King County

2003 GIS Production Operations and Maintenance Plan

Document History

Date	Who	Description
2/11/2003	GIS Technical Committee	Document completed and discussed at the GIS Technical Committee meeting.
2/14/2003	George Horning	GIS Technical Committee consensus vote for submitting document to the GIS Oversight Committee.
2/28/2003	Christie Most	Submittal of document to the GIS Oversight Committee.

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1 Introduction

This document describes the state of the King County Geographic Information System (KCGIS) program as of January 2003. It represents the culmination of a collaborative effort by personnel throughout the County to document the 2003 GIS work programs for participating agencies. GIS is critical to the business of King County as demonstrated in its use for property appraisal, permit review, emergency services, election services, wastewater facilities planning, natural resource and parks management, waste monitoring, public health, road maintenance, transit services, airport management, crime analysis, policymaking, and growth management. This document provides the details of how GIS supports those and many other business functions.

2003 marks the beginning of the second full year of operation of the KCGIS program under its current governance structure. In the spring of 2001, the King County Executive communicated his vision for the future of GIS. Implementation of this vision necessitated reorganization and consolidation of enterprise GIS functions under a single point of accountability – the Department of Natural Resources and Parks (DNRP) Director. It also established a management structure at both a technical and oversight level. The result is a streamlined, cost-effective organization for the coordination of King County GIS activities. A key mission of the consolidated organization is to generate an annual coordinated work plan (known as the Production Operations and Maintenance Plan or O&M). This document is that work plan and it builds on the information collected and described in the 2002 O&M, which was the first of its kind in King County. Like the 2002 O&M, the 2003 O&M provides lists of data and applications, descriptions of current work tasks, details of agency GIS programs, and information on GIS budgets. However, the 2003 O&M is more thorough and forward looking, and is a step closer to the goal of creating a dynamic document that serves as both a reference and a tool for strategic technology planning.

The outline and organization of the 2003 O&M is different than 2002. Two changes are significant. First, the work program for the King County GIS Center is no longer described in a separate chapter and its subsection headings now conform exactly to those for all the other agencies. Second, rather than inter-leaving the descriptions of discrete GIS units that are within the same agency as was done in the 2002 O&M, the work programs are separately and sequentially described in the 2003 O&M (see for example sections 3.7A, 3.7B, and 3.7C).

Chapter 2 of the 2003 O&M provides a high-level overview of the governance structure and organization of KCGIS with descriptions of roles and responsibilities. Chapter 3 describes the work programs for individual agencies participating in the KCGIS program. Chapter 4 serves as an appendix to include information about the governance committees and work groups. New to the appendix this year is a terms and definitions section, and summary tables for data and applications. The 2003 task list is also integrated into the appendix chapter, rather than being a separate document as was the case for the 2002 O&M.

The information in this document will be used to continue to refine KCGIS through cooperation, coordination, communication, and consensus. Development of the 2002 O&M served as a mechanism for identifying and capturing inter-department coordination issues, potential areas of duplication, and instances where improved communication would enhance the County's GIS investment. Using the governance structure established in 2001, issues raised by the 2002 O&M were distilled and reformulated as a set of priority initiatives. From the priority initiatives four discrete work tasks were identified and resources will be applied to those tasks in 2003. These tasks cover areas of data coordination, GIS software migration, cadastral data enhancement, and Seattle parcel data translation. The 2003 O&M will be used in much the same manner to identify and prioritize issues, and address them with planned actions for inclusion in the 2004 O&M.

KCGIS is a rich source of data, a unique set of innovative applications, and a group of highly skilled professionals serving the public's geographic needs. This resource is fundamental to the diverse business functions of the County, and this document describes it fully. Support from the Executive, management, and staff has provided a solid foundation for KCGIS to continue to grow and provide high-quality, cost-effective, and valued service to the citizens of King County.

2 King County GIS Organization

The King County Geographic Information System (KCGIS) is a consolidated and coordinated program involving 16 county agencies. The Director of the Department of Natural Resources and Parks (DNRP) is responsible for management of the KCGIS program. This assignment is the result of the King County Executive's 2001 decision to consolidate GIS and create a single point of accountability for the coordination and provision of GIS services. The consolidation decision was based on the County Executive's vision to optimize the delivery of GIS services to King County agencies, to preserve a stable source of funding for the KCGIS program, and for KCGIS to emerge as a regional provider of GIS services. The consolidation of the KCGIS program in its present form became effective on January 1, 2002.

The consolidated KCGIS program is governed by technical and oversight committees, which include representation from agencies across the county. The KCGIS Technical Committee addresses programmatic issues and makes recommendations to the KCGIS Oversight Committee regarding procedures, standards, and work initiatives. The KCGIS Oversight Committee approves the work of the KCGIS Technical Committee, develops the KCGIS budget, determines funding allocations, reports to the DNRP Director, and provides information to the Technology Management Board.

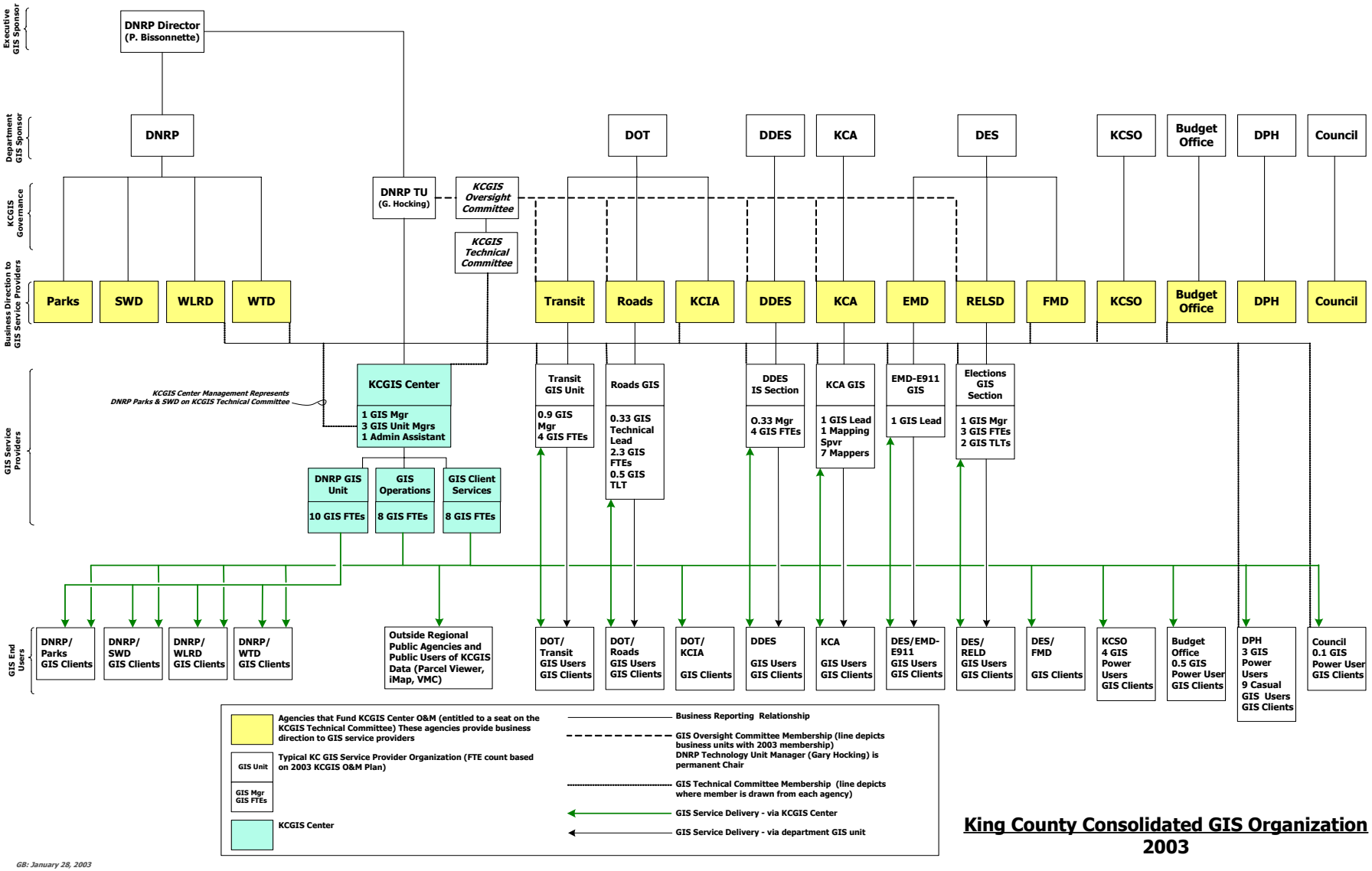
The consolidated KCGIS program includes an enterprise operation organized as the KCGIS Center, which is structured as an internal service fund managed by DNRP. The enterprise operations provided by the KCGIS Center are funded by the 16 participant agencies based on a cost allocation model that is revised annually. GIS operations and work functions not directly related to any specific agency's business are concentrated in the KCGIS Center. The remaining business specific GIS services are typically provided by the agency GIS units. However, when service by an agency GIS unit is not feasible or practical the KCGIS Center offers GIS client services on a cost reimbursable basis.

The consolidated KCGIS program is based on the principle that extensive coordination and collaboration occurs between GIS units in the county. This interaction includes most aspects of GIS from hardware and software, to data and applications, to the analysis and visual representation of information as maps and reports. It is also based on the premise that data are the core asset of the KCGIS program and every effort is made to freely share and systematically improve the county's GIS data.

The sections that follow in this chapter outline the roles and responsibilities of the various participants in the KCGIS program. The chart on the next page provides an illustration of the KCGIS governance structure and the relationships of the participants.

2.1 DNRP Director

The Department of Natural Resources and Parks (DNRP) Director is the executive sponsor of the KCGIS program and is accountable to the County Executive for the overall performance of the program. The DNRP Director has delegated day-to-day oversight of the KCGIS program to the DNRP Technology Unit Manager who also serves as chair of the KCGIS Oversight Committee. The Technology Unit Manager provides regular reports on KCGIS activities to the DNRP Director and Deputy Director. The DNRP Director has the responsibility to decide issues that cannot be resolved by the KCGIS Oversight Committee, to negotiate funding and develop revenues to support the KCGIS program, and to report program progress to the County Executive.



King County Consolidated GIS Organization
2003

2.2 KCGIS Oversight Committee

The KCGIS Oversight Committee membership consists of a single representative from each of the following agencies: Department of Natural Resources and Parks, Department of Transportation – Road Services Division, Department of Transportation – Transit Division, Department of Development and Environmental Services, and Department of Assessments. Members of the KCGIS Oversight Committee representing these agencies have the option to appoint two temporary members for one-year terms from other agencies or programmatic areas that have significant involvement in GIS. For 2003 the KCGIS Oversight Committee has designated the Department of Executive Services – Records, Elections, and Licensing Services Division to fill one of the temporary appointments. At this time the other temporary position is vacant.

Members of the KCGIS Oversight Committee must have authority for budget approval and policy decisions of GIS programs within their agency, and for representation of agency GIS customers. Members of the KCGIS Oversight Committee may not serve on the KCGIS Technical Committee at the same time. The DNRP Technology Unit Manager, who reports to the DNRP Director, serves as the DNRP representative and chair of the KCGIS Oversight Committee.

The KCGIS Oversight Committee is responsible for guiding the direction of the KCGIS program. Issues that cannot be resolved by the KCGIS Oversight Committee are escalated to the DNRP Director for a decision. The KCGIS Oversight Committee is required to meet at least once per quarter. The committee responsibilities include:

- Review and approval of the annual KCGIS Operations & Maintenance Plan.
- Review and approval of standards for policy and technical direction as recommended by the KCGIS Technical Committee.
- Address issues regarding enforcement and use of standards and best practices escalated from the KCGIS Technical Committee.
- Provide an annual report on KCGIS work program status to the Technology Management Board.
- Review and approval of the annual budget for the KCGIS Center.
- Recommend the annual cost allocation model for KCGIS Center services.
- Make recommendations to the Technology Management Board as needed.
- Resolve issues escalated from the KCGIS Technical Committee.

The KCGIS Oversight Committee charter and the current and historic committee member listing can be found in the Appendix (see Section 4.1).

2.3 KCGIS Technical Committee

Membership in the KCGIS Technical Committee is allocated on the basis of participation in funding of the KCGIS program. Each Current Expense (CX) agency and separate revenue fund contributing to the KCGIS Operation and Maintenance cost allocation model is granted one seat on the KCGIS Technical Committee. This chart lists the 16 agencies eligible for membership on the committee based on funding contributions in 2003. One additional seat on the committee is allocated to the KCGIS Center.

Assessments	Sheriff's Office	DOT-Airport
Budget Office	DDES	DOT-Road Services
Council	DES-E911 Program	DOT-Transit
DES-Facilities Management	DNRP-SWD	Public Health
DES-REALS	DNRP-WTD	KCGIS Center
DNRP-Parks and Recreation	DNRP-WLRD	

The membership of the KCGIS Technical Committee is reviewed and updated annually. A responsible authority within each participant agency appoints the KCGIS Technical Committee member. Committee members may not serve on both the KCGIS Technical Committee and the KCGIS Oversight Committee simultaneously. The KCGIS Technical Committee elects a chair and vice-chair annually.

The KCGIS Technical Committee is accountable to the KCGIS Oversight Committee and is responsible for developing standards, coordinating work programs, addressing programmatic issues, and making recommendations to the KCGIS Oversight Committee. Issues that cannot be resolved by the KCGIS Technical Committee are escalated to the KCGIS Oversight Committee. The KCGIS Technical Committee is required to meet at least once per month.

The KCGIS Technical Committee may create short- or long-term working groups for detailed analysis of significant organizational and technical issues. The KCGIS Technical Committee currently has three working groups (Best Practices, Cartographic Standards, and Operations and Maintenance). Details about these working groups can be found in Section 4.2.3. Participation in working groups is not restricted to members of the KCGIS Technical Committee. The working groups are created to accomplish a set of objectives and the KCGIS Technical Committee may reorganize or disband the working groups as needed.

Responsibilities of the KCGIS Technical Committee include:

- Coordinate KCGIS Center and department GIS unit work program development and develop an annual KCGIS Operations and Maintenance Plan for review and approval by the KCGIS Oversight Committee.
- Develop and recommend GIS standards and best practices for the KCGIS program to the KCGIS Oversight Committee.
- Recommend policy for GIS technology to the KCGIS Oversight Committee.
- Monitor the use of approved GIS standards and best practices and escalate enforcement issues to the KCGIS Oversight Committee.
- Inventory existing GIS data and applications and coordinate data and application development efforts.
- Provide a forum for discussion of GIS technical issues.
- Educate departments about the value GIS will add to business practices.
- Prepare quarterly reports on the status of the KCGIS program.

The KCGIS Technical Committee charter and the current and historic committee membership can be found in the Appendix (see Section 4.2).

2.4 Departments

Coordination and collaboration between department GIS programs has become more extensive as the KCGIS program matures. All aspects of the KCGIS program are addressed through the consolidated governance structure created in 2001, which is based on active department participation. Department GIS programs work together formally via the KCGIS Technical Committee, and informally via user groups, work groups, and ad hoc committees. As members of the GIS community and contributors and benefactors of the KCGIS program the department GIS programs responsibilities include:

- Develop and submit an annual work plan for review and inclusion in the KCGIS Operations and Maintenance Plan.
- Develop and maintain GIS data necessary to support department business needs, and when compatible, the needs of interested data stakeholders.
- Articulate department GIS business needs to the KCGIS community.
- Comply with GIS standards and best practices approved by the KCGIS Oversight Committee.

- Ensure all department data appropriate for sharing is integrated into the KCGIS data warehouse.
- Actively seek opportunities for cross-agency collaboration on data and application projects.
- Ensure data development and data maintenance tasks are quality controlled and are completed on schedule.
- Ensure department GIS personnel maintain sufficient levels of professional expertise.
- Work cooperatively in support of the regional KCGIS services vision.
- Actively participate on KCGIS committees and work groups.

2.5 KCGIS Center

The KCGIS Center provides enterprise services for the KCGIS program, fee-based client services to internal and external customers, and department specific GIS services to DNRP through a matrix management structure. The KCGIS Center is managed by DNRP for the benefit of the agencies participating in the KCGIS program. The KCGIS Center work program is developed under the guidance of the KCGIS Technical and KCGIS Oversight committees. The mechanism to accomplish this is the annual Operations and Maintenance (O&M) Plan that is developed by the KCGIS Technical Committee and approved by the KCGIS Oversight Committee. The KCGIS Center works in collaboration with these committees and the department GIS programs to coordinate the KCGIS program, to deliver the GIS services that King County department customers require to support their business needs, and to develop the systems necessary to build the GIS environment needed to attain the County Executive's vision.

Responsibilities of the KCGIS Center include:

- Provide a single point of contact via the client services manager for access to King County GIS services.
- Manage the KCGIS Spatial Data Warehouse.
- Provide database coordination services to ensure that KCGIS data development and data maintenance activities are rationalized.
- Set up and manage data acquisition and data sharing agreements and coordinate response to external data requests.
- Provide public access to GIS data.
- Facilitate integration of quality controlled department data into the KCGIS Spatial Data Warehouse.
- Coordinate with department GIS programs to ensure that data maintenance occurs on schedule.
- Comply with the GIS standards and best practices approved by the KCGIS Oversight Committee.
- Provide tools for developing, maintaining, and accessing KCGIS metadata.
- Actively participate on KCGIS committees.
- Market regional GIS services in coordination with King County departments.
- Provide GIS software and consultant contract administration.
- Provide professional and end-user GIS training services.
- Provide GIS expertise to departments as requested.
- Report data maintenance problems to the KCGIS Technical Committee.
- Coordinate the evaluation of technical options with department GIS programs and the KCGIS Technical Committee.

- Implement and maintain the architectural and system standards approved by the KCGIS Oversight Committee.
- Maintain a common application development environment.

2.6 KCGIS Budget and Funding

This section presents two tables that provide an overview of GIS related budgets and funding mechanisms for the KCGIS program.

This table outlines the approved 2003 budgeted funding for operation of the KCGIS Center.

KCGIS Center 2003 Budget and Revenue Allocations					
	GIS Center (Cost Center 3181M)			GIS Center DNRP Unit (Cost Center 3182M)	TOTAL GIS Center Budget (55026)[2]
Department Name (LowOrg)[1]	O&M Funding Model	Budgeted Client Services	Total GIS Center		
Department of Assessments (1599)	180,957	20,000	200,957		200,957
DDES (3419)	180,957	5,000	185,957		185,957
DES: EMD: EOC (2991)	0	10,000	10,000		10,000
DES: EMD: E911 (7543)	126,023	10,000	136,023		136,023
DES: Records & Elections (7250)	45,239	5,000	50,239		50,239
DES: Facilities Management Div (1519)	22,620	15,000	37,620		37,620
DES: ITS: I-Net (4901)	0	2,500	2,500		2,500
DNRP: WTD (7200)	144,873	30,000	174,873	378,245	553,118
DNRP: WLRD (3814)	146,166	0	146,166	439,609	585,775
DNRP: Parks Division (8244)	45,239	0	45,239	95,893	141,132
DNRP: SWD (1454)	55,652	25,000	80,652	48,096	128,748
DPH (1800)	37,739	12,500	50,239		50,239
DPH: EMS (1190)	7,500	0	7,500		7,500
DOT: Roads (1665)	98,341	87,250	185,591		185,591
DOT: Transit (5130M)	210,793	87,250	298,043		298,043
DOT: Airport (1765)	22,620	75,000	97,620		97,620
Sheriff's Office (1933)	22,620	20,000	42,620		42,620
County Council (1041)	22,620	12,500	35,120		35,120
Budget Office (1063)	22,620	32,500	55,120		55,120
DCHS (5301)	0	15,000	15,000		15,000
Prosecuting Attorney's Office (5028)	0	15,000	15,000		15,000
Boundary Review Board (1596)	0	7,500	7,500		7,500
Superior Court (6631)	0	5,000	5,000		5,000
District Court (6389)	0	5,000	5,000		5,000
Contingent Billing to KC Agencies	0	250,465	250,465		250,465
Billings to Agencies Outside KC	0	234,256	234,256		234,256
Total:	1,392,580	981,721	2,374,301	961,843	3,336,144

Notes:

1. The LowOrgs indicated are those that the Budget Office reported for KCGIS Center funding for 2003 budget expenses.
2. Agency GIS expense budgets are generally found in account 55026.

This table provides a comprehensive view of how GIS services are typically provided to each county agency, along with the funding mechanisms for obtaining those services.

2003 King County GIS Services Funding Mechanism Summary:					
GIS Service Recipients:	**GIS Service Providers:**				
	KCGIS Center Costs			**Department GIS Unit[4]**	**Outside Vendors[5]**
	O&M[1]	**Client Service[2]**	**DNRP Unit[3]**		
Department of Assessments	Fixed quarterly I/F Transfer	Service specific I/F transfer		Budgeted & paid internally	Billed to fund
DDES	Fixed quarterly I/F Transfer	Service specific I/F transfer		Budgeted & paid internally	Billed to fund
DES: EMD: EOC		Service specific I/F transfer			Billed to fund
DES: EMD: E911	Fixed quarterly I/F Transfer	Service specific I/F transfer		Budgeted & paid internally	Billed to fund
DES: Records & Elections	Fixed quarterly I/F Transfer	Service specific I/F transfer		Budgeted & paid internally	Billed to fund
DES: Facilities Management Div	Fixed quarterly I/F Transfer	Service specific I/F transfer			Billed to fund
DES: ITS: I-Net		Service specific I/F transfer			Billed to fund
DNRP: WTD	Fixed quarterly I/F Transfer	Service specific I/F transfer	Fixed quarterly I/F Transfer		Billed to fund
DNRP: WLRD	Fixed quarterly I/F Transfer		Fixed quarterly I/F Transfer		Billed to fund
DNRP: Parks Division	Fixed quarterly I/F Transfer		Fixed quarterly I/F Transfer		Billed to fund
DNRP: SWD	Fixed quarterly I/F Transfer	Service specific I/F transfer	Fixed quarterly I/F Transfer		Billed to fund
DPH	Fixed quarterly I/F Transfer	Service specific I/F transfer			Billed to fund
DPH: EMS	Fixed quarterly I/F Transfer				Billed to fund
DOT: Roads	Fixed quarterly I/F Transfer	Service specific I/F transfer		Budgeted & paid internally	Billed to fund
DOT: Transit	Fixed quarterly I/F Transfer	Service specific I/F transfer		Budgeted & paid internally	Billed to fund
DOT: Airport	Fixed quarterly I/F Transfer	Service specific I/F transfer			Billed to fund
Sheriff's Office	Fixed quarterly I/F Transfer	Service specific I/F transfer			Billed to fund
County Council	Fixed quarterly I/F Transfer	Service specific I/F transfer			Billed to fund
Budget Office	Fixed quarterly I/F Transfer	Service specific I/F transfer			Billed to fund

2003 King County GIS Services Funding Mechanism Summary:					
GIS Service Recipients:	**GIS Service Providers:**				
	KCGIS Center Costs			**Department GIS Unit[4]**	**Outside Vendors[5]**
	O&M[1]	**Client Service[2]**	**DNRP Unit[3]**		
DCHS		Service specific I/F transfer			Billed to fund
Prosecuting Attorney's Office		Service specific I/F transfer			Billed to fund
Boundary Review Board		Service specific I/F transfer			Billed to fund
Superior Court		Service specific I/F transfer			Billed to fund
District Court		Service specific I/F transfer			Billed to fund
Outside Agencies	Future – TBD	Billed to agency			

Notes:

1. KCGIS Center O&M expenses are 'fixed costs' funded by agencies on a share model basis determined annually. The share model is proposed by the KCGIS Center to the KCGIS Oversight Committee (subject to normal county budget development procedures). They are billed to agencies by the KCGIS Center at the beginning of the year for fixed quarterly interfund transfer via AIRS form.
2. KCGIS Center Client Services costs are provided on a 'full cost reimbursement basis', billed to agencies as work is completed. Most client services are billed by the hour. KCGIS Data CDs are sold for a fixed unit price and GIS training is provided on a per seat cost basis for each class. Client services are generally billed to King County agencies via individual interfund transfers. Outside agencies are billed via invoice and pay by check or PO.
3. KCGIS Center DNRP GIS Unit operations are funded on the basis of 'negotiated annual level of service costs' allocated to the four specific DNRP divisions that receive services. They are billed to the divisions by the KCGIS Center at the beginning of the year for fixed quarterly interfund transfer via AIRS form.
4. Department GIS Unit costs are budgeted internally for those departments that maintain their own separate GIS service operations. These departments generally have their own GIS unit or a designated GIS lead, along with their own budget and related work programs. Please see department specific information in Section 3 (3.x.2.4) for details.
5. Costs for outside GIS consultants and vendors are billed directly to the appropriate fund. Such costs may include:
   - GIS software purchase and maintenance
   - GIS required hardware
   - Specialized GIS based applications (e.g. E-911, Sheriff)
   - GIS data (e.g. digital orthophotography, imagery analysis and classification)
   - GIS consulting
   - Specialized GIS training
   - Custom GIS application development

3 2003 King County GIS Work Plan

Section 3 provides details of the GIS work programs for the KCGIS Center and the 16 agencies participating in the KCGIS program. Each agency work program is presented using the same outline progression. First a program overview is provided, which includes discussion of agency mission and business functions with descriptions of how GIS services support those functions. Also included is information for GIS staff requirements, the GIS hardware and software environment, and GIS budget. This is followed by discussion of spatial data maintained, enhanced, and developed by the agency. Then GIS applications developed and maintained by the agency are discussed. However, many smaller agency GIS programs have little or no GIS application activity to describe. Each agency section concludes with discussion of GIS system integration issues and descriptions of GIS client services and support offered by that agency.

Distinct agency programs that are within the same department are presented separately, but are grouped into the same tier-2 subsection of the Section 3. For example, all Department of Transportation GIS programs are in Section 3.7, distinguished as 3.7A – Road Services, 3.7B – Transit, and 3.7C – King County Airport. Due to its unique status as the enterprise GIS unit the KCGIS Center is presented first as Section 3.1 and is not grouped with the other GIS programs in DNRP (Section 3.5).

One agency, DES – Facility Management Division (FMD), is just beginning to develop a formal GIS work program. Once the work program for FMD has been completed it will be added to Section 3.4C as an amendment to this document. This is likely to occur by mid-year 2003.

3.1 GIS Center

The King County GIS Center's mission is to deliver efficient, high-quality GIS technology solutions to King County agencies, our regional customers, and the public, which meet the unique business needs of King County and the communities we serve. To carry out this mission the KCGIS Center works in partnership with the KCGIS governance committees, and King County departments and their GIS programs to provide enterprise GIS services including coordination, administration, infrastructure, data warehousing, and GIS applications. The KCGIS Center also provides customized GIS client services such as mapping, spatial analysis, and data development, as well as agency specific GIS services to the Department of Natural Resources and Parks (DNRP). In delivering these services the KCGIS Center strives to provide information systems that are accurate, consistent, accessible, affordable, and comprehensive.

The KCGIS Center is an internal service fund administratively located within the Technology Unit of DNRP. The Technology Unit is one of nine business units that comprise the DNRP Director's Office. The KCGIS Center is organized into three groups; Enterprise Operations, Client Services, and the DNRP GIS Unit. Enterprise Operations and Client Services are discussed in detail in the sections that follow. Complete information on the DNRP GIS program and the DNRP GIS Unit is provided in sections 3.5 – 3.5D.

3.1.1 Business Functions

The work program of the KCGIS Center supports a wide range of King County business functions by providing GIS services aligned to the core objectives of King County. These objectives, as stated in the county's mission statement, are to provide high-quality, cost-effective, and valued services. The following examples illustrate how KCGIS Center services support each of these objectives.

High-quality Service – By providing essential services from a central source the KCGIS Center facilitates the coordination and delivery of high-quality GIS technology solutions across county agencies. The centralization of administrative and management functions reduces the total effort required to deliver high-quality GIS services. By concentrating a full spectrum of enterprise and client services within a single organization the KCGIS Center fosters the development of highly specialized GIS skills and expertise. These skills can be leveraged to effectively apply the use of advanced GIS technology to serve county business needs. Also, the KCGIS Center functions as a single point of contact for agencies and individuals seeking GIS services, providing a mechanism to rationalize GIS service delivery. Finally, the KCGIS Center plays a key role in meeting strategic technology goals by helping develop and implement GIS standards and best practices.

Cost-effective Service – The consolidation of core enterprise services within the KCGIS Center allows these services to be provided to all county agencies in a cost-effective manner. For instance the KCGIS Center provides countywide administration of GIS hardware and software purchase and maintenance contracts, external data acquisition, GIS data sales, and GIS training, in each case negotiating to control and standardize costs. By pooling specialized staff skills and resources within a flexible management structure the KCGIS Center also delivers cost-effective, fee based client services on an as needed basis to agencies requiring GIS support. Costs to these agencies are both predictable and significantly lower than the cost for similar services from outside vendors. County clients also have access via the KCGIS Center to a far wider range of specialized GIS skills and cost-effective services than they could develop and support on their own.

Valued Service – The KCGIS Center administers the KCGIS Spatial Data Warehouse, which is utilized by nearly all county agencies as a valued enterprise resource of land-based information and data access tools. To support the KCGIS Spatial Data Warehouse, the KCGIS Center develops and maintains tools that enable the posting, integration, and sharing of GIS data across county agencies, including the core property layer RECDNET. The KCGIS Center also develops and maintains GIS end-user applications, which provide standardized and easy access to GIS information for non-GIS professionals. Finally, the KCGIS Center administers the county's GIS Internet presence, which provides knowledge resources for GIS professionals and users, and sophisticated GIS mapping capabilities via applications such as the Parcel Viewer and iMap. The value of the services offered by the KCGIS Center is further demonstrated by the rating of the Parcel Viewer and iMap as two of the top ten King County web pages.

Alignment with King County's core objectives of high-quality, cost-effective, and valued service provides the KCGIS Center with the opportunity to enhance the GIS programs and services of county agencies, enabling those agencies to optimize their use of the technology to support business functions and in the end provide better service to the citizens of King County.

3.1.2 GIS Program Overview

In 2002 the KCGIS Center completed its first year as an internal service fund within DNRP. In April of 2001 King County Executive Ron Sims designated the director of DNRP as the single point of accountability for all King County GIS activity. To support this new responsibility, the KCGIS Center was transferred from ITS (Information and Telecommunications Services) to the DNRP Director's Office Technology Unit. By December 2001, the KCGIS internal service fund had been established and the physical and organizational move to DNRP had been completed.

Also in 2001, DNRP consolidated all GIS staff in the various divisions of the department into a single operational unit managed by the KCGIS Center. The result is a scope of responsibility for the KCGIS Center that includes not only enterprise wide services, but also agency specific GIS service delivery, similar to that provided by GIS units in the Department of Transportation (DOT), Department of Development and Environmental Services (DDES), Department of Executive Services (DES), and Department of Assessments. In 2003 this responsibility includes GIS service delivery to all four DNRP divisions. The full details of the DNRP GIS Unit and the division work programs are provided in sections 3.5A – 3.5D.

The DNRP Technology Unit Manager provides administrative oversight of the KCGIS Center program and also serves as chair of the KCGIS Oversight Committee. Details of this oversight arrangement are discussed in Section 2. The DNRP Technology Unit also helps coordinate KCGIS Center system administration and office administrative support.

The KCGIS Center Manager reports to the DNRP Technology Unit Manager. The KCGIS Center includes 31 staff positions organized into three units. A key component of the effective management of the KCGIS Center is the ability to assign specific staff to tasks across these organizational units, to support operational efficiency, to develop redundant expertise, and to promote individual professional development. The following paragraphs describe the roles and responsibilities as assigned to each of these units, while acknowledging that the scope of work for certain staff members spans these functional categories.

Enterprise Operations – The Enterprise Operations Unit provides a range of management, administrative, and technical services to support the KCGIS program. 12.0 FTEs support these services, which are divided into two functional lines of business, administrative operations and technical operations.

Administrative functions of Enterprise Operations Unit are primarily carried out by 4.0 FTEs, which includes the KCGIS Center Manager, the Marketing & Finance Manager, the Enterprise Services Manager, and the Office Manager. Services provided by this group include staff management, program development and planning, budgeting, financial control, marketing, administrative and clerical support, enterprise coordination, contract management, and data acquisition. Administration of financial services includes management of the KCGIS internal service fund, annual budget development in accordance with the KCGIS governance structure, billing for client services and for annual cost allocation shares, financial expenditure controls, and financial reporting. The marketing services promote the use of KCGIS resources to county business sectors that may currently underutilize GIS technology, and to external agencies and businesses. Marketing furthers the Executive's vision of KCGIS as a regional service provider to local municipalities, utilities, and other public and private agencies by promoting the use of KCGIS products, resources, and services.

The technical functions of the Enterprise Operations Unit are provided by 8.0 FTEs and cover a broad spectrum including spatial data warehousing, RDBMS administration, website content management, application development, system administration, and infrastructure management. These services provide support to GIS professionals and GIS end-users throughout the County. Other services of this group include administration and publishing of GIS metadata, verification of data posted to the spatial data

warehouse to ensure compliance with database formats and standards, and data integration and quality control for the RECDNET maintenance process.

A new service offered by the technical operations group in 2003 will be enterprise data coordination. This service will include a comprehensive inventory and assessment of the GIS data holdings of King County in order to fully determine and describe data content and quality, and data purpose and fitness for use. Data development and data maintenance responsibilities and procedures will be thoroughly reviewed and recommendations will be made for improvements in these practices. The data coordination service will be an ongoing effort with the goal to establish a mechanism that promotes and results in continuous data improvement.

The enterprise data coordination service is being offered by redefining the job duties of a vacant ISA III position in the technical operations group of the Enterprise Operations Unit. This position will be filled in January 2003. There is currently one other vacant ISA III position in the technical operations group. The job duties for this position are under review as of December 2002 and the position will be filled when this review is complete.

The DNRP Technology Unit Manager provides input on strategic and technical direction for the Enterprise Operations Unit and participates in determining work assignments and duties for the system administrator and office manager functions. The KCGIS Center Manager oversees day-to-day operation of the Enterprise Operations Unit and other aspects of management and planning.

Client Services – The Client Services Unit offers a full spectrum of customized GIS consulting and project services on a cost-reimbursable basis to King County business units and to external customers such as local agencies, cities, and citizens. The services provided can be used to augment or supplement the existing GIS capability of an agency. The Client Services Manager leads the unit and the Production Coordinator assists in project management and service delivery coordination.

For 2003 the client services group has a maximum allocation of 9.25 FTEs. For the first time in several years there will be no allocations for TLT positions in Client Services. 3.0 of the 4.0 TLT positions allocated in 2002 will be converted to contingent FTEs by the beginning of 2003. This staffing model change was necessary because the limited term, single body of work definition no longer applied to the duties performed by staff in the TLT positions. One of the four TLT positions was converted as part of a mid-year 2002 supplemental budget request. The Metropolitan King County Council confirmed the change for two of the three remaining TLT positions when the 2003 budget was adopted near the end of 2002. Conversion of the fourth TLT position was denied, but the KCGIS Center may submit a supplemental budget request to restore the position in 2003 if work loads warrant. Recruitment to fill the contingent FTE positions began shortly after Council action. Each vacancy will only be filled in response to work loads demands. At this time it has been determined that there is enough work to fill two of the three converted positions.

Two Client Services Unit FTEs perform dedicated GIS project work for the Roads Services and Transit divisions of the Department of Transportation. 1.0 FTE is allocated to each division within a matrix management structure overseen by the Client Services Manager. KCGIS Center personnel allocated to these positions are co-located with staff in the divisions to which they are assigned.

One of the keys to managing project requests for client services is a flexible staffing structure within the KCGIS Center that allows the Client Services Manager to reach across the KCGIS Center organization to supplement skills as needed. This enables an expanded client service function that can draw upon highly specialized technical skills in the Enterprise Operations Unit on the occasional basis in which they are likely to be needed. For additional details on the services provided by the Client Services Unit see Section 3.1.6.

DNRP GIS – The DNRP GIS Unit is comprised of 10.0 FTEs. All ten are GIS analysts working within a matrix management structure, with program managers assigned to oversee lines of business based on the four DNRP divisions. The program managers interact as peers and coordinate support for DNRP projects by pulling from the pool of DNRP GIS Unit staff resources. DNRP GIS Unit personnel are generally assigned to a division and work with a specific program manager for most or all of their projects. However, the matrix structure allows program managers to share the pooled resources to optimize response to project demands.

