM is responsible for acquiring lands, easements, and other rights needed for public land management under FLPMA and acquiring land valuable for recreation under the Land and Water Conservation Fund. Easements may be required to provide access to public lands for multiple uses or to provide rights for specific projects such as livestock watering facilities, fences, and communications.

2.1.3 Exchanges

The BLM processes land exchanges, which are the trading of public land for state and private land, to simplify ownership patterns, improve respective management programs, and meet both public and private needs. The objective of exchanges is to acquire and dispose of lands and interests therein for the benefit of the public interest, such as for community expansion and recreation areas.

2.1.4 Withdrawals

BLM processes withdrawals to withhold public land from settlement, sale, location, or entry, under one or more of the general land and minerals laws. The purpose of a withdrawal is to limit activities under those laws and maintain other public values in the withdrawn area or to reserve the area for a particular public purpose or program.

2.1.5 Land Classification

BLM classifies public lands for management, retention, and disposition purposes. It determines how the land will be used, independent of any potential or pending applications.

2.1.6 Occupancy and Use

Occupancy and Use case processing involves processing and executing real property conveyance based on the requirements of acts, such as the Desert Land Entry Act. Applicants occupy and use the land for a specified purpose and may acquire title to the land.

2.1.7 Grants

The BLM processes applications for various types of grants. One type conveys land to public agencies for use as airports and airways. Another transfers Federal land to states to satisfy indemnity land entitlement for the support of schools. A third area covers the issuance of patents for the benefit of innocent purchasers for value of land-grant land from railroad carriers which have released their land grant claims.

2.1.8 Sales

The objectives of the land sale program are to dispose of public lands that would serve higher and better uses in private ownership as identified through a land use planning process, to improve management of Federal lands through the sale of tracts that are isolated or otherwise difficult to manage, and to dispose of land acquired for a specific purpose that is no longer needed for that purpose or any other Federal purpose.

2.1.9 Rights-of-Way

The primary focus of the rights-of-way program is the processing of public demand applications from individuals, corporations, utility companies, associations, and state and local governments. Rights-of-way are issued for such diverse uses as construction and operation of oil and gas pipelines, power transmission lines, energy development and distribution facilities, access roads, communication sites, and water pipelines.

2.1.10 Leases

Leases include the issuance of leases, permits, and easements. Leases authorize use of public land that often involves substantial construction, development, or land improvement and the investment of large amounts of capital which are to be amortized over time. Permits authorize use of public land for not more than three years that involve either little or no land improvement or construction, or investment that can be amortized within the term of the permit. Easements may be required to ensure that uses of public land are compatible with non-Federal uses occurring on adjacent or nearby land.

2.1.11 Conveyances

Conveyances are processed to transfer title to land to the State of Alaska, Alaska Natives, and other Federal agencies. The State of Alaska has the right to select national forest lands in Alaska which are vacant and unappropriated at the time of their selection. The Alaska Native Claims Settlement Act grants selection right to Alaska Natives and Alaska Native Corporations.

2.2 Minerals Cases

The Bureau of Land Management administers the public mineral resources of the United States and encourages their development in accordance with statutory provisions and conservation principles. The land subject to surface and subsurface minerals development includes public land administered by the Bureau and other agencies, acquired land, and land that has been patented with some or all of the minerals reserved to the United States. Mineral development activities include the competitive and noncompetitive leasing of land for oil, gas, potash, coal, and other minerals; the sale and free use disposal of minerals not subject to the leasing or mining laws; and the location and patenting of mining claims.

Energy and Minerals Resource Management includes the resource evaluation, leasing, and supervision of Federal and Indian coal, oil and gas, geothermal resources, oil shale, tar sands, and non-energy minerals. The BLM assesses environmental impacts of proposed minerals development and implements measures to mitigate any adverse environmental effects. The BLM is also responsible for the administration of laws relating to the location of claims, the mining on public lands, and for the sale of minerals materials. The program includes the economic evaluation, post-lease supervision, and inspection and enforcement aspects of resource management. Mineral resources are managed to provide a secure domestic source of energy and strategically important non-energy minerals.

- a. Fluid Energy Minerals. The Fluid Energy Minerals program includes oil and gas leasing and geothermal leasing activities. The program provides for processing additional lease adjustments and reviews of Indian mineral leases, and the implementation of legislation delegating inspection authority to states and Indian Tribes.

- b. **Solid Energy Minerals.** The Solid Energy Minerals program includes coal leasing and oil shale/tar sands leasing activities. The Bureau uses geologic reports of site inspections and the data gathered from other similar activities to determine whether or not to authorize the lease. The Bureau also needs to determine the availability of the land, who has authority, and the qualifications of the individual applying for the lease.
- c. **Non-Energy Minerals.** The Non-Energy Minerals program provides for the leasing of certain minerals, the sale of common variety minerals such as sand and gravel, and the administration of programs relating to mining on the public lands.

The Minerals Cases identified for analysis by the ALMRS-GIS Project Office are described in the following paragraphs.

2.2.1 Oil and Gas

The Oil and Gas program offers leases that provide for the right to develop and produce oil and gas resources for a specific period of time under certain agreed upon terms and conditions. The Bureau is responsible for oil and gas leases on approximately 600 million acres of public land and national forest, and private land where mineral rights have been retained by the Federal Government.

2.2.2 Geothermal Resources

The BLM issues leases of public, withdrawn, and acquired lands administered by the Departments of the Interior and Agriculture to encourage the development of geothermal resources. Geothermal deposits deep below the earth's surface are a realistic source of energy for many uses. Heat energy stored in subsurface brines, and geothermal steam pressures from controlled wells can be used to generate electricity, to desalt water, and to recover minerals. More than 95 million acres of public lands have been identified as being potentially valuable for production of this energy resource.

2.2.3 Coal

The United States owns sixty percent of coal reserves in the West, most of which are concentrated in five western Federal coal production regions located in Colorado, Montana, New Mexico, North Dakota, Utah, and Wyoming. In addition, by reserving the mineral estate at the time the land passed into private title, the Federal Government controls the leasing and reserving of coal and the other minerals underlying much private land.

2.2.4 Solids Other Than Coal

Public lands in Utah, Colorado, and Wyoming have the largest known oil shale reserves in the Free World. Tar sand deposits on Federal land in Utah may soon begin to contribute their share of energy to the Nation's needs as legal questions are cleared and technology makes tar sand development feasible. The majority of non-energy mineral leases include phosphate, sodium, potassium, lead, zinc, gold, silver, sand and gravel, and uranium. A few leases also exist for other minerals including iron ore, molybdenum, barite, quartz, copper, feldspar, fluor spar, and wavelite.

2.2.5 Salables

The BLM disposes of a common variety of mineral materials such as sand, stone, gravel, pumicite, cinders, and petrified wood from public land. Mineral materials are disposed of either by sale to the general public or by free use permit to qualified governmental and nonprofit entities.

2.2.6 Locatables

The Locatables program provides for the administration of rights granted to the public through the mining laws to prospect, explore, discover, locate, develop, extract, and process mineral deposits on the public lands. The program objectives are to encourage and protect the rights of the mining claimant; to prohibit the abuse of the mining laws; to ensure that mineral patent applicants comply with applicable laws and regulations; and to prevent unnecessary and undue degradation from operations under the mining laws to other resource values on the public land.

2.3 Resource Management Programs

The BLM is responsible for managing renewable resources such as timber, water, and wildlife, and for managing the use of public lands for recreational, ecological, scientific, and other nonconsumptive activities. The public lands contain resources of enormous national value, such as fossil fuel for America's energy needs, rangeland that contributes to the country's meat supply, and forests that supplement the nation's timber production. They provide significant recreational values and possess a vast cultural and historic heritage. They are the habitat of antelope, deer, elk, and caribou, as well as smaller wild animals and fish. Some parcels have value for community expansion, public works projects, and development by private interests.

Just as the resources overlap on the public land, these issues interrelate so that a change in the management of one resource will impact the management of another. The BLM has developed and implemented a management system to meet its multiple-use mandate and to guide its decisions and actions:

- a. A planning and decision-making process that balances alternative uses, includes public participation, and directs BLM's implementation activities;
- b. Implementation of land use plans, particularly by making on-the-ground improvements that increase productivity and resource values on the public land;
- c. Monitoring of resource conditions on the public land to determine the effectiveness of a wide range of activities; and,
- d. Service, operations, and maintenance activities to meet the public's needs and to provide cost effective protection of existing investments.

To accomplish its multiple-use mission, the BLM has developed a land use planning process called Resource Management Planning and the requisite resource management programs, which are described in the following subparagraphs.

2.3.1 Wilderness Management Programs

The Wilderness Management program provides for preservation and management through a system of inventories and studies. Wilderness data defines wilderness characteristics and describes existing uses within wilderness areas and study areas, information analyzed in the development of Resource Management Plans and specific program activities. Current Wilderness Management program emphasis includes: interim management on wilderness study areas, preparation of wilderness study reports and suitability recommendations, activity planning and management of designated wilderness areas, and coordination with the Geological Survey and Bureau of Mines on mineral surveys required by law.

2.3.2 Recreation Management Program

The Bureau of Land Management manages public land and water resources for their wildlife, scenic, archeological, and historical value. These values, in turn, enhance the quality of wilderness and outdoor recreation opportunities. The Bureau's recreation program contributes to the tourist economies of the Western States and helps satisfy the growing public demand for outdoor recreation by providing opportunities on Bureau-administered land. The more intensively used areas require direct supervision of recreational activities or of cooperative commercial and Bureau-regulated recreation operations.

2.3.3 Natural History/Cultural Resources Program

Through its Natural History Resource Management program, the BLM identifies natural areas on public land having significant scientific and educational values. The BLM develops and implements site-specific measures to protect these areas and facilitates use of the areas by researchers, educators, and other interested parties. Efforts are coordinated with other Federal agencies, State and local governments, and private institutions to identify types of natural areas needed for a balanced national system.

