WASHINGTON INTEGRATED NETWORKED GEO-BASED SYSTEM (WINGS) IMPLEMENTATION PLAN

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16. ABSTRACT

Abstract:

The purpose of this study is to provide the Washington State Department of Transportation, Aviation Division (WSDOT/AD) with the broad-based vision needed to apply new and emerging technology in geographic information systems (GIS) to aviation planning and reporting systems. This is the second of two reports. The first report documented the user needs, established data and application priorities, and presented a conceptual design for sharing geographic information pertaining to Washington's airports with airport sponsors, the Federal Aviation Administration (FAA), and other WSDOT divisions. This report provides an implementation plan.

This report builds upon the conceptual design to provide a broad-based implementation plan. Three implementation activities are described in phases.

Project organization and staffing requirements for policy, management, technical operations, and technical support are discussed in Section 3.

Section 4 addresses the estimated resource requirements for WSDOT to make the implementation of WINGS a success. Included are requirements for personnel, data conversion from a manual to a computer-based system, and hardware.

The final section of the report discusses outstanding issues and what next steps are required to begin the implementation of WINGS.

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WASHINGTON INTEGRATED NETWORKED GEO-BASED SYSTEM (WINGS)

IMPLEMENTATION PLAN

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December 1994

DISCLAIMER

The contents of this report reflect the views of the consultant team based upon user interviews with Washington Department of Transportation staff and the Federal Aviation Administration. The contents do not necessarily reflect the official views or policies of the Washington State Transportation Commission, Department of Transportation, or the Federal Aviation Administration. This report does not constitute a standard, specification, or regulation.

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IMPLEMENTATION PLAN

Prepared for

Washington State Department of Transportation

and the

Federal Aviation Administration
Seattle Airport Division

December 1994

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<center>INTRODUCTION</center>

1.1 PURPOSE

The purpose of this study is to provide the Washington State Department of Transportation, Aviation Division (WSDOT/AD) with the broad-based vision needed to apply new and emerging technology in geographic information systems (GIS) to aviation planning and reporting systems. This is the second of two reports. The first report documented the user needs, established data and application priorities, and presented a conceptual design for sharing geographic information pertaining to Washington's airports with airport sponsors, the Federal Aviation Administration (FAA), and other WSDOT divisions. This report will provide an implementation plan.

1.2 BACKGROUND

As envisioned, the *Washington Integrated Networked Geo-based System* (WINGS) will be implemented in a decentralized manner using two major software modules. The first module is ARC/INFO GIS software running on Unix-based workstations and file servers. This system will be located within the Olympia Service Center, with the primary responsibility of the base map implementation and updates being with Geo Services in the Planning and Programming Service Center (P&PSC). In addition to ARC/INFO, WSDOT plans to implement ArcView as a submodule to view and query geographic data and associated attributes. ARC/INFO will serve as the full-function GIS software with ArcView being used for display and query applications.

The second software module is the Airport Information Management System (AIMS) which has been developed by Gregory C. Rigamer and Associates, Inc., (g.c.r.) and has been implemented by many aviation offices in other states. WSDOT has decided to join the other states in the FAA Northwest Region to implement the AIMS software. The salient issue is that the AIMS software is easy to use by novice computer users, works in a desktop computer environment using Microsoft® Windows™, and can access digital GIS data being maintained within the ArcView environment. Therefore, the two software modules can interact in an integrated manner without the burden of translating data between systems. In addition, as the user base and level of sophistication grows over time, ARC/INFO and ArcView can be used to implement the full-range of GIS applications that are not supported in the AIMS software environment.

Implementation of WINGS will be led by a WSDOT project manager who will report directly to the Director for Aviation. The project manager will work in close collaboration with the WSDOT GIS Team which is comprised of staff from both the MIS Office and the P&PSC.

1.3   REPORT ORGANIZATION

This report documents a proposed development and implementation strategy for the WINGS project. It contains the following sections in addition to this introduction:

Section 2—Implementation Activities. This section identifies each of the activities that must be undertaken to develop WINGS. A general sequence of activities is defined. Budget estimates, WSDOT and professional services resources, and elapsed time estimates are provided for each activity.