Due to the complexity of their programs and the unique business needs of their divisions, separate GIS program managers are assigned to the Wastewater Treatment Division (WTD) and the Water and Land Resources Division (WLRD). These two managers are employees of their respective divisions and are not funded as KCGIS Center staff. The GIS work programs for the other two DNRP divisions, Parks and Recreation (PRD) and Solid Waste (SWD), are lesser in scale and a single program manager assigned from the KCGIS Center oversees both divisions. GIS program management for PRD and SWD requires less than a full FTE of effort, therefore only a portion of this staff member's time is dedicated to management of these two divisions.

The KCGIS Center Manager oversees the matrix management structure for the DNRP GIS Unit. The program managers for the DNRP divisions have responsibility to coordinate their efforts with the KCGIS Center Manager.

3.1.2.1 Training

The KCGIS Center administers a training program for GIS professionals and end users. For information regarding this program see GIS Training Program in Section 3.1.6. The following information is specific to training for KCGIS Center staff.

Staff development is managed through an individual training plan agreed with KCGIS Center management. Required training is generally made available during regular work hours within King County offices or at remote training sites when there are no other practical alternatives. Components of the plan include:

- Certified professional training through ESRI, Microsoft, or other appropriate vendor-based training programs. Coursework is progressive and may be instructor led or on-line interactive.
- Self-directed training of a 'continuing education' nature obtained via night or weekend classes. The KCGIS Center will reimburse up to 50 percent of the cost of successfully completed course work when it fits in with a logical staff development plan that meets the projected business needs of the KCGIS Center. There is a dollar limit determined annually for the amount of training reimbursement, based on budget considerations and the overall GIS training plan.
- Participation in professional conferences and individual research projects when the intention is to present or publish findings and results. These activities are encouraged if the work is relevant to the county's GIS program and if budget and workload permit their use.
- County-provided development training offered through the Office of Human Resource Management (OHRM) and DNRP.
- Learning on the job through the use of on-line information sources provided in the KCGIS Knowledge Base (see http://www.metrokc.gov/gis/kb/index.htm).
- Presentations by GIS staff on advanced topics and skills at GIS user and work group meetings.

Funding for KCGIS Center staff training is included in the annual budget. For 2003 this was reduced to an average of $1,250 per staff member, down from $1,500 in 2002. Training is allocated to individual staff based on an annual training plan, which reflects both individual and overall KCGIS Center workforce development goals.

3.1.2.2 Staffing Requirements

The KCGIS Center staffing model for 2003 consists of 31.0 FTEs allocated across four functional groups as noted in the chart below. This count includes the contingent FTEs in the Client Services Unit that will be filled as workloads require. The annual staffing model is developed in coordination with the KCGIS Oversight Committee. The KCGIS Center is led by the KCGIS Center Manager, a position converted in early 2002 from a vacant GIS analyst FTE as part of GIS consolidation. The KCGIS Center Manager position remained vacant until filled in June of 2002.

In 2002 and into 2003 the KCGIS Center will make use of interns to provide short-term support to cost reimbursable client services projects, or to priority initiatives as authorized by the KCGIS Oversight

Committee. Interns are full-time college students, hired under DNRP internship guidelines, interested in obtaining work experience in GIS. Internships are renewed or canceled at the end of each school term. The KCGIS Center only offers internships when salary savings or available contingency funds allow. The internships provide the KCGIS Center with an extremely effective mechanism to quickly add temporary staff to respond to increased workloads. The intern positions are not included in the staffing chart.

For the purposes of display in the staffing chart the KCGIS Center is shown as organized into four functional groups. However, there is crossover of roles and responsibilities and flexibility of staff assignments exists, especially between the Client Services and Enterprise Operations units. The staffing model for the DNRP GIS Unit is presented here, but additional staffing information for the DNRP GIS work programs can be found in sections 3.5A.2.2, 3.5B.2.2, 3.5C.2.2, and 3.5D.2.2.

Working Title	Focus	Class	Status	% GIS
Enterprise Operations – Administrative				
KCGIS Center Manager	Staff management and organization, program oversight and direction	ISA IV	FTE	100%
Finance and Marketing Manager	Budget, financial control, marketing	ISA III	FTE	100%
Enterprise Services Manager / PRD and SWD GIS Program Manager	Contracts administration, data acquisition, enterprise coordination / Program management	ISA III	FTE	100%
Office Manager	Administrative support	PA II	FTE	100%
Enterprise Operations – Technical				
Technical Supervisor	To be determined.	ISA III	FTE (Vacant)	100%
Data Coordinator	Data inventory, assessment, and coordination	ISA III	FTE	100%
Database Administrator	Database administration Oracle, SQL Server, ArcSDE	ISA II	FTE	100%
System Administrator	System administration, NT and UNIX	ISA II	FTE	100%
Application Developer	Front-end applications	ISA II	FTE	100%
Application Developer	Back-end applications, website content	ISA II	FTE	100%
Programmer/Analyst	Legacy application maintenance	ISA II	FTE	100%
Analyst	Cadastral data coordination	ISA I	FTE	100%
Client Services				
Client Services Manager	Program management	ISA III	FTE	100%
Production Coordinator	Project coordination	ISA II	FTE	100%
GIS Analyst	Matrix support for Transit Division	ISP III	FTE	100%
GIS Analyst	Matrix support for Roads Services Division	ISA II	FTE	100%
GIS Analyst	To be determined, filled as workload warrants	ISA II	FTE (Vacant)	100%
Training Coordinator	GIS training services	ISA I	FTE	100%

Working Title	Focus	Class	Status	% GIS
GIS Analyst	Publication cartography, website design	ISA I	FTE	100%
GIS Analyst	Analysis, data development	ISA I	FTE	100%
GIS Analyst	Analysis, data development	ISA I	FTE	100%
DNRP GIS				
GIS Analyst	Wastewater Treatment – data development	ISA II	FTE	100%
GIS Analyst	Wastewater Treatment – map production and analysis	ISA II	FTE	100%
GIS Analyst	Wastewater Treatment – map production and analysis	ISA II	FTE	100%
GIS Analyst	Wastewater Treatment – application support	ISA II	FTE	100%
GIS Analyst	Water and Land Resources – data development and analysis, map production	ISP III	FTE	100%
GIS Analyst	Water and Land Resources – data development and analysis, map production	ISP III	FTE	100%
GIS Analyst	Water and Land Resources – data development and analysis, map production	ISP II	FTE	100%
GIS Analyst	Water and Land Resources – data development and analysis, map production	ISA II	FTE	100%
GIS Analyst	Parks and Recreation / Solid Waste / Water and Land Resources – database development, analysis, map production	ISA II	FTE	100%
GIS Analyst	Parks and Recreation / Solid Waste / Water and Land Resources – database development, analysis, map production	ISA I	FTE	100%

3.1.2.3 Hardware and Software

Servers – The KCGIS Center as a subsection of the DNRP Technology Unit operates several UNIX and MS Windows servers. These servers support a number of tasks both for all GIS users in the county and specifically for KCGIS Center staff, and include providing access to 750GB of enterprise data storage space (*WILDFIRE*), managing enterprise software licenses (*ORCA*), and delivering Internet mapping services (*HERCULES*). All servers are accessible via the County LAN/WAN. Details for individual servers are provided below. All systems reside in the King Street Center except where noted.

WILDFIRE – Alpha Server ES40, Digital UNIX 5.0a. *WILDFIRE* is the primary data server for enterprise GIS data. *WILDFIRE* also runs the licenses for ARC/INFO 7.x and the applications written for that software. Those applications support the core of the KCGIS Spatial Data Warehouse, and include applications for data creation and management, metadata input and output, RECDNET (cadastral base) editing and integration, parcel layer extraction, and coverage to shapefile conversion. *WILDFIRE* also

runs the core RDBMS (Oracle) and ArcSDE, which serves a number of functions, most visibly as the primary data source for all ArcIMS based applications such as iMAP and the Parcel Viewer.

There are several mount points for *WILDFIRE*, each with a specific purpose as shown in the following chart.

Unix mount point	Windows share	Use of storage location	Permissions
/plibrary	/plibrary	Coverages	Read-only
/maint	/maint	Data development	Read/write GIS site
/projects	/projects	Active projects	Read/write defined by owner
/scratch	/scratch	Temporary work	Read/write defined by owner, cleared weekly
/plibrary2	/plibrary2	Shapefiles and remotely sensed images	Read-only

ORCA – Compaq 8000, Microsoft NT 4. *ORCA* acts as a central server for the KCGIS Center. It is the primary license server for ESRI products (except those on *WILDFIRE*). *ORCA* hosts a network install of ArcView 3.x that is used by WTD, and it provides a large file system used extensively by the KCGIS Center for administrative files and all forms of project components (including ArcView or ArcGIS projects, data, and documentation). The \\orca\projects share point is open to all GIS users for project level storage and file sharing.

HERCULES – www5.metrokc.gov, Compaq 7000, Microsoft NT 4. This machine resides in the Key Tower in King County's enterprise server computer room. It is in the KCWWW domain, which puts it in the "DMZ" between one firewall that separates it from the Internet and a second firewall that separates it from the rest of the KC WAN. *HERCULES* plays the web server role in the distributed architecture of the KCGIS Center's ArcIMS deployment. Currently the software installed on the server that is actively used includes the OS (NT4 sp6a), Web Server (IIS 4), Servlet Exec (a Java servlet engine), and the Oracle ODBC drivers.

KCGIS-SS1 and *KCGIS-SS2* – Gateway E-4650, Microsoft Windows 2000. These two machines were purchased in 2002 for the sole purpose of supporting the distributed architecture of the KCGIS Center's ArcIMS deployment. *KCGIS-SS1* serves as a "spatial server" to ArcIMS, which means that it receives requests from the "application server" component, connects to the data source (*WILDFIRE*, Oracle/SDE) and produces a response of either a map image or a stream of data in XML format. *KCGIS-SS2* also serves as a "spatial server" to ArcIMS, as well as functioning as the "application server", which means it is the machine where most ArcIMS administration takes place.

NATASHA – AlphaServer 2100 Unix Test Platform. *NATASHA* will become surplus in 2003. The functionality of this machine has been replaced by *WILDFIRE* and *ORCA* and it has been largely decommissioned.

BADINOV – Micron Powerserver NT 4. *BADINOV s*erves as the intranet web server for the KCGIS Center (http:\\badinov.metrokc.gov) and as a development server for ArcIMS applications. This machine runs its own installation of ArcIMS and Servlet Exec. In addition to the development versions of iMAP and Parcel Viewer, there are a number of intranet only ArcIMS applications served from this machine. *BADINOV* is an older machine and one of its two 333mHz processors is no longer functioning.

KCGIS-SQLDEV – Microsoft Windows 2000. Purchased in 2002 *KCGIS-SQLDEV* is a test server for SQL Server implementation. This machine may be available to support applications currently on *BADINOV*.

DNRP1 – Dell Network Attached Storage (NAS) Powervault 715N, Microsoft Windows 2000 NAS kernel. Purchased in 2002 by DNRP and managed by DNRP Technology Unit for use by the DNRP GIS Unit.

DNRP1 is the common server for DNRP GIS Unit and houses a DNRP GIS data warehouse as well as divisional GIS project work areas.

The following are new server equipment that will be deployed during the 4th quarter of 2002 and the 1st quarter of 2003. As these systems are deployed, some directories and data sets may be moved from *ORCA* and *WILDFIRE* to the data warehouse server or network attached storage as determined by KCGIS Center staff. Migration plans will be coordinated with GIS users in the county.

Data Warehouse Server – Microsoft Windows 2000. A two-cluster system initially configured with 1 RAID array, with future expansion for 3 additional RAID systems. This system will consist of two Dell PowerEdge 2650 dual 2.4GHz/512 Cache Xeon processors, 6 GB RAM, 2-18GB drives for O/S and transaction logs. The database array will be a single SCSI RAID array with 2-18 GB SCSI quorum drives and 12-35GB drives for data. The warehouse server will be configured with SQL Server 2000, ArcGIS 8.x and ArcSDE for SQL. The cluster system provides processing redundancy, fail over protection, and load balancing with added RAID systems.

KCGIS Center NAS – Quantum SNAP 4100 server, with 400 GB disk system. This machine will be provided by DNRP to offload KCGIS Center user home directories, administrative files and software media files from *ORCA*. This system will replace file space no longer available to the KCGIS Center on the ITS-FARM server and will support file space for new projects.

EOC NAS – Quantum SNAP 2200 server, with 160 GB disk system. This system will be installed at the Emergency Operations Center (EOC) for locally used shapefiles. This small desktop system will be automatically updated from the King Street Center using Quantum Server-to-Server software. This configuration will provide regularly scheduled updates of shapefiles to the EOC without requiring user intervention, and support EOC requirements to operate in standalone mode during emergencies.

Plotters

Bigfoot – HP DesignJet 2500CP. Large-format color ink jet plotter capable of plotting maps of virtually any length using 36-inch wide paper rolls with resolutions up to 600 dpi.

Yeti – HP DesignJet 3800CP. Large-format color ink jet plotter capable of plotting maps of virtually any length using 54-inch wide paper rolls with resolutions up to 600 dpi. Yeti is equipped with a Fiery X2-W, PostScript Level 3 Raster Image Processor for raster processing of extremely large files.

Alma – HP CLJ 8500 Color Laser Printer. High-capacity color printer capable of printing letter, legal, and tabloid (11 x 17-inch) pages with resolutions up to 600 dpi. Alma can also print duplex.

King Kong – HP DesignJet 5000PS. Large-format color ink jet plotter capable of plotting maps of virtually any length using 42-inch wide paper rolls with resolutions up to 1,200 dpi. King Kong is equipped with a UV ink system for producing fade and water resistant outdoor signage. This plotter is owned by the Parks and Recreation Division but is used and maintained by the KCGIS Center.

Server Software

Arc Internet Map Server (ArcIMS) – ArcIMS is an ESRI software product used to enable interactive mapping functionality on a web site. The ArcIMS package is composed of several server components, which are installed across multiple machines for optimal processing. The KCGIS Center administers ArcIMS services for both a public Internet mapping website and for an internal development and testing website.

Arc Spatial Data Engine (ArcSDE) – The KCGIS Center stores and serves enterprise data through ArcSDE (current version 8.1.1, service pack 1, build 854). ArcSDE facilitates multi-user access to spatial and tabular data stored in an RDBMS. The KCGIS Center currently administers ArcSDE on Oracle and will implement an ArcSDE instance on Microsoft SQL Server in 2003.

Arc8 License Manager – The Arc8 License Manager monitors and regulates ESRI licensed software use in compliance with current contract agreements.

Microsoft Internet Information Service (MS IIS) – MS IIS is a web server application used to publish documents and services on the Internet and intranet.

Oracle – Oracle is a relational database management system (RDBMS). Two database instances are licensed, a standard edition for the data warehouse and an enterprise edition to support data editing. The standard edition is licensed for an unlimited number of client connections and two host CPUs. The enterprise edition is currently licensed for 15 named users and includes the Oracle Spatial data types option.

Microsoft SQL Server 2000 – SQL Server is a RDBMS. The KCGIS Center has one enterprise license and plans to implement a data warehouse solution in SQL Server 2000. Further detail of this implementation can be found in the Enhancements section below.

Unity Servlet Exec – Unity Servlet Exec is a Java Servlet Engine that is used to deploy ArcIMS Internet mapping applications.

Client Software Licenses Managed for the Enterprise

The KCGIS Center manages licenses for ESRI software on four of the servers described above. The following tables describe the licenses maintained on each of these servers:

Wildfire

Software	Licenses
ArcInfo 7.x	21
COGO 7.x	9
GRID 7.x	1
Network 7.x	1
TIN 7.x	1
ArcPress 7.x	2
ArcView 3.x	2

Orca

Software	Licenses
ArcInfo 8.x	6
COGO 8.x	1
Network 8.x	1
ArcMapServer 8.x	1
ArcSdeServer 8.x	2
ArcSdeConnects 8.x	16
ArcView 8.x	10

KCGIS-SS1

Software	Licenses
ArcSdeServer 8.x	1
ArcSdeConnects 8.x	5

KCGIS-SS2

Software	Licenses
ArcSdeServer 8.x	1
ArcSdeConnects 8.x	5

The KCGIS Center also maintains licenses for ArcView 3.x and its extensions for use with NT systems on individual desktops. ESRI has authorized the operation of these licenses in a networked environment, enabling access and use by all KCGIS Center managers and staff. The following table describes these licenses:

Software	Licenses
ArcView 3.x	20
ArcView 3D Analyst	1
ArcView Image Analyst	1
ArcView Network Analyst	2
ArcView Spatial Analyst	3

ESRI software licenses are also used by GIS managers, staff, and end users in several other King County departments and agencies. The KCGIS Center supports this distributed use by centrally coordinating purchases, licensing, and maintenance of ESRI software products for all of these individual user sites. It also manages a master purchase agreement with ESRI, which enables the County to take advantage of the largest discounts available for purchases and maintenance of these software products, based on the combined volume of ESRI licenses held by all County departments and agencies.

Other GIS Related Software

Autodesk AutoCAD – Computer-aided design, version R13, not upgradeable.

ERDAS IMAGINE – Geographic image processing, version 8.4

Microsoft FrontPage 2000 – Web page editing and site management, three installed.

Microsoft FrontPage 2002 – Web page editing and site management, two installed.

Oracle JDeveloper Enterprise Edition – Oracle Java development environment.

Microsoft Visio 2000 Enterprise Edition – Data modeling, includes ESRI Geodatabase CASE extensions.

TechSmith SnagIt – Screen capture utility, one licensed and several shareware versions in use.

Altova XMLSPY – XML development environment.

LizardTech MrSID Geospatial Encoder – Geographic image compression.

Professional Graphics Software – Professional graphic design and illustration software tools are used to create publication-quality maps, and to support the design and production of map-based publications and web graphics.

Adobe Illustrator – Vector-based drawing and illustration; the primary map creation software; with the Avenza MAPublisher plug-ins, Illustrator can import GIS graphic, spatial, and attribute data, including geo-referenced raster images, and can export vector graphics to the Shapefile format, providing two-way data migration between ArcView/ArcMap and Illustrator.

Adobe Photoshop and ImageReady – Raster image editing and composition; Photoshop is used to create background image layers for maps, for digital photo editing, and with ImageReady for the creation of web graphics, including simple animations and rollovers.

Adobe LiveMotion – A correlate to Macromedia Flash (see below).

Adobe PageMaker – Document design and page layout; used to develop some map-based publications, such as park map brochures.

Adobe InDesign – Higher-end document design and page layout with more robust typesetting, layout, and production tools than PageMaker; used on newer map-based publications, such as the Mercer Island Park System Guide.

Adobe Acrobat – Electronic document conversion; creates portable, compact text and graphic documents from numerous original formats which can be read by a common reader application that is freely available; built-in tools allow the addition of interactive document navigation features.

Adobe Type Manager – Font management utility.

Macromedia FreeHand - A correlate to Illustrator; used for miscellaneous graphic tasks.

Macromedia Flash – Creation of dynamic, interactive, low-bandwidth vector-based graphics. Used to create animated, map-related presentations, and interactive, animated maps.

Enhancements

Backup and tape archiving – DNRP funded the acquisition of an enterprise class backup system in 2001 and implemented the system in 2002. Two systems are used to backup the KCGIS Center servers depending upon operating system platform. Tape sets are stored off-site and rotated weekly.

- Windows: The ADIC Scalar 100 tape library is used to backup multiple Windows servers including the KCGIS Center servers. Online storage capacity is 7 terabytes. Veritas Backup Exec for Windows NT and Windows 2000, Version 8.50. Incremental backups run nightly Monday - Thursday. The full backup runs on Friday evening.
- UNIX: The Benchmark DLT 7 SCSI tape library is used to backup the Compaq UNIX server *WILDFIRE*. Online storage capacity is 580 GB compressed, 280 GB uncompressed. Veritas Net Backup Business Server, Version 4.5GA. Incremental backups run nightly Monday - Thursday. The full backup runs on Friday evening.

Standalone GIS Data Warehouse Implementation – This is the second phase of the ESA/SAO data management project. In phase one, an upgrade to increase the amount of data storage capacity available on *WILDFIRE* was completed. Phase two of the project will acquire a new Windows 2000 Server/SQL Server 2000 system in order to implement a GIS data warehouse on a system separate from the current GIS data production environment on *WILDFIRE*. Production databases and data warehouses require significantly different architecture to operate optimally, which is why separation of these types of databases has become an industry standard. The new data warehouse will support the migration of King County's GIS application and analysis environment to the ESRI ArcGIS 8 product by providing the backend database engine needed in ESRI's new software architecture. It is anticipated this phase of the project will be completed during the first quarter of 2003.

ArcGIS 8 Production Environment Implementation – This is the third and final phase of the ESA/SAO data management project. In this phase a new ArcGIS 8 Geodatabase production environment will be implemented with a Windows 2000 Sever/SQL Server 2000 system design very similar to the data warehouse implemented in phase two. The existing UNIX/Oracle server, *WILDFIRE*, will continue to run in support of the ArcInfo 7 environment while applications are ported and data are modeled to the new ArcGIS 8 software and Geodatabase. This server providing new backend database engine functionality is needed in order to fully support the ESRI ArcGIS 8 software environment.

ArcGIS Software Migration Plan – The KCGIS Technical Committee identified migration to the ArcGIS 8 platform as a key concern for the KCGIS community. In response the KCGIS Oversight Committee directed the KCGIS Center to prepare a plan in consultation with participating King County agencies and ESRI to outline the timing and methodology for GIS software migration to the ArcGIS 8 environment. The plan will be a comprehensive description of the software and hardware transition environment and will include a recommended training path for GIS staff, agreement on what will be supported during and after the transition, resolution of data migration issues, a timetable, and identification of significant milestones to measure success. The plan will cover the scope of changes to GIS business practices including changes to data, data maintenance tools, system operations, license management, and applications for query, analysis, and display. The KCGIS Center will commit 0.2 FTE to this effort in 2003 and a portion of $25,000 allocated to KCGIS Center O&M budget in 2003 for ESRI consultant services will be used for this project. It is anticipated the software migration plan will be completed by mid-2003 and will be periodically reviewed, updated, and adjusted as milestones are reached.

3.1.2.4 Budget

The adopted 2003 KCGIS Center budget for the five standard O&M Plan reporting categories is presented below. Note that this does not include the DNRP GIS Unit portion of the KCGIS Center budget (see sections 3.5A.2.4, 3.5B.2.4, 3.5C.2.4, and 3.5D.2.4). The table also does not include various overhead and county central rate costs. For the total 2003 KCGIS Center budget refer to Section 2.6.

Item	Budget	Comments
Labor Costs (salary + benefits)	$1,702,288	Includes budget for contingent client services staff, but does not include a special class/comp settlement budget reserve of $157,865.
Hardware (acquisition and maintenance)	$100,000	
Software (acquisition and maintenance)	$77,350	
Training costs	$33,750	
Discretionary (consultants, outside services, materials, etc.)	$189,921	$147,500 represents appropriation authority for cost reimbursable expenses.

On December 10, 2001 the Metropolitan King County Council passed Ordinance 14270 establishing the KCGIS Center in DNRP as an internal service fund, "…for the purpose of accounting for financial resources for the full costing of operating, maintaining and enhancing automated geographic information systems that serve both county agencies and external customers." The ordinance designated DNRP as the fund manager and authorized the department to establish charges to recover the full cost for GIS services and operations. The ordinance further authorized annual appropriations of revenues, beginning in 2002, be included in the budgets of those agencies and funds either benefiting from the centralized GIS or receiving services from staff budgeted in the KCGIS Center fund. The KCGIS internal service fund was established on January 1, 2002 with an initial balance of $250,000. This initial fund balance was transferred from the ITS technology service fund and reflected the accumulated fund balance derived from KCGIS Center operations through the end of 2001.

KCGIS Center funding is obtained from three sources. The organization of the KCGIS Center is aligned with these funding sources, with overhead costs for management and administration of the KCGIS Center allocated accordingly to each.

- The KCGIS Center Enterprise Operations Unit is funded by 16 County agencies through a shared cost funding model (known as the KCGIS O&M Funding Model) negotiated annually by the KCGIS Oversight Committee. See Section 2.6 for details regarding the funding model, including a breakout of costs to each agency.
- The KCGIS Center Client Services Unit is funded by customer fees based on full cost recovery for provision of services. In 2003 the hourly fee for services will be $60.00 for analyst and programmer level services and $54.00 for technician level services.
- The DNRP GIS Unit is funded by the four DNRP divisions based on a calculated annual work program level of effort and associated staffing requirements. In 2003 the staffing requirements are: 4.5 FTEs for WLRD, 4.0 FTEs for WTD, 1.0 FTE for PRD, and 0.5 FTE for SWD. Any DNRP GIS work beyond the annual work program that cannot be accommodated by the DNRP GIS Unit is supported by KCGIS Center Client Services on the normal cost reimbursable basis.

3.1.3 Spatial Data

A key function of the KCGIS Center is to administer the enterprise spatial data warehouse, commonly known as the KCGIS Spatial Data Warehouse. The KCGIS Spatial Data Warehouse is a compilation of data from King County agencies, local, state, and federal organizations, and private data vendors. The KCGIS Spatial Data Warehouse is located on servers, which can be accessed via the KC WAN. For a listing of data available in the KCGIS Spatial Data Warehouse see Section 4.4.1. A catalog of the KCGIS Spatial Data Warehouse is provided on the Internet at http://www.metrokc.gov/gis/sdc/index.htm. This document also provides listings of spatial data maintained by King County departments that for various business reasons are not included in the enterprise spatial data warehouse (for example see Section 3.2.3).

Participants in the KCGIS program recognize the value of sharing GIS data with other organizations, and encourage data sharing whenever possible. Data sharing gives King County access to highly detailed, up-to-date information maintained by local agencies such as cities and utility districts. Access to local GIS data is critical for effective maintenance of important countywide layers such as parcels and the street network. The advantage of data sharing for local agencies is the availability of "adjacent area" information that is essential for their planning and management purposes, but which the agencies lack the resources to develop and maintain themselves.

The KCGIS Center currently shares data on an informal basis with a variety of state, county, city, and utility organizations. In addition, the KCGIS Center has established formal data sharing agreements with several governments and businesses. These are managed through written agreements in the form of memorandums of understanding or letters describing the terms and conditions of the data sharing arrangement. For a list of existing agreements see: http://www.metrokc.gov/gis/sdw/data_acquisition.htm.

3.1.3.1 Maintenance

The KCGIS Center has a unique set of responsibilities in regards to management of GIS data. These responsibilities include acquisition of data from external sources; development and temporary maintenance of data to support client services projects; stewardship of data that have no current data owner or active maintenance program; and ongoing maintenance of a limited set of data to support RECDNET integration and quality control. Listed in the following tables are data that fall into these categories. This is not a comprehensive listing of data available in the KCGIS Spatial Data Warehouse, the great majority of which are maintained by other King County agencies and are listed in the data sections for those agencies.

External Data Sources

The KCGIS Center maintains an ongoing program of acquiring data from a variety of external sources, both governmental and commercial. These data are generally acquired on a recurring basis, typically once a year, and are generally obtained at no cost, in exchange for King County's GIS data. In some cases, external data are acquired on an as-needed basis to meet specific project requirements. Data acquired on a recurring basis are generally loaded into the KCGIS Spatial Data Warehouse and updated as often as new data are received from the source agency. Data acquired on an as-needed basis may be loaded into the data warehouse, but often are not if there is no plan or schedule for future updates.

The following table lists data that have been acquired from external sources and are currently available in the KCGIS Spatial Data Warehouse. This table is organized by source agency, with a description of the general types of data acquired from each agency and a listing of the frequency of updates. Descriptive names used in this table are not the actual names of the data layers as stored in the data warehouse. Those names may be found in the Spatial Data Catalog (*http://www.metrokc.gov/gis/sdc/index.htm*). To the greatest extent possible, externally acquired data are loaded into the data warehouse without alteration of data content or of file and item names. If metadata files are provided by the source agency, the information they contain is incorporated into the Spatial Data Catalog. If such files are not provided, KCGIS Center data maintenance personnel create basic metadata for each data layer at the time it is initially loaded into the data warehouse.

Data Source	Data Description	Update Frequency
City of Bellevue	2 foot contours; Parcel boundaries; Lake shorelines; Streams; Street centerlines; Zoning boundaries.	Irregular

Data Source	Data Description	Update Frequency
City of Kent	Past annexations; Potential annexation areas; Building footprints; City limits; 5-foot contours; 25-foot contours; Spot elevations; Comprehensive plan; Driveways; Parks; Public facilities; FEMA flood zones; Fences; Hydrographic features; Tax parcels; Wetlands; Zoning; Survey points; Horizontal control; Utility poles and streetlights; Pavement edge; Major arterials; Street centerlines; Railroad tracks; Sanitary and storm sewer systems; Waterlines, mains, and fire hydrants; Drainage basins; Voter precincts.	Irregular
City of Seattle	Political and administrative boundaries; Tax parcels; Legal lots; Survey points; Control; Street network; Drainage and Wastewater Utility (DWU) database; Water distribution system; Hydrographic features; 2-foot contours; Break lines; Elevations; Known wildlife areas and corridors; Zoning classifications; Potential landslide areas and liquefaction zones; 100-year-flood hazard areas; Combined sewer overflow basin areas; Ditches; Former sanitary landfill areas.	Annually
City of Tukwila	Building footprints; Paved roads; Parking lots; Driveways; Gravel roads and driveways; Sidewalks; 2 foot contours; Areas where contours were interpolated due to dense vegetation; Drainage swales, streams, and wetlands. All of these were interpreted from 1999 Triathlon digital orthophotos.	Irregular
Pierce County	Political and administrative boundaries; Urban growth and urban service area boundaries; Tax parcels for all non-federal lands; Street centerline network; 100-foot contours; 20-foot contours for Western Pierce County; Basin boundaries for WRIA 10.	Annually
Snohomish County	Political and administrative boundaries; Integrated land records (including parcels); Street centerline network; Freeways and major roads; Hydrographic features; Public Land Survey (including township, range, section, and quarter section); USGS map index; Building footprints; Major rail lines; Paved airport runways; Urban growth boundary; Fire stations and schools; Park properties and recreational trails; Zoning regulations for unincorporated areas; Locations of known/protected mineral deposits.	Annually
Washington Department of Fish and Wildlife (WDFW)	Priority Habitats and Species (PHS) Marine Resources database; PHS Streamnet database; National Wetlands Inventory (NWI); Hydrologic Unit Boundaries; Marbled Murrelet and Spotted Owl Locations; Old Growth Timber Types.	Half-yearly
Washington Department of Natural Resources (WDNR)	Non-DNR major public lands; Soils.	Annually
WDNR	Shorezone Inventory database.	Irregular
Washington Department of Revenue (WDOR)	Regional Transit Authority boundary.	Irregular
Census Bureau	Census tracts, blocks, and block groups; Political and administrative boundaries; Tribal lands; Hydrographic features; Landmarks and key geographic locations; Streets, railroads, and utility lines; Population Forecast Analysis Zones (FAZ); Traffic Analysis Zones (TAZ); Urban Growth Area boundary; Urban/rural area designations.	Decennially

Data Source	Data Description	Update Frequency
Mt. Baker-Snoqualmie National Forest (MB-SNF)	Administrative boundaries; Roads; Trails; Hydrographic features; Developed recreation sites; Permitted alpine ski areas; Soils mapped for use and disturbance limits; Possible unstable soils affecting timber harvest or road building; Plant associations based on environment; Potential vegetation/plant development zones.	Irregular
US Forest Service	Forest production districts.	Irregular
US Geological Survey	Faults of the Seattle Fault Zone; Soils.	Irregular
GDT	5-digit ZIP Code boundaries, based on TIGER line files.	None planned
Olympic Pipe Line Company	Pipeline right-of-way through King County.	None planned

Data Temporarily Maintained by KCGIS Center

The KCGIS Center maintains stewardship on a temporary basis of GIS data that may be legacy or obsolete, or are under development in coordination with another agency. Data categorized as legacy or obsolete will be archived to storage media and eventually deleted from the KCGIS Spatial Data Warehouse based on KCGIS best practices. For data under development, data stewardship will transfer to the appropriate agency for ongoing maintenance upon completion of the data development phase.

Data Name	Data Description	Update Frequency
POCA	Public ownership and administrative boundaries	Irregular
RTABNDRY	Regional Transit Authority Boundary (approximate)	Irregular
ZIPCODE	King County ZIP Code boundaries	Irregular
CANOPY	Forest canopy	Irregular
FAULTS	Faults of the Seattle Fault Zone	Irregular
SOIL	Obsolete soils coverage	Irregular
SOILUSGS	Soils coverage from USGS	Irregular
BIGWATER	Largest water bodies in King County	Irregular
MUN_WSHD	Municipal watersheds	Irregular
PRECIP	Precipitation	Irregular
RAINSNOW	Rain on snow zones	Irregular
STORM10	10 year storm events	Irregular
FPD_USFS	US Forest Service Production Districts	Irregular
BIKEMET	Bicycle/non-motorized vehicle paved and unpaved routes	Irregular
E911_ESN	Emergency service areas	Yearly
NAVAID		Daily
ANTSITE	Antenna sites leased out by King County Property Services	Quarterly
LD_NAMES	Annotation from RECDNET for lot dimensions in map portal parcels	Other
REALPROP	Property Services King County owned parcels	Quarterly
ROW	Street right of way with PIN	Irregular
SCSTREET	Snohomish County street network	Irregular

Data Name	Data Description	Update Frequency
ST_ADDRESS	King County streets derived from RECDNET with address ranges.	Irregular
BASENET	King County centerline network.	Irregular
ST_NAMES	Street name annotation from RECDNET	Irregular

Data Maintained by KCGIS Center

The KCGIS Center has ongoing maintenance responsibility for a limited set of data that are key to the maintenance of the core cadastral base known as RECDNET. Other data included in the following table are static layers that do not require ongoing maintenance, or layers created for a specific purpose that are still useful to the enterprise, but have no ongoing maintenance plan.

Data Name	Data Description	Update Frequency
AIRINDEX	Center points of WSDNR aerial photos	Unknown
AIRPHOTO	Flight Lines for WSDNR aerial photos of King County	Irregular
ARTCLUST	Polygon coverage of clusters of public art sites in King County	Irregular
ARTSITES	Point coverage of public art sites in King County	Irregular
BASEADJ	Control points for adjustments of the cadastral base	Irregular
CONT20	20 foot contours from 10 meter DEM	Irregular
CONT50	50 foot contours from 10 meter DEM	Irregular
CONT100	100 foot contour lines from 10 Meter DEM	Irregular
INDEX	Index of RECDNET tiles	Irregular
INDEX_QT	Copy of the tiled index with township, range and 1/4 tile lines only	Irregular
INDEX_TR	Copy of the tiled index with township and range lines only	Unknown
MAPNUM	Map number index	Irregular
MAPNUMOK	Map number index	Irregular
MTPEAKS	Mountain peaks with elevations	Irregular
ORTHOIDX	Index for NIES orthophotos	Irregular
PLSS	Public Land Survey System	Irregular
POINOPUB	Points of interest owned or operated by non-public agencies	Irregular
POIPUB	Points of Interest owned or operated by public agency	Irregular
PS_BATH	Puget Sound bathymetry	Irregular
REFGRD16	Reference grid (1/16 sections)	Unknown
SOUNDING	Puget Sound soundings	Irregular
THOM_BROS	Thomas Guide page index	Irregular
WASHCO	County boundaries for all of Washington State	Irregular

3.1.3.2 Enhancement

Data Coordination – In 2002 the KCGIS Technical Committee identified several issues and concerns that affect the content and quality of the county's GIS data. Approaches to resolve these concerns and improve the county's GIS data will be formulated as a result of a data inventory, assessment, and

coordination initiative that will be undertaken by the KCGIS Center and begin in 2003. Examples of the issues the data coordination effort will address include:

- Identifying and transferring stewardship of data temporarily maintained by the KCGIS Center to the appropriate agency.
- Identifying data of unknown or undocumented sources and removing such data from the KCGIS Spatial Data Warehouse.
- Identifying departmental and project level data sets appropriate for cross agency sharing and migrating them into the KCGIS Spatial Data Warehouse.
- Completing metadata documentation for all data in the KCGIS Spatial Data Warehouse.
- Developing an ongoing data review and quality assurance process for data posted to the spatial data warehouse.
- Determining refresh policies for infrequently updated data.
- Negotiating data maintenance standards to ensure that data stewards develop and maintain data sets that meet the needs of a broad base of key stakeholders.
- Rationalizing data development and data maintenance activity across county agencies to eliminate redundant or inefficient efforts.
- Establishing a mechanism for ongoing review of data responsibility and data management practices.
- Developing data maintenance plans for data layers which currently lack a standard or predictable maintenance cycle (for example Sensitive Areas Ordinance (SAO) layers, Census layers, KCOWNED, and ST_ADDRESS).
- Determining planned update schedules for major data collection efforts such as acquisition of high-resolution orthoimagery.