The current Cultural Resource Management program focuses on protection, management, and inventory of archeological, cultural, paleontological, and natural history resources on the public land. The program's primary objectives are to identify these resources, evaluate their relative importance, and determine whether management actions are appropriate for preserving unique qualities.

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BLM's Paleontological Resource Management program provides for both scientific research and public educational/recreational use of fossils on public land. Several sites are of such national and international significance that they have been designated as National Natural Landmarks.

2.3.4 Rangeland Management Program

The Rangeland Management Program ensures that land use decisions involving livestock grazing on the public land are considered in the context of multiple use, with the intent of maintaining and improving the land for the present and future needs of the American people. The general goals of the rangeland management program are:

- a. To administer livestock grazing on the public rangeland to balance use and sustain resource productivity;
- b. To protect and improve the rangeland resources through sound land planning, which includes making cost-effective investment and management decisions;
- c. To make decisions in consultation, cooperation, and coordination with lessees/permittees, affected landowners, interest groups, individuals, and other agencies; and,
- d. To make sure that improvements in rangeland provide multiple use benefits.

2.3.5 Soil, Water and Air Management Program

Protection and management of the soil, water, and air resources of the public land are basic BLM responsibilities and are central to both the short- and long-term objectives of BLM programs. Identification or inventory of existing soil, water, and air resources provides the information needed for multiple-use planning and program management.

The program emphasizes activities such as soil surveying; improving water quality through land treatment or development facilities; maintaining watershed management structures and facilities; documenting and applying for water rights for public land uses; gathering soil, water, and air quality data necessary to make resource management decisions; taking inventory of hazardous materials sites; and evaluating, ranking, and initiating cleanup action on the highest priority hazardous materials sites on public land.

2.3.6 Forestry Management Program

The BLM is responsible for the management, development, protection, and sustained yield of millions of acres of forested land. The objectives of the Forestry Management Program include maintaining productivity to help meet current and future domestic needs for timber and other wood products, offering sawtimber from commercial forest land for sale, ensuring timber sale contract compliance, issuing fuelwood and other forest permits, reforesting harvested areas, and achieving optimum conditions for tree and stand growth.

2.3.7 Wildlife Habitat/Endangered Species Program

The Wildlife Habitat Management and Endangered Species Program includes activities for the protection, management, and improvement of fish and wildlife habitats for all species dependent totally or partially on public land for food and shelter. The BLM has cooperative management agreements with other Federal and State wildlife agencies responsible for species management.

2.3.8 Wild Horse and Burro Management Program

BLM's wild horse and burro program manages the estimated 21,000 wild horses and 4,000 wild burros roaming on public land. The management of the animals is consistent with the land use planning decisions and the implementation efforts to achieve the appropriate management level. This effort includes the humane capture and efficient disposal of the old, sick, or lame animals. The BLM manages the offering of the healthy animals captured for adoption, including the screening of qualified applicants. The Wild Horse and Burro Program protects and manages the wild horses and burros through implementation of herd management area plans and the monitoring of 200 herd areas.

2.4 Technical Support Programs

Technical Support programs include cadastral survey, engineering services, and mapping sciences. These programs support the Land and Minerals and Resource Management programs in their efforts to accomplish the Bureau's mission.

2.4.1 Cadastral Survey

To properly develop and effectively manage vast areas of public domain, public land surveys are required. Surveys establish on-the-ground boundaries for public land in units that can readily be identified and recorded in official field notes and plats. The rectangular system of surveys has now been extended over 1.4 billion acres of the original 1.8 billion-acre area. The cadastral survey program provides for the identification of land boundaries and legal property descriptions to facilitate both BLM's land management programs and the need of other Federal land-managing agencies. In Alaska, surveys are performed on land selected by the State for Settlement Act and other special purposes. In other states, surveys identify land boundaries that are prerequisite to resource management activities and decisions. This primarily involves surveying to establish boundaries and obliterated boundary markers.

2.4.2 Engineering Services

Engineering services include planning, designing, constructing, building, maintaining, and supporting structures and facilities needed by various programs within the Bureau. These activities range from having input to the Resource Management Planning (RMP) process, to the actual construction and/or maintenance of a facility.

2.4.3 Mapping Sciences

Mapping Sciences includes the areas of Photogrammetry, Remote Sensing, and Cartography. Photogrammetry is the science or art of obtaining reliable measurements by means of photographs or photographic images. Remote Sensing is the blanket coverage of a specific area for special coverage, such as checking forest fire damage or determining vegetation types. Remote Sensing involves the use of photographic and earth resource satellite tools to gather information. Cartography is the art, science, and technology of making maps. Cartography is concerned with all stages of evaluation, compilation, design, and drafting required to produce a new or revised map document from all forms of basic data (definition from the Glossary of Technical Terms in Cartography).

3 LIS MISSION ELEMENTS

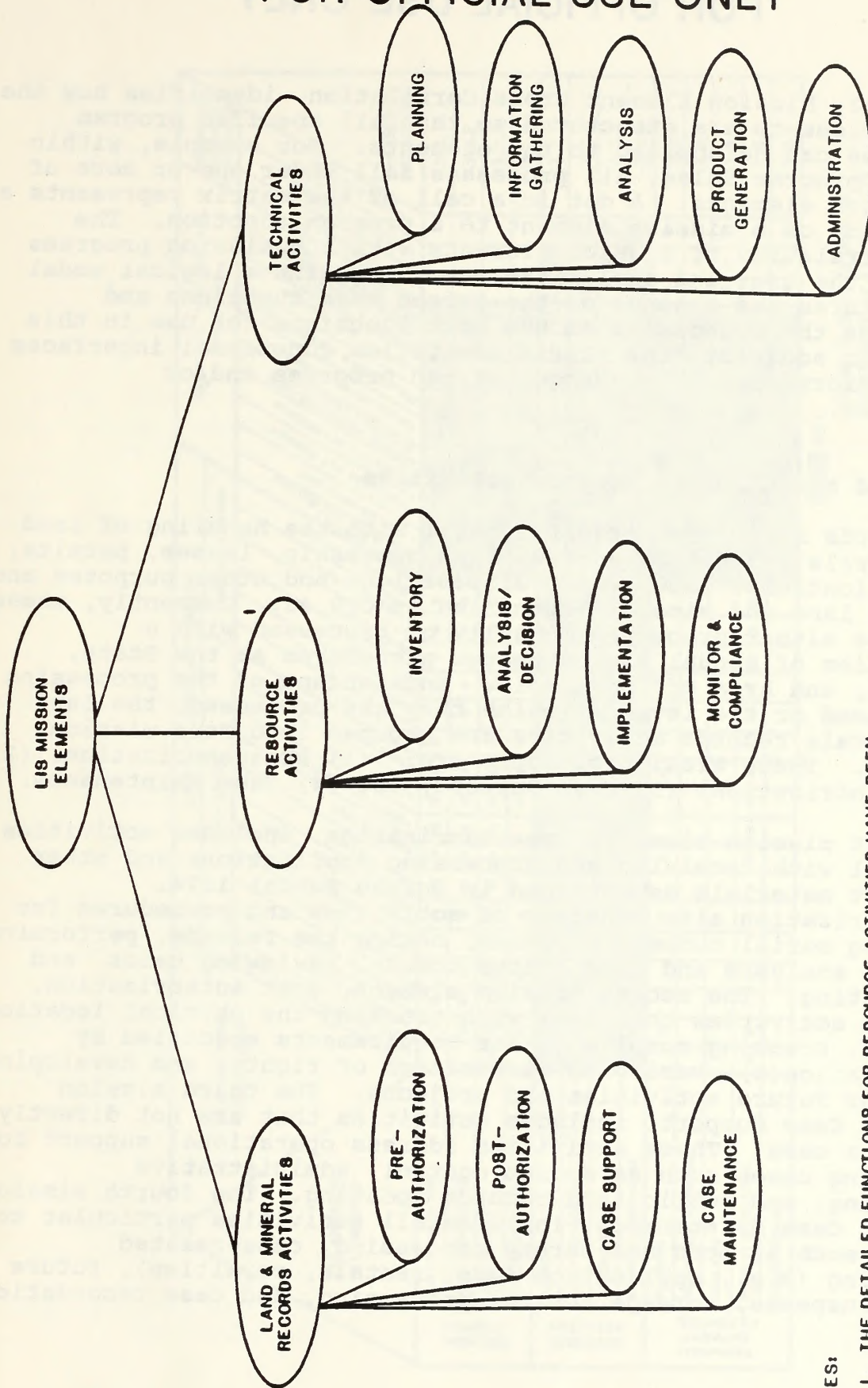
3.1 General

The purpose of this section is to provide a logical perspective on what functions are performed by the Bureau and how each function is currently being performed by the Bureau. This logical view of the BLM mission programs allows the analytical and user community to establish a common starting point for analyzing user requirements. Each viewpoint presented in this section will be referred to as an LIS Mission Element. The creation and development of the LIS mission elements are based on consensus among the LIS requirements study participants (i.e., both BLM and contractor personnel).

The LIS Mission Elements identify the current work functions performed by the Bureau. These elements provide a more detailed logical view (i.e., in terms of processing and activities) of the mission programs specified in Section 2 and lay the framework for grouping or categorizing user requirements. The description of each mission element is based on the information collected from the current system model and from information provided by specialists in the field of study.

The Land and Minerals Programs cases may be handled in a slightly different manner at each Bureau office depending on the unique requirements or operational procedures adopted for that office. Consequently, this volume presents the logical procedures and descriptions common to all applicable mission programs rather than specifying the organization and/or position performing the functions.