Section 3—Project Organization and Staffing. This section identifies the major roles and responsibilities of those WSDOT stakeholders who will implement WINGS.

Section 4—Resource Requirements. This section provides general estimates of the financial and staff resources needed to implement WINGS. It recommends the skill levels needed for the various roles. It identifies computer hardware, software, data conversion, and consulting requirements.

Section 5—Outstanding Issues and Next Steps. This section summarizes the key elements of the implementation plan and identifies a near-term action plan for mobilizing the implementation effort. A project schedule is included.

SECTION 2

IMPLEMENTATION ACTIVITIES

A strategic system development approach dictates that high-priority functions of WINGS be provided early, before lower priority functions are developed. For this reason, WINGS implementation is divided into three general phases:

- Phase 1—Implement AIMS
- Phase 2—Develop statewide geographic data layers
- Phase 3—Develop airport-specific data layers

Phase 1, implementation of AIMS, will address most of the high-priority application and data needs identified in the *User Requirements and Conceptual Design* report. Phases 2 and 3 will address the remaining high-priority needs in addition to most of the medium-priority needs.

Within each phase, a structured system development methodology is proposed.

2.1 PHASE 1—IMPLEMENT AIMS

WSDOT/AD must take a very active management and leadership role in the implementation of AIMS to ensure that requirements are appropriately defined and met.

2.1.1 Define AIMS System Requirements

A detailed evaluation of the specific requirements for AIMS implementation is needed. This evaluation should focus on the data requirements of the software relative to existing data resources, detailing a plan for conversion of existing data. The spatial accuracy requirements presented on page 4-6 of the *User Requirements and Conceptual Design* report will be followed for all AIMS data conversion activity.

In addition, the system evaluation should identify specific requirements to adapt existing AIMS software to meet the needs of the system's various users within the State of Washington. Hardware/software upgrade and acquisition specifications should be delivered. Finally, requirements for pilot implementation of AIMS should be identified. A pilot test plan and evaluation criteria will be developed by the Aviation Division.

It is recommended that this evaluation be conducted by g.c.r. because of their unique understanding of the AIMS software. The estimated elapsed time to perform the evaluation is 3 months, including contract negotiation. It is estimated that the cost of this effort will be $25,000.

2.1.2   Pilot AIMS Implementation

Implementation of AIMS should be tested through a pilot project to validate data conversion planning and resource estimates. The pilot implementation should be conducted at the Aviation Division Office at Boeing Field. Data loading should be completed for at least five airports with varying characteristics as part of the pilot project. Spatial accuracy requirements will be followed. It will be necessary to establish local coordinate control using global positioning system (GPS) technology to allow the spatial registration of geographic features. It is recommended that spatial registration be performed prior to data loading. The pilot data for each airport will include, at a minimum, all high-priority data identified in the *User Needs and Conceptual Design* in addition to land use and zoning. Sufficient statewide data (i.e., transportation and administration boundaries) should be included to demonstrate the use of data specific to an individual airport in conjunction with statewide data.

Upon completion of testing, the data conversion plan and resource estimates should be refined as necessary.

The estimated cost to implement AIMS, convert/load the pilot data for five airports, modify documentation, and train staff will range from $75,000 to $100,000. The amount will depend on the degree of ARC/INFO data conversion completed. The elapsed time to prepare the pilot system is 3 to 6 months, also depending on the degree of data conversion.

Thorough pilot testing should be expected to take another 6 months. Pilot project participants should carefully review the functionality and data quality provided by the system. Specific modifications to the software and data conversion plan should be identified by WSDOT.

Evaluation of the pilot study will also identify the system benefits and quantify them as much as possible.

2.1.3   Refine AIMS and Data Conversion Plan

Upon completion of the pilot project, the system and data conversion plan should be refined in accordance with WSDOT's specifications for full implementation. The estimated cost for this activity is $25,000 and should be expected to take 2 months.