The essential job duties for a vacant position within the KCGIS Center Enterprise Operations Unit have been redefined to lead the data coordination effort. Recruitment for this position has been completed and it will be filled in January 2003. A first priority in 2003 will be a comprehensive inventory and review of the GIS data holdings of King County. For each data set detailed information will be compiled, such as purpose, attributes, accuracy, completeness, frequency of update, and source. This information will be assessed in order to determine data quality and fitness for use. Data maintenance practices will also be critically reviewed. From this initial work recommendations will be brought forth to: eliminate instances of data redundancy; enhance existing data sets to meet a greater range of stakeholder needs; improve data maintenance standards and procedures; and close gaps in data content. The data coordination initiative is the beginning of a long-term process of ongoing data assessment, with goals to optimize GIS data management practices and to promote continuous improvement in the quality of the data in the KCGIS Spatial Data Warehouse.

Cadastral Data Enhancement Plan – In 2002 the KCGIS Technical Committee identified development of a plan for the enhancement of the cadastral base layer as a priority work initiative for 2003. In the later half of 2003 the KCGIS Center, in consultation with key stakeholders, will begin a detailed examination of methods to improve the quality and timeliness of the cadastral base layer. From this study a plan will emerge to address several fundamental issues. These issues include:

- Developing procedures to integrate parcel segregation and merger actions into the cadastral layer as soon after recording as possible.
- Developing a plan to systematically improve the positional accuracy of features in the cadastral layer.
- Identifying improvements to cadastral layer maintenance procedures and tools.
- Developing a new cadastral data model based on Geodatabase technology to replace the problematic and difficult to maintain RECDNET and keyfile system.

- Exploring the feasibility of creating a data maintenance consortium, modeled after the TNET project, to involve key cities in King County.

The long-term planning effort to enhance the cadastral data should lead to a cadastral layer of greater value that is more current, more accurate, and modeled to be maintained with procedures based on new software technology that supports a distributed data maintenance consortium. Full implementation of a cadastral data enhancement plan could incur significant new costs to the county in 2004 and beyond. Given the reality of the county's current budget situation a successful plan must seek remedies to minimize the impact on the county's budget. The KCGIS Center will commit 0.2 FTE to the cadastral enhancement planning effort in 2003 by redirecting job duties of selected Enterprise Operations personnel. A portion of $25,000 allocated to KCGIS Center O&M budget for ESRI consultant services may also be used for this project. Work on this priority initiative will likely commence after completion of the GIS software migration plan (see ArcGIS Software Migration Plan in Section 3.1.2.3).

Cadastral Framework Coverage (RECDNET) – As a part of the ongoing maintenance of RECDNET, the KCGIS Center works with the King County Assessor to resolve the deletion of certain type 12 arcs. Upon the redraft by Assessments of areas where survey control was inadequate in the original data conversion, the KCGIS Center permanently removes type 12 arcs flagged for deletion in the redrafted area. These deletions eliminate the vast amount of sliver polygons caused by the original and now unneeded arcs. Care is taken to retain type 12 arcs necessary to maintain the integrity of coverages that use these arcs for polygon boundaries (for example MAPNUM).

Conversion of Seattle Parcel Data – The conversion of Seattle parcel data into RECDNET format will continue in 2003. This conversion effort will allow Assessments to maintain Seattle parcel data within the same maintenance regime as is used for the other portions of the county. Currently Seattle parcel data are maintained using a separate set of procedures and tools and this conversion will greatly simplify and streamline Assessments parcel maintenance process. To assist with this effort the KCGIS Center will staff short-term production positions to perform the more routine conversion tasks. These production positions were be filled with college interns paid through salary savings derived from vacant Enterprise Operations positions. The KCGIS Center will also provide Enterprise Operations personnel to assist the conversion effort by monitoring integration processing, performing manual review of outputs, and assuring compliance with data warehouse standards.

Street Centerline Coverage (ST_ADDRESS) – In 2003 the KCGIS Center Client Services Unit will begin a project to add and edit roads and attributes for the street centerline coverage known as ST_ADDRESS. The King County Sheriff's Office funds this project.

Survey Control – The ability of many agencies to meet their specific business needs is dependent on positional accuracy enhancements to the cadastral base. There currently is no systematic plan for improving the accuracy of the cadastral features based on input of highly accurate survey data. In 2003 the KCGIS Center will begin the process to work with the Roads Services Division to develop a methodology for acquiring and utilizing new survey data for the unincorporated portions of King County. Also to be addressed in future efforts to improve the accuracy of the cadastral features will be obtaining survey data from King County cities.

King County Airport – In 2002, the KCGIS Center developed a documentation management system for historic leaseholds and ownership information. This work included the registration of 450 scanned maps and digitization of 500 buildings and 125 leases. These spatial data are stored as SDE layers, and a query tool was built for access and analysis. In 2003, this phase of the project will be in maintenance mode. The next phase, also scheduled for 2003, will be the extension of the documentation side of the project. Currently the KCGIS Center is providing storage for 425,000 pages of scanned documentation, and this volume will increase dramatically.

3.1.3.3 Development

The KCGIS Center has extensive experience and expertise in data conversion, development, and conflation projects. Projects for 2003 that have been identified and funded are listed below. The initial effort to develop and implement Geodatabase models for transitioning to the ArcGIS environment is also discussed in this section.

Geodatabase Modeling – Implementation of ArcGIS 8 necessitates replacing the coverage data model with a new database design, including relationship rules, using the Geodatabase framework. In 2003 the KCGIS Center will initiate an effort to develop the ArcGIS 8 database design for the cadastral framework. This effort will include collaboration with Assessments and other interested organizations. It will include subsequent meetings with GIS data stewards to develop relationship rules for other layers.

Census – In 2002, the raw 2000 federally provided census geometry was conflated to street centerline, parcel lines, and water features to derive census blocks matched to King County GIS data. From the census blocks, block groups, tracts, and census places were derived. Census data releases SF1, SF2, and SF3 are being imported into Oracle (eventually migrated to SQL Server), dBASE, and Access for easy, flexible, and rapid retrieval for queries. It is anticipated that the bulk of this work will be complete prior to the end of 2002 and the project will wrap up in early 2003. This project has been jointly funded by several agencies including DCHS, EOC, ORPP, REALS, and SWD.

EOC – The KCGIS Center Client Services Unit is engaged in a project to develop a set of comprehensive map layers for use by the Emergency Operations Center (EOC). This project will improve a number of map layers by including incorporated areas formerly out of the scope of interest of county departments. Included among the map layers to undergo detailed review and improvement is the LANDMARK layer, the SAO layers and other layers that depict environmentally sensitive features, and layers depicting facilities. Map layers will also be acquired from adjoining counties to build out a more complete data set for the Puget Sound region. This project is funded by the EOC.

3.1.3.4 Metadata

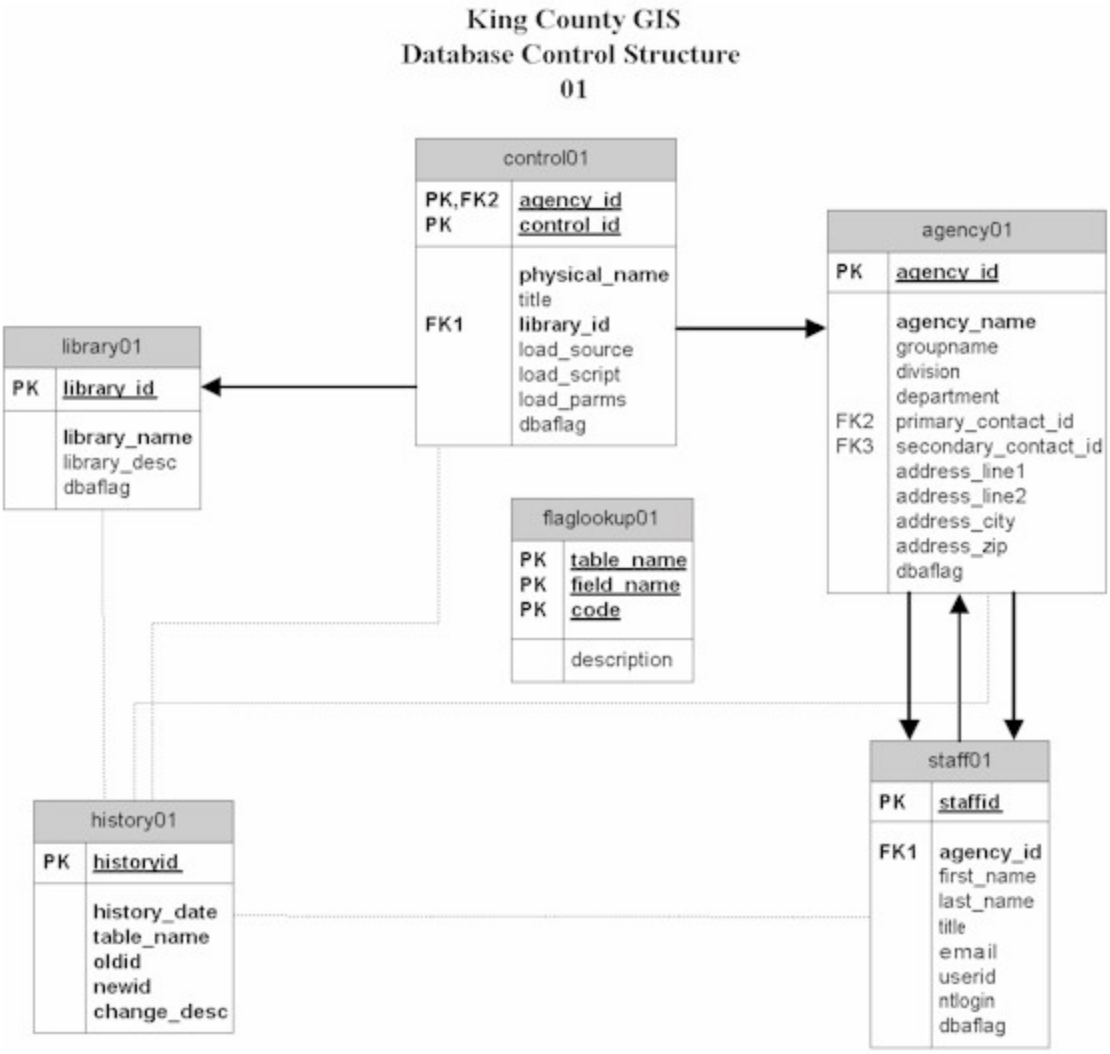
Metadata help to ensure that data retains value over time regardless of changes in personnel, organizational structure, use context, or data collection methods. Data collection, conversion, and maintenance are the core elements of the KCGIS program and tracking changes to data via metadata is essential to drive down the cost of KCGIS over time. Metadata also helps to eliminate the duplication of effort that results from a lack of knowledge about other data sources available within the KCGIS program.

FGDC-compliant metadata for layers in the KCGIS Spatial Data Warehouse are maintained by the agency that posted the layer. The KCGIS metadata format has five sections: Description, Contacts, Data Overview, Spatial Features and Constraints. Metadata information is stored in Oracle relational tables and is available in two formats: FGDC-compliant and a more readable KCGIS format. A subset of metadata specific to the standard data CD distribution is also generated. Metadata are maintained with the Doctool and Update applications. For details on these applications see Section 3.1.4 Spatial Applications.

Enhancement – In 2003 the KCGIS Center will work with agencies to ensure the completion of all metadata for layers in the KCGIS Spatial Data Warehouse. Also, full metadata will be created to document RECDNET.

Development – In 2003, the KCGIS enterprise metadata storage and maintenance process will be updated to accommodate the ArcGIS 8 environment. Metadata for spatial data will be maintained using the ArcGIS 8 Metadata Editor and stored in an XML format in Oracle. The KCGIS Center will also be investigating methodologies for generating metadata for non-spatial relational and object data possibly using the Oracle Metadata API.

The migration of metadata to mixed relational and XML storage necessitates changes in control applications, front-end routines that use metadata, and new methodologies for generating the Spatial Data Catalog. The pared down control structure that will remain in a relation format is illustrated below. Further details regarding tools that will be developed to handle metadata are provided in Section 3.1.4.3.



3.1.4 Spatial Applications

The KCGIS Center develops and maintains front end, back end, and utility applications to support enterprise GIS operations and provide user access to GIS data. The following sections detail the existing applications, and the application enhancement and development work program for the coming year.

3.1.4.1 Maintenance

Front End Applications

This suite of applications provides GIS end-users with a variety of easy to use information access options to the KCGIS Spatial Data Warehouse.

Name	Description	Language
AvLib	This ArcView extension (ArcView Library) provides users with streamlined methods to access and display layers in the KCGIS Spatial Data Warehouse. The application enables users to: browse spatial data layers by subject and feature type, with data layers identifiable by alias, filename, or description; add themes to a map view and automatically set various theme properties, such as symbology, which normally are randomly generated by ArcView; link data to metadata via an HTML browser; access image data, which is difficult to organize and retrieve by providing the user with menu choices for one click access to any image data on the system; load a standard view from a library of user defined views; store a map view locally or submit a view to the KCGIS Spatial Data Warehouse so that other users may access it; and generate maps using standard layouts.	Avenue
KC Parcel Tools	This ArcView extension provides users with an easy to use interface to selected Assessor's data in the KCGIS Spatial Data Warehouse. There are five main functions of this application, which include: queries based on a known PIN or taxpayer name; information lookups on previously selected parcels; access to the RECDNET framework layer LIBRARIAN tiles with tools for loading and managing arc and annotation features; generating quarter section maps of RECDNET data with minimal user input; and generating formatted mailing labels for selected parcels.	Avenue
iMap	iMap is a web browser based map viewer that provides online access to map layers and other related information. The map viewer generally requires a fast Internet connection. Data sets are grouped into Map Sets that present data from different subject areas. iMap includes a property search tool that is fully integrated with the basic application and thus accessible in all Map Sets. A variety of other data query tools are also part of the standard iMap user toolbox, including buffering, geocoding, query builder, and more. When a parcel is selected, URL links are presented linking to the Districts and Developments Conditions Report, the Property Report, and DDES Permits reports. A map output functions is also included.	ArcIMS, HTML, JavaScript, XML
Parcel Viewer	The Parcel Viewer is an application targeting property searches. This application does not require a fast Internet connection. Users can navigate the map and select parcels, or search for properties using address, cross streets or parcel number as input. Buffering and map output features are also included. Like iMap, when a parcel is selected URL links are presented linking to the Districts and Developments Conditions Report, the Property Report, and DDES Permits reports.	ArcIMS, HTML, ASP

Name	Description	Language
Districts and Development Conditions Report	The King County Districts and Development Conditions Report provides information on a property's characteristics, such as: parcel number, school district, zoning designation, jurisdiction, water district, comprehensive plan designation, ZIP code, sewer district, agricultural production district, county council district, council member, and watershed. Written in ASP and utilizing ArcIMS, it allows anyone with a web browser to access the page and enter either an address or a parcel number. If a matching record is found, the user is then given a full report of associated data for that property. This page will also take a parcel number as an argument in the URL, so other sites or applications can link into the report. iMap and the Parcel Viewer provide links to this report.	ArcIMS, ASP, HTML
KC Property Report	KC Property Report is an on-line query tool into the tabular data from the King County Assessor stored in the KCGIS Oracle RDBMS. Written in ASP, it allows anyone with a web browser to access the page and enter either an address or a parcel number. If a matching record is found, the user is given a full report of associated Assessor data for that property. This page will also take a parcel number as an argument in the URL, so other sites or applications can link into the report. iMap and the Parcel Viewer provide links to this report.	

Back End Applications

This suite of applications enables GIS professionals to manage and fulfill their data stewardship responsibilities.

Name	Description	Language
Doctool	Doctool allows data stewards to create and maintain metadata for spatial objects and their associated features. Users may document various aspects of the chosen object, including (but not limited to) abstract information, spatial descriptions, usage limitations, relates, and descriptions of specific spatial, tabular, and attribute features. The documentation is stored in a set of Oracle tables, which are accessed during the periodic update of the HTML pages used for the Spatial Data Catalog.	AML
Inview	Inview (INtegration VIEWer) is designed to allow users to view edits applied to the cadastral base (RECDNET) and cadastral base annotation coverages (RECDANNO). Use of Inview increases the overall efficiency of the submittal and integration procedure by decreasing the time necessary to perform QA checks and replacing the need for QA plots. Inview facilitates communication between agency users and the KCGIS Center integration application maintenance staff by providing a consistent, onscreen, visual checking device to quickly identify and document problems with submittals.	AML

Name	Description	Language
Keytool	Keytool allows users to create and maintain polygon keyfiles that describe GIS datasets conflated to the KCGIS cadastral superset coverage, RECDNET. A keyfile is an INFO table that describes the relationship between KEY, the unique polygon identifier for RECDNET, and a user-defined item that describes the user's feature that is derived from RECDNET. Using a choice of processing techniques, the necessary spatial data is extracted from RECDNET to form the desired polygon information. A GUI allows users to compare RECDNET with the original coverage line work and choose the correct polygons from RECDNET required to build the new coverage.	AML
Sitetool	Sitetool allows KCGIS members to maintain and update their spatial and organizational information. It consists of a set of applications that allow users to: register coverages and tables to the data warehouse; change the name, library, or data steward for existing data; and enter organization and staff contact information.	AML
Eventlog Reader	Eventlog Reader is a web-based application located on the intranet web server so only King County employees have access: http://badinov.metrokc.gov/eventlogform.asp. This application is used for building queries and viewing records from the "EVENTLOG" table in the Oracle database. Other applications, such as the nightly coverage posting routines, integration routines, and shapefile conversion routines, write information about their actions to the EVENTLOG table. Users can use the Eventlog Reader to easily review these records using their web browser.	ASP
MaintRec	The MaintRec tool provides King County agencies with a set of tools to populate tiled edit coverages with new or updated features. The edit coverages provide the KCGIS Center and the KC Assessor with the necessary information to perform their shared duties of maintenance and integration for the RECDNET and the RECDANNO layers. MaintRec includes the following interactive tools: extract RECDNET and RECDANNO features by user specified extents; import ArcInfo coverages, and translate DXF files and ArcInfo export files into coverages; display, select, add and edit arc and polygon labels and their associated attributes; display, select, add and edit subclass annotation and their associated symbol markers and leaders; execute quality assurance checks on edits, facilitate error detection and resolution, generate quality assurance check plots and error reports and generate finish plots; submit finalized edits to the proper submittal directory.	AML

Utility Applications

This suite of utility applications and scripts is used to operate the KCGIS Spatial Data Warehouse. These utilities are frequently run as scheduled batch jobs and are only run by administrative accounts.

Name	Description	Language
ArcSDE scripts	The ArcSDE scripts load spatial data layers from source coverages into Oracle schemas or libraries. The scripts provide consistent fieldname mapping and keywords for database storage parameters for each layer so that handling of a given layer is consistent from one	

Name	Description	Language
	load to the next. The SDE.DBTUNE table is the mechanism for tuning storage for a given layer. The DBTUNE table maps a keyword to a storage clause that specifies where specific resources for a particular table will reside. These scripts are slated for eventual replacement by ArcObjects applications.	
Docgen	The Docgen routine creates content for the Spatial Data Catalog. There are two output formats: a simple KCGIS format and FGDC compliant. Docgen currently does not write directly to the KCGIS website. Instead it creates the necessary files on *WILDFIRE*, which must subsequently be processed through Microsoft FrontPage in order to have the appropriate borders attached. Docgen is slated for replacement when the new metadata regime comes online.	AML, FrontPage 2000
Integrate	The Integrate routines provide multi-user editing capabilities in a LIBRARIAN environment. These routines test and incorporate the updates generated by King County agencies for their layers derived from the framework RECDNET and RECDANNO layers. The routines are called from the cron_update script as a part of the nightly database update processing. Two types of updates can be submitted from KCGIS agencies: manual updates and those generated from the MaintRec tool. The manual updates are submitted in the form of three coverages called: RECARC, RECPNT and RECANNO. Updates generated from the MaintRec tool use a different naming convention for the same three coverages so many edits can be submitted for a single tile. The name format is as follows: arc_<submit-id>; pnt_<submit-id>; ann_<submit-id>. They are in the identical data format as the RECARC, RECPNT and RECANNO coverages respectively. RECDNET Integrations – During integration all RECARC and RECPNT submittal coverages (includes MaintRec generated covers) for each tile are combined into one corresponding RECARC and RECPNT coverage. The combined coverage name format is arc<integrateid> and pnt<integrateid>. Using the combined coverages all changes are made to a copy of RECDNET. Data integrity checks are made to the new RECDNET coverage and if it passes, it is positioned for the update cycle to post into the KCGIS Spatial Data Warehouse. Upon failure of tests the tile will be “hung” (no updates integrated) until the manual intervention rectifies the errors and allows for integration. RECDANNO Integrations – RECDANNO submittal coverages are not combined for each tile and many RECDANNO submittals may be integrated into a copy of RECDANNO. Upon integration into the tiled RECDANNO coverage it is placed in the post directory structure for the update cycle to upload it into the KCGIS Spatial Data Warehouse. Complicated updates to RECDNET topology and all edits to RECDANNO are best handled using the MaintRec tool. Manual submittals should be limited to addition and deletion of arcs.	
LibTool Utilities	Unlike most other applications, LibTool is not a discrete tool (thus is misnamed), but rather a set of utility routines that are called from other enterprise AML applications. Currently used routines manage	AML

Name	Description	Language
	database connections, restore data structures in case of system crash, and manage the eventlog. (This "LibTool" is not to be confused with the in-development front-end ArcGIS application of the same name.)	
RDBMS scripts	RDBMS scripts are primarily used to support two processes, batch data loads and Oracle administration. Those that support batch data loads include: Legal Descriptions Data Load (cron_legal) – A scheduler process calls the shell script which transfers an ASCII extract file from the Recorder's Office mainframe and then uses Oracle's SQL Loader utility to load the data into an Oracle table. Assessor Tables Data Load (cron_kcaload_batch) – A scheduler process calls the shell script cron_kcaload_batch to preprocess the ASCII input files and load them into Oracle tables. Those that support Oracle administration include: Add_user – fPL/SQL scripts are used to streamline the task of adding database user accounts and to maintain duplicate data in different structures during migration of database structure or applications. New_regime – A PL/SQL stored procedure runs nightly to replicate tables used by the current control mechanisms (Sitetool, Update) to new tables for the coming control mechanism currently in design.	
Update	The Update routines are varied and perform many functions to update the data warehouse files for KCGIS sites. The routines are called from the cron_update script as a part of the nightly database update processing. The routines find submitted keyfiles (tiled and untiled), ArcInfo Export files, and coverages (tiled and untiled) in the posting directories; perform validation tests on the files; and post them to the public library. Corresponding shapefiles are generated and posted to plibrary2. Various lookup tables are updated to reflect the posted changes to the public data library.	

3.1.4.2 Enhancement

iMap – A list of specific enhancements and fixes for known issues will be used as a guide for continued improvement to the iMap interface. Programming for improved addressed searches, an improved layer list, and adding the ability to turn off and on labels for individual layers are among the items on that list. There will be a focus on identifying opportunities and methods for improving the performance and reliability of both the viewer and the infrastructure running the ArcIMS system. User comments and questions are being tracked and these issues will be evaluated and responded to on a case-by-case basis. Additional map sets will be added to iMap in 2003.

Parcel Viewer – Enhancements to the Parcel Viewer application include improving the address search routines, adding additional search criteria, such as city names, section, township and range, and condominium searches. The introductory pages will be redesigned to make it easier for users to find their way into and out of the application and will include a section to relay news of improvements, changes, or scheduled maintenance.

Legacy applications – In general, legacy applications listed in Section 3.1.4.1 are in maintenance mode and any enhancement requests will be evaluated conservatively. The exception is for minimal enhancements to the MaintRec editor. Although this tool will become obsolete once the new cadastral

framework model is in place, the long timeline involved may necessitate interim enhancements to MaintRec in order to meet client needs.

3.1.4.3 Development

As GIS across the King County enterprise migrates to Arc8 applications, data that were developed and are used in the ArcInfo 7.x environment will become obsolete. ArcView 3.x will also be phased out in favor of ArcView8. A major development push will be to replace and enhance many of the applications listed above to offer users the advantage of Arc8's much-improved interface, editing tools, and data structures.

This transition to a new software environment offers a rare opportunity to establish a best practice methodology for application development that can be implemented at the beginning of a major application cycle and applied throughout. Best practices for application development should be developed with cross agency participation, and should include the following: involvement and communication among client, developer, and user; determination of roles and responsibilities; a process for iterative development of applications; coding standards; deployment standards; the concept of common code and how best to implement it; development and implementation of testing requirements; continuity of support and long-term application maintenance; and standards for technical and user documentation.

KCTools – This ArcGIS 8 interface will provide KCGIS users a unified set of enterprise applications to assist with common tasks dealing with data access, query and analysis, map production, and data stewardship tasks. It will support users transitioning to the ArcGIS environment and provide long-term, extensible functionality. KCTools will consist of a number of discrete, independently developed modules, or sub-tools, distributed in a single updateable package. Modules will have a common look and feel, common icons, and a common style of user and technical documentation. Many of the elements will be based on existing ArcView 3 and ArcInfo applications, and are intended to provide KCGIS users a path for migrating to the new ArcGIS environment while maintaining compatibility with existing methodology and modes of operations. Modules planned for development in 2003 include the following:

- ***LibTool*** – This module will incorporate the functionality of the current ArcView 3.x extension AVLib and reflect the major components of its look and feel to assist users in the transition to the ArcGIS 8 environment. Users will be able to: easily access data warehouse layers, imagery, and metadata via an interface that offers "plain English" labeling; retrieve commonly used sets of symbolized views (e.g. "Hydro Basemap"); save and retrieve their own user-defined sets of symbolized views; generate maps using standard layouts; and easily set standard symbology and relates (if user is a data steward).
- ***ParcelTool*** – This module will incorporate the functionality of the current ArcView 3.x extension ParcelTools. Primary functions are: make queries based on PIN or taxpayer name; query for information based on user-defined criteria (for example distance from a selected parcel); view and map cadastral information with minimal user input; and format mailing labels for selected parcels.
- ***StewardTool*** – StewardTool will be the mechanism used by KCGIS staff working in a data stewardship role to: register new layers and tables into the control structure; update distribution requirements for new/existing layers; create, delete and update staff information; update organization information; submit a single layer (for immediate or later posting to the KCGIS Spatial Data Warehouse) by specifying source and native data type; and arrange for automatic batch submittals to be handled by administrative routine. StewardTool will replace the functionality of SiteTool.
- ***StreetTool*** – StreetTool is an ArcGIS 8 template that is currently in beta. It was developed to allow users to easily access and edit street centerlines and associated data layers, including addressing and other attributes. StreetTool is currently being used by Road Services to edit the CRIS line work and by the KCGIS Center for updating the ST_ADDRESS layer.

Metadata Tools – There will be three areas of development of metadata tools in conjunction with the change to ArcGIS 8.x. Efforts in this area will be performed concurrent with overall metadata efforts referenced in Section 3.1.3.4.

- Conversion of existing metadata content currently held in Oracle relational control tables – Preliminary work was done in 2002, and a prototype application was written in Java to output existing metadata as XML documents compliant with the ESRI Data Type Document for GIS metadata. The application is intended as a one-way translation until maintenance tools have been developed for ongoing metadata maintenance in ArcGIS 8.
- Metadata input – Customization of the GIS Metadata Editor supplied with ArcGIS to capture key control fields to ensure database consistency. This tool will likely take the form of a Custom Metadata Editor, pending further testing of the ArcIMS Metadata Browsing Tool.
- Output – While ArcGIS stores metadata as XML, and is capable of outputting in FGDC format, one of the hallmarks of King County GIS metadata has been the "user-parseable" format available on the KCGIS website. Likely implementation of the new XML-based output in user-parseable form will take the form of an XML Stylesheet (XSLT) for formatting, and a back-end application to push the metadata to the external website on-demand.

3.1.4.4 Documentation

KCGIS Center applications are documented to commonly accepted industry standards. KCGIS Center application development staff use directories on the *ORCA* server to organize and store code and documentation. Common practice calls for separate directories for each discrete application project.

3.1.5 System Integration

The KCGIS Center will continue to assist in reducing acquisition and maintenance costs associated with servers and server software at multiple locations throughout King County by providing access to the KCGIS infrastructure. In 2003 this infrastructure will be enhanced with server systems optimized to fully support data warehousing functions (see Section 3.1.2.3).

3.1.5.1 RDBMS Backend Support

Oracle – Oracle8*i* version 8.1.7 is used to store, maintain, and serve GIS and business data as well as any metadata tables and other data control structures. Oracle also is the RDBMS supporting the enterprise ArcSDE installation. The KCGIS Center has standard and enterprise licensed instances deployed.

Microsoft Access – MS Access is used to convert, manipulate, and compile tabular data as needed on client services projects. For example, conversion of ASCII text files of 2000 census data was accomplished using MS Access conversion templates provided by the US Census Bureau. Often KCGIS Center staff uses ArcView shapefile data as a starting point for queries or additional application activity, but then turns to MS Access for a greater variety of tools and data-processing capabilities than is available from the built in ArcView 3.x database engine. A general example of the use of MS Access for broader database functionality is the analysis of Assessor's tables and records to quantify land value and other statistics. As a specific example, the Port of Seattle requested that a compilation of certain Assessor's fields from numerous tables be attached to a shapefile of properties within the flight paths of SeaTac Airport.

Microsoft SQL Server – The KCGIS Center has acquired a test server upon which Microsoft SQL Server 2000 has been installed. In 2003 SQL Server 2000 will be tested and implemented as the backend database for the KCGIS Spatial Data Warehouse (see Section 3.1.2.3).

3.1.5.2 Other Data Management Activity

No other data management activity to report.

3.1.6 Client Services and User Support

The KCGIS Center supports end users both by the general enterprise-wide services it provides, and by the more focused and customized services it delivers to clients.

Enterprise-wide GIS services – These enterprise services both support end users directly and also enable GIS professional staff in other departments to deliver GIS services to end users within their own business areas. Enterprise services are provided by the KCGIS Center as part of its Operations and Maintenance (O&M) activities, funded by the annual KCGIS O&M funding model. The enterprise services may be described as primary and secondary services.

Primary enterprise GIS services – These services relate to the operation and maintenance of the KCGIS Spatial Data Warehouse. Primary enterprise services are described elsewhere in this document and include KCGIS Spatial Data Warehouse hardware, software, and system management (see Section 3.1.2.3), and development and maintenance of KCGIS Spatial Data Warehouse related back-end and front-end applications (see 3.1.4). These services are at the core of the KCGIS program and are generally available to all King County agencies.

Secondary enterprise GIS services - These services are support and coordination activities provided by KCGIS Center staff to enhance the use of GIS data and applications. They are available to all County staff. Typical secondary enterprise services include:

- Cross-agency coordination activities (for example KCGIS Technical Committee and KCGIS Users Group meetings).
- Regional coordination activities (for example representing KCGIS on the regional, state, and national level).
- Participating in the development of KCGIS standards, best practices and the annual O&M Plan.
- Contract management for software licensing and maintenance and consultant services.
- Communications services such as the KCGIS Internet and intranet websites, the KCGIS Knowledge Base, and GIS Day.
- Training forums such as brownbag briefings, webcasts, and general GIS educational opportunities.
- Help desk support for internal and external customers.

GIS Center Client Services – KCGIS Center client services are focused to meet the customized needs of specific clients. Clients can be either end users or other GIS professionals who need training, specialized technical assistance, or skilled staff to help meet peak workloads. The KCGIS Center Client Services Manager is the primary contact for service requests and manages all aspects of the Client Services Unit including customer relationship management. KCGIS Center Client Services are provided on a full cost reimbursable basis. For 2003 the standard KCGIS Center billing rate is $60 per hour. A lower rate of $54 per hour is available for certain production level work. Three major categories of KCGIS Center Client Service offerings are described below:

KCGIS Data CD Sales – Standard data sets are published four times per year and are available by mail order or through the King County DOT Road Services Map Counter, located in the lobby of the King Street Center. The Client Services Unit can also fill custom data requests on an hourly plus materials basis. For 2003 the standard CD unit cost is $90.

GIS Training – The KCGIS Center offers training in a variety of GIS courses at two sites in Seattle (King Street Center – DOT/DNRP computer training facility, and Key Tower – DES-ITS computer training facility). Courses are taught by KCGIS Center staff, or by outside trainers contracted or arranged by the KCGIS Center. Tuition varies based on cost factors but is generally extremely cost effective when compared to software training offered by private vendors. For 2003 planned courses include the following, which are more fully described on the KCGIS website (http://www.metrokc.gov/gis/services/training_course_outline.htm):

- Introduction to ArcView 3.x
- Advanced ArcView 3.x
- Introduction to ArcGIS
- Migrating from ArcView 3.x to ArcView 8
- Using KCGIS AvLib/Cartographic Standards
- Using KCGIS iMap
- Using KCGIS ParcelTools
- Putting GIS to Work in King County
- KC EOC GIS Volunteer Training
- Creating and Managing a Geodatabase
- Migrating from Avenue to VBA
- Introduction to Programming ArcObjects with VBA

Help desk-style support is also available from the KCGIS Center. The KCGIS Center, through its Training Coordinator and other support personnel, provides free help desk support in reasonable, brief increments. More comprehensive help desk programs that cover ongoing or more significant needs can be arranged with the KCGIS Center at the standard Client Services rate.

GIS Project and Consulting Services - The KCGIS Center staff includes professionals trained and experienced in spatial data development; database development and management, GIS development, management, and maintenance, and GIS data analysis and display. KCGIS Center professionals are further experienced in the application of King County GIS data to a multitude of business needs in service to King County agencies and other regional jurisdictions. Typical KCGIS Client Services projects include:

- GIS needs analysis and implementation planning.
- GIS data development.
- Geocoding services.
- Custom map production including publication quality brochures and displays.
- Large format plotting.
- GIS data analysis and reporting.
- GIS application development.
- Custom GIS implementation support.

Client User Base – The diagram in Section 2, King County GIS Organization, illustrates the relationship between the KCGIS Center and its client user base. Clients include both GIS professional staff in County departments and direct support to end-users. The user base is served directly (a GIS professional taking a GIS class, or making a connection to the KCGIS Spatial Data Warehouse) or indirectly (a citizen accessing iMap to research neighboring properties). The KCGIS Center user base is broad and includes clients from outside the county government. These can be purchasers of KCGIS data CDs, individuals attending a GIS training class, or a city that contracts for custom KCGIS Center client services. The KCGIS Center client base also includes the citizens of King County and others outside of the region who can utilize resources via the KCGIS website. These resources include iMap, the Parcel Viewer, the Virtual Map Counter, and the KCGIS Knowledge Base.

Marketing – The KCGIS Center Finance and Marketing Manager is responsible for a program of both broad based and targeted communications about the benefits and services of KCGIS in general and the KCGIS Center in particular. The goal of the marketing program is to increase awareness and use of KCGIS resources and services, both to enhance the efficiency of government operations through the

application of GIS technology, and to broaden the financial base supporting operations. Marketing also plays a key role in refining the concept of regional GIS and promoting regional GIS across the Puget Sound area.

2003 GIS Priority Initiatives – For 2003 the KCGIS Center Enterprise Operations and Client Services offerings outlined above will continue. Several new initiatives will begin as well, to support countywide GIS priority initiatives identified in 2002. These will be funded as part of the 2003 KCGIS O&M budget and include:

- KCGIS data inventory and assessment (see Section 3.1.2 and Section 3.1.3.2).
- GIS software migration plan development (see Section 3.1.2.3).
- Cadastral data enhancement plan development (see Section 3.1.3.2).
- Seattle area parcel data conversion support (see Section 3.1.3.2)

3.2 Department of Assessments

The mission of the Department of Assessments is to serve the citizens of King County by providing fair, equitable and understandable property valuations, forming the basis for funding of public services. The Department of Assessments is responsible for discovering, listing and valuing all taxable real and personal property within King County for preparation of the tax roll. The department has approximately 240 employees and is structured into five divisions. These divisions are Administration, Accounting, Residential Appraisal, Commercial/Business and Information Services.