The activities performed by the Bureau are organized into three logical areas: land and minerals records activities, resource activities, and technical activities. Each area provides a logical envelope for identifying detailed functions (elements) such as recording, maintaining, and retrieving land status, finance, and applicant data; processing cases during preauthorization and post authorization; tracking and monitoring cases; responding to various requests for reports and statistics; and supporting public research. These areas also classify the types of effort needed to perform a task (e.g., accounting, case processing, resource evaluation) and to identify the potential automated capabilities. **Figure 3-1**, LIS Mission Elements, illustrates the mission elements discussed in this section.



NOTES:

- I. THE DETAILED FUNCTIONS FOR RESOURCE ACTIVITIES HAVE BEEN DERIVED FROM THE AUTOMATED RESOURCE REQUIREMENTS STUDY.

Figure 3-1. LIS Mission Elements

Figure 3-2, Mission Element Cross Correlation, identifies how the mission elements are structured so that all specific program activities can be applied to the elements. For example, within the land program Sales, all processes fall under one or more of the mission elements. A dot in a cell of the matrix represents a correlation of a mission element to a program function. The cross correlation of mission elements with BLM mission programs provides the user and analytical community with a logical model that captures the essence of the Bureau work functions and delineates the boundaries of the work functions for use in this study. In addition, the matrix identifies functional interfaces and/or information interchange between programs and/or activities.

3.2 Land and Minerals Records Activities

The Records Activities primarily deal with the handling of land and minerals cases that address land ownership, leases, permits, use applications, sales, land dispositions and other purposes and usage of land and minerals specified in CFR 43. Currently, these cases are either processed manually or processed with a combination of manual and automated procedures at the State, District, and Area Office levels. Independent of the processing method used or the level at which they are processed, the land and minerals records activities are grouped into four mission elements. These mission elements are: (1) Preauthorization, (2) Post Authorization, (3) Case Support, and (4) Case Maintenance.

The first mission element, Preauthorization, includes activities that deal with receiving and processing applications and other pertinent materials as outlined in Bureau Manual 1274. Preauthorization also consists of activities and procedures for assigning serial numbers to cases, noting the records, performing conflict analysis and land status checks, reviewing cases, and adjudicating. The second mission element, Post Authorization, involves activities that deal with tracking the physical location of cases, tracking compliance for requirements specified by authorization(s), verifying disposition of rights, and developing plans for future activities and projects. The third mission element, Case Support, includes activities that are not directly tied to a case. These activities address operational support for processing cases such as docket control, administrative accounting, and public land records updating. The fourth mission element, Case Maintenance, includes all activities particular to a case, such as bond and surety processing, case-related accounting (e.g., application fees, rentals, royalties), future action suspense, acreage control processing, and case recordation updates.

The Land and Minerals Records activities are primarily governed by the Code of Federal Regulations (CFR) and appropriate BLM manuals and handbooks. These activities are performed by the Bureau to process cases that fall under one of the following categories, known as case types:

LAND CASES

=====

Public Administration (1800)
 Acquisition (2100)
 Exchange (2200)
 Withdrawals (2300)
 Land Classification (2400)
 Occupancy and Use (2500)
 Grants (2600)
 Sales (2700)
 Rights-of-Way (2800)
 Leases (2900)
 Conveyance Program (Alaska)

MINERALS CASES

=====

Oil and Gas (3100)
 Geothermal (3200)
 Coal (3400)
 Solids Non-Coal (3500)
 Salables (3600)
 Locatables (3800)

3.2.1 Preauthorization

The preauthorization period of processing a case begins when an application for a requested use is accepted and ends with one of three actions: (1) issuance of a use authorization, (2) rejection of the application, or (3) withdrawal or suspension of the application. Preauthorization includes all adjudicative and administrative activities as well as the resource evaluation of the land prior to issuance of a formal decision.

In most casework, a set of standardized steps are typically followed, as outlined in the BLM Manual 1274. These steps exemplify the types of undertaking that are required during preauthorization for each BLM office; i.e., the processing of incoming applications and permits, establishment of new case files, notation of applicable land status records, adjudication proceedings of cases, investigation analyzing alternative location possibilities, preparation of environmental assessments, appraisals, development of special permit stipulations, and issuance of grants and leases.

3.2.2 Post Authorization

The post authorization period of processing a case follows the issuance of the use authorization document and continues throughout the life of the terms identified in the authorization document. Post authorization consists of the following functions:

- a. Development Plan reveals how the entity (operator) is going to develop the specified area, including the exact location of the activities and how they will be conducted.
- b. Disposition of rights, which involves assignments, renewals, and terminations of rights-of-way.
- c. Monitoring/compliance represents a check of the terms of the authorized activity, including money, and on-the-ground construction.

3.2.3 Case Support

Case support activities are not particular to a land or minerals case, but allow for the processing of all cases. Case support activities include:

- a. Docket Control. Cases, both BLM initiated and public applications/requests that are serialized, are controlled documents and thus must be maintained in a controlled environment such as Docket.
- b. Administrative Accounting. One of the objectives of fiscal accounting is to control expenditures and revenues and the application of funds for all activities through a coordinated system of programming, accounting, and budgetary reporting. This includes integration of the accounting of the Bureau with the accounting of the Treasury Department and providing information to the Office of the Secretary of Interior, the General Accounting Office, the Office of Management and Budget, and the Treasury Department. Appropriate records of all cash received are prepared immediately upon receipt and prior to deposit. Collections are forwarded to an appropriate Federal depository.
- c. Records Notation. Public Land Records are a separate entity from the Land and Minerals Program. However, information and updates are noted to the records that are initiated by actions taken on cases. These records are used by other agencies and the public for a variety of reasons. For example, many programs use Master Title Plats to locate and verify legal descriptions for parcels, mining claims, withdrawals, and other land related information.

3.2.4 Case Maintenance

Case maintenance activities are activities particular to the processing of land and minerals cases. Case maintenance activities include:

- a. Bond and Surety. To ensure compliance with stipulations and Bureau policies, bonds are processed based on cases. Coordination of surety companies/parties is required to establish safeguards in dealing with BLM customers.
- b. Case-Related Accounting. Many public applications filed for title or use of public land require a filing fee and/or rental payment or cost reimbursement payment. This money must be entered into the Federal accounting system. Thus, there is a close interface between case processing and accounting; i.e., case accounting transactions must be noted to appropriate cases for proper coordination and continued processing.
- c. Future Action Suspense. The BLM currently maintains a manual tickler file system that informs BLM personnel when certain events/actions have been accomplished or transpired. These future action events are typically associated with case files. For the purpose of modernizing the Bureau, the future action suspense function is selected for automation in the Target System.
- d. Acreage Control. Acreage control is performed by the Bureau on a daily basis. This activity primarily consists of tracking and limiting the number of acres held by an individual, corporation, or state. The entitlement or restrictions may be set by an Act of Congress or other statutory requirements.
- e. Case Recordation Updates. Updates to case files outside of normal day-to-day case processing may be required by the Bureau. For example, major changes in Congressional policies and Bureau regulations may necessitate updates to land status or case dispositions.

3.3 Resource Management Activities

The Bureau is mandated to manage resources under the concept of multiple use. In managing resources, diverse activities are required to meet statutory and regulatory requirements. Resource activities are guided by the Bureau's resource management planning system(s) and related program requirements. Each individual activity follows its portion of the land use plan for actual field operations. The specific functions and definitions of each activity have not yet been defined. However, the

resource activities can be represented within the context of the BLM mission programs as follows:

RESOURCE MANAGEMENT PROGRAMS

=====

Energy/Minerals Resources Management Program
 Land Program Management
 Wilderness Management Program
 Recreation Management Program
 Natural History/Cultural Resources Program
 Rangeland Management Program
 Soil, Water, and Air Management Program
 Forestry Management Program
 Wildlife Habitat/Threatened & Endangered Species Mgt. Prog.
 Wild Horse and Burro Management Program

Resource Activities can be categorized into four mission elements. These mission elements are: (1) Inventory, (2) Analysis/Decision, (3) Implementation, and (4) Monitoring and Compliance.

The first mission element, Inventory, includes all efforts or activities to gather, compile, and analyze resource specific data. Inventory can be viewed as a systematic acquisition and analysis of information needed to describe, characterize, and/or quantify resources for land-use planning and management of public land. The second mission element, Analysis/Decision, includes all levels of planning (e.g., land use planning, activity planning, site planning), impact analysis and compliance with the National Environmental Policy Act (NEPA), budgeting, programming, and the administrative review and approval of proposed authorized uses. These types of activities are primarily related to analysis (i.e., interpreting, manipulating, and modeling resource data in a variety of ways). In conjunction with these activities, management and technical decisions must be made to approve or deny authorization of activities and/or implementation of specific actions. The third mission element, Implementation, includes the actual management and administrative actions the Bureau takes as a result of management decisions. Implementation consists of such activities as projects that the BLM undertakes, operational work that the BLM performs, and the actual issuance of authorizations permitting other uses/activities on public land. The fourth mission element, Monitoring and Compliance, involves evaluating and assessing implementation actions to assure compliance with stipulations, trends of resource elements as a result of changes in resource management policies, and monitoring of values and activities on public land.

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3.3.1 Inventory

The BLM, since the passage of FLPMA, manages resources in the context of multiple use. To accomplish an orderly and responsive management of resources, data compilation and analysis must be performed to provide the information necessary for management decisions. Although this process includes the collection of inventory data to identify resource values on public land, the implementation of a systematic approach to analyzing information is essential in describing, characterizing, and/or quantifying resources for land use planning and management of the public land.

3.3.1.1 Data Compilation

Data compilation is defined as the process to acquire data that best defines the current status of a resource. The measurement of the resource may then be input to an automated system for storage and retrieval. Coal volume data, wildlife habitat data, sand and gravel pits, landfill locations, oil and gas wells, and fire occurrence are all examples of inventory data depicting "what is out there" and "what the Bureau must manage."