2.1.4   Complete AIMS Implementation

Implementation of AIMS throughout the Aviation Division, FAA, and P&PSC will require an estimated 18 to 24 months, depending on the degree of data preparation/update required prior to data conversion. The complete WINGS database will include statewide data layers and airport-specific data layers for NPIAS, non-NPIAS, and planned facilities. It is important to note that the success of any information system depends not only on its ease of use but on the quality of its data. There is significant risk that AIMS will not be widely used if proper data preparation, spatial registration, or data updates are overlooked.

In addition to data preparation, the implementation activity includes hardware/software procurements, data conversion/loading, installation, training, and stabilizing data maintenance. At the end of this time, routine usage should be established.

The cost to support this effort should be estimated by g.c.r. as part of the recommended evaluation of AIMS system requirements. The cost to load data is included in Task 2.3.3. A preliminary estimate of the annual staff effort to manage and perform implementation is a .5 full-time equivalent (FTE) project manager and 1.5 FTE staff.

2.1.5 Update AIMS Data

Once the AIMS data is stabilized it must be continually updated in a routine manner to remain useful. If the credibility of the information in the system is questioned, potential users will quickly revert to the former methods of information gathering and grassroots support for the WINGS project as a whole will erode.

The diversity of data sources for updating AIMS is tremendous. It is anticipated that the gathering of this information and updating of the system will require 1 FTE allocation of staff for the life-cycle of the project.

Active involvement of those preparing WSCASP studies will be necessary to augment the data gathering effort.

2.1.6 Upgrade Airport Layout Plans (ALPs)

As new ALPs are developed in digital format, spatial accuracy and database standards should be applied. An outstanding issue is development of digital data format standards for production of ALPs. As new digital ALPs are developed, selected statewide data layers should be reconciled for map continuity at the edges of the plans. This should be performed by P&PSC.

2.2 PHASE 2—DEVELOP STATEWIDE GEOGRAPHIC REFERENCE DATA

This phase of activity is independent of Phase 1. It can progress in parallel, staggered with, or subsequent to Phase 1. The resources required to complete it are primarily WSDOT staff time. Statewide geographic reference data will be accessed through AIMS or an ArcView module within the WINGS environment.

2.2.1 Design and Develop Statewide Transportation Data Layers

Formal, relational data models should be designed for the statewide transportation layers. Replication of data layers should be avoided; a single layer should be designed to fulfill all WSDOT GIS requirements including WINGS. Physical database designs should be developed

that implement the data models. This activity should be coordinated by MIS and should utilize the expertise of the WSDOT GIS Implementation Team. Professional services expertise may be required. An end-user, application-oriented design process should be used, which includes WINGS and other WSDOT users. It is estimated the elapsed time for database design is 3 months if a senior GIS analyst is allocated 75 percent to this activity.

WSDOT will follow the spatial data requirements and data priorities detailed in the *User Requirements and Conceptual Design* for 1:100,000-scale mapping. WSDOT's overall schedule for translation of existing transportation data into ARC/INFO will consider the WINGS project requirements.

2.2.2 Access Specific Statewide Data Layers

Arrangements for access to other statewide ARC/INFO data layers that meet medium- and low-priority WINGS data requirements should be made as staff resources allow. MIS should provide technical consultation regarding access to these data layers. Maintenance for the statewide data layers will be the responsibility of Geo Services in the Planning and Programming Service Center (P&PSC). The Aviation Division should define the particular features and attributes to be selectively accessed from these data layers. The users of the WINGS must be able to view and query these data layers within the AIMS environment.

2.3   PHASE 3—DEVELOP AIRPORT SPECIFIC DATA LAYERS

2.3.1   Design-Required ARC/INFO Data Layers

Required ARC/INFO data layers that are specific to an individual airport include, zoning, lots/parcels, and emergency facilities. Utility data (stormwater, water, and sewer) may be included in AIMS to a limited extent but should eventually be designed as separate ARC/INFO layers to provide full geographic facilities management capabilities.