The coordination of GIS at Assessments is done through the Accounting division. Besides being a mechanism for updating the cadastral data, the purpose of GIS within the Department of Assessments is to assist with valuation and information delivery methods.

3.2.1 Business Functions

GIS within the Department of Assessments is used in valuing property, defending valuation methods and estimates, maintaining public records including maps, legal descriptions and taxing district boundaries, administering exemptions and calculating levy rates. GIS provides easy access to data that is valuable for performing Assessments business functions. GIS is integrated into many aspects of the Department's business functions including but not limited to:

Property Appraisal – Appraisers use GIS maps, applications and data when valuing property. GIS is used for data retrieval and analysis. In addition, GIS is used to update property characteristics.

Map/Property Boundary Maintenance - GIS is used for discovering and listing taxable real property within the County. Assessments is responsible, under RCW 84.40.160, for maintenance of property configurations within King County. GIS is being used to fulfill the responsibility. The old quarter section Mylar maps are being retired and being replaced by maps generated from GIS data. Numerous agencies and individuals both within and outside the County access GIS property boundaries maintained by Assessments.

Exemptions – Assessments administers a portion of The Open Space Act (Chapter 84.34 RCW), which provides for current use assessment of farm and agricultural land, timber land and other open space land. Once land is classified, taxes are based on the current use value of the land rather than its highest and best use. Assessments must maintain both current use value and market value on these properties. GIS provides analysis and mapping of characteristics unique to Current Use Exemption monitoring.

Annexations/Levy – GIS is used to produce maps and data for internal use specific to the Assessment calendar year. GIS is used to generate the taxing boundaries. From this, maps and lists are generated for State Department of Revenue for apportionment of utility valuations and the state levy.

Appeals – GIS data and analysis are used as evidence and support for defense of valuation decisions.

Miscellaneous Property Related Analysis/Public Info. – GIS is used for validation of proposed annexations, property search and information requests, Assessor maps, public notification of neighboring properties and other public agency requests.

3.2.2 GIS Program Overview

Assessments does not have a separate GIS entity from which business is conducted. The GIS "program" at Assessments is integrated into the whole department. GIS in Assessments consists of a coordinator, cartographers, analysts and users. The coordinator reports to the Accounting Division Manager.

The department has eight cartographers who are responsible for maintaining the countywide (corporate) cadastral data as well as other data sets used internal to Assessments. The cartographers are part of the Accounting Division and report to the Mapping Unit Supervisor. The priority of both the coordinator and cartographers is to support the appraisal function of the department and other mapping needs.

Appraisers in both the Commercial and Residential Appraisal Divisions make use of GIS in their daily business to effectively perform their job functions. In addition to the use of GIS generated map products, the department anticipates an increased use of GIS in the appraisal process. During 2002, Client

Services funds were used to develop ArcView applications that would make integration of GIS into the appraisal process easier for novice users. The KC Appraiser extension streamlines the steps necessary to set up projects for an individual appraiser. In addition, the tool enables the users to generate standard map products.

Programmers and analysts integrate GIS into applications and use GIS analysis for data updates. Programmers in the Information Systems Division have spatially enabled applications used throughout Assessments. Data development occurs at the request of users and may be done by the cartographers, appraisers or coordinator. Requests may be for new data layers or the accumulation of data sets from various jurisdictions and organizations.

Assessments works closely with the KCGIS Center to maintain the countywide cadastral data. Since Assessments does not have a staff of GIS programmers there is a heavy reliance upon the expertise of the KCGIS Center to build, maintain and support applications for maintenance of the countywide cadastral data set. In addition, to ensure the integrity of the cadastral data, Assessments requires daily attention from the KCGIS Center to ensure that data is integrated in a timely manner and fixed when there is a failure in the process. Assessments incorporates applications developed by the KCGIS Center, namely the iMAP, Parcel-Picker and Avlib into both internal and web-based applications.

While the ten-year MOU with the City of Seattle for maintenance of the Seattle GIS parcel data ended in August of 2002, conversion of the data to the King County format and coordination of data transfers between Seattle and KCGIS Center servers continues.

3.2.2.1 Training

Although there are no formal GIS courses offered by Assessments, Assessments does have access to training classes offered by the KCGIS Center. Funding for training is generally on a discretionary basis with staff required to pay for part of the training costs. Since appraisers are already required to maintain certification through continuing education, there is reluctance to pay for additional training. Many new ArcView users would benefit from a basic ArcView training session geared towards Assessments' business process. A plan for using 2003 Client/Service money for a custom GIS course is being developed. Internal training is conducted on an ad hoc basis as needs become apparent. Most group training is done in small groups on aspects of GIS that may be useful to a job function or a specific application. The Coordinator or other advanced GIS users who have written applications do internal training. As technology moves forward, Assessments will require substantial training to adapt to the new Arc8 application and data model. In the current environment, the cartographers are adequately trained and proficient users of COGO, GIS tools and the maintenance applications. When the shift is made to the Arc8 environment, substantial training will be required for the drafting staff to ensure the same proficiency exists and there is no drop in the level of output with regards to data maintenance. Extensive Arc8 training will not likely occur until a timeline for migration from the Arc7.x environment is established. Informal Arc8 training for individuals will occur through usage of the software.

3.2.2.2 Staffing Requirements

Assessments has one staff position to focus on GIS within the department. This position fulfills the roll of GIS coordinator, analyst, data developer and system administrator. In addition, appraisers, cartographers, analysts and programmers contribute to the integration of GIS into the department business. Most of the data maintenance and update is done within the Accounting Division while programmers, analysts and appraisers in other divisions implement GIS technology as well.

In addition to helping the public and Assessment staff with mapping related questions and research, the cartographers in the mapping section do the majority of the GIS data maintenance for Assessments. While their job titles do not reflect their GIS activity and knowledge, the majority of the cartographer's time is spent using GIS applications and tools to maintain the cadastral data and other associated data sets. The use of GIS for data maintenance of the cadastral data requires more staff time than the old manual methods of updating mylars. There are a number of reasons for this. First, Assessments currently maintains two different sets of GIS cadastral data, that for the City of Seattle and that for the rest of the County. The data and methods for updating these sets are not interchangeable and for the Seattle effort there are redundant steps due to the nature of the Seattle data model. Conversion of the Seattle data to

the County format should ease the maintenance load. Second, with the implementation of digital cadastral data drafting can no longer just "draw" plats or segs on the map to fit surrounding parcels but data must be adjusted as necessary based on the survey data received from cities and developers. Since every effort is being made to improve the positional accuracy of the cadastral data, drafting is often forced to redraw entire maps to reflect the improved survey control that is received with new plats. Positional problems still exist from the original conversion of the data. Poor control, improper registration of some maps during conversion and poor source materials created warped data. When drafting attempts to add data to these maps, there can be significant effort in completing the most simple property boundary modification. Finally, the addition of data into the RECDNET data model requires significant QA processing and data checking that was never an issue in the manual drafting paradigm.

No staffing changes are anticipated during 2003 but adjustments to the flow of information at Assessments should reduce the amount of backlog that occurs at certain times of the year. More discussion on improvements to data maintenance can be found in Section 3.2.3.1.

With the ongoing conversion of the Seattle data in 2003, there will be additional demands placed on the drafting staff, both for the conversion effort and to bring the Seattle data into compliance with the requirements of the appraisers and other users.

Staffing allocations are generally carried over from year to year. As the need for GIS within the department expands, existing staff has developed the skills necessary to integrate GIS into the department business functions.

Working Title	Focus	Class	Status	% GIS
GIS Coordinator	Coordination/Support	PAIII	FTE	100%
Mapping Unit Supervisor	Cadastral Maintenance	Mapping Unit Supervisor	FTE	75
Cartographer	Cadastral Maintenance	Cadastral Cartographer	FTE	95
Cartographer	Cadastral Maintenance	Cadastral Cartographer	FTE	95
Cartographer	Cadastral Maintenance	Cadastral Cartographer	FTE	95
Cartographer	Cadastral Maintenance	Cadastral Cartographer	FTE	95
Cartographer	Cadastral Maintenance	Cadastral Cartographer	FTE	95
Cartographer	Cadastral Maintenance	Cadastral Cartographer	FTE	95
Cartographer	Cadastral Maintenance	Cadastral Cartographer	FTE	95
Various – Appraisers, Programmers	Analysis/Application Dev.	Various	FTE	Difficult to quantify

3.2.2.3 Hardware and Software

Assessments has three SUN workstations networked together to operate as data servers. The two Sparc 20's are named Sungis1 and Sungis2 and the Sparc2+ is named KCA. The system holds approximately 15 gigs of data and is running Solaris 2.5. The data includes both the Seattle cadastral library contents, a replication of the King County library cadastral data and various data sets maintained by Assessments. Sungis1 is the Arc Info license server and main application server. Data is distributed across the three machines with the Sparc 2+ being used for processing large datasets. Phase out of the SUNs won't occur until the Seattle/King County data translation is completed. When the SUN equipment is phased out it is anticipated that all GIS data maintained by Assessments will be on a KCGIS Center server. In addition, GIS users at Assessments utilize a HP 1055cm plotter, digitizing tablet and color printers. Replacement of the digitizer will need to be addressed before Assessments will let go of all SUN equipment.

Maintenance of the corporate data is done on Wildfire. Wildfire is accessed from PC's using Hummingbird Exceed software. The PC's for drafting are running XP. Windows 2000 and XP are running on other PC's throughout the department. Assessments uses both ArcInfo and ArcView software.

Due to the limited capacity of the SUN machines, there is no outside access to data on these machines.

The I-NET connection to the 900 Oaksdale building where the Residential Appraisal group resides has reduced the amount of GIS data that needs to be replicated on Assessments servers.

With an increasing dependence on the KCGIS Center servers, Wildfire in particular, it is imperative to Assessments that the servers are stable and operational at all times during Assessment's standard work week. Once Assessments has shifted to Wildfire (or its replacement), a minimum of eight FTE's will be dependent on its operation for keeping the County cadastral data updated.

3.2.2.4 Budget

The proposed 2003 budget for Assessments is as follows:

Item	Budget	Comments
Labor Costs (salary + benefits)	$406,357	Based on table 3.2.2.2 coordinator and mapping staff labor.
Hardware (acquisition and maintenance)	$0	Hardware is outdated and not eligible for maintenance contracts. No plan to replace in 2003.
Software (acquisition and maintenance)	$12,000	Maintenance only. No budget for acquisition.
Training costs	$0	No separate funds for GIS training. Training is provided on a discretionary basis
Discretionary (consultants, outside services, materials, etc.)	$20,000	Total is for Client /Services money. No other separate funds exist for GIS discretionary items.

3.2.3 Spatial Data

The Department of Assessments maintains a variety of GIS data sets both for corporate users and for specific department uses. The most widely used data set is the cadastral data for the County. This corporate data set is primarily maintained on the KCGIS Center server Wildfire. The department data is stored both as tiled library coverages and countywide coverages. Shapefiles are usually generated from coverage data although the appraisal groups maintain some shapefiles for their needs. Conversion of the Seattle data to the County format is expected to occur throughout 2003. Until this effort is completed, the maintenance effort will be shifted from one data set to another. Upon completion of the Seattle data translation, the need for maintenance of data on Assessments obsolete SUN servers will go away. At this time, moving Assessments data sets to a KCGIS Center server can occur.

3.2.3.1 Maintenance

While drafting makes every effort to map property changes in a timely fashion, the tax calendar and system limitations at Assessments may impact this effort. Assessments is still working on the King County mainframe when new properties are created or merged. There are two main types of property changes that occur, segregation and merger (seg/merge) and new plats/condos. When seg/merge activities occur, the property is created in the abstract section, sent to mapping for addition to the GIS and then basic information such as value history and taxpayer information are sent for keypunch into the mainframe. It takes at least a week to process a seg/merge request. Mainframe data is downloaded to Assessments SQL database once a week. Once the data has been downloaded, the appraisers can begin adding property characteristics to the data. Plats and condos are treated differently than seg/merges. This creates a lag time between when the property is recorded and when the data is put into

the GIS or Assessments server. Plats are not added to the system continually throughout the year due to the need for Assessments to close the tax roll for certification. In order for a plat to make it onto the tax roll for a given year, it must be recorded by May 31 of the prior year. Because a current year tax roll is still active after May 31, complete sets of new account numbers are not generated until later in the year when the tax roll closes or before May 31 of the year for which it will be taxed. There is a small window of opportunity at the end of the year when complete account numbers for plats received after May 31 can be assigned on the mainframe. Because of Annexation deadlines and other assignments for the platting staff, assignment of complete plat parcel numbers does not resume again until April. During the time that the tax roll is closed for certification, drafting still makes the seg/merge changes to the GIS data but the mainframe and server data is not updated until the tax roll is reopened in January.

Timeliness of ongoing maintenance of the cadastral data has received attention over the last year. As noted earlier, legacy positional problems continue to plague the maintenance process. Assessments has little control over these other than to redraw the data to conform to more accurate data standards. Cartographers are diverted from routine maintenance operations to redraw large portions of data just to complete a minor maintenance task. Other issues that impact timeliness which are in Assessments control will continue to be pushed in 2003. The generation of account numbers for plats closer to the time of recording will enable the drafting staff to incorporate the plats earlier in the year. Assessments has already made significant progress on the 2004 tax roll plats (recorded June 1, 2002 – May 31, 2003). Another area for increased efficiency is the use of previously generated spatial data (.dxf files) from cities and developers. Assessments has incorporated .dxf data in the past but is being more aggressive in both requesting the data and training users to incorporate these data sets. Informal arrangements with some cities are in place for receiving digital data. Some developers routinely deliver digital data to Assessments. As a general rule, efficiencies gained via the use of digital data only occur when plats are larger than forty lots.

While not likely to happen soon, modifications to the RECDNET data for complete removal of type 12 arcs on an ongoing basis would also help streamline the cadastral maintenance process. As more and more changes are administered to the RECDNET database the number of type 12 arcs (arcs marked for delete) and associated polygons increases. This generates many sliver polygons that must be dealt with during the maintenance and checking process.

Assessments is responsible for maintenance of the following corporate data sets.

Data Name	Data Description	Update Frequency
RECDNET	Countywide Cadastral Data. Includes streets and other features necessary for describing property boundaries. Based on the legal description of the property.	Updated daily as segregation/merger activities take place
PARCEL	Countywide parcel boundaries derived from RECDNET.	Updated daily as segregation/merger activities take place.
RECDANNO	Countywide Cadastral Annotation. Includes street names and other features necessary for describing property boundaries.	Updated daily as segregation/merger activities take place.

Assessments maintains the following department data sets.

Data Name	Data Description	Update Frequency
PARCEL	Seattle Parcel Data. As part of a MOU with the City of Seattle, Assessments maintains the parcel data for the City service area in accordance with standards defined	Updated daily as segregation/merger activities take

Data Name	Data Description	Update Frequency
	by the City. Because the Seattle data is not integrated with the rest of the County, the current parcel data exists only on Assessments Unix servers.	place.
PLAT	Plats. New plats are added to this layer when the positional accuracy of RECDNET is in question or when a plat is so large that using the Maint_Rec tools is inefficient.	Updated as needed
COMAREAS	Commercial Area boundaries.	Updated as needed
RESAREAS	Residential Areas boundaries – under construction.	Updated as needed
KCASURV	Survey data necessary for building new plats or redrawing cadastral data.	Updated as needed
CITY ZONING – VARIOUS COVERAGES	Zoning for incorporated cities. Incorporated zoning data is generated (but not necessarily maintained) as a means for updating the server tables.	Updated as needed
KCAWET	Wetland boundaries taken from department overlays and updated wetland information.	Updated as drafting has time to convert data from department overlays.
KCACODE	Levy Code Boundaries.	Updated as needed to meet statutory requirements for development of the data.
KCACITY	City boundaries for Assessments purpose	Updated as needed to meet the March 31 statutory requirements for deployment of the data.

3.2.3.2 Enhancement

Spatial accuracy improvements are ongoing but effective enhancements must start with improved survey control data where the original data used in conversion is faulty. In 2002 Assessments, in conjunction with the KCGIS Center, undertook one of many necessary improvements of the ref_grid layer that was used as the base grid for conversion of the cadastral data. Updates to ref_grid will likely continue into the future. The ref_grid data was put together from various sources as part of the King County GIS Capital Project. Sources include cities, the King County Survey branch, the KCGIS Center and Washington Department of Natural Resources (DNR). Development of new control and rectification of data to the new corners should be a separate data enhancement project funded through the KCGIS Center with input from Assessments. Rectification of data to new control could require hundreds of labor hours especially if the data must be redrawn. At this time, it is difficult to provide an estimate for the time required to rebuild the cadastral data to improved control. Some work has already been done at Assessments as part of the data maintenance process. Some problems are more severe than others and the data more dense. To

date, the known problem areas include, but are not limited to, portions of Kirkland, Auburn, Enumclaw; many areas especially in Ranges 8 through 12 where DNR POCA data was used as section control data; many quarter-sections along major water bodies (except the City of Seattle Service Area) and about 300 quarter-sections that were captured from Assessor 1"=200' mylars.

The cities, such as Kirkland and Des Moines, are developing their own GIS data that may be used in the future as part of the spatial accuracy data enhancement effort. Assessments currently uses the Seattle GIS data that has a very high level of spatial accuracy when updating the Seattle area parcel data. We expect this kind of "data sharing" to continue even after the conversion of the Seattle data to the King County format. There will be opportunities in the future for incorporation of cadastral data sets maintained by other jurisdictions. It should be noted however that GIS data from other entities does not always translate into useable data for the King County GIS database. Differences exist in the format, quality and type of data captured. In some cases, there is more effort required to bring external data sets into compliance with the County data format than to draw the data from scratch.

3.2.3.3 Development

Ongoing conversion of the City of Seattle GIS data to the King County GIS format is anticipated to occur during 2003. While Assessments is the maintainer of this data, the benefit for conversion of the data to the county standard goes to all users of the cadastral data. The Seattle conversion effort was identified as a priority work initiative and approved by the GIS Oversight Committee for 2003. Interns were hired in late 2002 to work on the conversion effort. The interns are managed by the KCGIS Center.

Detailed Residential Appraisal Area Boundaries have never been available as a GIS layer. These boundaries outline "neighborhoods" of properties as they relate to the appraisal process. In order to take full advantage of the KC Appraiser extension Assessments needs to have detailed information for the boundaries of residential areas. Conversion of the data has begun and will likely be completed in late 2003.

Sensitive Area data from the mylar overlays may be transferred to a GIS layer. These data were compiled from the King County Wetlands inventory with modifications and calculations performed by Assessments at the time that the data was created. Additional wetland data from cities and short plats are also included in this data set. There is not a separate funding source for this type of project. This data was skipped over as part of the King County GIS Capital project as data that would be captured elsewhere. The data on the overlays is critical to performing accurate appraisal of properties with wetlands. Unless a comparable source for the information can be obtained digitally, this data needs to be converted to satisfy the needs of appraisers. There is no deadline on conversion of the data except for the extinction of our SUN equipment to which Assessments digitizing tablet is tied.

3.2.3.4 Metadata

FGDC documentation exists for the GIS Parcel and RECDANNO data on the server *Wildfire*. No documentation exists for RECDNET (which is administered by KC GIS but primarily edited by Assessments. Assessments has no access for documenting RECDNET). Since RECDNET is the backbone for the configuration of parcels it should be documented. Documentation exists for maintenance decisions that have been set for the cadastral data. Extensive documentation and maintenance practices exist for the maintenance of the City of Seattle data. Most documentation exists as Word documents. Little documentation exists for department data sets. During 2003, Assessments will continue to improve the documentation of department data sets.

3.2.4 Spatial Applications

Assessments relies on two types of spatial applications: internal department applications, which are developed and maintained at Assessments; and external applications, which were not developed by Assessments but are necessary for completing Assessments work. Access and input to external applications has a direct impact on the ability of Assessments to perform its business functions.

GIS Client Services funds were used in 2002 to create both an ArcView extension for appraisers and a more general application that would be used to integrate GIS spatial data with various in-house VB

applications. The ArcView extension – KC Appraiser – was developed as a stepping stone for non-GIS users to overcome the standard learning hurdles that preclude many people from initiating the learning process. The application allows users to easily clip and join datasets based on spatial or tabular data boundaries. In addition, the application provides users with access to standard data sets and setups as well as cartographically standard map output. A data administration tool was developed in conjunction with KC Appraiser to provide a mechanism for standardizing data display options. The second application, callable from VB applications, will generate parcel shapefiles based on geographic or tabular data boundaries. The datasets will be available for use with internal VB applications.

3.2.4.1 Maintenance

The following internal applications are maintained by Assessments:

Name	Description	Language
KingView	This application was developed by Assessments' Information Services Division for appraisers to use in valuing property and defending appeals. Additionally, it can be used by other staff as a tool for running quality assurance checks against the spatial and tabular data.	VB/Map Objects
KC Appraiser	This ArcView extension streamlines setup steps necessary for appraisers to access tabular and GIS data. In addition it contains utility for making standard map products. This application was written by the KCGIS Center with Client/Services funding.	Avenue
ViewControl	This application was designed for the data administrator to set up and control the display of layers available to the KC Appraiser extension. This application was written by the KCGIS Center with Client/Services funding.	Avenue
County2002	This is an ArcView project designed to jumpstart users into the use of ArcView. While not technically an application it is used throughout the commercial appraisal division for the annual appraisal process.	
Plot	Used for generating the King County Assessor map.	AML
LotSqft	Used for updating lot size information in the SQL server tables from annotation placed during the cadastral maintenance.	AML
Plat	A series of routines used for adding new plats to the Assessor GIS plat library as well as transferring data to Wildfire for incorporation in RECDNET.	AML
Seaqsmap Nonseaqsmap	Standard plotting applications based on server data for Commercial and Residential appraisers.	AML
Newuntar	Data transfer routines for replication of Wildfire data on Assessments servers.	AML
Modchoose	Generates a map patch and list of parcels that fall within a particular annexation.	AML

The following are external applications that are used by Assessments but maintained by other organizations:

- Mant_Rec and associated data integration applications is used for maintaining the cadastral data. This set of applications impacts Assessments ability to efficiently perform maintenance of the cadastral data. Assessments had direct input into development and testing of these tools. See the KCGIS Center section for an application description.

- Parcel-Picker, AVLib and iMAP are used on a daily basis for easy access to the public library data. See the KCGIS Center section for an application description.
- The City of Seattle created Seattle maintenance and data transfer routines under the name Phred. There is a shared responsibility for maintenance of the applications. No changes have been made to the application for a number of years.

3.2.4.2 Enhancement

The KCGIS Center has been responsive to requests by Assessments for changes to the maintenance-related applications. Additional requests exist but may be difficult to implement due to the RECDNET design and extensive retooling that would be required to the maintenance process. These additional improvements are mentioned as issues that may or may not be addressed in the current maintenance application but which should be addressed in future application design. Improvements to Maint_rec and related applications would help reduce the time and effort required updating the corporate cadastral data. The maintenance process has high overhead for data extraction, integration and checking. Reduction in this overhead would directly impact the amount of time spent on each property change. Improvements to Maint_rec include the complete removal of type 12 arcs from RECDNET at the time of coding and real time integration of data into RECDNET so post integration quality assurance can be eliminated.

With the development of the data extraction tools by the KCGIS Center, enhancements to existing applications written by Assessments Information Services group will likely occur. Potential enhancements include integration of GIS with the Assessments Comp Sales application, the ability to update server data and the separation of data layers for Commercial and Residential appraisers.

3.2.4.3 Development

No new development is anticipated for 2003.

3.2.4.3 Documentation

Documentation for Arc Info applications is minimal and generally done at the code level. Applications that are used routinely by the drafting staff have instruction sheets describing operation of the application. A user's guide has been developed for the King View application and the KC Appraiser extension written by the KCGIS Center.

3.2.5 System Integration

Assessments maintains all property characteristics data in SQL Server. Numerous tables are used to store the data. Applications have been written to access and update the server files. There is no real-time connection between the SQL server data and maintenance of the GIS data. Integration of GIS with the business applications is a priority but will be balanced with other application needs/priorities within the department. Real time connectivity is unlikely to occur until the cadastral data is converted to the Arc8 environment where it can be stored in the SQL Server. Results from GIS analysis are used to update server data.

3.2.5.1 RDBMS Backend Support

The King View application provides users with access to a snapshot GIS parcel shapefile and real-time access to the SQL Server data. Most ArcView users use snapshots of both the server data and the GIS data when performing analysis of the data.

The Assessor e-Real Property and internal Real Property applications link to the KCGIS Center Parcel Picker application. For users outside Assessments, the KCGIS Center provides one stop shopping for many County GIS users by having Assessment data accessible from the Parcel-Picker Application. The monthly data extract provided to the KCGIS Center in addition to the real-time access to RECDNET generally provides adequate information for County users. Over time this should reduce the amount of internal queries for Assessment information. Access to the data from the *iMAP* application provides external access to a snapshot of data until there can be a a more direct link to the Assessor data.

3.2.5.2 Other Data Management Activity

The majority of Assessments data management activities are used to support the department's extensive Real and Personal Property systems. These systems are maintained on SQL Server. The Information Services Section has developed numerous applications for querying and updating the SQL Server data.

3.2.6 Client Services and User Support

GIS application and data priorities are set by the division managers and processed within the appropriate division. Most department GIS activity is driven by the needs of the appraisers. Priorities are given to the Residential and Commercial appraisal groups for their needs on the annual revaluation of property. Production of maps and the accumulation of data for use in ArcView analysis is the primary activity for the revalue process. The appraisers generally do their own GIS analysis for appraisal related issues. The coordinator supports internal ad-hoc requests for GIS mapping or analysis. Requests from cities and other entities for analysis of property value information are fielded as needed. Some ad-hoc requests are forwarded to the KCGIS Center when the request is beyond the scope of Assessments' responsibility.

The drafting section requires ongoing support from the GIS Coordinator for dealing with data maintenance/development and software/hardware issues.

The relationship with the City of Seattle and its GIS group in Seattle Public Utilities has provided Assessments with weekly and routine updates of the Seattle legal layer as well as zoning in exchange for updates from Assessments for parcels and tabular data. The quality of the Seattle data is very high so the positional accuracy of the parcel data for the City closely matches that of the Seattle legal layer.

A working relationship with the KCGIS Center for data maintenance and application development is imperative for the existing data maintenance model. Real time updates to the cadastral data would be the preferred scenario but the current data model does not support this. Nightly processing of data and periodic manual intervention occurs as part of the data integration process. The result is either overnight integration or delayed integration of the cadastral changes. The KCGIS Center is extremely responsive to the needs of the drafting section for incorporation of new data and for improvements to the maintenance process. An agreement with the KCGIS Center requires a two-day turnaround on any data integration or data fixes submitted by Assessments. While not ideal, this two-day minimum turnaround has kept the data reasonably current.

Relationships have developed with cities and other jurisdictions for feedback on problems and access to the cadastral data.

3.3 Department of Development and Environmental Services

The mission of the Department of Development and Environmental Services (DDES) is "to serve, educate and protect the community through the implementation of King County's development and environmental regulations." To carry out this mission the department is responsible for receipt and review of building and land use permits, inspection of building construction and land development, and for administration and enforcement of building, land use, fire, and environmental codes. DDES has jurisdiction in unincorporated King County and has approximately 250 employees organized into three divisions. These divisions are Administrative Services, Building Services and Land Use Services.

The GIS function for DDES is housed in the Administrative Services Division and is managed within the Information Services (IS) Section. The IS section provides a full range of information technology services to the entire department including GIS services. The IS Section provides GIS services to meet the primary objectives as follows: to speed delivery of department services; to enhance permit review; and to support decision-making.

3.3.1 Business Functions

The IS section of DDES provides geographic analysis, geographic data development and maintenance, customized end user applications, and map production services to the staff, customers and stakeholders of DDES. GIS Analysts in the section support a variety of the department's business needs by manipulating and presenting geographic information in the form of maps, graphics, data files and reports. Analysts also develop, integrate and maintain corporate and department geographic data sets, and ensure consistency of data between GIS systems and the Permits Plus system.

The work program of the IS section uses GIS to support several of the core business functions of the department including:

Permit Receipt (Intake) – Permit technicians use applications and databases developed by the IS Section during permit screening and intake. These tools and data sets are essential to successfully conduct intake review and complete the permit application process. Site location, zoning, development conditions, sensitive areas and other land related factors are identified and confirmed using GIS tools. Permit viability is assessed, permit requirements determined, and permit routing initiated. Customized applications integrated with the department's permitting system provide these functions at the public front counter and in the permit intake center.

Permit Review – GIS tools are used in several sections of the department to support permit review. For example, the Site Engineering and Planning Section uses them to generate a series of maps for each project under review. These maps illuminate a range of factors that influence site planning. The Plan Review Services Section uses GIS to determine snow-load and site slope factors, which guide decisions on roof and foundation requirements. The Current Planning Section uses GIS to determine development conditions, historic zoning and planning requirements.

Inspection and Enforcement – GIS tools are used by the various inspection and enforcement sections of the department to determine inspection areas, project assignments and to balance inspection and case workloads.

Regulatory Review – The Land Use Division uses GIS tools to develop planning proposals for regulatory control. GIS techniques are also used in programs with regulatory impact including Endangered Species Act (ESA) response, comprehensive planning, sub-area planning, sensitive areas protection and management, and special use studies.

Public Information – GIS maps, data, and applications are used extensively in the department for public information and education. Development controls such as zoning, land use, and sensitive areas are depicted using GIS techniques on maps and atlases, and in newsletters and bulletins. Property-based data are disseminated to the public via customized Internet applications including the "Development Conditions Search Engine" and the "Planning Maps" and "Sensitive Areas" map sets of *iMAP*.

3.3.2 GIS Program Overview

The IS Section is responsible for carrying out the GIS program plan for the department. The Section Manager reports to the Administrative Services Division Manager. In addition to programming, technical support, network administration, and addressing staff, four GIS analysts/programmers report to the IS Section Manager. Currently one of the GIS analysts/programmers is designated as Acting Lead GIS Analyst. It is expected that the acting lead position will be converted to a permanent designation in 2003. The GIS services are organized around three functional categories of work. These are data, mapping and analysis.

The Acting Lead works with the IS Section Manager to coordinate internal efforts, ensure efficient use of GIS analyst/programmer time, and coordinate GIS data development and maintenance with other agencies. Each of the remaining three GIS analyst/programmers has a primary duty representing each of the three functional categories. The database administrator is responsible for the department's GIS data warehouse, and administrating the MS SQL Server 2000/SDE data server. The mapping and analysis administrator is responsible for the coordination of spatial analysis projects and the generation of mapping products. The application developer is responsible for development, enhancement and maintenance of the department's GIS applications.

The IS Section provides services to DDES staff, customers and stakeholders. Requests for assistance come directly from DDES staff in the form of service requests. After service requests have been evaluated and received management approval, they are routed by the Acting Lead to appropriate GIS staff for response. In keeping with the Countywide GIS consolidation, agencies that have traditionally relied on DDES for their GIS needs are redirected to the KCGIS Center Client Services Manager. If needed, the IS Section will provide subject area expertise or project materials to the KCGIS Center Client Services Manager in order to assist in completing these service requests.

3.3.2.1 Training

GIS end-users in the department receive training from IS Section staff in the operation of GIS applications and the appropriate use of GIS data. This is most often carried out in structured training sessions of 90 to 120 minutes. These training sessions are offered annually, or more often if requested, to each section or work unit. Training content is customized for each session to suit the needs of the attendees.

There is no formal training program nor is there a line item training budget within DDES for the GIS analyst/programmers. However, ad hoc requests for training may be approved by DDES management based on need and availability of funds. When training is authorized, the funding source is the DDES revenue fund.

As the IS Section migrates to the ArcGIS 8 software platform the staff are supplementing their skills through formal course work. This formal course work will continue in 2003 and the migration implementation plan is carried out. GIS professionals at DDES are encouraged to participate in relevant seminars and conferences, as well as the KCGIS user meetings. Analysts/programmers adhere to the set of GIS professional responsibilities that were developed by the GIS Technical Committee in 2002.

3.3.2.2 Staffing Requirements

The GIS component of the IS Section staffing model for 2003 consists of 4.0 FTE GIS Analysts/Programmers (ISA-II) and 0.33 FTE Program Manager. During 2002 the GIS was combined with the Information Services Section and management of GIS staff is now provided part time by the Information Services Manager. The former 1.0 FTE GIS Program Manager (ISA-III) position has been eliminated. Additionally 0.5 FTE GIS Technician (ISA-I) position has been eliminated. It is the expected that one of the ISA-II Analyst/Programmer positions will be replaced with an ISA-III Lead Analyst/Programmer position in 2003. The reduction in positions is in response to an overall decline in DDES staff for 2003.

All GIS positions are supported from the overhead portion of the department's base and hourly permit fee calculations. These costs are spread across all DDES direct service sections according to budgeted FTE counts. In 2003 the total staffing budget (salaries plus benefits) for the positions that provide GIS services to DDES is approximately $344,952.

Working Title	Focus*	Class	Status	% GIS
IS Section Manager	Staff supervision, program management, GIS/IS integration	Program Analyst IV	FTE	33
Acting Lead GIS Analyst	Staff coordination, staff skill development, data development and documentation, county wide data development and maintenance coordination	ISA II	FTE	100
Database Administrator	SQL Server and SDE administration, data import and conversion	ISA II	FTE	100
GIS Application Developer	Application development, end user education, ArcMap Topology	ISA II	FTE	100
Mapping and Analysis Administrator	Map production, data analysis	ISA II	FTE	100

3.3.2.3 Hardware and Software

The IS Section operates GIS in a PC environment. The department operates several PC servers. Data are retrieved for the servers via a fiber optic connection to a Storage Area Network (SAN) device. Those servers devoted in whole or in part to GIS services are as follows.

DDES710 – An HP NetServer E800 running Windows 2000. A production data and license server, it runs the ArcInfo license manager, ArcSDE, and MS SQL Server2000. It provides ArcSDE geo-database GIS data for mapping and analysis projects.

DDES001 – An older 200 megahertz Pentium running Novell Netware 4.11. A production data, print queue and network log-in server, it provides shapefile GIS data for DDES' ArcView 3.1 counter application. *DDES001* will soon be replaced with an HP NetServer 12000r.

HERCULES - The IS Section also has a one-half share in a Windows NT server known as *HERCULES. HERCULES* currently resides on the 24th floor of Key Tower. *HERCULES* is used by DDES in cooperation with the KCGIS Center as an Internet server for publishing interactive mapping applications developed with MapObjects and ArcIMS.

The department is served by a fiber optic external network connection under the INET program. The PC desktop environment used by GIS staff consists of 1.7 GHz Celeron based machines running Windows 2000. ESRI ArcGIS 8.1, ArcInfo Workstation, and ArcView 3.1 are installed on the Windows 2000 PCs.

The GIS end-users in the department are currently standardized on Windows 98, but will be upgraded to Windows XP in 2003. The PC network for the department is an Ethernet LAN with multiple servers and a data transfer rate of 100 megabits per second.

Three ArcInfo 8.1 floating licenses are run from a license manager on *DDES710*. Also included is one license each for 3D Analyst (TIN), Spatial Analyst (GRID), and ArcPress. ArcInfo software licensing and maintenance are handled in cooperation with the KCGIS Center. Twenty ArcView GIS 3.1 licenses are run from a LAN installation on *DDES001* and are accessible by nearly all PCs in the department.

Specialized output devices used by the IS Section include an HP DesignJet 1055CM color plotter and a Canon CLC 900 color copier/printer. Maximum roll size for the plotter is 36". Maximum sheet size for the copier/printer is 11" by 17". Both devices are networked and accessible via the department's LAN.

Ancillary software used by the IS Section include Adobe Acrobat Distiller 5.0, Adobe Photoshop 7.0, Microsoft Access 97, Macromedia Dreamweaver MX, XML Spy 3.0, and Visual Basic.

The move to ArcGIS 8.1 by the IS Section necessitates the adoption of the Spatial Data Engine (SDE) and a database management system (DBMS). DDES has begun to set up a local instance of SDE using MS SQL Server 2000 for the DBMS. The implementation plan for SDE at DDES will be complete, and implementation will have begun by January 2003. The implementation will be completed during 2003.