In the energy and minerals area, data is compiled for geology (mineral deposition); geochemical (identification of mineral deposits through their chemical characteristics); geophysical (identification of mineral deposits through their physical characteristics); mineral production/occurrence (location of economic or subeconomic deposits of mineral commodities); satellite imagery and aerial photography (map base and stratigraphic and structural geologic interpretation); transportation; administrative boundaries; and demographics (mineral economics).

The compilation of water resources information by the water resources specialist is difficult since water is a mobile resource and involves techniques and instrumentation somewhat unique to this discipline. The inventory provides the data, information, and interpretations that are essential for the protection and management of the water resource, for understanding its relationship with other resources, and for sound land management decisions in general. Water resource characteristics are surface and groundwater quality, quantity and distribution, water uses, and developments. Water resources are inventoried to characterize the target resource and define management opportunities for its use and development which will enhance multiple use of the BLM tract while allowing the Bureau to meet its statutory obligations to protect water resources.

Cultural resource inventory includes analytical and descriptive narrative and maps, as well as the following site attributes:

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site location, site function, cultural affiliation/historical theme, chronological placement, site size and depth, environmental setting, and site condition. The National Historic Preservation Act (1966) causes each state to have a State Historic Preservation Officer (SHPO) whose responsibility it is to maintain a state-wide inventory of cultural resource sites. All Bureau site records are contributed to the SHPO's master site files. Often the SHPO's inventory is automated. In some cases Bureau offices access the SHPO's files to supplement or use in lieu of the Bureau's own records.

Sources of recreation data include the identification of unique and high value recreation resources and areas where Bureau resources are located and capable of meeting public requirements for recreation. The data includes road traffic counts, visitor use counts (i.e., lake, river, wilderness area), visitor surveys, recreation opportunity spectrum classification, sign and road plans, scenic quality classes, use rates, distance zones, and visual sensitivity. Quantity and quality and spatial position data are collected for vegetation, landform, wildlife, and other natural resources and public use factors. Data used by the recreation program but generated by other programs includes cadastral survey data on ownership, transportation and sign plans from engineering, air photo data, hunting and other recreation data from other agencies and states, and chamber of commerce information. Wilderness creates data based on its inventories which define wilderness characteristics or describe existing uses within wilderness areas or study areas. For both programs, the raw data is compiled for analysis in Resource Management Plan (RMP) planning and specific program activities.

The basic inventory data for forest management describes the existing volume, productive capability, condition, and location of the forest resource.

Wildlife (wildlife, fisheries, threatened and endangered species of plants and animals) inventory data is collected by various methods and at various levels of intensity. Inventory involves locating, mapping, and measuring wildlife resource values, as well as identifying potential conflicts, opportunities, or areas of high interest. Wildlife data is used for planning and implementation of programs to accomplish the management objectives and goals of FLPMA, the Sikes Act, and the Endangered Species Act. The Bureau's authorized ADP system for the wildlife program is the Wildlife Information System (WIS).

Rangeland program data compilation is used to determine ecological site and ecological status.

Fire management collects and stores two data bases: historic fire occurrence and weather data from a system of remote automated weather stations (RAWS). Fire management uses data

such as surface cover types, water resources, soils, transportation systems, and elevation.

Inventory for land will use the land and minerals records for ownership and use data. General land inventory relates to the more intensive uses of land (e.g., urban-suburban, utility corridors, communication sites).

The Wild Horse and Burro Information System is made up of four separate data bases: Applicant, to record all the information about each individual who submits an application to adopt a wild horse or burro; Disposal, to track individual animals that have been captured and freezemarked; Herd Area, to store and manipulate data on the various herd areas identified by BLM; and Events, to record information about upcoming events in the program.

The Soil Resource Management Program, administered as part of the Soil, Water, and Air Management Activity, collects and maintains soil resource information at a level of intensity consistent with management needs and in accordance with the NCSS program. From this data, soil interpretations are developed, tested, and applied to guide the use and management of the soil and water resources. The soil resource inventory process includes the systematic examination, description, classification, mapping, and interpretation of the soil resource in a given geographic area. Data is displayed and presented in the form of a unique spatial concept presented through the soil map. The map is accompanied by a narrative and tabular system. Current automation of soil information includes: digitizing soil survey maps to provide the capability to generate various thematic (interpretative) maps (GIS); soil characteristics, properties, and behavioral information stored in data files at National Soil Survey Area Data Base (NSSAD) at Fort Collins, Colorado; and the SCS-SOILS 5 and 6 data bases at Ames, Iowa.

Road and other facilities are inventoried by engineers or responsible program personnel. Data on physical facilities is used for mapping, planning other activities, and monitoring the condition and cost for planning and construction of facilities.

3.3.1.2 Data Analysis

Data analysis is an essential component of inventory to provide the users with the capability to determine data currency, adequacy, and accuracy. Field data may be collected based upon statistical analysis. The editing, updating, and collection are dependent on the internal analysis that may be provided.

Land data and natural resource data are analyzed to provide for management alternatives in given locations for both short-term and long-term goals.

Fire management data analysis is used to convert cover types to fire fuel types, combine fuel type slope and occurrence to define fire problem areas, compute distance, compute area, and identify fill sites for engines using water resources and transportation system data. It provides real-time graphic presentation of the occurrences of lightning from the Automatic Lightning Detection System (ALDS), fire fuels, political boundaries (e.g., state, BLM, United States Forest Service (USFS), Bureau of Indian Affairs (BIA)), transportation networks, and RAWS locations.

Fire management decisions are based on the following factors: the potential role of fire in enhancing or inhibiting the ability to achieve resource objectives for forage management, habitat management, wilderness management, air quality management, etc.; range site and condition/forest habitat type; potential impact of wildfire on life and property; potential impacts that may occur from implementing suppression and prescribed fire actions; feasibility of adopting particular management actions needed to implement suppression and/or prescribed fire strategies; and cost of fire management actions for areas designated as fire suppression, fire use, and fuel management areas.

For the Rangeland Program, data is used to conduct an analysis of vegetation.

For recreation, various models exist to refine the data into meaningful information: travel time models, recreation needs analysis, suitability models for development, unsuitability models restricting development, off road vehicle plans, classifications, and visual resource management classification models. Wilderness suitability models, which delineate potential wilderness areas, are based on area size, wilderness value, uniqueness, and roadless criteria. This data is used by all programs to determine the extent to which wilderness classification may affect management of their resources.

Data is analyzed to identify potential conflicts that may exist among cultural resources and other resources. This analysis provides projections and estimates of the density, distribution, and character of cultural resources across the landscape for cultural and other supported resource management and Bureau planning system input needs. Raw inventory records are used to formally evaluate cultural resources and place them into categories of socio-cultural, current scientific, management, conservation, and/or potential scientific use.

Water resources data requires a large analysis workload. Examples of the analysis are:

- a. Streamflow data are run through state-discharge regressions to allow for tabulation of mean annual and mean monthly discharges,
- b. Probability distribution analysis may be required to define the frequency of floods, and
- c. The hydrologist may need to summarize quantitative diversion rights to water.

Computer support to the data analysis phase often comes from the individual working in a microcomputer environment, or from a large water resources data base available to the hydrologist, mainly through a local United States Geological Survey (USGS) or Environmental Protection Agency (EPA) contact, or through a BLM Service Center specialist.

Mineral resources data is used to quantify significance of mineral resources.

For Administrative Services, analysis of expenditures and revenue trends are important and are linked to land, mineral, and resource program activity in some cases (e.g., Bureau funding of forestry on land revested from a grant to the Oregon and California Railroad).

3.3.2 Analysis/Decision

The Bureau's mission of analysis/decision-making encompasses the areas of planning and environmental analysis. Analysis is the transformation of collected data into a form that can be used for making management decisions. Analysis is used for all levels of planning, impact analysis and NEPA compliance, budgeting, programming, and the administrative review and approval of proposed authorized uses. Analysis results in a decision that approves or denies activities and authorizations, allows specific actions to occur, or triggers some kind of implementation action.

Analysis brings together a number of factors, such as national goals and objectives and financing and resource management needs, that result in planning requirements, financial reality, environmental considerations, and operations priorities for the long and short term.

3.3.2.1 Planning

Bureau land use planning activities for analysis/decision-making include all Resource Management Planning (RMP) activities and

financial management activities. Two activities exemplifying planning are described below:

- a. The water resource program depends on the Annual Work Plan (AWP) process for the budgetary resources to accomplish the program proposed from the field offices and approved by the Soil, Water, and Air Program leaders. Soil, Water, and Air are the key creators of the technical, cost, and justification material which comprise the AWP. These comments also apply to program evaluation. Water resources are a building block resource underpinning most of what other BLM resource programs propose to do through the RMP process. Therefore, water data are used to make interpretations for the RMP as well as the Activity and Project Plans which follow the RMP.
- b. Recreation planning includes reconciliation of conflicting uses of land and specific activity plans for the recreation program such as site development, construction and maintenance, and operation. Use permits for controlling recreation activities such as hill climb races, group use of shelters, and permits to control use rates for wild and scenic river areas require interfaces to the land programs. Recreation site operations at some sites/areas involve coordination with law enforcement, either by the BLM or through arrangements with local enforcement agencies.

3.3.2.1.1 Financial Management

Bureau of Land Management programs are funded through six major operating appropriations, several minor permanent and trust appropriations, and reimbursements from other Federal agencies for work performed on their behalf. In addition, the BLM budget includes one annual appropriation and numerous permanent appropriations that provide funds to State and local governments in which Federal land resources are located. The appropriations are for payments in lieu of taxes or shared revenues from the sale, lease, or disposition of resource commodities.