The estimated cost for database design of zoning, lots/parcels, and emergency facilities layers is $25,000. The estimated elapsed time to perform this design effort is 3 months. The estimated cost for design of the utility layers is $45,000. The estimated elapsed time is 4 months.

In total, this estimated cost for this task is $70,000 with an estimated elapsed time of 7 to 8 months.

These estimates assume that a well-qualified consultant produces the database designs, using an end-user, application-oriented design process that produces complete design documentation.

2.3.2 Specify Preparation and Conversion of ARC/INFO Data Layers

General data preparation/conversion specifications and cost estimates should be developed for zoning, lots/parcels, emergency facilities, and other high-priority data layers. These specifications and estimates must be flexible enough to deal with multiple source data formats, from local government jurisdictions containing 152 airports. It is estimated that this effort would cost $25,000 and require 3 months if a consultant were retained. This assumes that a sampling of source document types is used rather than a complete inspection of source documents from all local government jurisdictions.

The specifications and cost estimates for utilities data preparation and conversion must deal with multiple source data formats for those major airports where utility data would be automated. It is estimated that this effort would cost $60,000 and require 5 months if performed by a consultant.

In total, this task is estimated to take 8 to 9 months with estimated cost of $85,000.

2.3.3 Prepare and Convert Data to ARC/INFO Format

Data must be collected, then the data must be prepared and converted to ARC/INFO format in accordance with specifications. The industry standard for data preparation and conversion costs is 70 to 80 percent of the total project costs. Actual WSDOT MIS experience with transportation related database conversion indicates that these percentages may be less. An accurate cost estimate to perform data preparation and conversion should be completed after database design and the preparation of specifications. Preliminary estimates range from $150,000 to $600,000 over a 1- to 2-year period.

Staff must be involved in quality assurance and acceptance of converted data and also be accountable for preparing detailed cost estimates.

2.3.4 Develop ARC/INFO Data Layer Maintenance Applications

Each ARC/INFO data layer must be maintained using information actively gathered from each airport. The project manager within the Aviation Division will implement a data maintenance plan. This will require close coordination with the airport managers and the WSDOT regional offices.

The AIMS product does not provide geographic data maintenance capabilities; ARC/INFO will be used for GIS data maintenance. ARC/INFO applications should be developed, using structured application development methods, to ensure that data integrity is preserved and maintenance activities are efficient. The estimated consulting cost to develop maintenance applications for the six layers identified in the *User Requirements and Conceptual Design* ranges from $90,000 to $150,000, depending on the specific requirements. It is estimated that this activity would require 9 months. WSDOT may have staff resources that can undertake some or all maintenance application programming.

2.3.5   Maintain ARC/INFO Data Layers

Information must be routinely gathered from local government agencies to update zoning, parcel, and off-airport emergency facility data. Utility data must also be updated from a variety of sources. Maintenance of these airport specific data layers will be the responsibility of the Aviation Division, although steps should be taken to prevent this office from becoming a data processing center. It is anticipated that this data gathering/maintenance effort would combined with the AIMS data maintenance effort described earlier. An estimated .5 FTE would be required in addition to the AIMS data maintenance effort.

2.3.6   Develop Supplemental ARC/INFO Data Layers

WSDOT staff should design, specify, convert, and maintain supplemental data layers over time, as resources allow. These layers include medium- and low-priority data not addressed above.

SECTION 3

PROJECT ORGANIZATION AND STAFFING

In order to make WINGS a reality, a formal structure of roles and responsibilities must be adopted and maintained. This section addresses these organizational issues.

The guiding principle is to provide an organizational approach that aids WSDOT employees in the development and operation of WINGS with a minimum of undesired consequences or costs. The actual division of work is based on the principle originally noted by Henri Rayol (H. Koontz, 1978, "Essentials of Management") that

> *"...the more an organization structure reflects the tasks or activities necessary to attain goals and assists in their coordination, and the more roles are designed to fit the capabilities and motivations of people available to fill them, the more effective and efficient an organization's structure will be."*

The proposed project organization is designed to facilitate cooperation among divisions, divide the work into manageable modules, and use existing organizational entities to the extent possible. The proposed project organization addresses policy, management, technical operations, and technical support functions.