3.3.2.4 Budget

The proposed 2003 GIS budget is as follows:

Item	Budget*	Comments
Labor Costs *(salary + benefits)*	$344,952	Estimated for 4.33 FTE
Hardware *(acquisition and maintenance)*	$5,000	Disk space on department SAN and maintenance contracts.
Software *(acquisition and maintenance)*	$21,600	Licenses and maintenance agreements.
Training costs	$18,000	Some of this training may occur in 4th Qtr of 2002.
Discretionary *(consultants, outside services, materials, etc.)*	$10,000	General supplies. $5,000 is Budgeted Client Services from the KCGIS Center. Historically this has not been used, and is included here for consistency with section 2.6.

** All amounts shown are estimates from larger section and/or department budgets.*

3.3.3 Spatial Data

The IS Section operates a broad data program including maintenance, enhancement and development of both corporate and department GIS data. Corporate data are those that are distributed to an audience beyond DDES and are available in the KCGIS Center data repository. Department data are those developed solely for use at DDES.

GIS data are held in two main data repositories at DDES. One data repository is a series of directories on *DDES001*, which contains ArcView shape files and is set up to mirror the structure of the KCGIS Spatial Data Warehouse. The other data repository is a set of ARCINFO 7.x coverages held on *DDES001* that are maintained using workstation ArcInfo 8.1. These coverages closely mirror the contents of the KCGIS Spatial Data Warehouse, although some names for directories and files are different. The ARCINFO 7.x coverages will be migrated into SDE during 2003, and then abandoned. A description of the GIS data program at DDES is included in the following sections.

3.3.3.1 Maintenance

Two tables are presented in this section. The first table lists corporate GIS data for which the department serves as steward and that reside in the KCGIS Spatial Data Warehouse. The second table lists data that are primarily for internal department use and are not posted to the KCGIS Spatial Data Warehouse.

Corporate Data

Data Name	Data Description	Update Frequency
ZONING	Polygons representing zoning classifications for unincorporated King County as well as portions of the County annexed or incorporated since 1993 (King County zoning is no longer in effect in annexed areas, information is retained for historic purposes only). Attributes include current and potential zoning.	As needed (Upon passage of KC Ord. Approximately 2-5 times/year)

Data Name	Data Description	Update Frequency
COMPLU02	Polygons representing King County Comprehensive Plan land use designations for unincorporated King County as well as portions of the County annexed or incorporated since 1993 (King County planned land use is no longer in effect in annexed areas, information is retained for historic purposes only). Archival versions of planned land use are retained on an annual basis (e.g., Complu00, Complu99, etc.)	As needed
GRWTHPAT	Polygons representing King County generalized land use pattern, which is a simplification and grouping of the Comprehensive Plan land use designations.	As needed
UGLINE02	Lines representing the King County Urban Growth Area (UGA) boundary. Archival versions of the UGA boundary are retained on an annual basis (e.g. Ugline00, Ugline99, etc.)	As needed
CLRESTR	Polygons representing clearing and grading restrictions as defined by Title 16 Building and Construction Standards – 16.82.150 of King County Code.	As needed
DPA	Polygons representing demonstration project areas as defined by Title 21A Zoning – 21A.55 of King County Code.	As needed
PSC	Polygons representing areas with property specific development standards (also known as P-suffix conditions) as defined by Title 21A Zoning – 21A.38 of King County Code.	As needed
SDO	Polygons representing areas with special district overlay designations as defined by Title 21A Zoning – 21A.38 of King County Code.	As needed
SDR	Polygons representing areas with special drainage requirements as previously defined by Title 9 Surface Water Management – 9.04 of King County Code. These requirements have been repealed but the layer is retained for historical purposes.	None planned
SHORELINEMMP	Polygons representing Shoreline Management Master Program designations as defined by Title 25 Shoreline Management of King County Code.	Irregular
COALMINE	Polygons representing Sensitive Area Ordinance coal mine hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Irregular
ERODE	Polygons representing Sensitive Area Ordinance erosion hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Irregular
SLIDE	Polygons representing Sensitive Area Ordinance landslide hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Irregular
SEISM	Polygons representing Sensitive Area Ordinance seismic hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Irregular

Data Name	Data Description	Update Frequency
WETLD	Polygons representing Sensitive Area Ordinance wetlands as defined in Title 21A Zoning – 21A.24 of King County Code. Attributes include wetland ID and wetland rating (also known as class). An Access database linked by wetland ID provides detailed wetland inventory data.	Irregular
FEMAFLDP OR FLDPLAIN	Polygons representing Sensitive Area Ordinance flood plains Flood Plains (may be owned by DNRP)	Irregular
AGRPDDST	Polygons representing the Agricultural Production District (APD) as defined by Chapter 3 of the King County Comprehensive Plan.	As needed
FORPDDST	Polygons representing the Forest Production District (FPD) as defined by Chapter 3 of the King County Comprehensive Plan.	As needed
RFFA	Polygons representing the Rural Forest Focus Area (RFFA) as defined by Chapter 3 of the King County Comprehensive Plan.	As needed
HORSE_COMM	Polygons representing Equestrian Communities as defined by Chapter 3 of the King County Comprehensive Plan.	As needed
CITYMAST	Polygons representing city annexation boundaries, including pending annexations. Includes current corporate boundaries and annexation and incorporation activity since mid-1980's. Key attributes include jurisdiction, annexation status and annexation effective date. The layer City is a derivative of Citymast.	As needed
CITY	Polygons representing current city boundaries. Layer City is a simplified derivative of Citymast.	As needed
CPAREA	Polygons representing Community Planning Areas as defined by various planning documents.	None planned
KCADDRGRID	Lines representing King County addressing grid as adopted by Resolution 16622.	None planned
MUCKL_IR	Polygons representing Muckleshoot Indian Reservation boundary.	None planned
SCHSITE	Points representing school sites.	Irregular
DRAINCAR	Polygons representing parcels associated with drainage incident citizen action requests (formerly known as drainage complaints). Derived periodically from drainage incident database maintained by DNRP-WLRD.	Irregular
UAC	Polygons representing Unincorporated Area Councils (UAC).	As needed
ASGWC95	Polygons representing areas susceptible to ground water contamination as defined by Chapter 4 of the King County Comprehensive Plan.	None planned
FARMLAND	Polygons representing properties participating in the Farmland Preservation Program.	Irregular
FIRESTN	Points representing fire station sites.	Irregular

Data Name	Data Description	Update Frequency
FPD_LINE	Lines representing the Forest Production District (FPD) boundary as defined by Chapter 3 of the King County Comprehensive Plan.	As needed
MPS	Polygons representing road mitigation payment system zones, which are derived from Small Area Zones (SAZ).	As needed

Department Data

Data Name	Data Description	Update Frequency
TDR	Polygons representing parcels receiving or sending Transfer of Development Rights (TDR).	As needed
JPA	Polygons representing joint planning areas as defined by the King County Comprehensive Plan.	Irregular
BOG_DA	Polygons representing bogs as regulated by the Surface Water Design Manual	Irregular
ERS_DA	Polygons representing erosion drainage as regulated by the Surface Water Design Manual.	Irregular
LH_DA	Polygons representing landslide hazard drainage areas as regulated by the Surface Water Design Manual.	Irregular
MDPA	Master Drainage Plans Areas as defined and regulated by the Surface Water Design Manual.	Irregular
MRWATERS	Polygons representing major receiving water bodies as regulated by the Surface Water Design Manual.	Irregular
BSNWIDE	Polygons representing basin wide drainage conditions as defined by Surface Water Design Manual.	Irregular
AREASPFC	Polygons representing area specific drainage conditions as defined by the Surface Water Design Manual.	Irregular
HISTSITE	Parcel specific database of historic sites as defined by the King County Historic Resource Inventory.	Irregular
INTERLOC	Polygons representing DDES interlocal agreements with various cities and agencies.	As needed
CITYIMP	Polygons representing impact areas (areas of interest) as defined by various cities.	Irregular
SCHDIST	Polygons representing school districts. A derivative of Election's schdist with additional attributes.	Irregular
CDIST96	Polygons representing King County Council Districts. A derivative of Election's kccdst with additional attributes.	Irregular
BLDG_IA	Polygons representing building inspection areas.	Irregular
LU_IA	Polygons representing land use inspection areas.	Irregular
CODE_IA	Polygons representing code enforcement areas.	Irregular

Data Name	Data Description	Update Frequency
GRAD_IA	Polygons representing grading inspection areas.	Irregular
ESA_IA	Polygons representing Environmental Species Act (ESA) inspection areas.	Irregular
CLEAR_IA	Polygons representing clearing inspection areas.	Irregular
ESC_IA	Polygons representing erosion and sediment control inspection areas.	Irregular
Z_XXXXX	A series of polygon layers representing zoning changes per various King County ordinances. Each layer shows the before and after zoning for a given ordinance. Layer name provides ordinance number (e.g. Z_11353).	As needed
LU_XXXXX	A series of polygon layers representing Comprehensive Plan land use changes per various King County ordinances. Each layer shows the before and after planned land use for a given ordinance. Layer name provides ordinance number (e.g. LU_11353).	As needed
SANT.MDB	Parcel specific database for Sensitive Area Notice on Title (SANT) information.	Monthly
UGAREA01	Polygons representing the Urban Growth Area (UGA).	As needed
STREAM	Lines representing the Sensitive Area Ordinance streams as defined in Title 21A Zoning – 21A.24 of King County Code.	Irregular
SNOWLOAD	Polygons representing ground snow load zones.	Irregular
INTRMPAA	Polygons representing interim Potential Annexation Areas (PAA) for cities in King County.	As needed
KINGADDR.MDB	Parcel specific database of situs addresses as recognized by DDES for properties in unincorporated King County.	Continually
PERMPAR	Polygons representing parcels associated with DDES permits. Includes historical parcels that no longer exist.	Monthly
PARCELS.MDB	Parcel specific database for development conditions information.	As needed
CHINOOK	Polygons representing 500-foot buffer from streams identified by Chinook distribution analysis.	As Needed
MINE97	Polygons representing mineral resource sites as defined by Chapter 3 of the King County Comprehensive Plan.	As needed
FCCTELCO	Points representing locations of existing and planned telecommunication facilities as registered with the Federal Communication Commission (FCC).	Quarterly
ARSONSXX	Points representing the locations of fire investigations for the given year. Layer name provides the year (e.g. ARSONS98).	Irregular

3.3.3.2 Enhancement

GIS data enhancement work by the IS Section is subject to priorities as established by DDES management. Typically these priorities are established during an annual review, which occurs in the first quarter of the year and includes input solicited from sections and work units. Once management has established the priorities the resulting work plan is often subject to revision as situations warrant.

Therefore the list of data enhancement projects included in this subsection is subject to change. The projects are listed with their Service Request Numbers used by the IS Section for project control.

Layer Conflation –(SR# 535, 536, 555) Currently most of the efforts to enhance GIS data at DDES are focused on conflation of cadastral-based data layers to match the cadastral features maintained by the Department of Assessments. The conflation work is necessary to accurately depict boundaries for such features as zoning, which was completed in 2002. Layers that will undergo conflation in 2003 include a suite of development condition layers (code restrictions, demonstration project areas, p-suffix conditions, and special district overlays), comprehensive plan land use designations, and city boundaries. The development condition layers are prioritized for early completion, with conflation of the other layers to follow. These layers will be used internally and posted to the KCGIS Spatial Data Warehouse.

King County Addressing Grid – (SR# 642, unevaluated) The King County addressing grid needs further attribution along Public Land Survey section lines. In the initial development of this layer many section lines were left without attribution, which results in labeling problems in various mapping applications. The attribution will be completed in 2003. Also, the feasibility of adding city-based addressing grids will be explored. It is known that approximately 12 cities have addressing grids that vary from the King County system. The amount of work required to accurately depict these independent address grids is unknown. This layer will be used internally and posted to the KCGIS Spatial Data Warehouse.

Historic Sites – (SR# 551) The historic sites layer maintained by DNRP and the historic sites database maintained by DDES have never been reconciled. In 2003 these data sets will be compared and the differences examined and corrected. The final product will be a GIS layer with table relates to additional attribute data. The completed layer will be for DDES use and will be updated annually. This layer will be used internally and posted to the KCGIS Spatial Data Warehouse.

Development Conditions Pre-Conversion Layers –(SR# 543) The Parcel.mdb, which contains parcel specific development condition information, is a standalone and separately maintained database. The database is used as the source for the "Development Conditions Search Engine" on the Internet. Since this is a parcel specific database it needs to be updated every time there is parcel segregation or merger activity. Keeping it synchronized with other information sources is problematic. Converting the information contained in this database into a set of GIS layers would drastically reduce the need for updates because the boundaries for the development conditions, on which the parcel specific data are based, rarely change. Creating the conditions layers will also ensure that information obtained from the "Development Conditions Search Engine" will match other sources such as "Base2." Not all development conditions need to be spatially reconstructed from Parcel.mdb. Only the pre-conversion conditions (that is the conditions that were in effect prior to the completion of second phase of the zoning conversion, which was adopted by Ordinances 12822, 12823, and 12824 on July 18, 1997) need to be built. This layer will be used internally and posted to the KCGIS Spatial Data Warehouse.

Addresses and Street Designations – (SR# 554) The IS Section will participate with a DOT Transit Division effort to create a new high-resolution transportation network and a maintenance plan to ensure the continued accuracy and completeness of the data layer. DDES will be responsible for maintaining addressing and street network data in unincorporated King County. DDES will continue to work with GIS Center and Assessments to provide more timely data update of addresses for use in the iMAP web application. This layer is jointly maintained by several agencies and jurisdictions; it will also be used internally.

ESA/Critical Areas Ordinance Sub Basin Analysis and Database Development – (SR# 608) As part of the department's support of the ESA/GIS Chinook Data Work Group, ongoing improvement of the Tri-County sub-basin database will be required. The process of presenting formal reports to the public was begun in 2001 and will continue into 2003. This layer is used internally and shared with DNRP WLRD staff for planning purposes.

3.3.3.3 Development

Data development work is subject to the same management process for setting priorities as established by DDES for data enhancement work. Typically these priorities are established during an annual review, which occurs in the first quarter of the year and includes input solicited from sections and work units.

Once management has established the priorities the resulting work plan is then subject to revision as situations warrant. Therefore the following list of potential data development projects is taken from known interests but is subject to change.

Subdivision Tracking Database – (SR# 565) A layer will be created to aid in long term tracking of land use actions that result in the subdivision of properties. For example when a plat is recorded the parcel numbers associated with the preliminary plat application are retired and the parcel layer is reconfigured to depict the new plat. The result is a loss of the spatial linkage to preliminary plat. The Land Use Services Division is still tracking plat applications, which date to the 1970's. What is needed is a layer to depict the original parcel with attribution to maintain the relationship to the information in the preliminary plat application. Research will be conducted and a layer will be created of subdivided properties and their offspring properties. This layer will be used internally.

3.3.3.4 Metadata

In 2003, the IS Section will review all metadata in the KCGIS spatial data catalog for all layers for which DDES has stewardship responsibility. All metadata will be made complete and up to date.

The IS Section maintains a data catalog (DataCatalog.mdb) in Microsoft Access. This catalog is an inventory of GIS data stored and maintained either for use in applications or on a recurring basis for mapping and analysis. The catalog contains descriptive information about the data with indicators to show which DDES applications use the data. The IS Section data administrator has responsibility for updating the catalog.

3.3.4 Spatial Applications

The IS Section has an extensive GIS application development and support program. The primary tools used in this program include ArcView applications developed with Avenue, ArcIMS applications using XML and Java, and web interfaces using Cold Fusion and Microsoft Access. The spatial application program at DDES is described in the following sections.

3.3.4.1 Maintenance

The following is a list of applications that are currently maintained by the IS Section:

Front-End Applications

Name	**Description**	**Language**
Planning Maps	Planning Maps is a map set incorporated into *iMAP*, King County's ArcIMS Internet application. It primarily used to obtain information on zoning classifications and land use designations for unincorporated King County. The map set is designed to provide DDES staff and its customers with quick and easy access to this basic planning information. Planning Maps was developed in collaboration with the KCGIS Center.	XML
Sensitive Areas	Sensitive Areas is a map set incorporated into *iMAP*, King County's ArcIMS Internet application. It primarily used to obtain information on various types of sensitive areas and environmental layers in unincorporated King County. Because of the large number of layers needed for the Sensitive Areas they have been composed into two subsets -wet themes and dry themes. The map sets are designed to provide DDES staff and its customers with quick and easy access to environmental information. Sensitive Areas was developed in collaboration with the KCGIS Center.	XML
Base2	"Base2" is a customized ArcView project used by staff at DDES to locate and determine the characteristics of a parcel and its vicinity. "Base2" has been the primary tool available to GIS end-users at DDES for the last several years. Lagging performance has always been an	Avenue

Name	Description	Language
	issue with "Base2" as response times to queries can be frustratingly slow. To reduce end-users reliance on "Base2" much of its functionality and information content has been ported to quicker browser-based applications such as the "Parcel Locator*"* and now *iMAP*. The adoption of ArcSDE for GIS data storage at DDES gives further incentive to replace "Base2" and the underlying ArcView 3.1 software, which can not access data from ArcSDE. Nevertheless, the application will continue to be supported at DDES for the foreseeable future.	
Auto Plot	"AutoPlot" is a customized ArcView project that provides a quick and easy method for printing a series of maps that are used during field or site plan review. Each map in the series depicts a different set of environmental or regulatory features that may effect site development.	Avenue
Development Conditions Search Engine	The "Development Conditions Search Engine" is an Internet application using Cold Fusion and Microsoft Access. It provides parcel specific development condition information for unincorporated King County in tabular format with access to scanned and indexed map images.	Cold Fusion
Parcel Locator 2	"Parcel Locator 2" is an ArcIMS based internal web application that is designed to be linked from DDES' permitting system, and meet specific attribute reporting needs of DDES staff.	Java Script, HTML, XML

Back End Applications

Name	Description	Language
SANT Data Entry Module	The "Sensitive Area Notice on Title (SANT) Data Entry Module" is a user interface for the SANT database (SANT.mdb). The interface is designed to aid data entry personnel in collecting the pertinent information from recorded notice on title documents. The collected information is used in DDES parcel finder applications such as "Base2" to inform users about sensitive area features that are associated with a subject parcel.	AML

3.3.4.2 Enhancement

Spatial application enhancement work by the IS Section is subject to priorities as established by DDES management. Typically these priorities are established during an annual review, which occurs in the first quarter of the year and includes input solicited from sections and work units. Once management has established the priorities, the resulting work plan is then subject to revision as situations warrant. Therefore the following list of spatial application enhancement projects is subject to change.

Development Conditions Search Engine – (SR# 543) The "Development Conditions Search Engine" will be redesigned in 2003 to retrieve source information from GIS layers rather than from tables maintained in Parcel.mdb. Maintenance of Parcel.mdb is time consuming and largely redundant work, which can be eliminated once the "Development Conditions Search Engine" is no longer reliant on Parcel.mdb. This project is tied to the data enhancement effort to use Parcel.mdb to generate the layers that would be required as source information for the redesigned "Development Conditions Search Engine." The conversion of the application to use shape files rather than tables will ensure that information provided by the "Development Conditions Search Engine" will match information retrieved from "Base2."

Base2/AutoPlot – (SR# 571)In order to reduce staff time spent on "Base2" and "AutoPlot" maintenance, they will receive a new common data source management interface. This will enhance the effort to reduce

reliance on unique DDES data layers, and increase the benefit of using layers directly from the KCGIS Spatial Data Warehouse.

DDES Defined Map Sets – (SR# 579) Additional map sets for *iMAP* will be identified and developed in 2002 based on priorities established by DDES staff and management. The map sets will typically be developed to serve a specific business need, rather than attempting to create generic map sets that may not serve any given business need particularly well. Tentatively, the map sets to be developed for *iMAP* include development conditions and snow load analysis.

3.3.4.3 Development

In 2003 DDES will complete the migration of GIS data from ArcInfo 7.x coverages to ArcSDE layers. The GIS analysts will complete the transition from using ArcView 3.1 and ArcPlot for analysis and mapping to using ArcMap. The only planned new applications are designed to aid in this transition. The applications will typically be developed to serve a specific business need. One application has been identified to date, an automated tool to summarize and display the distribution of an arbitrarily defined set of permits in an arbitrary set of geographic areas.

3.3.4.4 Documentation

Documentation of DDES GIS applications is usually maintained within coding scripts. This documentation typically includes header sections, with purpose statements and modification history, and comment lines embedded in the code. Limited user material has been prepared for AutoPlot and Base2. Basic "getting started" and overview instructions are available for *iMAP*. There are no other plans to provide further documentation of DDES GIS applications.

3.3.5 System Integration

The focus of the GIS staff in the IS Section is to provide land information to support the primary business of the department, which is to reliably process permits. Other staff in the IS Section have responsibility for maintaining the permit processing systems. A vendor-supplied solution, 'PERMITS' Plus®, provides the user interfaces and back-end databases for the permitting system. The IS unit has built several additional systems to support the department including time keeping, financial, management reporting, and data warehousing. The GIS staff receives support from and works with the rest of the IS unit to add the land-based information component to the department's systems.

3.3.5.1 RDBMS Backend Support

The IS Section currently uses Microsoft Access for back-end support of GIS. This function is limited to a handful of specific use databases such as SANT.mdb and Parcel.mdb, which are discussed in previous sections. In addition the IS Section makes use of an Open Database Connection (ODBC) to an Informix data warehouse of permitting information. This connection is used to extract information from the data warehouse for use in GIS applications, and for mapping and analysis projects. The IS Section has begun to migrate to ArcGIS 8.1 during 2002. GIS data currently kept in ArcInfo 7.x and in Microsoft Access will under go a transition to MS SQL Server 2000 running on Windows 2000. This migration is expected to be complete in 2003.

3.3.5.2 Other Data Management Activity

The bulk of DDES data management tools and processes are geared to support the department's permitting system and its related functions. These systems are maintained in an Informix DBMS running on a UNIX platform. The merger of GIS staff into the IS Section in 2002, is expected to provide improved integration of GIS and more conventional information services.

3.3.6 Client Services and User Support

The customer base for the IS Section is typically personnel from all divisions within DDES requiring various GIS services. Services provided include responding to ad hoc requests for information and

addressing long-term customized support for GIS end-users. The services generally fall into the categories of mapping, analysis, data development and applications.

Mapping and analysis services at DDES most often relate to parcel and/or permitting issues. Data development services are initiated when a customer's project requires new data. Many of the data sets created in these circumstances are only utilized for the duration of the project, but occasionally they have broad significance and are retained in data libraries at the department or corporate level. Application services are defined by user requirements and are developed to support specific business functions, most often based on the need to retrieve information about a parcel.

Services are requested through a formal service request form. The service request is evaluated by an IS Section staff member with a recommendation on the advisability of the project, an estimate of hours needed, and a completion date for the project. The evaluated project then must be approved by a DDES Division Manager or his representative and by the IS Section Manager. At that time the project is assigned to specific staff. Service requests are prioritized by review with clients and supervisors, taking into account project complexity, duration of the project, and the availability of staff. The lead analyst directs the GIS analysts weekly meetings at which active projects are reviewed, methods are discussed, and complementary efforts coordinated.

For work plan development the IS Section Manager solicits input from staff and management to determine the highest priority projects and issues for the coming year. The IS Section Manager compiles the input and presents findings to the DDES senior management team. The management team rates projects, which are then incorporated into the long-term work plan for the IS Section.

DDES is active in the use of the Internet, and the IS Section plays a primary role in the development of content and applications for the web. The GIS analysts work closely with the DDES Webmaster to provide a variety of methods to disseminate GIS information on the Internet (http://www.metrokc.gov/ddes/gis/). These include map images, a database search engine and interactive mapping applications.

Map Images – The IS Section maintains a web page of reference maps in PDF format (http://www.metrokc.gov/ddes/gis/archive.htm). The contents of this page include:

- The King County Zoning Map,
- The King County Comprehensive Plan Land Use Map,
- The DDES Base Map and
- The Ground Snow Load Map.

In addition, two atlases are reproduced on the Internet in PDF format. These are:

- The King County Zoning Atlas, and
- The King County Comprehensive Plan Land Use Atlas.

The reference maps and atlases are updated and posted to the Internet as changes to their underlying information occur. The IS Section also maintains a web page to track city annexation and incorporation activity. The page includes maps for each recent or proposed annexation.

Database Search Engine – The IS Section maintains a database search engine, which provides information on development conditions associated with parcels. The application, known as the "Development Conditions Search Engine" uses a Cold Fusion license on the Internet server known as *Persephone* to query information in an Access database stored on the same server. This search engine is scheduled to be replaced by an ArcSDE implementation. That replacement is dependent on the conflation of the Development Condition layer.

Interactive Mapping Applications – The department purchased and owns a half share in the Internet server known as *Hercules*. *Hercules* is the server used by King County to house Internet mapping applications run with ArcIMS software. The IS Section partners with the KCGIS Center in the development of ArcIMS applications within the *iMAP* environment. Further details on the section's activities in interactive mapping applications are available in the DDES Spatial Applications section above.

3.4 Department of Executive Services

The Department of Executive Services (DES) provides services to the citizens of King County through the following agencies:

- Office of Civil Rights
- Office of Emergency Management
- Facilities Management
- Finance and Business Operations
- Human Resource Management
- Information and Technology Services
- Records Elections and Licensing Services
- Office of Risk Management

The Department of Executive Services also houses the Board of Ethics and the Civil Rights Commission.

The mission of DES is "***To serve the public and enable others to serve***". The goals of the department are:

- Identify and meet changing customer requirements.
- Encourage and expand the use of strategic partnerships.
- Maintain and enhance a highly skilled workforce reflecting the diverse community we serve.
- Manage capital, human, information and technology resources to improve services and information sharing.
- Exercise responsible stewardship of county resources.

Major GIS services within DES are provided by two distinct work units: The E-911 Program Office, located within the Office of Emergency Management (OEM) and King County Elections GIS (KCEGIS) section. Both provide key information services to support the specific business needs of the respective divisions within DES. The Asset Development and Management section of the Facilities Management Division, maintains one networked Arc View workstation with one ArcView license.

3.4A Office of Emergency Management

The mission of the Office of Emergency Management/E-911 is to provide leadership and high quality services that improve the safety of the pubic in King County. Also to identify and meet changing customer requirements, encourage and expand the use of strategic partnerships. And maintain as well as enhance an empowered, highly skilled workforce reflecting the diverse community we serve. Foremost the office is responsible to provide leadership to meet the current and future needs of King County. The E-911 division ensures continued effective operation of the E-911 System so that high quality 911 service is provided to the public, regardless of the technology used to call for help.

3.4A.1 Business Functions

The E-911 Program Office is committed to providing public safety solutions and support to sixteen Public Safety Answering Points (PSAPs), in King County. PSAP support includes technical, GIS, administrative, and financial funding from the 911 tax. The E-911 Program Office is located within the Office of Emergency Management, under the Department of Executive Services. The GIS section of the E-911 Program Office primarily supports the use of GIS applications to locate wireless and wireline 911 distress calls that are displayed on the Ali-Trakker map viewer, installed at the PSAPs. 911 GIS support services range anywhere from training end users on the use of Ali-Trakker, troubleshooting GIS related problems, to fulfilling requests for GIS data layers. With professional GIS end-user support, the GIS administrator is a key information service provider of specific GIS data related to the business needs of its clients, primarily the PSAPs. As the volume of wireless and wireline 911 distress calls increases in King County, an easy to use, easy to understand, PSAPs front-end mapping application must be maintained in order to ensure all 911 calls are given a geographic location when possible.

Wireless 911 distress calls to PSAPs have increased within the last few years. GIS has fast become an essential tool to help locate wireless 911 distress calls. The FCC has mandated that by December 31, 2005 all cell phone service providers be Phase II compliant. Meaning a 911 distress call should have an exact x,y location attached to the call that PSAP equipment would then be able to interpret and display a point to the caller's physical geographic location.

3.4A.2 GIS Program Overview

The GIS section of the E-911 Program Office is set up to support wireless and wireline 911 call location display at the PSAPs. The E-911 GIS program is not in the business of creating new GIS data layers, rather maintaining, coordinating the use of GIS data for PSAPs from various GIS resources, and reporting updates to GIS data lenders. Continuous maintenance and periodic updates of GIS layer information will ensure that PSAPs are displaying the most up to date GIS data.

Furthermore, it is the duty of the E-911 GIS Administrator to keep current with updates to GIS layers that have been modified by the KCGIS Center, Transit, and KCEGIS as well as any other participating GIS agencies from whom E-911 has borrowed GIS data. The GIS administrator will also report back to the GIS data lender updates to the borrowed GIS data layers once updates become available. On occasion the GIS administrator will GPS locations of residential, business, public, and custom built geographic entities to verify correct real world locations. These sites would most often be in direct relation to a PSAP request for site or street verification. Once the site or street information has been collected and processed through the E9GIS software, the updates will be transmitted to the PSAPs as well as KCGIS, and any other GIS data lender to the E-911 Office.

Procedures – The installed Ali-Trakker application comes with a built in function to record 911 and GIS discrepancies. With an increasing volume of 911 calls throughout King County, and our changing geography, not every single call will match to an address a hundred percent of the time. Therefore, a call discrepancy manager was built into the Ali-Trakker application to allow for the capture and recording of GIS or 911 call discrepancies. Calls that are captured as discrepancies are then transmitted to the E-911 Office via the 911-net for further review and corrections. An example of a GIS discrepancy would be a caller is calling from one location and the map display is set to move to another location. The dispatcher would digitally record the GIS discrepancy on the map and send it off to the E-911 Office. The E-911 GIS Administrator would then identify where the discrepancy occurred, correct it, and notify the KCGIS Center

or the GIS data lender of the discrepancy and corrections made. E9GIS is a ArcView extension/VB application. E-911 uses E9GIS to perform all core GIS and 911 related functions. Anywhere from data creation to existing GIS data maintenance is integrated into E9GIS. E9GIS combines all GIS and Automatic Location Identifying (ALI) data developed and maintained for use on the AliTrakker application at the PSAPs. E9GIS is specifically designed to integrate core GIS and E-911 functions that help to maintain 911 and addressing data. E9GIS has an export utility that exports GIS corrections as shapefiles to forward onto GIS data lender. Metadata would have to be updated separately reflecting the change. Once the GIS data has been updated at the E-911 Office, it would be broadcasted down to all the PSAPs via the 911 data network.

Support - One E-911 GIS Administrator reports to the E-911 Program Manager. The E-911 GIS Mapping Administrator is responsible for the following duties:

- All GIS operations in the E-911 Program Office and the PSAPs
- Maintenance of GIS data and the
- Maintenance of Ali-Trakker map view application
- Upgrades, updates, and management of GIS information used at the PSAPs
- Coordination with wireless carriers for new cell tower information and updates to existing cell towers.
- Coordination of GIS data exchange with county GIS departments identified in the 2002 Work Task list.
- Technical support to PSAPs related to mapping and GIS
- GIS business expertise
- To work in conjunction with the KCGIS Center and various city GIS departments
- Coordinates with PSAP Computer Aided Dispatch (CAD) vendors
- Assist in the integration process of map display features between CAD and GIS mapping
- Maintaining current knowledge of technological changes in 911 and telecommunications industries.
- Help determine the impacts of GIS industry changes on the PSAP map system

Work Program - The GIS work program is determined by the E-911 Program Office. GIS services to PSAPs are prioritized by the order in which mapping is installed and activated at the PSAPs. This is based on the number of wireless 911 calls answered at the PSAP. Request for GIS assistance are received via phone, e-mail or at the quarterly PSAP meeting. Depending on the nature of the request for GIS data and the availability of the data, the request is processed. Daily communications between the PSAPs and the GIS section of the E-911 Program Office is ongoing via e-mail, phone, fax, or through the 911 data network.

The E-911 work plan is technology driven. Wireless carriers are mandated by the FCC to provide wireless call location information to PSAPs. King County is mandated by state law to provide countywide E-911 service. It is the responsibility of the county to ensure that the PSAPs are capable of receiving and utilizing the call location data. Wireless 911 calls have gone up to approximately 70% of the total 911 calls in King County, and this percentage continues to increase. In order to display the location information associated with each 911 call, 911 call location technologies must be installed at the PSAPs. The instillation of the Ali-Trakker map view application was coordinated through quarterly PSAP meetings, wireless carriers and the Ali-Trakker vendor.

3.4A.2.1 Training

Training primarily consist of end user clients at the PSAPs on the Ali-Trakker GIS map view application. Training dispatchers at the PSAPs is a job responsibility of the GIS Mapping Administrator. There is no set budget for in the E-911 GIS program for training. Training qualifications were written into the job description of the GIS Administrator position as a required responsibility.

Current and future training will focus on new employees at the PSAP who would need Ali-Trakker map view application training. GIS training for the E-911 GIS Administrator will be accomplished by participation in upcoming GIS conferences, application workshops, and King County GIS sponsored training classes. These are funded through the E-911 training budget.

3.4A.2.2 Staffing Requirements

Currently there is only one GIS Mapping Administrator in the E-911 Program Office who is responsible for maintaining, updating, installing, accumulating, and processing GIS data for PSAP use. The staff position is funded through the E-911 tax for one FTE to administer the PSAP GIS infrastructure. The GIS Administrator is highly skilled and knowledgeable about 911 and GIS technologies. It is important the GIS administrator know as much about GIS as he or she knows about the business of 911 so that current and future day to day business needs of 911, including mapping are appropriately addressed.

The E-911 GIS Administrator is also responsible for maintenance and upgrade of the Ali-Trakker map system when upgrades come available as well as maintenance of five servers installed at five of the sixteen PSAPs for call recording and call history management.

Working Title	Focus*	Class	Status	% GIS
E-911 GIS Mapping Administrator	Support GIS functions in E-911 Office and PSAPs	ISA II	FTE	100

In addition to the permanent full time GIS mapping administrator the E-911 Program Office is also going to utilize the skills and helpful knowledge of interns form the King County Work Study Program. These individuals are students from surrounding colleges, University of Washington, South Seattle Community College, and University of Puget Sound. Currently one intern will be trained on the menu driven E9GIS application to help with the identification of homes, office building, residential infrastructures, public infrastructures, and visible utilities that could be identified as landmarks or points of reference by 911 callers. These points can then be brought up on the Ali-Trakker application when a 911 call is in progress. The intern will also assist with GPS and data maintenance projects related to mapping in the E-911 Office.

3.4A.2.3 Hardware and Software

All existing hardware that will be installed at the PSAPs to support GIS functions in 2002 and 2003 has been ordered. Servers, pc's, and monitors were installed at the five primary PSAPs and three of the secondary PSAPs will be installed with monitors and pc's for mapping before the end of 2002. There will also be no changes to the established 911-net (WAN) used to transport GIS and 911 call related information to and from the E-911 Office and the PSAPs.

E-911 GIS currently has the following license structure:

Software	Licenses
ArcView	
Version 8.2	
Core	1
Spatial Analyst	1
Version 3.1	
Local Installs	2
Ali-Trakker Map Viewer	
Washington State Patrol	10
Valley Communications	38
Seattle PD	19
Bellevue PD	6
King County Sheriff	12
Kirkland PD	6
Bothell PD	5
Redmond PD	6
University of Washington	1

Software	Licenses
AT-Admin	
Washington State Patrol	1
Valley Communications	1
Seattle PD	1
Bellevue PD	1
King County Sheriff	1
Bothell PD	1
Redmond PD	1
Kirkland PD	1
University of Washington	1

3.4A.2.4 Budget

The proposed 2003 E-911 GIS budget is as follows:

Item	Budget	Comments
Labor Costs (salary + benefits)	$64,426.08	One FTE GIS Administrator Position
Hardware (acquisition and maintenance)	$0	Hardware is outdated and not eligible for maintenance contracts. No plan to replace in 2003.
Software (acquisition and maintenance)	$135,000	Acquisition of GIS layers for PSAPs maps.
Training costs	$0	No separate funds for GIS training. Training is provided on a discretionary basis
Discretionary (consultants, outside services, materials, etc.)	$20,000	Outside consulting is not a job function of GIS mapping Administrator.

Staff funding is supplied from the E-911 wireless and wireline tax.

3.4A.3 Spatial Data

The E-911 GIS division is responsible for maintenance and updates to the current Emergency Service Zone Numbers (ESN) boundaries. ESN boundary changes are forwarded to the E-911 Program Office for processing. The GIS administrator is responsible for updates and improvements to the ESN boundaries. These changes are then forwarded to the KCGIS Center. Also, Cell towers and cell sectors are maintained by the E-911 GIS division. PSAP specific data such as patrol zones, tow zones, special patrol districts can be created, updated and maintained by the E-911 GIS division if requested by PSAPs.