3.3.2.1.1.1 Annual Work Planning

Program needs, requirements, workmonths, procurement, and contract support for each fiscal year's work plan are built into the planning cycle. Financial management planning evolves from the Annual Work Plan (AWP). The AWP forms the basis for outyear work requirements such as cadastral survey requirements, production of activity plans, and other work identified in the RMP. The AWP is divided into three tiers: the Preliminary

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Annual Work Plan (PAWP), the Annual Work Plan, and the Mid-Year Review.

The PAWP is a compilation of field office requests for funding for each task scheduled during the fiscal year. Requests from all offices are compiled into a request to Congress for the Bureau's allocation of funds.

The AWP is developed from the actual funds that Congress allocates to the Bureau. The Washington Office spreads the funding to the State Offices, which then further allocate funds to the offices within their jurisdiction. The AWP, then, may control the actual funding and, therefore, the accomplishments of certain Bureau missions.

At mid-year, management reviews the fiscal year expenditures and updates funding needs. Current allocations may be re-allocated to meet requirements, or additional funds may be requested. State and Washington Offices monitor expenditures of the AWP based upon units of accomplishment, reported every two weeks. Units of accomplishment are measured differently for each program, as they are task-oriented.

3.3.2.1.1.2 Program Evaluation

Program analysts in State and Washington Offices monitor program accomplishments and needs in light of law, policy, guidance, and budget, and to assess the efficiency and objectives of the program. The analysts provide broad evaluations of the programs to ensure that current and future direction is in keeping with the Bureau's overall objectives. The evaluations may raise management issues that can be identified for appropriate action.

Internal and external wildlife program evaluations are conducted at all levels. Data storage, data analysis, planning input and quality, program implementation, and monitoring are all evaluated.

For forest management, program tracking and costs, accomplishments, acres treated, volume in sales, etc. are currently reported through manually assembled reports and the automated material sales system.

3.3.2.1.2 Resource Management Planning

Resource Management Plans (RMPs) are prepared for Resource Areas to provide a comprehensive framework for managing resources and allocating uses of the public land. RMPs are issue driven, that is they respond to current concerns for land and resource management. RMPs also are comprehensive, in that an

Environmental Impact Statement (EIS) is accomplished to address the consequences of implementing each of several management alternatives developed in the plan. When Bureau management decides to write an RMP, it must:

- a. Follow the principles of multiple use and sustained yield;
- b. Use a systematic, comprehensive, interdisciplinary approach, fully considering physical, biological, economical, and social aspects of public land management;
- c. Identify, designate, protect, and specially manage areas of critical environmental concern (ACECs);
- d. Consider relative significance of the public land products, services, and effect on local economies;
- e. Rely on the inventory of the public land, their resources, and other values, to the extent such information is available, or conduct inventories where a lack of data is identified during preplanning;
- f. Consider present and potential uses of the public land;
- g. Consider the impact of Federal actions on adjacent or nearby Federal or non-Federal land and on private land surface over Federally-owned subsurface minerals;
- h. Consider the relative scarcity (uniqueness) of the values involved and the availability of alternative means and locators for realization of those values;
- i. Weigh long-term benefits and consequences of proposed actions against short-term benefits and consequences;
- j. Comply with applicable laws, policies, and guidance, including State and Federal air, water, noise, and other pollution standards and plans;
- k. To the extent possible with the public laws, coordinate with the resource planning and management programs of other Federal agencies and departments, State and local governments, and Indian tribes; and,
- l. Provide the public with early notice and frequent opportunities to participate in the preparation of plans.

Specific steps of the RMP process are to develop the preplanning contract, identify issues, develop planning criteria, collect inventory data and information, analyze the current management situation, formulate alternatives, estimate effects of

alternatives, select preferred alternatives, publish the draft and final RMP/EIS, select the RMP, implement the plan, and monitor and evaluate the plan.

For cultural resources, site records and inventory reports including the site evaluations are used for analysis to present the resource to management for decision.

Present and potential uses of the forested public lands are considered in the process, using the results of the inventory process as inputs.

RMPs will include land activities when appropriate (e.g., exchanges to acquire land otherwise unavailable for acquisition, easement acquisition for timber haul roads).

Fire-management-related determinations include Management Objectives, Management Areas, and Management Restrictions. Management Objectives identify fire, fire related, and fire fuels related management objectives for the subject area. Management Areas include Fire Suppression Areas, Fire Use Areas, and Fire Fuels Management Areas. Management Restrictions show where some types of fire management practices may cause unacceptable damage.

The following fire management related data are usually required during resource management planning: historical fire occurrence analysis, historical fire weather, fire effects, allocation of fire management resources, air quality standards and restrictions, and fuels management.

3.3.2.2 Environmental Analysis

Environmental Analysis includes NEA compliance activities (exclusive of inspection and enforcement), such as Environmental Impact Statements (EISs), Environmental Assessments (EAs), Categorical Exclusions (CXs) and Programmatic EAs. Environmental Analysis is accomplished in response to proposed activities on the public land. Work includes acquiring and analyzing data, describing the proposed activities, assessing the impacts of the proposed activity, and issuing a decision on the proposed action.

The Cultural Resources Program involvement in the Environmental Analysis procedure is similar to other resource programs, but includes addressing the National Historic Preservation Act at the same time as the EA. Section 106 of the act involves consultation, filing of reports, and exchange of information. Site records and inventory reports, including the site evaluations, are analyzed to present the resource to management for decision.

The Water Resources Program is both a creator and often a user of information in the task of environmental analysis. Data gathered during various inventory types and levels for the Soil, Water, and Air Program is probably some of the most extensively used environmental data in the EA process of any collected by the other renewable resource programs.

ROS classes and ORV plans and wilderness classification and allowed uses are evaluated as they interface with other proposed actions or resource uses.

For Forest Management, an environmental analysis is accomplished, as required, for proposed activities such as timber sales or vegetation treatments, such as prescribed fire or non-sale removal of trees (pre-commercial thinning). Inventory data describes the existing conditions in the forest area.

3.3.3 Implementation

Implementation includes the actual management and administrative actions the Bureau takes as a result of management decisions. Included are projects the BLM undertakes, operational work the BLM performs, and the actual issuance of authorizations permitting other uses or activities on the public land. Some examples of the types of activities performed by various resource programs are presented in the following:

- a. Cultural Resource Use Permits are issued to qualified applicants who propose to identify, evaluate, and record cultural properties on Bureau administered land. Private sector organizations providing required cultural resource inventory consultant work in support of other land use applications must hold Cultural Resource Use Permits to perform such inventory work. BLM is directly responsible for reviewing, issuing, and monitoring all cultural resource and paleontological work. The entry and tracking of information regarding these permits is automated using the Bureau's ASPN software.
- b. Water resources may provide descriptive data for a withdrawal or right-of-way application. This data may be created or simply reformatted. Often, it is placed into an environmental assessment. When the use authorization is for natural resource extraction (e.g., leasable mineral exploitation) or harvest (e.g., a timber management plan), the water or air resource data description and impact analysis may be more detailed than for land actions.
- c. In the recreation and wilderness areas, use authorization may include river use permits, guide services, recreation

area use (camping, off-road vehicle (ORV) area, etc.), motorcycle and BMX races, R&PP use, and other special use permits. Visitor use or backcountry permits may be required to limit access.

3.3.3.1 Use Authorization

Before a land use can be authorized, a determination must be made as to whether or not to allow the use. This determination is arrived at through the NEPA process of selecting the best alternative. It is documented by a Categorical Exclusion, an Environmental Assessment, or by an Environmental Impact Statement. Use Authorizations specify a variety of ways for using the public land. It could be a recreation permit for an ORV race, a firewood collection permit, jojoba picking permit, or a grazing lease.

In the forest management program, use authorization can consist of permits or a timber sale contract to remove forest products, such as timber, firewood, fence posts, poles, or Christmas trees. The authorization is for a specific quantity and for a specific geographic area. The geographic area is identified generally through the RMP and Activity Planning process and is directly supported by the inventory data. The quantity to be removed is determined by a supplementary inventory, referred to as a timber "cruise," for the specific area of use. The quantity of material removed and the funds received are tracked and accounted for in the existing "material sales" system.

3.3.3.2 Activity Planning

Activity Plans provide site-specific plans which implement broad decisions in the RMP/EIS. They include environmental assessment of the effects of these specific activities. Each Bureau program may produce an Activity Plan for its area of concern. These may include:

- a. Allotment Management Plans (AMPs)
- b. Forest Management Plans
- c. Wild Horse and Burro Management Plans (WHMP, WBMP)
- d. Wildlife Habitat Management Plans (HMPS)
- e. Fire Management Plans
- f. Off-Road Vehicle Plans (ORV Plans)
- g. Recreation Area Management Plans (RAMPs)
- h. River Management Plans
- i. Scenic Plans
- j. Site Plans
- k. Watershed Management Plans
- l. Transportation Plans
- m. Sign Plans

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- n. Initial Attack (Fire) Plans
- o. Wilderness Management Plans
- p. Wilderness Study Area Interim Plans
- q. Area of Critical Environmental Concern (ACEC) Plans
- r. Cultural Resource Management Plans (CRMPs)

Land use development potentials should be part of activity planning. For example, renewable resource plans may indicate range improvement, if significant land use changes appear imminent.

3.3.4 Monitoring and Compliance

This function includes those items associated with the monitoring and compliance of activities authorized by BLM. Monitoring consists of detecting changes in resource conditions or trends. Monitoring data is collected to determine changes, trend, or progress relative to objectives or decisions that were carried out in the planning or decision processes. Monitoring may also include monitoring human use, surveillance, and/or compliance with specific authorization, conditions, or terms. Compliance uses the results of the monitoring to determine that all terms and conditions of the authorization are being met.