3.1   POLICY

The implementation of WINGS is consistent with the WSDOT's overall direction for implementing GIS technology. WINGS will utilize the same core hardware, software, and statewide data layers as the corporate WSDOT GIS. Specific data layers developed for WINGS will be made available for other departmental uses such as intermodal planning and/or data support management systems required under ISTEA.

The three WSDOT stakeholders in WINGS (Aviation Division, Planning and Programming Service Center, and Management Information Systems) will share responsibility for the success of the implementation effort. Therefore, it is of paramount importance that implementation policy formulation be developed by representative management from all participating divisions. Senior managers should be actively involved or should delegate responsibility and authority to a mid-level staff person. In addition, representatives of the FAA should be included, or at least regularly briefed.

Policy issues include:

- Scheduling of WINGS implementation activities
- Budget coordination
- Commitment of resources
- Standards for WINGS data layers

- Standards for WINGS application development
- Distribution of WINGS data, including on-line access
- Coordination with other WSDOT GIS implementation efforts

3.2   MANAGEMENT

Management of WINGS implementation and ongoing operation will be the responsibility of the Aviation Division. The WINGS project manager will report directly to the Director for Aviation and will work in close cooperation with the WSDOT GIS Team. The major project management concerns include:

- Establishing and following a process for developing collective policy recommendations and building consensus among divisions

- Providing the policy group with information necessary for policy formulation

- Coordinating with MIS and FAA to establish recommended data standards and general data management procedures for WINGS special purpose data layers

- Coordinating with users in all stakeholder organizations to standardize application development and data access procedures

- Monitoring system development and system performance

- Identifying deviations from standards, budgets and schedules

- Assuring the quality of WINGS special purpose data layers and applications

3.3   TECHNICAL OPERATIONS

Technical operation of WINGS will be the responsibility of the Aviation Division. Technical operations personnel should report directly to the WINGS project manager. It must be assumed that the Aviation Division staff will require training without reducing primary service objectives. Technical operations responsibilities include:

- Gathering the information necessary to update WINGS

- Participating in the design of WINGS special purpose data layers

- Developing selected WINGS special purpose data layers

- Performing quality assurance and acceptance testing of any WINGS special purpose data layers that are developed

- Updating and documenting WINGS special purpose data layers

- Providing user support and training for WINGS applications

- Performing MIS-directed system administration of the WINGS data server

- Disseminating WINGS data in accordance with policy

- Coordinating on-line access to WINGS in accordance with policy

3.4　TECHNICAL SUPPORT

Technical support will be provided by the MIS Office and the GIS Team. The MIS Office will be responsible for:

- Hardware support
- General system administration including routine backups
- General software support
- Database design and application development support
- Network communications

The GIS Team will be responsible for:

- Standards and guidelines for GIS implementation
- ARC/INFO and ArcView user support
- ARC/INFO and ArcView applications development
- Design of statewide transportation data layers
- Disseminating statewide transportation data for use with WINGS applications

SECTION 4

RESOURCE REQUIREMENTS

4.1 OVERVIEW

The resources required to implement WINGS are summarized in Table 4-1. Annual operating and maintenance costs are also included. The table presents the required WSDOT and FAA staff in FTEs, costs for computer hardware and software, and the estimated costs for professional services.

WSDOT internal resource costs can be added to the hardware/software and professional services costs presented in Table 4-1. These implementation costs have not been included since WINGS will be implemented mostly with existing staff who will be trained to use the technology.

4.2 PERSONNEL

The following subsections describe the minimum WSDOT staff expertise to make WINGS a success.

4.2.1 Project Management

The project manager (salary range 58) must primarily have a complete understanding of project management skills including oral and written communication, the ability to determine and evaluate budgets and schedules, negotiating skills, goal orientation, and a strong team player. Secondly, the project manager must have a complete understanding of aviation planning. Lastly, the project manager should have a general understanding of GIS and be able to comprehend and evaluate technical alternatives presented by staff or consultants.