3.4A.3.1 Maintenance

Data Name	Data Description	Update Frequency
POLICE, FIRE AND EMS ZONES	PSAP specific data layers boundaries that PSAPs refer to when dispatching specific emergency services to locations.	As Needed
CARRIER CELL TOWER LOCATIONS	Points of cell towers in King County that is regularly updated and added.	As Needed
SECTOR COVERAGE AREAS	Polygons of cell towers that cover specific areas in King County, attached to cell towers.	As Needed

3.4A.3.2 Enhancement

Enhancements to the current Street Network (St_address) will be reported to the KCGIS Center as discrepancies are reported and recorded by dispatchers at the PSAPs.

3.4A.3.3 Development

N/A

3.4A.3.4 Metadata

N/A

3.4A.4 Spatial Applications

The E-911 Program Office GIS division does not provide any spatial application services. However, we do use spatial applications purchased from MicroData GIS to manage E-911 geographic and Ali data. AliTrakker, AT-Admin, AT-Server, e9GIS, e9Wireless, and e9collector are the suite of MicroData products specially designed and deployed here in King County, for E-911 mapping and Ali data maintenance. MicroData suite of applications are all maintained, upgraded, and modified by MicroData.

The users are always welcomed to suggest modifications and enhancements to all or any of the MicroData products. One suggestion we have offered to MicroData is to note that King County is in the process of reviewing data conversion from ArcView3.x to ArcGIS and that MicroData also be looking down the road with their applications being able to interpret ArcGIS files.

3.4A.4.1 Maintenance

N/A

3.4A.4.2 Enhancement

N/A

3.4A.4.3 Development

N/A

3.4A.4.4 Documentation

N/A

3.4A.5 System Integration

N/A

3.4A.5.1 RDBMS Backend Support

Currently GIS data is managed through MicroSoft Access or Excel.

3.4A.5.2 Other Data Management Activity

N/A

3.4A.6 Client Services and User Support

The E-911 Program Office provides user based support to all PSAPs currently using the Ali-Trakker map view application. The E-911 Program Office GIS section works closely with the PSAPs to assess their needs for GIS and to fulfill map data requests. Currently and in 2003 the E-911 GIS section will support essential GIS needs of the PSAPs, upgrade and maintain Ali-Trakker map viewer application, and provide any other GIS services to meet PSAP needs.

3.4B Records, Elections, and Licensing Division

Division Mission: To provide innovative, responsive and accessible services to residents, communities, businesses, King County departments and private entities to effectively meet our customers' needs.

Division Strategic Goals:

- Increase public access to and awareness of Division services
- Promote and facilitate compliance with laws and regulations to ensure voter enfranchisement, public safety and animal welfare.
- Utilize technology and other means to help provide high quality, responsive customer service at reasonable costs throughout the division.
- Develop and support a workforce that continues to successfully balance the need to meet increasing service expectations with limited available resources.

Changing Dynamics:

- An overall eroding CX tax base seriously hampers our ability to provide quality mandated services.

3.4B.1 Business Functions

The King County Elections GIS (KCEGIS) work unit has the primary GIS responsibility for the creation, integration and maintenance of geographic boundary data incorporated into the "District" theme of the King County Coordinated GIS (KC GIS) Program. The District data layer is utilized by many agencies within King County and it supports numerous County department business applications. KCEGIS staff supports division and department business functions by providing digital map and CD production services, data creation, integration, maintenance and analysis.

Listed below are department business functions by division that rely on geographic data and GIS applications:

- ***Political Redistricting/ Voting District Maintenance -*** GIS analysts within the division are responsible for the implementation and integration of data resulting from Federal, State and local redistricting plans *(RCW 29.69B-29.70).* To support this program, GIS tools applications and spatial data are used by Elections staff to analyze plans and implement district changes.
- ***Jurisdiction Boundaries -*** In King County, the Manager of the REALS performs the business function of the "County Auditor." Under State law, the "Auditor" is mandated to conduct primary, general and special elections for all political jurisdictions (including cities, towns, and minor taxing districts) within the County and to perform all duties required in order to carry out this function. *(RCW 29.04.020).* In order to do this, the "Auditor" must maintain the latest accurate information describing the geographic boundaries of these jurisdictions, as well as the director, council, or commissioner districts within, and ensure that such information is kept current. *(RCW 29.15.026 and Public Rule Doc. No. ELE 9-4-1).*
- ***Election Support -*** Jurisdictions in King County can conduct as many as seven elections per year. GIS staff, data, and tools are used to support the business of conducting elections. Candidate filing, jurisdiction flagging, ballot layout and design, absentee ballots, voting equipment delivery, routes, troubleshooter zones, production of the Local Voters Pamphlet, and polling place location and assignment *(RCW 29.57)*, all rely on spatial data and applications maintained and supported by KCEGIS staff.
- ***Voter Registration -*** the Elections office processes approximately 800,000 voter registration transactions per year. The State law *(RCW 29.07.220)* requires the Auditors office to maintain a database containing names, address, major political districts, minor taxing districts (jurisdictions) and precinct information for every voter. KCEGIS staff maintains spatial data and supports the applications crucial to this business function.

- ***Document Recording -*** The King County Records Office (Records) processes and records documents related to real estate transactions and collects excise tax and recording fees *(RCW 36.22.010).* The recording procedure relies on accurate up to date city jurisdiction information to process these transactions. KCEGIS data and staff provide support to this business application.

3.4B.2 GIS Program Overview

The KCEGIS work unit is physically housed in the King County Records Elections and Licensing Services Division (REALS). The GIS Program Manager reports to the Election Superintendent for operations and maintenance of Election related work programs. The Program Manager also interfaces with the Division Management Team, and or appropriate department staff for coordination of cross-departmental projects.

In 2003, three FTE GIS analyst positions, and two TLT GIS staff report to the Program Manager. These analysts perform duty assignments supporting four basic business areas: political redistricting, minor taxing district boundary maintenance, voter registration, and election support and customer service. Duties and job responsibilities are shared between GIS staff, with the division of labor coordinated and assigned by the Program Manager. Although the workload is distributed evenly between staff members, one GIS analyst is responsible for supporting the ongoing data maintenance needs and requests of the Voter Registration section, one GIS analyst has the primary responsibility for data integration and maintenance to the district themes, and one analyst handles special data requests and all production related issues. The two GIS TLT positions will be working on various GIS projects, providing data maintenance, integration, data QC, election specific application development, and assist in client support to offices and agencies within DES.

Customer service for both internal and external clients is reviewed and approved by the Program Manager. This is accomplished by coordinating special projects and requests with the KCGIS Center, to determine which agency should respond to the request. KCEGIS provides client services to support staff efforts in REALS, DES and numerous other internal County agencies.

The services provided by KCGIS staff include GIS data analysis, census demographics, cartographic production and CD and map sales. These services are also provided to the general public and clients outside the County organizational structure. In 2002, KCEGIS staff provided approximately 75 CDs and 450 paper maps containing spatial data.

3.4B.2.1 Training

The Record Elections and Licensing Services Division does not have a formal GIS training program. GIS courses and workshops are attended when both time and current budget allow. Both the KCEGIS Program Manager and staff participate in specialized GIS training courses that are offered by the KCGIS Center. KCEGIS staff also receives specialized training classes to meet the needs of the business units to which they provide support (i.e., special census training, election data management). The Program Manager receives training in administration and management, and must maintain certification as a Washington State Certified Election Administrator (CEA). This is accomplished by attending various training sessions and workshops held throughout the year, offered by the Office of the Secretary of State.

Non-GIS Division staff receives training in specific applications related to spatial data; to support related Voter Registration & Elections programs (i.e., Polling Place Finder). This end user training is accomplished by the Program Manager or one of the two FTE GIS analysts.

The 2003 training budget for KCEGIS of $2,000.00 is inadequate to meet the training needs of the work group. Due to the lack of funding, during the first half of 2003 most of the training effort will focus on utilizing online virtual campus courses from Environmental Systems Research Incorporated (ESRI) and other vendors. In the second half of 2003, KCEGIS staff needs to receive training in Arc 8 and courses related to the new software model. Additionally, further end user training on division specific applications will occur in 2003.

3.4B.2.2 Staffing Requirements

For 2003 the KCEGIS staff consists of 1.0 FTE program manager, 2.0 FTE analyst/programmers, 1.0 FTE analyst/technician (vacant), and 2 TLT analyst/programmer positions.

Working Title	Focus	Class	Status	% GIS
GIS Program Manager	Staff supervision, GIS coordination, program management	ISA III	FTE	75%
GIS Analyst / Programmer	Data integration, data maintenance, GIS analysis	ISA II	FTE	90%
GIS Analyst / Programmer	Data integration, data maintenance, GIS analysis	ISA II	FTE	90%
GIS Analyst	Elections and voter registration support, street file maintenance	ISA I	FTE (vacant)	90%
GIS Analyst	Jurisdiction QC, meta data	ISA I	TLT	100%
GIS Analyst	REET project, data/ documentation	ISA I	TLT	100%

GIS positions within the Records Elections and Licensing Services Division are CX funded with 80 percent revenue backing. The Source of revenue is obtained from election billing for incorporated cities and towns in King County pursuant to RCW 29.07.101and RCW 29.07.030.

The KCEGIS staffing allocation for 2003 is inadequate given the existing body of GIS work and special GIS projects that require completion. The vacant FTE ISA I analyst position is crucial to the division for the long term, if KCEGIS continues its current level of customer service and division staff support.

3.4B.2.3 Hardware and Software

KCEGIS operates GIS in both UNIX and PC environments. The PC environment consists of a mixture of eight PCs from various manufactures, with varying clock speeds and hardware configuration. The hardware for the majority of the Elections domain is comprised of Dell Dimension XPS T500 workstations running a combination of Windows NT 4.0, Windows 2000 Professional, and XP Professional. KCEGIS operates and maintains a Dell Poweredge 4200 server specifically for GIS data, applications, and map library, this environment is where assorted shape files and projects (i.e. redistricting plans, annexation data, PDFs, and related GIS images) and other related data are stored. A Digital Equipment Corporation (DEC) alpha workstation running UNIX provides the primary GIS development platform. A Dell Inspiron 8200 Laptop is used for remote poll scan and Election Day trouble shooting GIS activities. KCEGIS utilizes an HP Design Jet 2500 CP plotter as its primary output device for large format map production. Other printing resources include an HP 2500 CM Professional Series Color Printer, and numerous HP Laser printers available via the Election Domain Local Area Network. KCEGIS currently has one primary ArcInfo floating license on *Wildfire* and five ArcView 3.2 licenses. During the first half of 2003, the section will migrate to the ArcGIS 8.1 environment thus discontinuing the floating ArcInfo license.

Maintenance of KCEGIS' corporate data is performed on *Wildfire* operating UNIX from PCs using Hummingbird Exceed software. Departmental data specific to REALS KCEGIS is stored and backed up on Dell Poweredge servers housed in the King County Elections office. Voter registration data, election data and applications are stored and backed up on servers housed at King County Information and Technology Services (ITS). Additional software used by the section includes: Avenza Map Publisher Adobe Illustrator 9.0, Adobe Acrobat 5.0, Adobe PageMaker 6.5, Adobe Photoshop 6.0, Coldfusion, Visio Professional, Microsoft: Access, Excel, Project, Powerpoint, SQL, Visual Basic, and Visual InterDev.

In 2003, the REALS Division will be moving to a support model in which the Information and Technology Services Division will provide hardware and software support. It is not clear at this time what, if any, impacts will be on the KCEGIS workgroup. This issue will be addressed further in subsequent versions of the O & M plan.

3.4B.2.4 Budget

Item	Budget	Comments
Labor Costs (salary + benefits)	$285,336	
Hardware (acquisition and maintenance)	$6,800	
Software (acquisition and maintenance)	$2,000	
Training costs	$2,000	
Discretionary (consultants, outside services, materials)	$7,700	

3.4B.3 Spatial Data

Many agencies within DES utilize some form of spatial data such as street address files or associated data queries related to address. Some of this data is maintained in-house while other agencies opt for applications and data to be maintained by other offices such as ITS. This is primarily due to the lack of in-house IT resources to create and maintain applications and data.

KCEGIS develops, maintains and enhances a range of corporate and department GIS data. Once corporate GIS data has been created or updated on the REALS network, the data is stored as ArcInfo coverages and associated shapefiles on the KCGIS Center server *Wildfire*. Many County and external agencies use spatial data developed by the REALS Division to perform their respective business functions.

3.4B.3.1 Maintenance

In order to meet State and Federal statutes, the Elections GIS staff must create and maintain geographic boundary data for those jurisdictions that elect candidates or conduct special election on propositions. In King County, these corporate data sets consist of the following:

Corporate Data

Data Name	Data Description	Update Frequency
CITYDST	Boundaries of incorporated cities and towns	Updated as needed for election purposes, REET
CONGDST	Congressional District boundaries in King County	Every 10 years, following the Decennial Census
DIRDST	Director districts within the Seattle School District	Yearly
DSTCODE	Unique Voting Levy Description Polygons (unique ballot styles)	immediately following annexation activity
FIRDST	King County Fire Protection Districts	immediately following annexation, or merger activity
HSPDST	King County Hospital Districts	immediately following annexation activity
JUDDST	King County Court Electoral Districts	Yearly
KCCDST	Current King County Council Districts	Every 10 years, following the Decennial Census

Data Name	Data Description	Update Frequency
LEGDST	Legislative Districts in King County	Every 10 years, following the Decennial Census
LIBDST	King County Library District	Immediately following annexation activity
MS1DST	Proposed Electoral Districts group 1 (temporary ballot measures such as the merger of 2 water districts)	As needed for election purposes
MS2DST	Proposed Electoral Districts group 2 (temporary ballot measures)	As needed for election purposes
MUNDST	County recognized Municipal Incorporation Districts (explain)	As needed for election purposes
PRKDST	King County Park Districts / Special Park authorities	immediately following annexation activity, or creation
SCHDST	Public School Districts in King County	immediately following notification of Transfer of Territory
SWRDST	King County Sewer Districts	immediately following annexation, or merger activity
VOTDST	Voting Districts (commonly referred to as Precincts)	Yearly
WSDST	Combined Water and Sewer Utility Districts	immediately following annexation, or merger activity
WTRDST	King County Water Districts	immediately following annexation, or merger activity

KCEGIS staff also maintains corporate spatial data for Cemetery, Airport, and other associated misc. districts.

Department Data

Data Name	Data Description	Update Frequency
STREETSEG	Street centerline master address file (MAF)	continually
PRECINCT	Voting precinct assignment	as needed for election purposes
LEVY	Minor taxing district assignment	as needed
COMBO	Unique Ballot style	as needed for election purposes
POLLPLACE	Election polling place assignment	as needed for election purposes
ROUTE	Election supply delivery routes	as needed for election purposes
ZONE	Election day trouble shooter assignments	as needed for election purposes

3.4B.3.2 Enhancement

In 2003 the REALS division GIS staff will focus on improving spatial accuracy of minor taxing district coverages via the Jurisdiction QC Project. KCEGIS TLT staff will completing this effort and the GIS Program Manager will be coordinating with various Departments, the KC GIS Center, the related taxing districts, and cities and towns in King County. Other data enhancement will occur with the completion of the Real Estate Excise Tax (REET) project in 2003. REALS GIS staff will also be working the King County Assessor GIS staff, in an effort to enhance the CITYDST coverage and maintenance routines. The goal of this project is to allow for a single point of city annexation processing between the two agencies.

3.4B.3.3 Development

New data development will occur as the result of planned work programs and ongoing election management support. In 2003, the KCEGIS unit will be developing coverages and data related to school director districts, PUD commissioner districts, Chinese language ballot areas, zipcode and carrier routes, and additional poll data.

3.4B.3.4 Metadata

FGDC documentation exists for GIS Coverages on *Wildfire*. This documentation is currently out of date and needs to be improved. In the second half of 2003, the metadata will be brought up to the approved KCGIS and FGDC standards. This work will be assigned and completed by one of the TLT positions funded for 2003.

3.4B.4 Spatial Applications

The REALS Division GIS work group supports numerous spatial applications related to the administration of elections, voter registration and document recording. The majority of the applications reside on the IBM host mainframe computer at ITS.

The two major types of applications that KCEGIS staff support are related to the Vote process and the Simulation processes.

The Vote Update applications assign the correct Jurisdiction information to clients who are registering to vote or moving to a new address in King County. Applications and Graphic User Interfaces (GUIs) allow for street, address, name, DOB and other data to be entered by Division staff and stored as part of the VoteMaster file. Other related applications identify and flag Absentee, Inactive, Cancelled and Service voters.

The applications related to the Simulation process allow for multiple “what if” scenarios related to jurisdiction and street segment management.

3.4B.4.1 Maintenance

Voter and Election related GIS applications are reviewed and maintained yearly, or as the need arises. There is no current proposal for a system of scheduled maintenance.

3.4B.4.2 Enhancement

The Election section of the REALS Division has implemented an automated Election Management System (EMS). One component of the EMS is includes ballot layout, design, production, and ballot tabulation. The Ballot Tabulation portion of the contract has been fulfilled and has been in operation since September of 1998. The Voter Registration component, which includes a GIS backbone, is still under development and due to recent legislation, must now interface with a state wide voter registration system. No definitive date has been set for the completion of this component.

3.4B.4.3 Development

The development of GPS applications for Poll routes, locations, and Trouble Shooter zones is currently being analyzed by the REALS Division. If feasible, this development effort will be coordinated with OEM

and discussed with the KCGIS Center. During the first half of 2003, KCEGIS staff will be partnering with ITS and the King County web team to develop a web based, voter and polling place look up application. This effort will include major enhancements to the REALS division web site, resulting in improved customer service for 2003.

3.4B.4.4 Documentation

Documentation of division applications are sparse and incomplete and still need to be updated. The maintenance process for city annexations is being reviewed and documented in the first quarter of 2003. As Election business processes are review and or re-engineered, each will process, or procedure will be fully documented by KCEGIS staff.

3.4B.5 System Integration

N/A

3.4B.5.1 RDBMS Backend Support

N/A

3.4B.5.2 Other Data Management Activity

N/A

3.4B.6 Client Services and User Support

The KCEGIS unit provides GIS support to all Division staff working with spatial data, (i.e., address, street segment files, and candidate information) and GIS analysis and production services to other public agencies and the public. The Elections Office, located on the 5th floor of the King County Administration building, operates a map and data services counter where individuals can purchase or order custom data products, with the emphasis on demographic and political data. KCEGIS staff also provides user support to REALS Division staff for spatial data used to support the business functions of the Division.

3.4C Facilities Management Division

The GIS work program for the Facility Management Division (FMD) is still being developed. It will be added as an amendment to this document when it has been completed. This is likely to occur by mid-year 2003.

3.4C.1 Business Functions

3.4C.2 GIS Program Overview

3.4C.2.1 Training

3.4C.2.2 Staffing Requirements

3.4C.2.3 Hardware and Software

3.4C.2.4 Budget

3.4C.3 Spatial Data

3.4C.3.1 Maintenance

3.4C.3.2 Enhancement

3.4C.3.3 Development

3.4C.3.4 Metadata

3.4C.4 Spatial Applications

3.4C.4.1 Maintenance

3.4C.4.2 Enhancement

3.4C.4.3 Development

3.4C.4.4 Documentation

3.4C.5 System Integration

3.4C.5.1 RDBMS Backend Support

3.4C.5.2 Other Data Management Activity

3.4C.6 Client Services and User Support

3.5 Department of Natural Resources and Parks

The mission of the King County Department of Natural Resources and Parks (DNRP) is to be the steward of the region's environment and strengthen sustainable communities by protecting our water, land, and natural habitats, safely disposing of and reusing wastewater and solid waste, and providing natural areas, parks and recreation programs.

The Department has about 1600 employees who provide a wide range of services to King County residents and visitors. Specific services include:

- Protect and restore aquatic and terrestrial ecosystems and protect public health and safety.
- Promote agricultural waste reuse and help protect the quality of biosolids and reclaimed water.
- Protect public health and the environment by conveying and treating the region's wastewater.
- Provide solid waste transfer and disposal services for County residents and businesses.
- Provide high-quality park and recreation programs, services, and facilities.

The Department is organized in four operational divisions: Water and Land Resources, Wastewater Treatment, Solid Waste Management, and Parks and Recreation.

The Department of Natural Resources and Parks is unique, because the County Executive and Council have tasked it to also manage King County's central GIS resources and services. Administratively, this function is located within the DNRP Director's Office Technology Unit as the King County GIS Center (see section 3.1).

GIS is used throughout the Department of Natural Resources and Parks for a variety of core business functions. Typical GIS applications include support to staff planning the billion dollar Brightwater Project expansion to the wastewater treatment system, web mapping services to enhance more effective use and customer satisfaction of County parks, analysis of remote imagery to assess critical habitat needed for endangered species recovery, and detailed mapping of potential sites for a future solid waste transfer station.

GIS services within the Department are provided by the KCGIS Center's DNRP GIS Unit. This unit is a part of the KCGIS Center, which is responsible for staffing, budget, standards, and coordination. During the budget development cycle each division designates the number of GIS staff required from the KCGIS Center to meet its business needs for the coming year. Individual staff can be dedicated to a single division, or managed on a pooled basis across division lines, as required to meet business needs and availability.

To ensure effective utilization, each division designates a GIS program manager who oversees the day to day work assignments of the GIS staff allocated to that division. DNRP GIS Unit activity is coordinated by the KCGIS Center manager in cooperation with the division GIS program managers.

3.5A Wastewater Treatment Division

GIS analysts support this division's mandate to be a steward of the region's environment by protecting the water, land and natural habitats and safely disposing of and reusing wastewater and solid wastes.

3.5A.1 Business Functions

GIS staff provide services to augment planning of wastewater services, monitor for changed conditions and develop programs to meet customer needs. WTD GIS analysts also maintain and support enterprise data that are related to wastewater business such as the FIRS database. All data sets that are created and maintained by the following divisional programs are available on KCGIS Center's enterprise servers Wildfire and DNRPLIB1. Specific business functions/programs include:

Conveyance System Improvements - The Conveyance System Improvements (CSI) project is a multi-year, multidisciplinary effort to prioritize and coordinate regional conveyance system planning. The County's regional conveyance system consists of over 250 miles of pipes and 42 pump stations in addition to force mains, regulators and tunnels that transport wastewater from local sewer systems to the County's two existing regional secondary treatment plants. The CSI project focuses on County-owned regional conveyance facilities. GIS data management, cartographic production and analyses are critical to the support of this program in maintaining an inventory of the conveyance system, providing modeling input and serving as a means to distribute information to the multiple participants in the regional program.

Brightwater Siting and Conveyance - GIS provides maps and analysis for siting recommendation and criteria analysis for siting a third wastewater treatment plant. GIS data and tools will also be used extensively to plan conveyance and outfall siting for new plant.

Regional Infiltration/Inflow Control Program - GIS supports the program's goals to reduce the amount of excess clean storm water and/or groundwater that enters the local sewer collection systems. New and updated coverages depicting local sewers, King County sewers, meter locations, modeling basin locations and sewerable areas are created. Maps and analysis to support wastewater modelers are created. The GIS support of this program is closely affiliated with a prime contractor, Earth Tech.

Facilities Inspection - The Facilities Information Retrieval System (FIRS), a GIS-based database, is used for tracking facilities and sewers data and for developing the Onelines atlas. Related is GIS support for the Facilities and Offsite Inspection teams through development of automated tools, databases and cartographic products.

3.5A.2 GIS Program Overview

The DNRP GIS Unit provides GIS services to the Wastewater Treatment Division (WTD), with four employees assigned to this group. The GIS analysts associated with the WTD are closely associated with specific long-term project assignments. One analyst is the primary contact for the Infiltration and Inflow study, closely aligned with a consultant working for King County; a second analyst is primarily responsible for the new Brightwater treatment plant siting and outfall design support; a third has emphasis on the conveyance systems improvement projects and Brightwater conveyance projects; while the fourth focuses on offsite facilities one-lines, local sewer-lines and monitoring data. There is cross support between staff and each member shares in handling ad hoc assignments. However client requests are generally closely associated with the staff member representing that project emphasis, and assignments are directed on that basis.

3.5A.2.1 Training

Although the Wastewater Treatment Division does not provide any formal GIS-related training classes of its own, such training is available to the WTD GIS Analysts and to other staff from a variety of internal and external sources. The KCGIS Center provides training through a combination of County-specific courses and standard ESRI courses, which are taught by its own ESRI-certified instructors. Please refer to Section 3.1.6 for more information regarding these courses. In addition, ESRI offers a range of instructor-

led courses, which are taught in the ITS facility at Key Tower. During 2003, these courses will be offered approximately once each month.

Formal GIS and related software and data management training is also available from ESRI and other commercial providers at other locations in the Puget Sound region, including the ESRI regional office in Olympia. Selective use of such training to address specific needs.

The WTD GIS Analyst positions require a considerable breadth of GIS-related skills and abilities for both essential and specialized tasks. Ongoing professional development for these four analysts through 2003 will continue to focus on meeting specific division and project requirements. The WTD analysts will continue their training in migrating to ArcGIS 8. Building Geodatabases will specifically enable the WTD analysts to move efficiently to the Arc 8 software when the time comes. The analysts will also participate in general professional training such as "Effective Communication Skills", "Presentation Skills", and "Interpersonal Conflict Resolution."

3.5A.2.2 Staffing Requirements

There are four GIS analysts within the DNRP GIS Unit who primarily support the needs of the Wastewater Treatment Division. They are classified as follows:

Working Title	Focus	Class	Status	% GIS
GIS Analyst	Brightwater T.P. Support	ISA II	FTE	100%
GIS Analyst	Conveyance System Support	ISA II	FTE	100%
GIS Analyst	Inflow/Infiltration Project Support	ISA II	FTE	100%
GIS Analyst	General Wastewater Support	ISA II	FTE	100%

3.5A.2.3 Hardware and Software

During 2002 server functions were migrated to a Dell server running Windows 2000 OS . The GIS share is titled *Iliamna,* a shared virtual drive on server *WTD DATA* and serves as a combined production and development environment for four WTD GIS analyst. It is solely a data server, since networked ArcInfo and ArcView license support is provided by the KCGIS Center server named *Orca*.

Beginning this fall (October, 2002) DNRP GIS users have a new GIS Unit Server, DNRPLIB. This server combines GIS datasets from the WLRGIS, PARKS-01, and ILIAMNA servers into one place, thus eliminating the need for these separate servers. When the process is complete, DNRP GIS users will map one drive to DNRPLIB for DNRP-related GIS data, and continue as they do currently to map one drive to King County enterprise data on the KCGIS Spatial Data Warehouse. The KCGIS Spatial Data Warehouse is not involved in or affected by the consolidation plans presented here.

These are the benefits of this project:

- More GIS Data: GIS users will have access to more GIS data than before since the new server will hold GIS data from Parks, Wastewater Treatment, and Water & Land Resources divisions in addition to GIS data obtained from external to King County agencies or jurisdictions.
- Easier GIS data access: Up until now, it has been a difficult process for GIS users in one division to be able to access GIS data that resides on another division's server. Since all divisions will now be posting GIS data on one public server, all users will have easy access
- Reduction of GIS data duplication: Since all DNRP GIS data will be located on one server, duplication of GIS data on multiple servers will be minimized. This will reduce conflicts between multiple versions of GIS data. Reduction of confusion: DNRP GIS users will now have one place to go for their DNRP GIS needs. [NOTE: For King County-wide data needs, DNRP GIS users will continue to use The KCGIS Spatial Data Warehouse as before.] In addition, as part of the

preparation for moving GIS data to the new server, the divisional GIS groups are looking through existing GIS data and weeding out old and redundant data.

- More information about GIS data via the intranet. All GIS data on the new server will appear in a web-based catalog available on the intranet. Users will be able to search the catalog for GIS data by several data attributes such as the division or data steward responsible for it, the thematic folder it appears in, or by keywords. The results of such searches will be presented as a dynamic on-line table from which users can select and display the full catalog entry for specific datasets. These catalog entries give an "at a glance" summary of important information about the dataset and offer links to more extensive metadata if it is available (or as it is developed).
- A better GIS data environment. Up until now, DNRP GIS users have accessed data on servers that have not been maintained as "production" GIS data servers. This means that changes to the file structure or data locations on a server might occur without prior warning. In addition, the data on the server had relatively no standards to meet in order to be posted, so users had no idea how much confidence to place in the data. The new server, however, will be run as a production server. This will mean advance notification of data deletions, fewer structural changes, and data standards.

WTD GIS will migrate to GIS software ArcGIS 8.x from ArcView 3.X under the guidance from the KCGIS Center.

3.5A.2.4 Budget

The proposed 2003 KCGIS Center, DNRP Unit, WTD Budget for the five standard O&M Plan reporting categories is presented below. Note that the KCGIS Center overhead costs allocated to the DNRP Unit are not included below. For additional 2003 WTD Budget information, see sections 2.6 and 3.1.2.4.

Item	Budget	Comments
Labor Costs (salary + benefits)	$309,068	Includes allocated labor costs for KCGIS Center management and administrative support
Hardware (acquisition and maintenance)	$3,400	
Software (acquisition and maintenance)	$10,360	
Training costs	$6,560	
Discretionary (consultants, outside services, materials, etc.)	$34,220	Includes $30,000 for support services from the KCGIS Center Client Services Unit.

3.5A.3 Spatial Data

The Wastewater Treatment Division maintains and enhances a number of data sets associated with wastewater infrastructure and its planning, operation, and maintenance. WTD has production data on the enterprise level as well as other data sets in development. These data are maintained either by analysts or through data specific applications.

3.5A.3.1 Maintenance

Corporate data sets

Data Name	Data Description	Update Frequency
FACILITY	Manholes, pump stations, regulator stations, treatment plants. The Facility point coverage is generated from coordinate locations in the	Weekly

Data Name	Data Description	Update Frequency
	Facility Information Retrieval System (FIRS). It represents all facilities in the King County Wastewater Treatment System.	
IWPERMIT	Industrial Waste Permits	As needed
PLANT	Regional Wastewater Treatment plants. It contains the location of regional wastewater treatment plants, including King County owned plants and others in King, Pierce, and Snohomish Counties.	As needed
SERVAREA	Sewer service basins contributing flow to KC WTD facilities. It depicts the King County Wastewater Service Area. Sewer service basins, not political boundaries, define it. It represents the area from which local component agency sewer utility districts collect flow that is eventually conveyed and treated by King County. Additionally, it is defined by the Urban Growth Boundary to encompass potentially sewerable area for planning flow projections.	As needed
SEWER	Major sewage conveyance system. This coverage depicts King County Wastewater Treatment Division's conveyance system. It is generated from the Facility Information Retrieval System (FIRS), a database maintained by the Wastewater Treatment Division, Facility Inspection Section. Arc segments represent sections of conveyance pipe between manholes or other facilities (see FACILITY point coverage).	Weekly
SITEPLAN	Facility footprints. Building footprints of treatment plants or other facilities	As needed
SWRBASIN	WPCD defined boundaries for sewer basins including planning basins (PATPLA). SWRBASIN shows sewer infrastructure flow basins in King, Pierce, and Snohomish Counties. This coverage is used for modeling and planning wastewater flows. This coverage does NOT represent the King County Wastewater Treatment Service Area (see coverage SERVAREA).	As needed
WTRSAMP	Water Sampling sites. Sampling locations from LIMS database. WTRSAMP is a point coverage representing the location of water quality sampling sites. The coverage is generated weekly from the LIMS oracle database maintained by the King County DNR Environmental Lab. Each point has an attribute identifying its LIMS locator ID.	Weekly

Division data sets

Data Name	Data Description	Update Frequency
FLOWMNTR	Contains depictions current and historic monitors used in in a variety of projects from day to day system flow monitoring to I/I project monitoring.	As needed
SWR_AGEN	A depiction of the sewer agencies that provide flow to WTD. This data set is for cartographic and planning purposes only and does not show individual service areas or district boundaries. It should not be confused with sewer_dist maintained by Records and Elections.	As needed
LOCALLN	Contains depiction of local sewer pipes with available attribute information	As needed

Data Name	Data Description	Update Frequency
	information	
LOCALMH	Contains depiction of local sewer facilities with available attribute information	As needed
CSO	Combined Sewer Overflow discharge locations.	As needed
WTDBSN	Basins used by WTD to plan and manage wastewater flow.	As needed
SWRLND00	Areas of sewered land delineated using local line sewer information, Emerge imagery, and parcel lines based on 2000 data	Never
SWRLND	Areas of sewered land delineated using local line sewer information, Emerge imagery, and parcel lines based on 2001 data	As needed
MDLBSN00	Basins developed for WTD modelers through the Inflow and Infiltration project based on 2000 data.	Never
MDLBSN	Basins developed for WTD modelers through the Inflow and Infiltration project based on 2001 data.	Never
MNIBSN00	Basins developed for flow monitoring efforts through the Inflow and Infiltration project based on 2000 data.	Never
MNIBSN	Basins developed for flow monitoring efforts through the Inflow and Infiltration project based on 2001 data.	Never

The division also maintains multiple non-corporate themes and deals with a significant number of acquisitions of data from external sources.

3.5A.3.2 Enhancement

WTD GIS analysts will migrate WTD facility data and local sewer lines to Arc 8.x geodatabase during 2003. Data for unpopulated fields in these layers will be entered, as time allows.

3.5A.3.3 Development

No new layers are planned on being developed in 2003. However, current layers will be migrated to ArcGIS 8.x.

3.5A.3.4 Metadata

Metadata for spatial data is being populated as the layers are being uploaded to the new DNRP servers. This is an ongoing process.

3.5A.4 Spatial Applications

The Wastewater Treatment Division maintains a number of legacy application originally programmed in AML and Avenue for support of asset management and planning efforts within the division. The four analysts have the ability to do routine maintenance of these applications and are in the process of gaining the skills to migrate these functions to more efficient and up-to-date formats including VBA and Geodatabases.

3.5A.4.1 Maintenance

The following is a list of applications that are currently maintained by the WTD analysts:

Front-End Applications

Name	**Description**	**Language**
Facilities Information Retrieval System (FIRS)	FIRS is an application used to create the WTD sewer infrastructure data, which include sewer lines, manholes, treatment plants, pump stations and regulator stations. This application uses ArcView 3.x as the front end and MSAccess as the backend. This data support all WTD infrastructure based analysis and products including the Onelines atlas.	Avenue VB
Moss	Moss is a map set incorporated into *iMAP*, King County's ArcIMS Internet application. It offers a view of data collected by King County in support of studies to find the best location for a treated wastewater marine outfall. Unlike the other map set hosted through the KC GIS *Map Portal*, this is a project-specific Map Set that is not based on a Countywide map extent, nor does it contain the parcel search function that is common to the Countywide map sets.	IMS

Back End Applications

Name	**Description**	**Language**
IW	IW stands for Industrial Waste and is designed to help identify permit locations within selected sewer/drainage basins. Basins can be selected from a map directly or by tracing the sewer network from a specific node (manhole).	AML
Wtrsamp	Wtrsamp creates sample site locators from the DNRP Environmental Laboratory LIMS (Oracle) database with associated water sampling summary information . Updated weekly for access from the corporate library	AML

3.5A.4.2 Enhancement

The FIRS database structure will be updated in late 2002 and early 2003 to correct design limitations. As the data is migrated to a geodatabase data format the functions of the FIRS application will become obsolete as they are inherent to the new format.

3.5A.4.3 Development

Efforts are underway to develop an Arc 8.x GIS application to help identify where to reduce I/I. The KCGIS Center is working in conjunction with the WTD analysts to create an Arc 8.x form front end which will allow for basin selection and variable manipulation. These inputs will be calculated in a SQL server backend created by migrating pre-existing MS Excel spreadsheets developed by WTD modelers. The output will be the results of changes on the flow of certain basins and the cost of these changes to the I/I pilot project. Planning will also begin on an application to make rain gauge and flow monitor collected data available through the GIS depiction of the collection devices.

3.5A.4.4 Documentation

Documentation for these applications is available in green binders provided to each of the WTD analysts.

3.5A.5 System Integration

System integration at this point is lacking within WTD. Plans for 2003 include identifying the current data that is being used across the division and identifying which data are appropriate for integration and visualization through GIS.

3.5A.5.1 RDBMS Backend Support

Access databases have been extensively used to store attribute data, particularly that collected from field visits. The Environmental Laboratory LIMS Oracle database is accessed to provide updated attribution of the Wtrsamp coverage.