The mission element Monitoring and Compliance includes the maintenance, evaluation, and adjustment of management decisions and prescriptions relating to use authorizations and program activities. The Bureau is responsible for conducting studies, enforcing the conditions assigned to use authorizations and program activities, and protecting the various coincident resource values and developmental opportunities covered under multiple use of resources on the public land.

3.3.4.1 Studies

The need for studies is predicated on BLM receiving or defining issues which relate to policy, planning, and management items associated with any or all resource programs. Only when answers are determined to be associated with analysis of complex issues will research be accomplished to arrive at cogent and relative responses. Some examples of the types of activities that may be required under studies are as follows:

- a. Water resource studies/research are normally performed only as a last resort by the BLM and are usually contracted to other agencies, such as the USGS or a university. Research is used for a complex water issue for which basic information is unavailable to management. The SWA program, particularly water and air, has been a

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very active area of BLM renewables in using research and development.

- b. Use and environmental degradation studies are often conducted for recreation resources. Data from programs such as soil erosion, vegetation, air and water quality, and wildlife is used to generate reports. The studies are used by other programs as well. Wilderness areas are monitored for change detection and to ensure compliance with allowable uses.
- c. In support of soil management programs, studies are identified and conducted to provide needed soil property and behavioral production information for specific soils and soil uses.
- d. Wildlife Program studies are as varied as the number of species and different habitats that the Bureau manages. Habitat, population, and impact/mitigation studies vary in complexity. Wildlife monitoring studies are based on management objectives identified in the RMPs and HMPs. They are resource specific, measurable, obtainable, and coordinated with other resources (e.g., range or wildhorse and burro). Data files are used to track progress toward management objectives, and identifying when and where to conduct monitoring.
- e. Forest management studies may require the tracking of activities (a historical record) and comparison with the existing condition as defined by the inventory analysis.

3.3.4.2 Enforcement and Protection

The nation's public resources such as timber, range, archeological and historical sites, and mineral resources are subject to unauthorized use regulations. Such cases often involve need for enforcement actions of various kinds. For example, an illicit antiquities market and trade exists wherein "pothunters" prey upon publicly administered cultural resources. Both public awareness and law enforcement programs are coordinated among various Federal, state, and local governments involving public affairs staff, cultural resources staff, and law enforcement staff.

As part of prevention and detection, authorized uses are being monitored for compliance with the conditions and stipulations assigned in the authorizing document. Examples of these types of activities are:

- a. A water and air enforcement action often involves a BLM use authorization (e.g., a surface occupancy for

exploration). The problem may be nothing more than a simple violation of instream or effluent water quality standards, correctable by a modification of sediment pond design. Enforcement actions may require field data collection for comparisons above and below the site of interest. These actions may rely on some statistical or graphical products from a large data base such as EPS's STORET system.

- b. Recreation and wilderness areas may be patrolled by law enforcement officers or resource specialists to ensure lawful use and protect environmental values. Fee collection may be considered enforcement. Data on patrols and use is recorded and flows into public land records and other recreation oriented reports. Law enforcement agencies may also maintain this data. Records are maintained on violations.
- c. Enforcement in forest management consists primarily of contract administration (compliance checking). It uses the contract (use authorization) specifications.
- d. Water support for fire control includes pre-fire planning by advising on water sources, spring dependability, and well serviceability. The Bureau's Groundwater Site Inventory and the Water Data Management systems are a means of data retrieval. Both the air and water programs participate through the creation and presentation of climatological data records. Water resource specialists provide information for fire management, such as "emergency fire rehab" generated by an interdisciplinary visit of the emergency fire rehabilitation team in the days immediately following the control/mop-up of a wildfire.
- e. For recreation areas, forest pests, rodents, bears, and other hazards with potential to degrade environmental or experimental quality are monitored and managed. While monitored, wilderness values will usually not be altered as they are generally left to natural means.
- f. The wildlife program is responsible for analyzing and monitoring the Animal Damage Control plan and programs administered by the United States Department of Agriculture (USDA), Animal Plant Health Inspection Service (APHIS). The plan is written to control both mammalian and avian predators of domestic livestock and native game species.
- g. Forest inventory data may identify an existing or a potential problem. Special inventories or surveys (perhaps using remote sensing techniques) may be

necessary. Prevention and/or treatment activities are planned as needed and funded.

3.4 Technical Activities

Technical support activities are the technical tasks which support the processing of Land and Minerals Cases and Resource Activities. The technical programs within the scope of this study include Cadastral Survey, Mapping Sciences, and Engineering.

In support of Land and Minerals and Resource Activities, technical support activities can be categorized into five mission elements. These mission elements are: (1) Planning, (2) Information Gathering, (3) Analysis, (4) Product Generation, and (5) Administration.

3.4.1 Planning

Planning consists of Annual Work Planning and Project Planning. Program needs, requirements, workmonths, procurement, and contract support for each fiscal year's work plan are built into the annual work planning cycle. The Annual Work Plan (AWP) forms the basis for outyear work requirements such as cadastral survey requirements, production of activity plans, and other work identified in the RMP.

Project Planning is initiated upon a formal request through a BLM entity. This request can be generated by BLM, other government agencies, or the private sector. Project planning consists of project initiation, cost/benefit analysis, project layout, schedules, and staffing.

3.4.2 Information Gathering

Information gathering is the collection of historical and project data, including field data. This mission element may consist of complex field data gathering to very simple office type file searches. The information is reviewed and documented for further analysis and processing. The process of project data collection may consist of cadastral surveys, photogrammetry, remote sensing, mapping projects, and engineering projects.

3.4.3 Analysis

Analysis is the process by which data collected through various programs is transformed into meaningful information that can then be used for making management decisions. Analysis consists of

computations, designs, compilations, evaluations, interpretations and estimations. The results of the analysis mission elements are environmental considerations, draft map information, draft plat information, draft field notes, designs, recommendations, and coordinate information and attributes.

3.4.4 Product Generation

Product generation consists of the preparation of final products from data that has been gathered and analyzed. Products consist of maps, plats, field notes, designs, structures and facilities, roads, reports, and documentation.

Paper products are generated through a manual and/or automated process. Permanent structures and facilities are a direct result of either an in-house construction project or contract project.

3.4.5 Administration

Administration consists of normal office and derived support, approval authorities, monitoring, inspection, compliance, training and maintenance. The processes within Administration are inspections of new projects or existing structures and facilities, monitoring of contractors, approval authority for maps, plats, field notes and designs, development of training programs and plans, and the upkeep of facilities and structures.

4 METHODOLOGY

4.1 General

The user and system requirements specified in this study were developed using a structured methodology applied to the activities conducted in the Requirements Definition Phase of the System Life Cycle. The results of this phase are contained in the current activities analysis, LIS requirements analysis, and the LIS Specification and Statement of Work (SOW).

Figure 4-1, LIS Requirements Definition Phase, illustrates the analysis activities, their functional relationships, and their respective input and output. The Requirements Definition Phase is identified in the figure as the second phase of the life cycle of a project. The completion of this phase is at milestone II, program go ahead, and when the acquisition phase can commence. The first activity in the Requirements Definition Phase, current model development, was initiated in November 1986. This activity was initiated to define and model the current BLM operations, specifically, the land and minerals case types.

Upon completion, this view of the current activities was used as a baseline during the LIS requirements analysis activity to derive user requirements.

The results of the requirements analysis are documented in this four-volume study. The functional requirements identified in this study may then be incorporated into the final LIS Functional Specification.

4.2 Current Activities Analysis

The system analysis process began with the collection of sufficient data about the current applications (i.e., the operational environment) and its users to further refine the program objectives, user needs, and required system capabilities. The information collected from the field was transformed into a physical model to establish among users and analysts a common view of the current environment prior to automation. The current activities analysis produced a set of case processing models -- the Current System Description -- that illustrates how the Bureau currently conducts its land and minerals case business. This structured approach is based on DeMarco analysis techniques: data flow diagrams (DFDs), input-process-output (IPO) narratives, and data dictionaries. (Demarco, T., Structured Analysis and System Specification, New York: Yourdon Press, 1979).