The project manager must have the respect of the Aviation Division staff and be able to integrate the implementation of WINGS into the everyday work environment. This individual, as delegated by the Director for Aviation, will have the responsibility and authority to make project decisions.

An alternative to having a staff person within the Aviation Division is to contract for project management services as the project begins and gradually develop a WINGS project manager within the Aviation Division.

4.2.2 GIS Analyst

The Aviation Division and Geo Services within the P&PSC will each have at least one GIS Analyst (salary range 54). The analysts will have a minimum of three years working with ARC/INFO including database design, applications design, and applications programming

Table 4-1--WINGS Resource Requirements

IMPLEMENATION ACTIVITIES

	Years Elapsed	Project Manager	Aviation Staff	P&PSC Staff	MIS Staff	FAA Staff	Computer Hardware/ Software	Professional Services
Phase 1 - Implement AIMS								
Define AIMS System Requirements	0.25	0.10	0.05	0.05	0.01	0.01		$25,000
Pilot AIMS Implementation	1.00	0.70	0.90	0.50	0.10	0.10	$12,500	$100,000
Refine AIMS and Data Conversion Plan	0.15	0.10	0.25					$25,000
Complete AIMS Implementation	2.00	0.50	1.50		0.10		$72,500	footnote 1
Subtotal (elapsed years * FTE)		1.74	3.95	0.51	0.30	0.10	$85,000	$150,000
Phase 2 - Develop State-Wide Data								
Transportation Data Layers	0.25	0.10	0.10	0.25	0.05		footnote 2	
Subtotal (elapsed years * FTE)		0.03	0.06	0.19	0.01			
Phase 3 - WINGS Special Purpose Data								
Design Required ARC/INFO Data Layers	0.60	0.05	0.05	0.10	0.02	0.02	$40,000	$70,000
Specify Data Preparation and Conversion	0.70	0.15	0.15	0.30	0.04			$85,000
Prepare and Convert Data to ARC/INFO	1.50	0.30	1.00					$600,000
Develop Data Maintenance Applications	0.75	0.10	0.20	0.20				$150,000
Develop Supplemental ARC/INFO Layers	2.00	0.25	2.00	2.00	0.50			
Subtotal (elapsed years * FTE)		1.16	5.98	4.21	1.04	0.01	$40,000	$905,000
Total WINGS Implementation		2.93	9.99	4.91	1.36	0.11	$125,000	$1,055,000

OPERATING AND MAINTENANCE ACTIVITIES

	Years Elapsed	Project Manager	Aviation Staff	P&PSC Staff	MIS Staff	FAA Staff	Computer Hardware/ Software	Professional Services
Update AIMS Data	WSCASP	0.20	1.00					$4,800
Upgrade Airport Layout Plans								
Access Specific State-Wide Layers			0.10	0.25			footnote 2	
Maintain ARC/INFO Data Layers		0.10	0.50		0.02			$9,000
Annual WINGS Operating and Maintenance		0.30	1.60	0.25	0.02			$13,800

* Staff time in full-time equivalents (FTE) not including ongoing tasks

footnote 1 - Included in task 2.3.3

footnote 2 - Included in full WSDOT GIS Implementation

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using the Arc Macro Language (AML). Experience with implementing a client-server GIS solution using external relational Structured Query Language (SQL) databases is desired. The analyst responsible for database design must have experience with data flow and entity relationship diagrams and be able to clearly document all aspects of the database design. The analyst responsible for applications development must have experience performing user interviews, developing user requirements, translating the requirements into program specifications, programming and debugging, and developing user guides and programmer documentation. One analyst will be required that has a thorough understanding of ArcView and an introduction to object-oriented programming using Avenue (ArcView programming language).

An analyst must also have a technical understanding of the AIMS software and be able to integrate additional GIS functionality with ArcView or ARC/INFO as the level of user sophistication expands.