3.5A.5.2 Other Data Management Activity

WTD GIS staff work closely with other work units to cooperatively manage and integrate data from these groups into the GIS program. Some examples include:

- Planned future coordination with DNRP Environmental Laboratory in developing additional non-spatial data into spatial data. An existing example of this integration is the Wtrsamp coverage that derives weekly refreshed data from the LIMS Oracle database at the laboratory.
- Working with the Facilities Inspection Team to develop GIS applications using that workgroup's pipeline survey data stored on video.
- Coordinating with the Capital Improvement Program group to develop non-spatial project data into GIS application data.
- Working with the Modeling workgroup to structure data and design application requirements to view and analyze rain gauge and flow monitor data.

3.5A.6 Client Services and User Support

Primary WTD projects are allocated among the four WTD GIS analysts, with each staff member having lead responsibility for a given project including CSI, facility inspection and maintenance, I/I, and the Brightwater Treatment Plant effort. Though there is crossover among the staff, each analyst focuses primarily on support for those clients associated with their respective area of responsibility. An estimated 65 to 75 percent of each analyst's time is associated with support for clients within their primary business focus. Another 10 to 25 percent of their time is associated with crossover user support to assist other analysts in their areas of focus.

Examples of the client services work performed by WTD analysts include the production and maintenance of the Onelines infrastructure atlas in both hard copy and intranet formats, population analysis for flow calculation and CSI schedules, I/I basin delineation, and parcel analysis including land use and availability. The Onelines atlas is an update of a purely graphic atlas that is now based on GIS data. It provides planning and O&M personnel with location and attribute information including pipe length and diameter, that can be used both in the field as a laminated book as well as on the web for quick searches of facilities necessary for planning work. Population analysis is an ongoing service performed on PSRC population forecasts in conjunction with King County planning and infrastructure data to plan for future improvements in both conveyance and facilities including the Brightwater Treatment Plant. Basins were delineated based on the local conveyance system which feeds into the WTD service area to identify pilot areas for I/I reduction projects. Parcel analysis is used extensively to site both the Brightwater Treatment Plant site as well as any related conveyance and construction needs.

Estimates of GIS analyst workload related to client requests vary from 55 to 80 percent of the analyst's time, depending on the overall position requirements for each analyst. The consistency of these estimates is complicated by the large number of project requests made with little or no lead-time, and by projects that start small but grow significantly larger as the work progresses.

3.5B Water and Land Resources Division

Stewards of safe and clean water resources, healthy habitats, and functioning landscapes throughout King County.

Protect and enhance quality of life, public health, and public safety by managing our water and land "infrastructure" (farms, forests, shorelines and marine waters, rivers, lakes, streams, and associated watersheds and drainage systems throughout the region).

Technical experts on King County's regional environmental quality for defining and implementing strategies for resource protection.

3.5B.1 Business Functions

WLRD GIS services provide data, tools and analytical support to assist in planning and monitoring of the natural environment. Multiple mandates include sustaining healthy watersheds, protecting public health and water quality, preserving open space and working farms and forests, ensuring adequate water for people and fish, managing public drainage systems and protecting/restoring habitats. Specific business functions include:

- ***Strategic Initiatives*** - GIS is used for analysis of policy and funding.
- ***Science, Monitoring and Data Management*** - Water quality, hydrologic assessment and analysis. Coordination with various data management and field activities to ensure efficient access to all relevant spatial data.
- ***Land and Water Stewardship Services*** - GIS services for programs including watershed support, groundwater management, lakes program stewardship, and hazardous waste.
- ***Office of Rural and Resource Programs*** - Data development, analysis, and mapping for programs including agriculture, forestry, resource protection incentives, noxious weeds mitigation and natural lands management.
- ***Stormwater Services*** - GIS supports service delivery analysis, drainage investigation, and inspection services. Regulation, compliance, and NPDES permit compliance are also supported.
- ***Flood Hazard Reduction Services*** - GIS data and analysis are used to predict and monitor flood hazard zones and provide basin-wide regional analysis.
- ***Capital Projects and Open Space Acquisitions*** - GIS is used to depict and analyze proposed acquisitions, and provide ecological and surface water engineering services.

3.5B.2 GIS Program Overview

Four and a half GIS analyst FTE's in the DNRP GIS Unit are matrixed to the Water and Land Resources Division to provide GIS services. They are affiliated with the GIS, Visual Communications and Web group. The DNRP GIS Unit staff that support WLRD receive project assignments based more areas of expertise and geographically-defined environment resource specialty than by major projects. One analyst maintains the GIS intranet site, develops ArcIMS applications and has primary data responsibilities for WRIA 9 and jurisdictional data layers. A second analyst has comparable WRIA 8 responsibilities, including maintenance responsibilities for the hydrography layer, as well as being the remote sensing lead. Forestry, agriculture, land ownership, noxious weeds and current use assessment data layers are the primary responsibilities of the third analyst, along with acting as data and analytical lead on open space acquisitions. The fourth analyst is responsible for WRIA 7 and provides support as needed for the other analysts. Client requests are routed based on these various staff emphases and time availability.

3.5B.2.1 Training

The Water & Land Resources GIS Analyst positions require a considerable breadth of GIS-related skills and abilities for both essential and specialized tasks. Due to a severely constrained training budget,

ongoing professional development for these analysts through 2003 will have to be clearly focused on meeting specific division and project requirements. As in 2002, a training plan will be designed for each analyst to guide this development and ensure that courses taken provide the greatest benefits needed to meet these requirements. The analyst and the GIS Program Manager, taking into consideration the specific requirements of that analyst's work program, will develop each training plan jointly.

3.5B.2.2 Staffing Requirements

There are four GIS analysts within the DNRP GIS Unit who primarily support the needs of the Water and Land Resources Division. There are two additional analysts in the GIS Unit who are available on a part-time basis to work on GIS projects for the Office of Rural and Resource Programs. The total amount of their combined availability is equal to a 0.5 FTE.

They are classified as follows:

Working Title	Work Focus	Classification	Status	% GIS
GIS Analyst	Water and Land Resources Division	ISP III	FTE	100
GIS Analyst	Water and Land Resources Division	ISP III	FTE	100
GIS Analyst	Water and Land Resources Division	ISP II	FTE	100
GIS Analyst	Water and Land Resources Division	ISA II	FTE	100
GIS Analyst	Parks and Recreation – Data development, analysis	ISA II	0.25 FTE	100
GIS Analyst	Solid Waste – Analysis	ISA II	0.25 FTE	100

3.5B.2.3 Hardware and Software

The Office of Rural and Resource Programs (ORRP) within WLRD maintains an Intel system named *Wlrnt5* running NT 4.0. The GIS share, *ORRP*, serves as a combined development and production environment. It is solely a data server and hosts no licenses. Both coverages and shapefiles are stored.

The GIS,Visual Communication and Web Unit within WLRD maintains GIS data and project working space on dnrp1, a server maintained by the KCGIS center. It has three partitions: DNRPLIB, the DNRP production GIS data warehouse; SLIB, a limited access development data warehouse; and PROJECTS, a share for each division to store project related files. ArcGIS 8.x licenses are maintained on \\wlrnt11, a server maintained by WLRD LAN, as well as ArcView 3.2 licenses.

Each DNRP division maintains its own complement of output devices. Due to capacity limitations, access to the plotters is generally restricted to the GIS analyst staff, though they are networked and accessible via division LANs. WLRD has the following devices available for plotting and printing needs:

Division	Large Format Plotter	Other Output Devices
WLRD, GIS&VC	HP DesignJet 2500CP, 36" width max	HP 8500 N Color Laser Printer, 11x17 maximum
WLRD, ORRP	HP DesignJet 2500CP, 36" width max (not specifically dedicated to ORRP)	HP 8500 N Color Laser Printer, 11x17 maximum (not specifically dedicated to ORRP)

The WLRD *ORRP* server hosts four ArcView v.3.1 shared network licenses but no ArcInfo licenses. The WLRD GIS and Visual Communications server, *Wlrnt6*, hosts 45 ArcView v.3.1 shared network licenses. In addition, three standalone ArcView v.3.2 and three standalone v.3.1 licenses are used within the division.

Ancillary software available to GIS analysts within WLRD includes ERDAS Imagine, for aerial and satellite image processing and image classification, and a suite of desktop publishing software. Web content development software and ArcIMS programming software are also used by WLRD GIS analysts.

3.5B.2.4 Budget

The proposed 2003 GIS Center, DNRP Unit, WTD Budget for the five standard O&M Plan reporting categories is presented below. Note that GIS Center overhead costs allocated to the DNRP Unit are not included below. For additional 2003 WTD Budget information, see sections 2.6 and 3.1.2.4.

Item	Budget	Comments
Labor Costs (salary + benefits)	$309,068	Includes allocated labor costs for GIS Center management and administrative support
Hardware (acquisition and maintenance)	$3,400	
Software (acquisition and maintenance)	$10,360	
Training costs	$6,560	
Discretionary (consultants, outside services, materials, etc.)	$4,220	

3.5B.3 Spatial Data

WLRD maintains and updates corporate data sets in the KCGIS Center enterprise data warehouse and the Division data sets in the DNRP data warehouse. Additional data are also developed, as needed, on a project-by-project basis. These project-related data are stored in a separate projects partition in the DNRP data warehouse.

3.5B.3.1 Maintenance

Corporate data sets

Data Name	Data Description	Update Frequency
CHNLMIGR	River channel migration hazards	Irregular
DRNBASIN	Drnbasin is King County Department of Natural Resources, Water & Land Division's (KC WLRD) version of Water Resource Inventory Areas (WRIA) and watersheds in King County. Please note that KC's version differs from the supposed "official" version that the Washington State Department of Ecology (WA DOE) produces (available on their web site). Most notably, in the KC version, WRIA 9 includes Vashon Island and Elliott Bay basin, and the Rock Creek area is included in WRIA 8, not WRIA 9. For the King County area, drnbasin is generally considered to be more correct than the WA DOE version, and is what KC WLRD uses in all planning efforts.	As needed
DRNSTUDY	SWES Engineering Studies	Irregular
FISH9	Dist. of 7 salmon spp. in WRIA 9 streams, 5 presence classes. FISH9 contains fish distribution information in Water Resource Inventory Area 9 for seven fish species: chinook *(Oncorhynchus tshawytscha)*, coho *(Oncorhynchus kisutch)*, sockeye *(Oncorhynchus nerka)*, chum *(Oncorhynchus keta)*, pink *(Oncorhynchus gorbuscha)*, steelhead	Annually

Data Name	Data Description	Update Frequency
	(Oncorhynchus mykiss), & cutthroat trout *(Oncorhynchus clarki)*.	
FISH9_PT	Point observations of 7 salmon spp. In WRIA9, 7 observ. Classes. FISH9_PT contains fish observation information in Water Resource Inventory Area 9 for seven fish species: chinook *(Oncorhynchus tshawytscha)*, coho *(Oncorhynchus kisutch)*, sockeye *(Oncorhynchus nerka)*, chum *(Oncorhynchus keta)*, pink *(Oncorhynchus gorbuscha)*, steelhead *(Oncorhynchus mykiss)*, & cutthroat trout *(Oncorhynchus clarki)*.	Annually
FISHV	Dist. of 5 salmon spp. in Vashon streams, 1 presence class. FISHV contains fish distribution information on Vashon Island for five fish species: chinook *(Oncorhynchus tshawytscha)*, coho *(Oncorhynchus kisutch)*, chum *(Oncorhynchus keta)*, steelhead *(Oncorhynchus mykiss)*, & cutthroat trout *(Oncorhynchus clarki)*.	Annually
FISHV_PT	Point observations of 5 salmon spp. On Vashon. FISHV_PT contains fish observation information on Vashon Island for five fish species: chinook *(Oncorhynchus tshawytscha)*, coho *(Oncorhynchus kisutch)*, chum *(Oncorhynchus keta)*, steelhead *(Oncorhynchus mykiss)*, & cutthroat trout *(Oncorhynchus clarki)*.	Annually
FLDPLAIN	A digital representation of the paper FEMA flood maps. This coverage details the locations of 100 year floodplains and floodways as defined by the Federal Emergency Management Agency.	As new data is received from FEMA
GWMA	Groundwater Management Areas. GWMA depicts the boundaries of areas that have undergone groundwater management planning according to a Washington state program	As needed
HABITAT	King County Wildlife Network. The Wildlife Habitat Network was designed to link high quality streams, wetlands, and open space lands, and to minimize habitat fragmentation. The goal of the network is to make sure that habitats remain connected across the landscape after development occurs.	None planned
HYDROGAUGE	King County Hydrological Gauges	Weekly
KC_WHPA	Well Head Protection Areas are designed to show where contamination can flow into a well. Delineation of these zones is part of EPA's Source Water Protection Program. “Time-of-travel” zones define how long it would take contamination to reach the well at 6 month, 1 year, 5 year, and 10 year intervals.	As needed
SURFGEOL	KC Surface Geology	None planned
WELL_A	Water supply wells, group A. Public Water System wells with 15 or more connections, as recorded by the WA Department of Health. See also related datasets WELL_B and WELL_ALL.	As needed
WELL_ALL	All well locations from King County groundwater database. This dataset shows the locations of all wells listed in the King County Groundwater database. These are mainly private wells of individual homeowners, but some Public Water Supply group A or group B wells are also included. See also related datasets WELL_A and WELL_B.	As needed
WELL_B	Water supply wells, group B. Public Water System wells with 2 to 14 connections, as recorded by the WA Department of Health. See also	As needed

Data Name	Data Description	Update Frequency
	related datasets WELL_A and WELL_ALL	
WTRBODY	Open Water	As needed
WTRCRS	Streams - topological network. This coverage contains watercourses for King County drainage basins, including some areas in adjoining counties. WTRCRS is designed as a topologically complete network of stream centerlines, with extensive related attribute tables. This data set is integrated from numerous sources, primarily at 1:24,000 scale. WTRCRS cross-references other commonly used hydrographic data inventories, and is also suitable for medium to small-scale map displays and generalized analyses.	As needed
WTR_SERV	Water Service Areas	Irregular
WQ_LOCS	Sampling locations for groundwater quality. These data show the well and spring locations where King County has sampled for groundwater quality. More detailed information about the sampling points is found in the additional related table, wq_locs.smp, which has a many to one relationship with the coverage.	As needed

Division data sets

See DNRPLIB Data Warehouse Catalog: http://dnr-web.metrokc.gov/dnrtech/dnrpgislib/dnrplib_div_data.cfm (Scroll down past Parks to see WLR datasets).

3.5B.3.2 Enhancement

NA

3.5B.3.3 Development

Two data development projects, originally under the auspices of the ESA/SAO data acquisition initiative, are in progress and will be in development in 2003. Funding for these projects is multi-departmental but project lead and GIS support contributions will be provided by the department.

- Multispectral Imagery Landcover - Department funding is provided from WTD, though project support is provided by WLRD GIS. With the landcover classification complete, this project is now focused on developing the impervious surface data layer. Portions of the impervious surface data layer were delivered in 2002. This project should be completed in 2003.
- Hydrography Theme - Groundwork and work plan development has been largely completed for development of a new hydrographic model for King County. Development work for this theme began in 2002 and continues, pending sufficient funding, through 2003. The initiation of the GIS work is dependent on the successful completion of the current Digital Elevation Model data project. Fallback alternatives include revamping the existing KC hydrography database, wtrcrs, or using and accepting stewardship responsibilities for the portion of the WA DNR framework hydrography data set covering King County. Any alternative chosen will include development and maintenance of route system to support environmental and facilities event mapping.
- Natural Lands Management Database: to be developed in conjunction with the Parks Division. Started in 2002, approximately 30% of the King County parks acreage is being transferred and will be directly managed as natural lands. An initial database has been created which includes categorization of properties. This will be expanded with data from site visits and from resource management decisions.

- Resource Lands Program Participation Database: this multi-layered database will integrate existing and new data from multiple forestry, agriculture, and resource incentive (current use assessment) programs, and will support monitoring efforts.
- Major Landowners: the desired product is a database that provides ownership information on public, non-profit, and large private lands. This will require identification, verification, and integration of information from multiple sources, and involves interest and cooperation across divisions and departments.
- Land Cover Change Database: which will allow tracking of temporal changes in parcel size, development, and conversion from forestland.
- Event Table Development: the WLRD Science, Monitoring and Data Management (SMDM) group has started the process of migrating its existing aquatic habitat, fisheries, and hydrologic data to MS SQL-Server. The databases and data extraction tools are being designed to take advantage of dynamic segmentation capabilities of ArcView and ARCINFO by creating event tables for use with a routed hydrography layer. The effort is using the Washington and Oregon Hydrographic Framework data model, which is not currently implemented in the KC GIS WTRCRS routed hydro layer. Close cooperation with the hydrography theme project above will be necessary to ensure route development and maintenance to support SMDM's dynamic segmentation applications.
- Dynamic Segmentation QC and Analysis Tools: SMDM is contracting with the KCGIS Center group to provide Avenue programming assistance to develop two ArcView applications. The first works in conjunction with a Visual Basic data entry application to visualize stream habitat and riparian field data in order to check the spatial accuracy and attribute coding. This product should be completed by the end of December 2001. The second application is in the preliminary design stage and its purpose is to provide extended query and analytic functions to generate and use event themes for environmental assessment and monitoring purposes. This product will require many weeks of development effort by KC GIS Center and SMDM staff in the first quarter of 2002.

3.5B.3.4 Metadata

At this time, WLRD has developed metadata for only a few selected datasets that are posted on PLIBRARY. However, the datasets posted on PLIBRARY represent a small fraction of the datasets that WLRD creates, maintains, or otherwise stewards on DNRPLIB, and none of these other datasets have formally developed metadata. WLRD plans to launch a project to address this problem in 2003. The project will both create metadata for existing datasets using tools in ArcGIS 8.x as well as set up methods and procedures for future metadata creation.

3.5B.4 Spatial Applications

3.5B.4.1 Maintenance

The Division does not directly support any ArcView-based or other custom applications through the GIS staff. Various workgroups have expressed interest in ArcView and/or ArcIMS-based applications to meet their needs.

Currently two ArcIMS map services are running on the KC GIS *Map Portal*, Hydrographic Information and Groundwater Project. This Map Set presents the hydrographic features of King County, including wetlands and drainage basins. The opening view shows drainage basins, drainage sub-basins and wetlands on a countywide basemap of rivers, streams and lakes.

3.5B.4.2 Enhancement

ArcIMS map services continually undergo enhancements to both the interface and particular mapsets.

3.5B.4.3 Development (not in priority order):

- *ARCIMS: Stormwater Services* - KC GIS portal application to support drainage complaint tracking and response. This application is close to completion and will require only some additional modification to launch
- Creation of a utility program to create a coverage at regular intervals from the WRIA 9 project database

3.5B.4.4 Documentation

NA

3.5B.5 System Integration

3.5B.5.1 RDBMS Backend Support

The division's primary Microsoft SQL server, primarily used by the Scientific Monitoring and Data Management (SMDM) workgroup, is not currently used or accessed for GIS data. Query tools have been developed to create event tables from stream habitat data for GIS applications. This and other opportunities exist to make greater use of this resource, particularly in light of the development of GIS-related and data sets that could be spatially enabled.

3.5B.5.2 Other Data Management Activity

WLRD Science Monitoring and Data Management (SMDM) section has started a multi-year program to move its aquatic habitat, fisheries, benthics, stream flow and meteorological data into a MS SQL-Server environment with other WLRD environmental datasets to follow. The majority of these data will be spatially enabled for use as event themes in ArcView and ArcInfo. A substantial amount of work is going into data modeling, standardizing data item definitions, establishing quality control procedures, documenting datasets and designing data loading and extraction tools. SMDS is coordinating its activities with the GIS O&M Technical Committee and other cross-agency data management groups.

3.5B.6 Client Services and User Support

Formal requests for GIS analytical and cartographic products are initiated through digital or hardcopy forms. This method provides a mechanism for the user to think through the request and for cost coding to be performed. Though this system can assist in documenting the work to be done, it does not necessarily perform a perfect role in workload planning, since some requests are made with very little lead-time and very tight deadlines.

Estimates of GIS analyst workload related to client requests vary from 55 to 80 percent of the analyst's time, depending on the overall position requirements for each analyst. The consistency of these estimates is complicated by the large number of project requests made with little or no lead-time, and by projects that start small but grow significantly larger as the work progresses.

The GIS intranet web design and content are managed by the WLR group within the DNRP GIS Unit, in concert with Departmental intranet staff. WLR GIS staff also provide significant content input.

3.5C Parks and Recreation Division

The mission of the Parks and Recreation Division is to operate and maintain the parks, trails, facilities, and programs which comprise the King County Park System. During 2002, this organization began a major transition which will fundamentally change the scope of this mission and the manner in which it is carried out. At the beginning of that year, in preparation for major funding reductions, the Parks Department was merged into the Department of Natural Resources to create the Department of Natural Resources and Parks. Operating within that new structure, the Parks and Recreation Division has begun to focus on key regional properties and facilities and on parks and recreation within the unincorporated areas of the County. An ongoing effort is underway to transfer parks and facilities within incorporated areas to the cities in which they are located and, if necessary, to close those which cannot be transferred. The combination of funding reductions and a large amount of new activity related to transition planning and implementation has caused the Division's GIS resources to be strained significantly through 2002. This situation will be exacerbated in 2003 by a reduction in staff from two full-time GIS Analysts to a single FTE, even as the demand for services and support continues to grow.

3.5C.1 Business Functions

GIS capabilities in the Parks and Recreation Division are used for inventory and maintenance of Division properties and facilities and to monitor and maintain recreational facilities and open space. Specific business functions include:

- ***Facilities and Site Maintenance*** - Maintain a safe and inviting parks environment, enriching the public's experience. Manage open spaces and natural areas in a manner that fosters a thriving environment for habitat and safe appropriate visitation of parkland by the public. GIS is used to develop, enhance, and maintain information and maps about sites and facilities that Parks maintains, and to develop and maintain applications that ease access to those maps and information. GIS is a central part of its “ParksInfo” system, integrating with data about Park facilities stored in the “Park Site and Facilities Information” (PSAFI) database.
- ***Recreational and Event Services*** - Provide primary recreation services for residents in unincorporated areas of King County, including pool and open-water programs. Provide a year-round facility for hosting quality entertainment and life-enriching educational events. GIS supports this function through cartographic production, specifically brochure publication. GIS staff also work with recreation staff in using data stored in the non-GIS CLASS database to create facilities maps.
- ***Program Development and Land Management*** - GIS plays a major support role in mid- to long-term project and capital planning, through cartographic production and spatial and tabular analysis to produce project and planning reports. Specific components of this business function include: long-term plans for parks, open space, natural area, and trail acquisitions and developments; development and coordination of the annual Capital Improvement Program and the 6-year Capital Improvement Program; property management oversight on all special use permits; development of Special Use Agreement park property improvements and park encroachments; and pursuing capital grant funds and management of special grant programs.

3.5C.2 GIS Program Overview

Through 2002, two full-time analysts within the DNRP GIS Unit have provided GIS services and support to Parks and Recreation Division projects and programs. Each of these FTEs has been assigned specific core areas of responsibility, in addition to providing ad hoc services and support upon request. One analyst has been responsible for design, management, and maintenance of the parks facilities database, while the other has focused primarily on managing parks and trails map layers, GPS data collection, and property data.

In 2003, the Parks and Recreation Division will only be able to fund the equivalent of one full-time GIS Analyst. Responsibility for funding the second FTE will be assumed in equal shares by the Solid Waste Division (SWD) and the Water and Land Resources Division (WLRD). Both of these analysts will divide

their time between the needs of all three divisions and will work on projects for all three, while retaining their core responsibilities for Parks. The allocation of time and effort to the needs and projects of each division will be planned and monitored to ensure that it stays in correct proportion to the funding share provided by that division.

The work of these GIS Analysts in support of the Parks and Recreation Division is supervised by the Division's GIS Program Manager as part of a system of matrixed management, coordinated between the KCGIS Center and DNRP divisional GIS program managers. This enables close coordination with the management, staff, and projects of the KCGIS Center, as well as ensuring access to the full range of the Center's resources. Supervision of these positions will continue in this manner through 2003.

Coordination between the Parks GIS Analysts and the other members of the DNRP GIS Unit staff is maintained through ongoing informal discussions, project-driven cross-division support, and a monthly Unit staff meeting. Coordination with other departments and with the rest of the KCGIS Center is maintained primarily through monthly user group meetings and monthly GIS Center staff meetings, as well as regular, ongoing coordination through less formal, project-oriented discussions. These coordination activities will continue through 2003.

3.5C.2.1 Training

Although the Parks and Recreation Division does not provide any formal GIS-related training classes of its own, such training is available to the Parks GIS Analysts and to other Division managers and staff from a variety of internal and external sources. The KCGIS Center provides training through a combination of County-specific courses and standard ESRI courses, which are taught by its own ESRI-certified instructors. Please refer to Section 3.1.6 for more information regarding these courses. In addition, ESRI offers a range of instructor-led courses, which are taught in the ITS facility at Key Tower. During 2003, these courses will be offered approximately once each month.

Formal GIS and related software and data management training is also available from ESRI and other commercial providers at other locations in the Puget Sound region, including the ESRI regional office in Olympia. Selective use of such training to address specific needs (e.g., ASP for web site design and development) is anticipated during 2003. Specialized training at locations outside the region (e.g., ERDAS courses in Denver, Colorado) may also be necessary when such training is not offered in or near Seattle.

The Parks GIS Analyst positions require a considerable breadth of GIS-related skills and abilities for both essential and specialized tasks. Ongoing professional development for these two analysts through 2003 will continue to focus on meeting specific division and project requirements. As in 2002, a training plan will be designed for each analyst to guide this development and ensure that courses taken provide the greatest amount possible of the knowledge needed to meet these requirements. Each training plan will be developed jointly by the analyst and the GIS Program Manager, taking into consideration the specific requirements of that analyst's work program and leveraging the benefits of specialized training taken individually by maximizing cross-training opportunities with other members of the DNRP GIS Unit staff.

Beyond the needs of the Parks GIS Analysts, skill development for GIS users within the Division has generally focused on ArcView 3.x training. This has been accomplished primarily through introductory-level ArcView courses provided by the KCGIS Center. Additional support for these users has taken the form of ad hoc trouble-shooting and assistance with understanding and applying the functionality of the software. As the ArcView user base in the Division continues to grow, this informal training and assistance will place an increasing workload on the Parks GIS Analysts. To avoid having this become burdensome, an inventory of ArcView users within the Division should be conducted during 2003 to assess skill levels and identify needs for both advanced training and, if necessary, refresher courses. This additional training should then be arranged for the affected managers and staff, to the extent that resources are available to fund it. Wider dissemination of ArcView skills and abilities among Division GIS users will help limit the need for day-to-day assistance from the GIS Analysts, allowing them to focus on providing products, services, and support which require advanced skills and abilities.

3.5C.2.2 Staffing Requirements

Through 2002, two full-time analysts within the DNRP GIS Unit have provided GIS services and support to the Parks and Recreation Division. In 2003, that Division will only be able to fund one of these FTEs. Responsibility for funding the second FTE will be assumed in equal shares by the Solid Waste Division (SWD) and the Water and Land Resources Division (WLRD). Both analysts will divide their time between the needs of all three divisions and will work on projects for all three. In addition, the GIS Program Manager for the Parks & Recreation Division will spend a portion of his time supervising the work of the two analysts in support of the Division's needs. All three of these positions are part of the staff of the KCGIS Center and are located within the Center's offices. The title, work focus, classification, status, and time allocation for each of the two GIS Analysts are as follows:

Working Title	Work Focus	Classification	Status	% GIS
GIS Analyst	Parks and Recreation / Solid Waste / Water and Land Resources – database development, analysis, map production	ISA II	FTE	100%
GIS Analyst	Parks and Recreation / Solid Waste / Water and Land Resources – database development, analysis, map production	ISA I	FTE	100%

3.5C.2.3 Hardware and Software

Through 2002, the Parks and Recreation Division has maintained a Compaq Proliant 1600 server ("Rasta") as a combined development and production server. This system runs Windows NT 4.0 and has a GIS file system designated as Parks-01. Although Rasta is primarily a data server for both shapefiles and coverages, it also hosts six ArcView 3.2 licenses, which are shared over the Division's network. Before 2002, it also hosted the Division's single networked ArcInfo license, but this was transferred to the GIS Center's ESRI license server ("Orca") at the beginning of that year. In 2003, Rasta will continue as the server for ArcView licenses, the Park Site and Facilities database (PSAFI), and several non-GIS Access databases which are used for administrative functions. GIS data which are maintained to support specific division or department needs will be migrated to a new DNRP data server, a process which is described below in this section.

The GIS desktop environment used by the Division's GIS Analysts is primarily Windows NT and 2000. Other ArcView users within Parks and Recreation operate in a similar environment, using a mixture of Windows 98, NT, and 2000. Network connectivity, software installs, and upgrades for GIS implementation are provided by the Division's LAN support staff. Few if any changes to any of these items are anticipated during 2003.

For map production and other graphics needs, the Parks and Recreation Division operates a Hewlett-Packard DesignJet 5000PS large-format plotter ("Kingkong"). This device is located within the KCGIS Center offices at King Street Center, which are adjacent to the Division's offices. This location allows convenient access to Kingkong for both the Parks GIS Analysts and Division managers and staff, and enables the KCGIS Center to maintain it along with its own large-format plotters. The Parks GIS Analysts also have access to those plotters when their work requires it.

During 2002 a dedicated data server was acquired and installed to consolidate maintenance and management of GIS data which have been developed by DNRP staff primarily for internal use. These data are typically designed to meet specific departmental needs and are not intended to be maintained in the KCGIS Spatial Data Warehouse for general use. The analysts in the DNRP GIS Unit have reviewed and evaluated all of these data and are now migrating needed data to the new server and either archiving or deleting the remaining data. As part of this effort, the Parks GIS Analysts have reviewed and evaluated all Parks-related GIS data and are in the process of completing the necessary migration, archiving, and deletion of these data. This work is expected to be finished during the first quarter of 2003.

3.5C.2.4 Budget

The proposed 2003 GIS Center, DNRP Unit, Parks and Recreation Division Budget for the five standard O&M Plan reporting categories is presented below. Note that GIS Center overhead costs allocated to the DNRP Unit are not included below. For additional 2003 Parks and Recreation Budget information, see sections 2.6 and 3.1.2.4.

Item	Budget	Comments
Labor Costs (salary + benefits)	$79,148	Includes allocated labor costs for GIS Center management and administrative support
Hardware (acquisition and maintenance)	$875	
Software (acquisition and maintenance)	$1,965	
Training costs	$1,640	
Discretionary (consultants, outside services, materials, etc.)	$1,105	

3.5C.3 Spatial Data

The Parks and Recreation Division has maintenance and management responsibilities for a small number of GIS data layers stored in the KCGIS Spatial Data Warehouse. The Division also develops and maintains data which are primarily for internal use. Through 2002, these data have been stored on the server Rasta, but they are in the process of being migrated to the new DNRP data server, as described above in the Hardware and Software section.

As the Division makes the transition to operating under an entirely new business model in 2003, there will be changes in the status of a significant number of parks, trails, facilities, and programs. These changes will necessitate numerous updates to both enterprise and agency data layers maintained by the Division. Keeping the affected data layers current will be a high priority for the Parks GIS Analysts throughout the year. They will need to work in close coordination with managers and staff to ensure that these updates are made promptly and consistently as new information is received regarding these changes.

3.5C.3.1 Maintenance

The Division maintains two GIS data layers in the KCGIS Spatial Data Warehouse. These data are maintained as ArcInfo 7.x coverages and as shapefile equivalents. Maintenance and updates are performed on an as-needed basis, generally whenever information is received regarding changes to the Division's parks, trails, facilities, and programs.

Parks and Recreation - Enterprise Data

Data Name	Data Description	Update Frequency
PARK	All parks in King County, including those which are owned and/or maintained by other agencies and jurisdictions	As Needed
TRAIL	Trails in King County	As Needed

Additional coverages and shapefiles intended primarily for internal use have been maintained on the server Rasta. During 2002, these data have been have reviewed and evaluated for relocation to the new DNRP data server. The Parks GIS Analysts are now in the process of migrating needed data to the new server and either archiving or deleting the remaining data.

Parks and Recreation - Agency Data

Data Name	Data Description	Update Frequency
ATLASANNO	Various annotation layers designed for 39-page parks atlas	As Needed
CIP	Yearly Parks CIP projects mapped	Annually
HWYSIGN	Points for Highway Signs, for Atlas Mapping	None Planned
MAINTDIST	Maintenance Districts	As Needed
OPSPASYS	Open Space Systems polygons from Open Space Plan	None Planned
PARKPLAN	PARK layer with planning information attached	As Needed
PARKS_P	Parks Property	As Needed
PSAFI_FACILITIES	Facilities	As Needed
RESCOORD	Resource Coordinator Districts	As Needed
STRGRID	Section grid for Parks Atlas Mapping	None Planned
WTANNOAT	Water features annotation used for Parks and by others	As Needed

In a few cases, individual GIS users maintain data at the workgroup level, usually in the form of modified shapefiles or subsets of master data. Related attribute data are often maintained at this level as well. Maintenance of such data is the responsibility of the individual user.

Coordination by the Division with other jurisdictions and agencies may result in the acquisition of data which those organizations maintain for their parks, trails, facilities, and programs. Such acquisitions may occur on a one-time basis, but are more often arranged on a recurring basis to ensure periodic updates of these data. In some cases, these data require conversion or translation to ensure compatibility with enterprise and agency GIS data. Such procedures are performed by the Parks GIS Analysts. If there is an ongoing need to update and maintain data from other jurisdictions and agencies, the analysts will assume that responsibility. Acquisitions of such data will be made by the KCGIS Center, as part of its ongoing program of data acquisitions from outside sources.

3.5C.3.2 Enhancement

Although enhancements are made to data at all levels discussed in the Maintenance section above, there is not a comprehensive plan for the Division that establishes priorities or specifies a schedule for data enhancements. Most enhancements are performed on an as-needed basis, usually in response to requests based on project requirements. Because of this, and the generally low volume of such requests, a formal data enhancement plan has not been felt to be necessary. If the need for data enhancements increases significantly during 2003, the Parks GIS Program Manager will assess that need with Division managers and staff and, if appropriate, proceed with development and implementation of a formal plan.

3.5C.3.3 Development

The Parks GIS Analysts continually maintain and improve data layers related to Parks and Recreation facility use and maintenance. This development does not specifically include the creation of any new data layers, but does represent the ongoing maintenance of the GIS layer Park and the related PSAFI and Parkprop databases. The Division does not currently have any responsibilities for new data development. This is not expected to change during 2003.

3.5C.3.4 Metadata

Metadata for Parks-related data layers in the KCGIS Spatial Data Warehouse are maintained in the Oracle relational database managed on the KCGIS Center enterprise data server ("Wildfire"). These metadata are published online in the KCGIS Spatial Data Catalog, which is accessible via the GIS

Center's web site. This serves as the primary source of descriptive information for the data layers maintained by the Division in the KCGIS Spatial Data Warehouse. These metadata meet minimum FGDC compliance standards and are created and updated as necessary by the Parks GIS Analysts, using the standard DOCTOOL utility.

Metadata are also being developed for Parks-related data which reside on the new DNRP data server. These metadata will be developed to meet minimum FGDC compliance standards, and will be created and maintained by the Parks GIS Analysts, using the standard DOCTOOL utility.

KCGIS has as a goal full FGDC-compliant metadata for all enterprise and agency GIS data. The Division may be able to make some progress toward that goal for their data during 2003, but reduced funding and numerous other staff commitments will strictly limit the amount of this effort.

3.5C.4 Spatial Applications

The Parks and Recreation Division is responsible for a group of spatial applications that have been developed to support the Division's business functions. These include ArcView applications developed with Avenue, ArcIMS applications, and database update and query tools. These are maintained on an as-needed basis by the Parks GIS Analysts, in coordination with the KCGIS Center application development team.

3.5C.4.1 Maintenance

Through 2002, the Parks GIS Analysts have maintained the following spatial applications:

Parks and Recreation – Spatial Applications

Name	Description	Language
ParkView	Look-up tool to access general information for parks, trails, facilities, and programs.	ArcView 3.2a - Avenue
PSAFI	Park site and facility information application, which tracks detailed data for all park sites and the facilities within them.	MS Access, SQL Server
IMAP Parks System	KCGIS Map Portal map set that provides an overview of the County's park system.	ArcIMS

These applications will continue to be maintained as needed through 2003, but it is anticipated that this activity will require relatively little time and effort.

3.5C.4.2 Enhancement

The existing applications maintained by the Division are complete and operational in their current form. Enhancements are occasionally developed by the Parks GIS Analysts, in response to user requests, but none are currently planned and there is no formal application enhancement plan or program. Reduced funding and staff resources in 2003 will strictly limit the development of new enhancements to those which are necessary for essential Division business functions. Any such enhancements will be made by the Parks GIS Analysts, working in coordination with the KCGIS Center application development team.