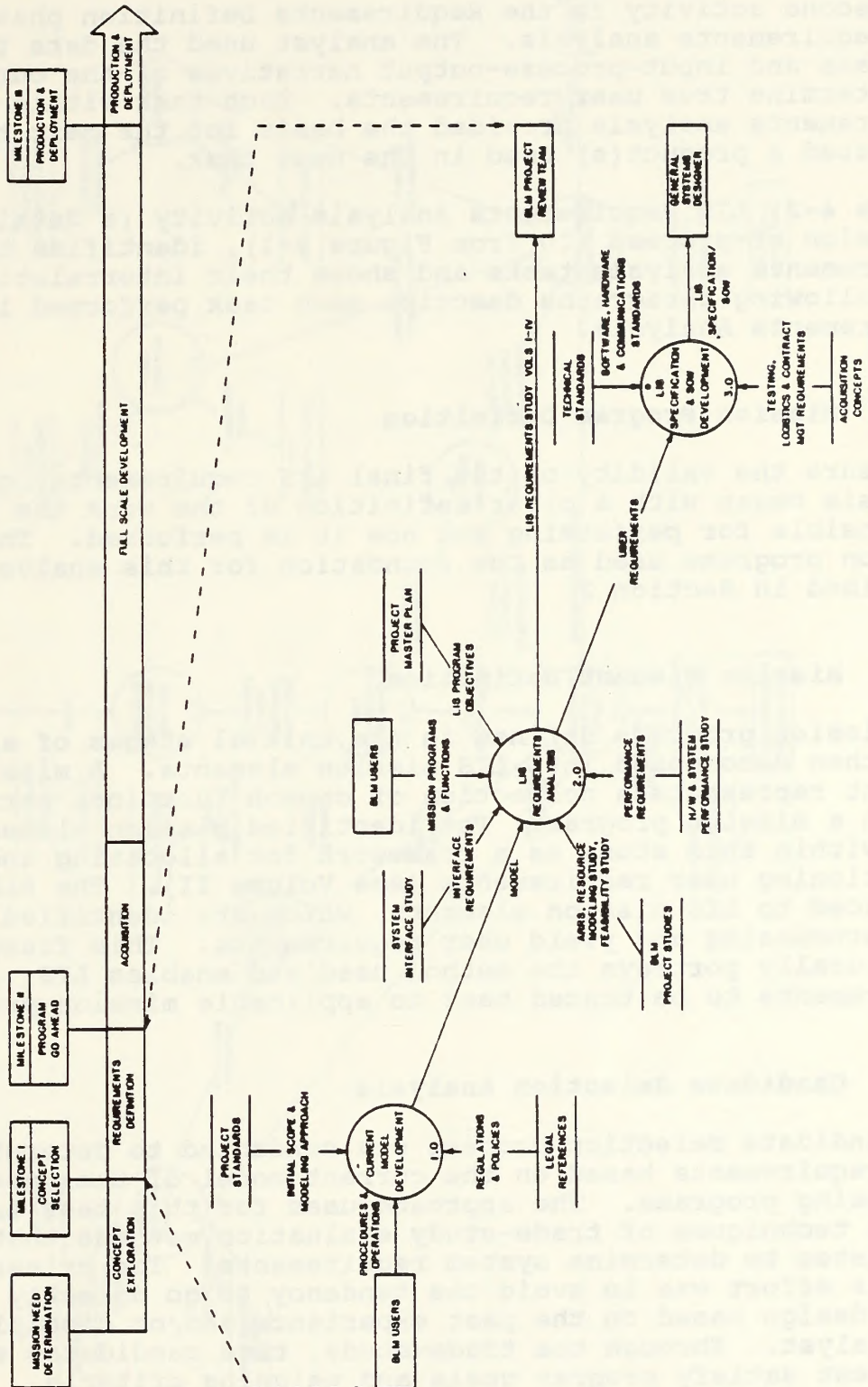


Figure 4-1. LIS Requirements Definition Phase

4.3 LIS Requirements Analysis

The second activity in the Requirements Definition phase was the LIS requirements analysis. The analyst used the data flow diagrams and input-process-output narratives of the current model to determine true user requirements. Each task within the requirements analysis provided the basis for the next task or generated a product(s) used in the next task.

Figure 4-2, LIS Requirements Analysis Activity (a detailed explosion of process 2.0 from Figure 4-1), identifies the requirements analysis tasks and shows their interrelationships. The following paragraphs describe each task performed in the Requirements Analysis.

4.3.1 Mission Program Definition

To ensure the validity of the final LIS requirements, the analysis began with a clear definition of the work the BLM is responsible for performing and how it is performed. The BLM mission programs used as the foundation for this analysis are described in Section 2.

4.3.2 Mission Element Definition

The mission programs defined in the initial stages of analysis were then decomposed into LIS mission elements. A mission element represents a collection of common functions performed within a mission program. The identified mission elements are used within this study as a framework for allocating and partitioning user requirements (see Volume II). The BLM program is traced to LIS mission elements, which are identified within case processing and yield user requirements. This framework structurally portrays the method used and enables LIS requirements to be traced back to applicable mission programs.

4.3.3 Candidate Selection Analysis

The candidate selection process was conducted to determine true user requirements based on the current model of the case processing programs. The approach used for this task is founded on the techniques of trade-study evaluation methods that examine candidates to determine system requirements. The primary purpose of this effort was to avoid the tendency to go directly to a point-design based on the past experience and/or discipline of the analyst. Through the trade-study, true candidates surface that best satisfy program goals and weighing criteria. This structured procedure was used for the candidate selection process to ensure rational and unbiased selection.

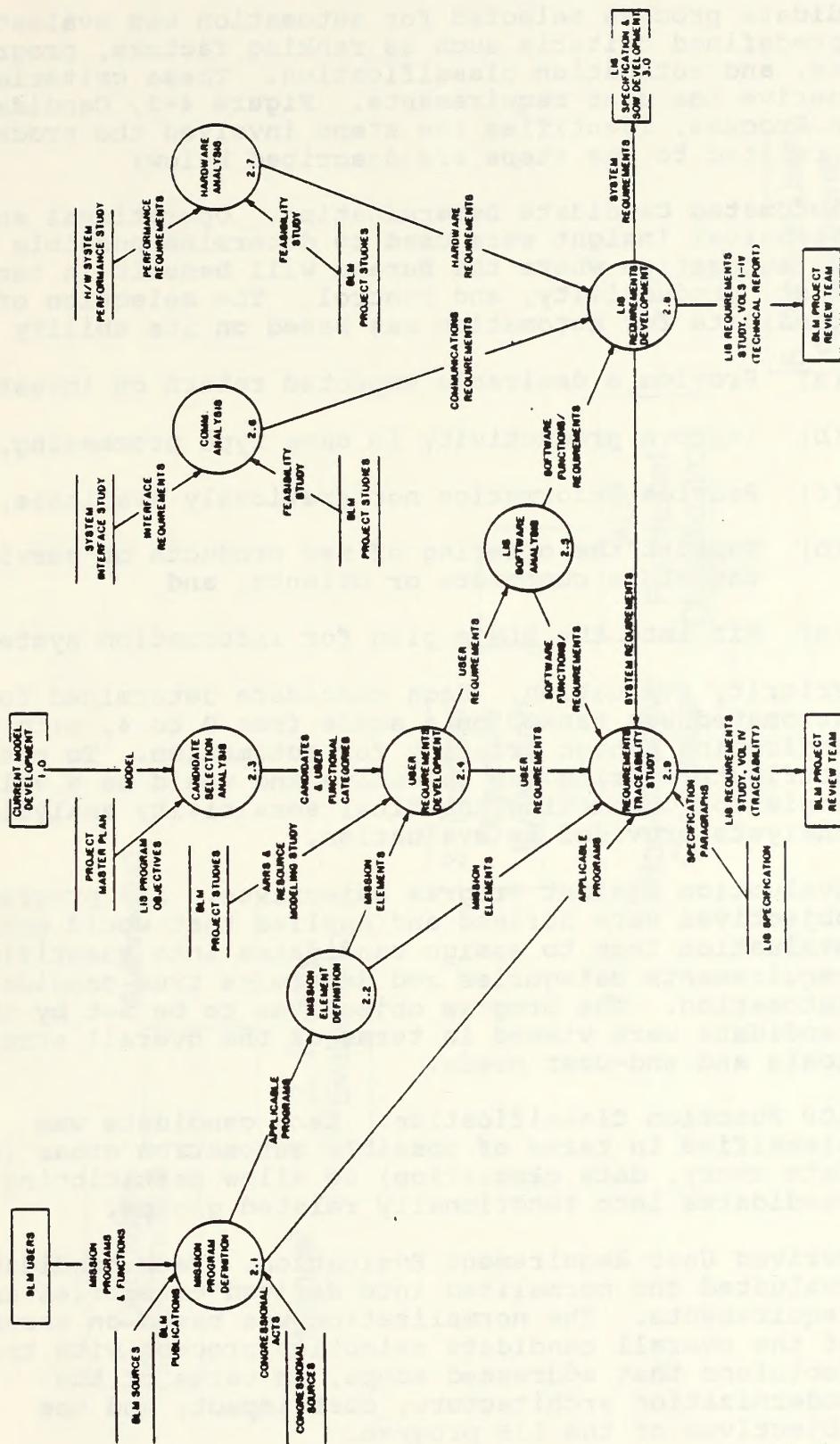


Figure 4-2. LIS Requirements Analysis Activity

Each candidate process selected for automation was evaluated against predefined criteria such as ranking factors, program objectives, and automation classification. These criteria were used to derive the user requirements. Figure 4-3, Candidate Selection Process, identifies the steps involved in the process. The criteria related to the steps are described below:

- (1) Automated Candidate Determination. Operational and technical insight were used to determine possible areas of automation where the Bureau will benefit in terms of cost, productivity, and control. The selection of a candidate for automation was based on its ability to:
 - (a) Provide a desirable expected return on investment,
 - (b) Improve productivity in case type processing,
 - (c) Provide information not previously available,
 - (d) Support the offering of new products or services to the BLM's customers or clients, and
 - (e) Fit into the BLM's plan for information systems.
- (2) Priority Evaluation. Each candidate determined to be automated was ranked on a scale from 0 to 4, with a 4 indicating a high priority for automation. To ensure the attribute scoring was objective and would be a valid basis for conducting the final sensitivity analysis, six analysts provided an evaluation.
- (3) Evaluation Against Program Objectives. LIS program objectives were defined and applied that would enable the evaluation team to assign candidates into quantifiable requirements categories and determine true candidates for automation. The program objectives to be met by the candidate were viewed in terms of the overall strategic goals and end-user needs.
- (4) ADP Function Classification. Each candidate was classified in terms of possible automation areas (e.g., data entry, data generation) to allow partitioning of candidates into functionally related groups.
- (5) Derived User Requirement Evaluation. Each candidate was evaluated and normalized into derived categories and user requirements. The normalization was based on assessments of the overall candidate selection process with trade-off decisions that addressed scope, in terms of the modernization architecture, cost impact, and the objectives of the LIS program.