4.2.3 System Analyst

The MIS Office system analyst (salary range 54) will be responsible for hardware support in both the Unix and Microsoft Windows environment. This individual will have a broad understanding of GIS technology with both ARC/INFO and ArcView. The system analyst will also have a very general knowledge of the AIMS software. A primary responsibility of the system analyst is to establish and manage the network communications between Olympia, the Aviation Division at Boeing Field, and the Regional FAA office in Renton.

4.2.4 Aviation Staff

The primary user of WINGS will be staff in the Aviation Division (average salary range 54). These persons will be trained to use AIMS and will provide recommendations for additional functionality to the GIS analyst with the Aviation Division. The aviation staff will be responsible to perform data maintenance.

4.3   DATA PREPARATION AND CONVERSION

The costs to convert existing data into AIMS (Phase 1) should be estimated by g.c.r. as part of the recommended evaluation of AIMS system requirements.

The costs for developing statewide data layers (Phase 2) are independent of the WINGS project.

The costs for developing WINGS special purpose data layers (Phase 3) should be estimated once detailed ARC/INFO database designs and conversion specifications have been prepared.

4.4   SYSTEMS

Table 4-2 shows the allocation of new computer hardware and software needed for WINGS implementation. It also shows annual hardware/software support costs at 12 percent per year. No hardware/software replacement costs are included. These computer systems costs will be refined by the recommended evaluation of AIMS system requirements.

Table 4-2–WINGS Hardware/Software Cost Allocation

User Group	Unix Workstations			Personal Computers			Inkjet Plotters
	Units	Cost	Annual Support	Units	Cost	Annual Support	
Aviation Division	1	$40,000	$4,800	3	$22,500	$2,700	$5,000
P&PSC				6	$45,000	$5,400	$5,000
FAA				1	$7,500	$900	
Total	1	$40,000	$4,800	10	$75,000	$9,000	$10,000

SECTION 5

OUTSTANDING ISSUES AND NEXT STEPS

5.1   AIMS MAINTENANCE AND SUPPORT

The ongoing AIMS software maintenance and support provisions of g.c.r. should be carefully examined to determine the true cost of using the software. Access to telephone hot-line support during operating hours is highly recommended. Timely distribution of error corrections and new releases is crucial to the ongoing success of the system's implementation.

5.2   AIMS CUSTOMIZATION

The AIMS basic software functionality should not be customized, or extended, to provide an all-purpose user interface to WINGS data. Standard viewing or query functionality of geographic data should be handled through an ArcView application. The AIMS software will initiate an ArcView session then return to the AIMS window environment.

In addition, the need for ad hoc GIS applications is likely to exist at some level. As WINGS users become more familiar with the available spatial data, the demand for custom GIS applications is likely to grow. These will be designed and integrated as the WINGS functionality increases with either ArcView or ARC/INFO AML menu-driven applications. It is not practical to customize AIMS to handle such a wide range of spatial query and display capabilities.

5.3   AIMS PILOT PROJECT

The following types of potential users should be considered for involvement in the pilot project:

- The WINGS project manager
- Key WINGS/AIMS implementation support staff
- An airport manager
- A planner from a regional WSDOT office

The WINGS policy group should agree on the number and location of pilot project airports. The pilot should test the scope of the AIMS software and provide a representative evaluation of the quality of existing data. The following airports illustrate the range of size and characteristics that should be considered in the selection:

Airport	Characteristics
Spokane	Hub Airport
Boeing Field	Reliever Airport[1]
Omak	General Aviation with Airport Manager
Tri-Cities	Tower and Scheduled Service
Anderson Field	General Aviation without manager