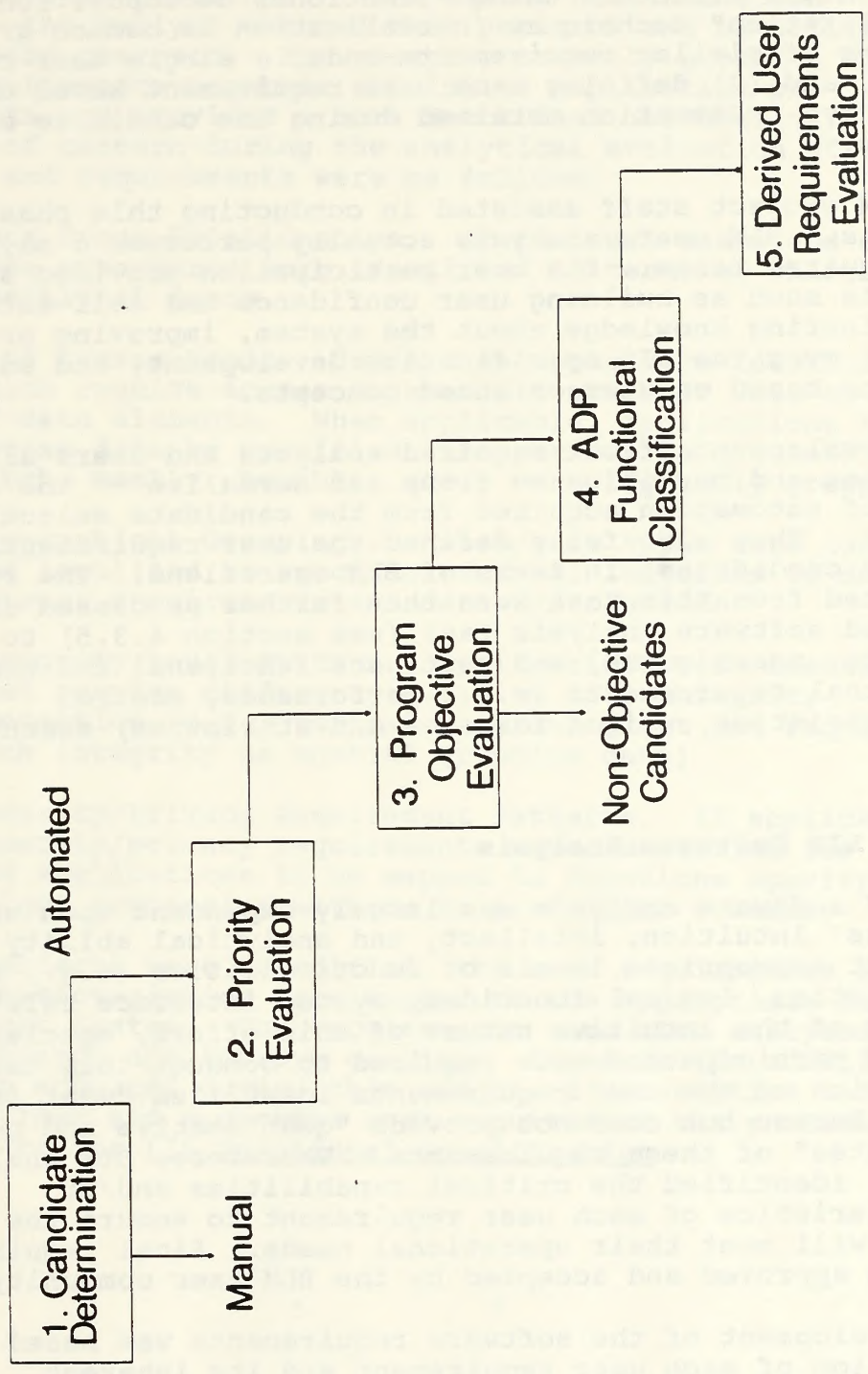


Figure 4-3. Candidate Selection Process

4.3.4 User Requirements Development

The development of the user requirements involves two fundamental steps: (1) organizing the derived user requirements into a hierarchical structure using "functional decomposition" and "normalization" techniques (normalization is common grouping and labeling of similar requirements under a single user requirement title), and (2) defining each user requirement based on the collective information obtained during the candidate selection process.

The BLM project staff assisted in conducting this phase of the analysis. BLM users/analysts actually performed a majority of the required tasks. BLM user participation provided significant benefits such as building user confidence and self-esteem, disseminating knowledge about the system, improving project control over the LIS specification development, and solving problems based on user-oriented concepts.

This development effort required analysts and users alike to decompose and partition -- group and normalize -- the selected areas of automation acquired from the candidate selection process. They also fully defined the user requirements (commonly grouped candidates) in terms of BLM operations. The requirements generated from this task were then further processed during the detailed software analysis task (see section 4.3.5) to produce accurate, unambiguous, and pertinent functional and non-functional requirements (e.g., performance, control characteristics, unique features and attributes) essential to the LIS.

4.3.5 LIS Software Analysis

The LIS software analysis was largely dependent upon users' and analysts' intuition, intellect, and analytical ability to abstract appropriate levels of functionalities (e.g., end-user capabilities, logical functions, system interface relationships). Because of the intuitive nature of this effort, special attention and BLM participation were required to conduct this task. The generation of the user requirements identifies "what is needed" by the Bureau but does not provide "quantitative and qualitative attributes" of these requirements. Therefore, BLM analysts (users) identified the critical capabilities and/or characteristics of each user requirement to ensure the Target System will meet their operational needs. Final requirements must be approved and accepted by the BLM user community.

The development of the software requirements was based on the definition of each user requirement and its inherent characteristics. This task was a highly iterative process. First, the analyst constructed a hierarchical structure chart

using decomposition and normalization techniques to model the functional requirements similar to those procedures specified in section 4.3.4. To construct this chart, the analyst reviewed and evaluated each user requirement for proper mapping and allocation to Target System functions. When making classification decisions, the analyst ensured that patterns and partitioning criteria were observed. For example, commonly grouping all case update requirements together eliminated duplication of requirements and provided a more functional orientation. Some of the areas of concern during the analytical evaluation of functions and requirements were as follows:

- a. User Group Relationships. Operational users and case type procedures were identified in terms of shared functional needs.
- b. Data Access Needs. Users/case types were identified which require access to specific areas of data or groups of data elements. When applicable, applications that access data by specified time periods (e.g., interactive, batch, weekly, monthly, etc.) were logically grouped.
- c. Geographical Groupings. Users/case types were identified and localized to specific regional locations to determine network requirements and data distribution.
- d. Integrity Level Pattern. Applications were identified that require different levels of data integrity protection (e.g., textual material might not require as much integrity as spatial graphics data).
- e. Security/Privacy Requirement Patterns. If applicable, security/privacy requirements were identified for data and applications to be mapped to functions specifying unique processing methods or protection schemes.

Once the patterns were identified, the user requirements and analyzed characteristics were mapped to the appropriate functions of the Target System. The requirements were also analyzed to avoid redundancy and improve clarity. Based on the additional information acquired during this effort, a descriptive definition of each refined and augmented user requirement was published and transposed to the LIS Functional Specification.

4.3.6 Requirements Traceability Study

The requirements traceability study supports the BLM review team by providing a step-by-step forward and backward trace of all requirements covered by this study. Mission programs are directly correlated to derived mission elements (logical work functions) and candidate selection matrices. The candidate processes are directly correlated to user requirements, which are in turn correlated to the functional requirements.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The results of this document reflect the study of the land and minerals cases and technical activities programs. The LIS Functional Specification, submitted on 29 April 1988, contains the results of this study as of that date. A tentative list of Land and Minerals user requirements was included in that document since the candidate selection analysis process had been performed on only seven cases.

5.2 Recommendations

It is recommended that the functional requirements identified in Volume III of this study be incorporated into the LIS Functional Specification.

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APPENDIX B: ACRONYMS AND ABBREVIATIONS

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Table containing acronyms and abbreviations, with text mirrored horizontally. The text is extremely faint and mostly illegible due to the quality of the scan.

ACEC Area of Critical Environmental Concern
ADEMP ADP & Data Communications Equipment Modernization Project
ADP Automated Data Processing
AFS Alaska Fire Service
AFS Auditing and Financial System
ALDS Automatic Lightning Detection System
ALMRS Automated Land and Minerals Record System
AMP Allotment Management Plan
AMS American Management Systems Incorporated
APHIS Animal Plant Health Inspection Service
ARRS Automated Resource Requirements Study
ASPN Trade Name
AWP Annual Work Plan

BIA Bureau of Indian Affairs
BIFC Boise Interagency Fire Service
BLM Bureau of Land Management
BRASS Bonus and Rental Accounting Support System

CFR Code of Federal Regulations
COTS Commercial off-the-shelf
CRMP Cultural Resource Management Plan
CX Categorical Exclusion

DFD Data Flow Diagram

EA Environmental Assessment
EIS Environmental Impact Statement
EPA Environmental Protection Agency
ESO Eastern States Office

FEDSIM Federal Computer Performance and Evaluation Simulation
Center
FLPMA Federal Land Policy Management Act
FMS Financial Management System
FS Field Station

GIS Geographic Information System
GSD General Systems Design

HMP Habitat Management Plan

IPO Input-Process-Output

LIS Land Information System

MMS Minerals Management Service

NCSS
NEPA National Environmental Policy Act
NSR National Systems & Research Co.
NSSAD National Soil Survey Area Data Base

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O&C Oregon and California
ORV Off-road vehicle

PAWP Preliminary Annual Work Plan

R&PP Recreation and Parks Permits
RAMP Recreation Area Management Plan
RAWS Remote Automated Weather Station
RFC Request for Comments
RFI Request for Information
RFP Request for Proposal
RMP Resource Management Plan
ROS

SC Service Center
SHPO State Historic Preservation Officer
SOW Statement of Work
SWA

USFS United States Forest Service
USGS United States Geological Survey

WBMP Wild Burro Management Plan
WHMP Wild Horse Management Plan
WIS Wildlife Information System

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