[1] A reliever airport is located near a large airport and absorbs overflow.
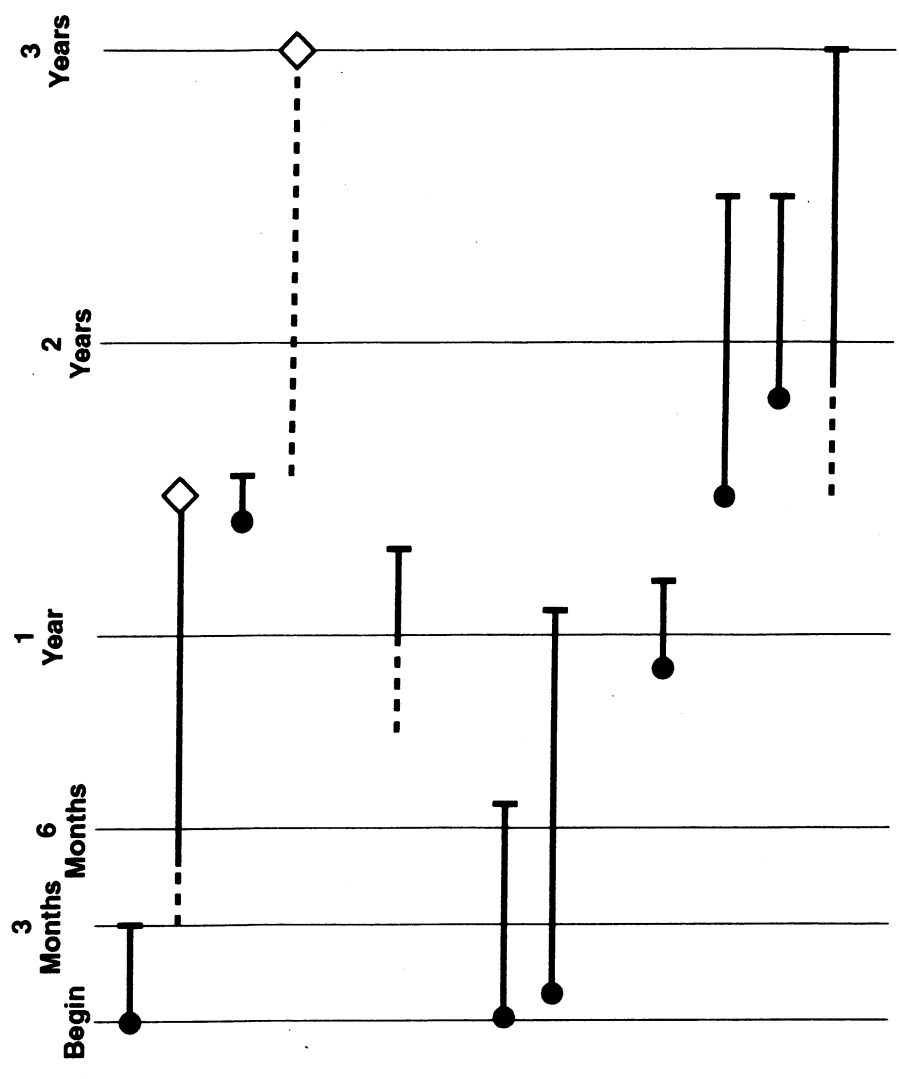
5.4   MARKETING WINGS

The success of WINGS depends on the users, support personnel, and providers of data. Outreach to all of these groups is necessary. Briefing materials, a quarterly newsletter, and user meetings should all be employed to gain broad based support. In addition, effectively including as many potential WINGS users as possible in the evaluation of AIMS systems requirements will help foster ownership of the project by future users. Finally, it will be important to clearly identify for users how AIMS fits as part of the larger WINGS project, thereby avoiding confusion over the boundaries of systems.

5.5   RESOURCES

The WINGS project will require substantial management and staff commitment across all stakeholder organizations. Beyond enthusiasm and enlightened self-interest, the project participants are going to need the allocation of hours to do the work required to successfully implement the system. Technical training will be required for staff to use the system and for staff to perform data maintenance. Where internal resources cannot be allocated or hired, either due to work loads or lack of technical expertise, commitment of funds for professional services will be required.

5.6   SCHEDULE

Figure 5-1 presents a timeline for implementation. A beginning date has not been set since the implementation of the project has not been funded by WSDOT. At a minimum, WSDOT should expedite the funding to complete the pilot study with the five suggested airports, determine the tangible benefits, and make the commitment to implement the full project.

WINGS Implementation Schedule