3.5C.4.3 Development

There will be little or no development of new Parks-related applications in 2003, due to reduced funding and numerous other staff commitments. No new application development is currently planned and there is no formal application development plan or program. The existing ParkView application will eventually need to be replaced by a new application written in Visual Basic which performs the same type of information access functions in the ArcGIS 8.x environment. There are also numerous routines written in the Arc Macro Language (AML) for generating standard map products which will have to be rewritten in Visual Basic for use with ArcGIS 8.x. Most of these development projects will have to be deferred until the funding situation for the Division is more stable and other, higher-priority projects have been

completed. A limited amount of this development may be possible during 2003, but this will depend on the Parks GIS Analysts receiving appropriate training and having time available to work on these projects. Any new application development which does take place will be done by those analysts, working in coordination with the KCGIS Center application development team.

3.5C.4.4 Documentation

Existing documentation of Parks and Recreation Division GIS applications is maintained in various formats and in varying levels of detail. Standard documentation for all Division-maintained applications should be developed. The FGDC content standard for documentation of spatial applications should be used as the basis for all new application documentation. This standard could prove particularly useful for documenting successive process steps relating to application enhancement and maintenance. In 2003, as with application development and enhancement, the amount of new application documentation which can be completed will depend on the amount of time the Parks GIS Analysts have available to perform this work.

3.5C.5 System Integration

As noted above in the Spatial Data section, the Parks and Recreation Division has maintenance and management responsibilities for specific GIS data layers stored in the KCGIS Spatial Data Warehouse. Division staff also maintain data which are primarily for internal use and which are being migrated to the new DNRP data server from their previous locations on older Parks servers. New data and updated layers are checked into these systems as needed, using established procedures and data integration routines. Beyond this, the Division has no responsibilities for the operation or maintenance of these systems.

3.5C.5.1 RDBMS Backend Support

At present, the spatially related tabular attribute data maintained and used by the Parks and Recreation Division are stored in a mixed environment, which includes:

- INFO tables for ArcInfo data coverages - accessed using ArcInfo software with enterprise and agency data layers.
- Dbase files for shapefiles, shapefile equivalents, and standalone data tables - accessed using ArcInfo and ArcView software with enterprise and agency data layers.
- Oracle database tables – accessed from instances running on the KCGIS Spatial Data Warehouse server.
- Microsoft SQL Server tables - maintained in central locations on the Parks GIS data server.
- Microsoft Access databases - maintained by individual staff for independent use in stand- alone desktop environments.
- Microsoft Excel spreadsheets - maintained by individual staff for independent use in stand- alone desktop environments.

The Parks GIS Analysts make extensive use of SQL Server tables running on the Parks GIS data server. Several park site databases are stored and maintained on this server, using Access to access SQL Server.

There is expected to be little or no consolidation of the tabular attribute data maintained by the Division in 2003, due in part to reduced funding and numerous other staff commitments and in part to the need for a comprehensive plan to guide the overall consolidation of such data for all of KCGIS.

3.5C.5.2 Other Data Management Activity

In addition to their normal data maintenance and management responsibilities the Parks GIS Analysts have created and maintained numerous other non-GIS databases for the Division in recent years. This

has included the ParkPay database, the Turn-Around-Document database, the Accounts Payable database, and the Labor Management database.

These databases have typically been developed and maintained in response to requests from Division management, despite the fact that they are administrative databases which would normally be the responsibility of administrative staff. Given the reduction in Division GIS support to a single FTE in 2003, it will most likely be necessary to transfer responsibility for these databases to more appropriate administrative staff. The Parks GIS Program Manager will work with Division management during the year to find a solution and effect the transfer of this responsibility.

3.5C.6 Client Services and User Support

The principal client base for GIS services and support in the Parks and Recreation Division are its managers and staff. Most of the requests which the Parks GIS Analysts receive are for maps, data, analysis, technical support, and other services which are needed for Division planning, projects, and programs. An important secondary clientele is the group of County administrators and staff who set and administer parks and recreation policy, interact with the public to answer questions and resolve issues, and provide information and education to schools, the media, and the general public. Finally, the client base includes elected officials, citizen groups, and individuals from throughout the County, who use GIS services in many ways, from participating in public planning meetings to using a trail map to plan a hiking trip.

The Parks GIS Analysts receive most requests for services and support directly from a group or individual within the Division, either via e-mail or a personal contact. In some cases, requests are made by another County agency or by a group or individual from the general public. These may be received directly from the client, through someone within the Division, or through the Parks GIS Program Manager. Once a request has been received, one of the GIS Analysts is assigned to perform the work and contacts the requestor to confirm details and schedule for delivery. The analyst then proceeds to develop the requested products or services, working in coordination with the client until the request has been successfully fulfilled.

To enable Division managers and staff to use GIS-based resources with as much independence as possible, the Parks GIS Analysts maintain an intranet web site that contains links to dozens of static maps, as well as Cold Fusion interfaces to databases maintained by the GIS Analysts to support specific business functions. These include the Park System Caller Log database, the Concessionaires database, and the Park Inspections database. In addition, the GIS Analysts have installed ArcView on the Parks network for use by any Parks Administration employee. Employees are encouraged to make use of the ArcView-based ParkView application for basic information queries. To help ensure that Division managers and staff make optimal use of these online resources, training is conducted periodically to reinforce employee awareness of their availability and applicability to their needs.

At present, the services and support provided to Division clients, and the tools and procedures for providing them, are not expected to change significantly during 2003. However, the reduction in GIS staff support to a single FTE, and the sharing of the Parks GIS Analysts with other divisions and their needs, will limit the ability of those analysts to handle all of the work that will be requested of them. This situation will require greater involvement by the Parks GIS Program Manager in coordinating priorities and work assignments with managers and staff of the other divisions. It is likely that some Division needs will have to either be met by the KCGIS Center Client Services Group or be deferred until the Parks GIS Analysts are available to handle them. Alternatively, as noted above in the Training section, wider development of GIS skills and abilities within the Division is likely to be necessary to lessen the dependence of managers and staff on the GIS Analysts and ensure that needed work can be successfully completed on schedule.

This situation is likely to remain fluid for much of the year, and an ongoing effort will be required to assess and resolve issues and to identify and implement solutions which will enable levels of customer service and support to be maintained as effectively as possible.

3.5D Solid Waste Division

The mission of the Solid Waste Division is to provide transfer and disposal services for solid waste materials in King County, using innovative waste reduction and recycling services and programs to reduce the overall amount of material that must be managed. The Division serves residential and non-residential customers, as well as commercial disposal services. Solid Waste maintains ten closed landfills and the Cedar Hills Regional Landfill in Maple Valley, which is the only operational landfill within the County. The Division also operates eight geographically dispersed transfer stations and two rural drop boxes. The primary goal of these activities is to conserve natural and renewable resources by providing customers with readily available services and placing a continuing emphasis on public awareness of conservation and the benefits of their participation in the Division's programs. Through 2002, the Solid Waste Division has had limited involvement in the use of GIS, working primarily with the KCGIS Center Client Services Group or outside contractors to obtain products and services for specific projects. In 2003, GIS support for the Division will increase and will take place within a more formal structure, with funding being provided to support a 0.5 FTE within the DNRP GIS Unit.

3.5D.1 Business Functions

Since 2003 will be the first year during which the Solid Waste Division has available dedicated GIS resources, the specific details of how those will be used to support Division business functions will be determined as the year progresses. An initial work program has been developed which identifies the projects on which this support is expected to focus. These are described below in the GIS Program Overview section. It is anticipated that GIS will be used to support the operation of the Division's transfer and disposal services and facilities. It is also expected to be used to create and maintain the data layers necessary for planning and managing Solid Waste programs and outreach to the public. During the year, GIS will provide varying levels of support to each of the following business functions:

- ***Waste Reduction and Recycling*** - GIS will be used to develop and maintain data and maps about the services and facilities that Solid Waste operates, and to develop and maintain applications that facilitate access to those data and maps. These activities will support both ongoing operations and maintenance and the Division's outreach and education programs.
- ***Environmental Stewardship*** - Protecting the environment is an integral part of the Solid Waste Division's mission. GIS will be used to produce maps and analysis to help plan and implement programs to clean up, restore, and preserve the environment in King County. These programs include Community Litter Cleanup, Abandoned Vehicle Removal, and Contaminated Sites Management (hazard assessment and site cleanup/redevelopment).
- ***Facility Improvements*** - GIS will support planning and design of major capital projects to upgrade transfer stations and other facilities, through cartographic production and analysis of spatial and tabular data to produce project and planning reports. GIS will also be used for analysis and mapping in the site selection process for a new transfer station.
- ***Environmental Monitoring*** – The Solid Waste Division conducts extensive environmental monitoring of groundwater, surface water, wastewater, and landfill gas at the Cedar Hills Regional Landfill and the closed landfills which it maintains. This monitoring is designed to detect and assess environmental impacts of site activities and to ensure the effectiveness of the control systems which have been installed. GIS will be used to develop and maintain data and maps to illustrate the results of these monitoring activities, as well as for analysis to support assessment and planning needs.

3.5D.2 GIS Program Overview

Through 2002, the Solid Waste Division has made limited use of GIS products and services, and has had no dedicated funding or staff available for developing or acquiring such support. When maps or analyses have been required for specific projects, Division managers and staff have typically worked with either the KCGIS Center Client Services Group or an outside contractor to obtain the needed products and services. In 2003, however, GIS support for Solid Waste will increase and will take place within a more

formal structure. The Division will provide funding to support a 0.5 FTE to work on Division projects within the DNRP GIS Unit, whose staff currently support the Parks and Recreation Division (PRD), the Wastewater Treatment Division (WTD), and the Water and Land Resources Division (WLRD). Responsibility for funding the remaining 0.5 FTE will be assumed by WLRD.

In preparation for having this new level of GIS support available to the Division, an initial work program has been developed which identifies the projects on which the Solid Waste GIS Analysts will focus their efforts during 2003. These include:

- **Illegal dumping complaints tracking and mapping**

  Enhancement of the current process for entering and processing illegal dumping complaints in a GIS-compatible database, including automated processes for standard and custom map creation and for standard and custom data analysis.

- **Cedar Hills odor complaints tracking and mapping**

  Enhancement of the current process for entering and processing Cedar Hills odor complaints in a GIS-compatible database, including automated processes for standard and custom map creation and for standard and custom data analysis.

- **Notification assistance**

  For SWD actions requiring notification of neighbors, development of an automated process for creating notification mailing labels for all properties within a given distance of the site of the proposed action.

- **Cedar Hills landfill neighbor outreach and property sales tracking**

  Track ownership changes in the vicinity of the Cedar Hills landfill to ensure current information for notifications; provide notification to Cedar Hills neighbors in advance of significant events.

- **Spatial data inventory**

  Inventory and conversion of existing SWD CAD files into GIS-compatible files (while maintaining the existing CAD files); creation of an automated process for converting CAD files to GIS-compatible files after they have been created or modified.

- **Facility database and GIS layer creation and maintenance**

  Mapping and creation of spatial database of all SWD facilities, ranging from Cedar Hills landfill down to individual buildings and small-scale facilities within sites; creation of normalized database detailing multiple aspects of every facility; creation of front-end data input, editing, and data retrieval application.

- **Monitoring Wells tracking, mapping, and analysis**

  Creation of a GIS database of SWD monitoring wells from documents, hardcopy maps, and other sources; custom mapping and analysis using information from this database.

- **HAZUS data coordination**

  Creation, maintenance, and mapping of SWD data layers for use in disaster response planning, utilizing HAZUS software from FEMA.

- **New transfer station siting analysis and mapping**

  Definition of search region for new transfer station; spatial and tabular querying of parcels based upon multiple criteria; maps and reports detailing candidate parcels in several phases of decision-making.

- **Customer home address mapping by transfer station**

Geocode home addresses of the users of each transfer station; analyze usage patterns to support planning for new and/or expanded sites.

- **Internet mapping/information service creation & maintenance**

  Creation of a SWD Map Set for inclusion on the KCGIS Center iMap application, which will enable users to show SWD map layers, look up transfer stations and other information, and get maps online.

- **General planning map and analysis support**

  Design and produce maps and perform geographic analysis as requested to support division-wide needs.

As the year progresses, this work program will be reviewed and revised as necessary to reflect new project needs and changing priorities within the Division. This will be a joint effort of the Solid Waste GIS Program Manager and Division managers and staff.

The GIS support effort for Solid Waste will be shared between two existing full-time Analysts in the DNRP GIS Unit. Both of these analysts will divide their time between the needs of PRD, WLRD, and Solid Waste and will work on projects for all three divisions. The Solid Waste GIS Program Manager will supervise their work, set priorities, and guide overall work direction, in coordination with Division managers and staff. The allocation of time and effort to the needs and projects of each division will be planned and monitored to ensure that it stays in correct proportion to the funding share provided by that division. This supervision will be performed as part of a system of matrixed management, coordinated between the KCGIS Center and DNRP divisional GIS program managers. This system enables close coordination with the management, staff, and projects of the KCGIS Center, as well as ensuring access to the full range of the Center's resources.

Coordination between the Solid Waste GIS Analysts and the other members of the DNRP GIS Unit staff will be maintained through ongoing informal discussions, project-driven cross-division support, and a monthly Unit staff meeting. Coordination with other departments and with the rest of the KCGIS Center will be maintained primarily through monthly user group meetings and monthly GIS Center staff meetings, as well as regular, ongoing coordination through less formal, project-oriented discussions.

3.5D.2.1 Training

Although the Solid Waste Division does not provide any formal GIS-related training classes of its own, such training is available to the Solid Waste GIS Analysts and to other Division managers and staff from a variety of internal and external sources. The KCGIS Center provides training through a combination of County-specific courses and standard ESRI courses, which are taught by its own ESRI-certified instructors. Please refer to Section 3.1.6 for more information regarding these courses. In addition, ESRI offers a range of instructor-led courses, which are taught in the ITS facility at Key Tower. During 2003, these courses will be offered approximately once each month.

Formal GIS and related software and data management training is also available from ESRI and other commercial providers at other locations in the Puget Sound region, including the ESRI regional office in Olympia. Selective use of such training to address specific needs (e.g., ASP for web site design and development) is anticipated during 2003. Specialized training at locations outside the region (e.g., ERDAS courses in Denver, Colorado) may also be necessary when such training is not offered in or near Seattle.

The Solid Waste GIS Analyst positions require a considerable breadth of GIS-related skills and abilities for both essential and specialized tasks. Ongoing professional development for these two analysts through 2003 will continue to focus on meeting specific division and project requirements. As in 2002, a training plan will be designed for each analyst to guide this development and ensure that courses taken provide the greatest amount possible of the knowledge needed to meet these requirements. Each training plan will be developed jointly by the analyst and the GIS Program Manager, taking into consideration the specific requirements of that analyst's work program and leveraging the benefits of specialized training taken individually by maximizing cross-training opportunities with other members of the DNRP GIS Unit staff.

Beyond the needs of the Solid Waste GIS Analysts, skill development for GIS users within the Division has been limited and has generally focused on ArcView 3.x training. This has been accomplished primarily through introductory-level ArcView courses provided by the KCGIS Center. Additional support for these users has taken the form of ad hoc trouble-shooting and assistance with understanding and applying the functionality of the software. As the ArcView user base in the Division grows, this informal training and assistance will place an increasing workload on the Solid Waste GIS Analysts. To avoid having this become burdensome, an inventory of current and potential ArcView users within the Division should be conducted during 2003 to assess skill levels and identify needs for training at both beginner and advanced levels. This additional training should then be arranged for the affected managers and staff, to the extent that resources are available to fund it. Wider dissemination of ArcView skills and abilities among Division GIS users will help limit the need for day-to-day assistance from the GIS Analysts, allowing them to focus on providing products, services, and support which require advanced skills and abilities.

3.5D.2.2 Staffing Requirements

In 2003, the Solid Waste Division will for the first time allocate funding in its budget for dedicated GIS support. This funding will provide for a 0.5 FTE to work on Division projects within the DNRP GIS Unit, whose staff currently support the Parks and Recreation Division (PRD), the Wastewater Treatment Division (WTD), and the Water and Land Resources Division (WLRD). Responsibility for funding the remaining 0.5 FTE will be assumed by WLRD. As noted above in the GIS Program Overview section, GIS support for Solid Waste will be shared between two existing full-time Analysts in the DNRP GIS Unit. Both of these analysts will divide their time between the needs of PRD, WLRD, and Solid Waste and will work on projects for all three divisions. The Solid Waste GIS Program Manager will supervise their work, set priorities, and guide overall work direction, in coordination with Division managers and staff. The allocation of time and effort to the needs and projects of each division will be planned and monitored to ensure that it stays in correct proportion to the funding share provided by that division. The title, work focus, classification, status, and time allocation for each of the two GIS Analysts are as follows:

Working Title	Work Focus	Classification	Status	% GIS
GIS Analyst	Parks and Recreation / Solid Waste / Water and Land Resources – database development, analysis, map production	ISA II	FTE	100%
GIS Analyst	Parks and Recreation / Solid Waste / Water and Land Resources – database development, analysis, map production	ISA I	FTE	100%

3.5D.2.3 Hardware and Software

The Solid Waste Division does not maintain any type of server for GIS-related software or data. Individual managers and staff currently share the use of the Division's two ArcView 3.2 licenses. Any spatial or related tabular data used for particular projects are typically stored on the individual user's PC. Early in 2003 a review will be made of the number and distribution of existing ArcView licenses in the Division. Usage patterns for these licenses will be reviewed and current and potential users will be surveyed to estimate potential future demand for this software. Based on this assessment, a determination will be made as to the adequacy of existing licensing. Recommendations regarding the purchase of additional GIS software will then be based on that determination. This review, assessment, and recommendation process will be done together with the assessment of user skill levels and training needs described above in the Training section.

The desktop environment used by the Solid Waste GIS Analysts is primarily Windows NT and 2000. Other ArcView users within the Division operate in a similar environment, using a mixture of Windows 98, NT, and 2000. Network connectivity, software installs, and upgrades for GIS implementation are provided by the Division's LAN support staff. No changes are anticipated to this during 2003.

The Solid Waste Division does not operate any large- or medium-format output devices for map production or other graphics needs. As GIS support for the Division expands in 2003, the Solid Waste GIS Program Manager will discuss with the KCGIS Center and the Parks and Recreation Division the possibility of using their Hewlett-Packard large-format plotters for Division mapping and graphics needs. Such an arrangement may be possible, depending on the volume of output already being generated by those plotters and on Solid Waste being able to contribute to the costs of plotter maintenance and materials. Access to these devices would enable efficient plotting operations for the Division, as they are all located close to the Solid Waste GIS Analysts.

During 2002 a dedicated data server was acquired and installed to consolidate maintenance and management of GIS data which have been developed by DNRP staff primarily for internal use. These data are typically designed to meet specific departmental needs and are not intended to be maintained in the KCGIS Spatial Data Warehouse for general use. As GIS use in Solid Waste grows during 2003, the Solid Waste GIS Analysts and other Division managers and staff are expected to begin using this data server to store and maintain data of this type.

3.5D.2.4 Budget

The proposed 2003 GIS Center, DNRP Unit, SWD Budget for the five standard O&M Plan reporting categories is presented below. Note that GIS Center overhead costs allocated to the DNRP Unit are not included below. For additional 2003 SWD Budget information, see sections 2.6 and 3.1.2.4.

Item	Budget	Comments
Labor Costs (salary + benefits)	$39,574	Includes allocated labor costs for GIS Center management and administrative support
Hardware (acquisition and maintenance)	$475	
Software (acquisition and maintenance)	$982	
Training costs	$945	
Discretionary (consultants, outside services, materials, etc.)	$25,541	Includes $25,000 allocated for work to be performed by KCGIS Center Client Services

3.5D.3 Spatial Data

The Solid Waste Division does not currently maintain any spatial data in the KCGIS Spatial Data Warehouse, nor does it maintain any division-specific data on the new DNRP data server. As GIS support for the Division increases during 2003, the Solid Waste GIS Program Manager and the Solid Waste GIS Analysts will work with managers and staff to identify and define data which will need to be created or acquired to meet program and project requirements. They will also assess the quality and suitability of existing Division data for current and future projects. As new data are developed and existing data are adapted for use in projects, they will be evaluated for their potential ongoing applicability to Division needs. If there is an anticipated long-term need for such data, they will be moved into either the KCGIS Spatial Data Warehouse or the DNRP data server for long-term storage and maintenance by the Solid Waste GIS Analysts. As the transition to an organized data management structure proceeds, detailed documentation will be prepared for those data layers and their maintenance programs. This will include complete, FGDC-compliant metadata for each data layer being maintained by the Division on either of these data servers.

3.5D.3.1 Maintenance

Please refer to Section 3.5D.3 - Spatial Data for details regarding the Solid Waste Division spatial data program.

3.5D.3.2 Enhancement

Please refer to Section 3.5D.3 - Spatial Data for details regarding the Solid Waste Division spatial data program.

3.5D.3.3 Development

Please refer to Section 3.5D.3 - Spatial Data for details regarding the Solid Waste Division spatial data program.

3.5D.3.4 Metadata

Please refer to Section 3.5D.3 - Spatial Data for details regarding the Solid Waste Division spatial data program.

3.5D.4 Spatial Applications

No GIS-based spatial applications are currently under development or in operation to support the needs of the Solid Waste Division. As GIS support for the Division increases during 2003, the Solid Waste GIS Analysts will work with managers and staff to define, develop, and deploy applications which will be necessary to meet the requirements of specific projects and users. They will also assess the suitability of existing applications being operated elsewhere within KCGIS for use in current and future projects. If such applications can be used to meet the Division's specific needs, the GIS Analysts will work in coordination with the developers of those applications to make any necessary modifications and implement them for use within Solid Waste. The GIS Analysts will also develop documentation, provide training and assistance to Division users, and assume responsibility for maintaining and enhancing these applications on an ongoing basis.

3.5D.4.1 Maintenance

Please refer to Section 3.5D.4 - Spatial Applications for details regarding the Solid Waste Division spatial applications program.

3.5D.4.2 Enhancement

Please refer to Section 3.5D.4 - Spatial Applications for details regarding the Solid Waste Division spatial applications program.

3.5D.4.3 Development

Please refer to Section 3.5D.4 - Spatial Applications for details regarding the Solid Waste Division spatial applications program.

3.5D.4.4 Documentation

Please refer to Section 3.5D.4 - Spatial Applications for details regarding the Solid Waste Division spatial applications program.

3.5D.5 System Integration

As noted above in the Spatial Data section, the Solid Waste Division has no current maintenance or management responsibilities for any GIS data layers stored in either the KCGIS Spatial Data Warehouse or the new DNRP data server. During 2003, however, this is expected to change, as data are developed, modified, and acquired to support Division programs and projects. Once standard QA/QC procedures have been completed, and the quality and reliability of these data have been verified, they will be checked into the appropriate data server, using established procedures and data integration routines. At that time, complete, FGDC-compliant metadata will be prepared and entered into the online Spatial Data Catalogue for each data layer being checked into either of these data servers. Beyond this, the Division has no responsibilities for the operation or maintenance of these systems.

3.5D.5.1 RDBMS Backend Support

The spatially related tabular attribute data most likely to be used by the Solid Waste GIS Analysts on Division projects are stored and maintained in a mixed environment, which includes:

- INFO tables for ArcInfo data coverages - accessed using ArcInfo software with enterprise and agency data layers.
- Dbase files for shapefiles, shapefile equivalents, and standalone data tables - accessed using ArcInfo and ArcView software with enterprise and agency data layers.
- Oracle database tables – accessed from instances running on the KCGIS Spatial Data Warehouse server.
- Microsoft Access databases - maintained by individual staff for independent use in stand- alone desktop environments.
- Microsoft Excel spreadsheets - maintained by individual staff for independent use in stand- alone desktop environments.

As the GIS Analysts become familiar with the tabular attribute data maintained by individual users within the Division during 2003, an initial effort may be made to organize and consolidate these independent databases. This will depend on availability of staff time, in light of numerous other commitments, as well as on coordination with the users who maintain these databases, to assess their suitability for wider use and determine whether they will require any further development for GIS-related purposes. Any large-scale effort of this type within the Division should be guided by a comprehensive plan to guide the overall consolidation of such data for all of KCGIS.

3.5D.5.2 Other Data Management Activity

Solid Waste Division managers and staff develop and maintain a variety of non-GIS data related to the Division's programs, services, and operations. Because Solid Waste has had very limited involvement with GIS in the past, very little is known about these data and the functions they serve at present. It is likely that at least some of these data may have value for GIS-related purposes, but this is yet to be determined. As the Solid Waste GIS Analysts begin working on Division projects and developing client relationships in 2003, they will begin discussing these data with the users who maintain them and assessing the applicability of these data to GIS-based projects. If this effort identifies a significant number of these databases as being of interest, it may be desirable to consider a coordinated management and maintenance effort, to help ensure that these data are available to all managers and staff who would benefit from their use.

3.5D.6 Client Services and User Support

The Solid Waste Division has only occasionally been a client for GIS services and support through 2002. However, with the availability in 2003 of a dedicated 0.5 FTE to work on Division projects, GIS support will increase and will take place within a more formal structure. The principal client base for GIS products and services will be Division managers and staff. Most of the requests which the Solid Waste GIS Analysts receive for maps, data, analysis, technical support, and other services are expected to originate with them. On some occasions, the GIS Analysts may perform work for contractors who are working on Division projects, but this will most likely be limited during 2003.

As discussed above in the GIS Program Overview section, an initial work program has been developed which identifies the projects on which the Solid Waste GIS Analysts will focus their efforts during 2003. For each of these projects, the Solid Waste GIS Program Manager and GIS Analysts will work with the Division client to define the specific tasks to be completed and to set the schedule on which the work will be performed. As the project proceeds, the GIS Program Manager and GIS Analysts will meet as needed with the client to review progress and discuss any issues or problems which have surfaced. Specific details of tasks and schedules will also be discussed and revised when necessary at these coordination meetings.

In addition to the projects identified on the Solid Waste GIS work program, the GIS Analysts may receive requests for services and support directly from a group or individual within the Division, either via e-mail or a personal contact. In some cases, requests may be made by another County agency or by a group or individual from the general public. These may be received directly from the client, through someone within the Division, or through the Solid Waste GIS Program Manager. Once a request has been received, the GIS Program Manager will confirm its priority relative to existing projects, schedule it accordingly, and assign the work to one of the GIS Analysts. The analyst will then proceed to develop the requested products or services, working in coordination with the client until the request has been successfully fulfilled. During 2003, this type of ad hoc request is not expected to occur often, since the Division managers and staff will have to familiarize themselves with the GIS capabilities and resources available to them before they will be able to identify needed products and services and make requests to receive them.

3.6 Department of Public Health

The mission of the Department of Public Health - Seattle & King County is to achieve and sustain healthy people and healthy communities throughout King County by providing public health services which promote health and prevent disease. Public Health - Seattle & King County provides direct services and education to the residents of King County, Washington, in order to prevent health problems from starting, spreading, or progressing. Public Health helps the entire community, protecting and promoting the health of all residents.

3.6.1 Business Functions

Currently the Department of Public Health does not have a coordinated GIS program. Three divisions are using GIS in support of their business: Environmental Health (EH), Epidemiology, Planning & Evaluation (EPE), and Emergency Medical Services (EMS). The Department also does not have any person with full-time GIS responsibilities. Overall, there are three employees who are using GIS (ArcView) on almost an everyday basis (power users) and another 9 people who have ArcView installed on their desktops.

3.6.2 GIS Program Overview

Environmental Health

Environmental Health has been using ArcView software for several years. In the past, most of the support for GIS in EH was received from DDES GIS in an arrangement between DDES and Health. At the administration level of both departments an understanding was reached that GIS was for mutual benefit of both. Since DDES had the expertise, a plotter for large maps, as well as a handy customized ArcView project called “base2”, the staff at DDES trained and installed the data for ArcView use at EH.

With the move of the KCGIS Center to DNRP, a mandate also came down suspending the arrangement between DDES and EH. All GIS support must now come from the KCGIS Center. The availability of the free plotter, the updates of base2 files, extra training and other tasks once performed without direct cost to EH now must be brokered through the KCGIS Center. Since EH has not needed any of these services in some time, there have been no immediate consequences. As far as support for the user is concerned, the KCGIS Center staff have quickly answered all e-mail messages requesting help. Plotting large maps may still be a service that EH will have to pay for, unless a plotter is purchased at the Health Department.

Many of the EH staff members that were originally trained by DDES have either left the department, or are only using GIS on an occasional basis. One staff member does the bulk of GIS tasks in EH at this time. Several staff use GIS on an occasional basis, and several more access information via the KCGIS Center Internet mapping site. EH currently owns 5 licenses for ArcView 3.1 and one license for ArcView 3.2 that was awarded by a Livable Cities grant from ESRI Software. The 5 licenses are shared over the local server with staff from EPE, as well as the several occasional EH users. The ArcView 3.2 license is installed locally for the one staff member who uses GIS on a daily basis. EH would like to upgrade the local software to ArcView 3.2, or would like to upgrade to ArcView 8 in the near future. Since other staff members in other Health Department Divisions (EPE) are accessing the software locally, it is expected that a sharing agreement can be reached to distribute the costs of any upgrades to those users with a business need for the software.

Epidemiology, Planning & Evaluation

Until recently, EPE has used GIS primarily for creating static thematic maps to display data on health events in King County and Washington State. EPE receives requests for these descriptive maps from other Health Department units that have no GIS capability of their own, and from community, research and health care organizations and the general public. EPE also produces a number of reports each year that include thematic maps on topics such as the distribution of childhood asthma hospitalization rates by zip code in King County.

ArcView is now used to geocode large, annually updated data sets such as King County birth and death records. We’re looking at additional ways to geocode exception data that have valid street addresses that are not yet included in the underlying street database.

EPE is currently exploring possibilities for expanding our GIS capacity and further integrating GIS into its core assessment functions. In particular, we're searching for additional software that could be used in conjunction with ArcView to do spatial statistical analysis on disease distribution and trends, and exposure events. There are also plans to add an interactive mapping function to an analytical software package (VistaPH) that was developed in EPE and is now being used by local and state health jurisdictions throughout Washington.

As part of a data warehouse project, we are evaluating the feasibility of web mapping as a way of distributing community information. In relation to this project, we are considering whether we should switch from ArcView 3.x to ArcGIS 8.x.

Presently, there are only two people in EPE using ArcView; one primary user and one occasional user. One received basic training through a course offered by King County GIS, and the other attended an ESRI class but is largely self-taught. We rely primarily on the King County data library as our source of geospatial data.

Emergency Medical Services

EMS is utilizing GIS capabilities to produce timely thematic maps for the customers (Fire Departments, Paramedic Services) as well as to perform quality control, data analyses and planning. The requests for maps are generated by EMS staff, research organizations, hospitals and, general public. Annual and semi-annual reports with cartographic materials are published and distributed among all Seattle-King County Fire Departments, Paramedic providers, County Council, etc.

Currently there is one person in EMS using ArcView 8.2 on a regular basis and another for specific projects.

The Division is using GIS Public Library to access geographic data.

3.6.2.1 Training

- Three Power Users
- Several occasional desktop users
- Several more Internet mapping users

There is a general interest in additional Basic and Advanced GIS training in the Department

3.6.2.2. Staffing Requirements

Currently, the Department does not have a dedicated GIS staff member.

3.6.2.3 Hardware and Software

- ArcView 8.2, one copy
- ArcView 3.1 –3.2, 7 copies in the Department

3.6.2.4 Budget

Item	Budget	Comments
Labor Costs (salary + benefits)	$0	No separate funds for GIS
Hardware (acquisition and maintenance)	$0	No separate funds for GIS
Software (acquisition and maintenance)	$0	No separate funds for GIS
Training costs	$0	No separate funds for GIS training
Discretionary (consultants, outside services, materials, etc.)	$12,500	For client services. Plotting materials purchased as needed.

3.6.3 Spatial Data

The Department of Public Health does not maintain special data sets for corporate uses. EH has data in Envision.

3.6.3.1 Maintenance

There are several shapefiles that are maintained in the Department and updated occasionally including fire stations, hospitals, medic unit locations and their primary service areas. These shapefiles are not posted to the public library, as they usually do not conform to corporate standards. Data in Envision would be appropriate to share via central server or warehouse. EH also would like to access parcel based data from the central files directly. Currently EH must use the Assessors extract and transfer the files from the CD to the Envision server.

3.6.3.2 Enhancement

Assistance needed in acquiring spatial data that is not currently available through Public Library (including historic data).

3.6.3.3 Development

EH Envision data available for mapping purposes.

3.6.3.4 Metadata

N/A.

3.6.4 Spatial Applications

Different programs have specific needs for some customized applications either desktop, laptop (mobile), and/or web based. There are no specific applications besides base2. However there may be some tie-ins to some of the I-map projects currently being developed. Currently Envision data is in development. In the near future, EH Envision users should be issued mobile devices for accessing and inputting data in the field. Mapping systems for districting, for assigning work and for tracking of outcomes will need to be developed.

3.6.4.1 Maintenance

N/A.

3.6.4.2 Enhancement

EH Envision Data.

3.6.4.3 Development

N/A.

3.6.4.4 Documentation

N/A.

3.6.5 System Integration

N/A.

3.6.5.1 RDBMS Backend Support

N/A.

3.6.5.2 Other Data Management Activity

N/A.

3.6.6 Client Services and User Support

- Providing maps for the Departmental use and clients.
- Some consultations on spatial statistical analysis.

3.7 Department of Transportation

The King County Department of Transportation is committed to helping people travel around the region. The Department has about 5,000 employees who provide a wide range of transportation services to the people who live, work, shop, play or travel in King County. Specifically, the Department of Transportation

- Provides all County residents bus service, paratransit, carpool assistance, vanpools and other alternatives to driving alone.
- Designs, builds, operates and maintains roads and bridges in the County's unincorporated areas.
- Provides roadway and traffic maintenance services to incorporated cities on a contracted basis.
- Works with other jurisdictions and organizations to plan our transportation investments.
- Creates programs and facilities for pedestrians, bicyclists and horseback riders.
- Provides vehicles, equipment, maintenance and supplies to all King County departments.
- Operates one of the busiest general aviation airports in the country - used by aircraft of all sizes and types, and filling a wide range of commercial and recreational needs.

GIS is used throughout the Department of Transportation for a variety of core business functions that crosscut operations, planning and customer service primarily in the Transit, Road Services, and Airport Divisions. GIS use varies from electronic delivery of simple x-y coordinate locations, to applications developed using off-the-shelf GIS desktop software, to complete custom-built map interfaces. GIS staff create, maintain, analyze and deliver geographic information to support department staff and automated systems. Specific knowledge of transportation related programs and business systems is critical to effective delivery of GIS functionality to end-users. For the most part, DOT GIS staff are transportation professionals first and GIS analysts second. They are experts in the application of GIS as a tool to address transportation issues.

The Department is structured into five Divisions: Transit, Road Services, Fleet Administration, Airport and the DOT Director's Office. Both Transit and Road Services maintain Geographic Information Systems data and applications necessary to support department and County business needs.

Despite the common theme of Transportation, the Transit, Road Services, and Airport Divisions provide very different services to the public. The diverse business needs of users and systems in these divisions necessitate differing approaches to the delivery of GIS services. The support and delivery of GIS to core functions is centralized in the Transit Division, decentralized into work units located throughout the Road Services Division, and largely outsourced to the GIS Center for the Airport. The expertise of GIS staff within each of these divisions matches the needs and requirements of division-specific users and systems. Again, intimate knowledge of division-specific business needs is critical to effective delivery of GIS support services.

GIS activities that cross department lines are managed through the KCDOT GIS Coordination Committee. This Committee coordinates activities such as training, transportation network maintenance and development efforts, digital orthophotography specifications and acquisition, and other large-scale projects that might impact the GIS of either division. The KCDOT GIS Coordination Committee also represents a mechanism for DOT to develop a single coordinated voice regarding decisions made at the County GIS level.

3.7A Roads Services Division

Road Services GIS activities are focused on supporting planning, engineering, construction, maintenance, emergency response and Traffic Services for unincorporated King County. This includes maintaining and supporting datasets that are necessary to support Division, Department, and County business needs and the public's need for information. Road Services GIS staff provide user support, technical application support, spatial information, analytical reports, facilitate the use and standards of GIS practices, data organization, cost-effective ways of collecting data, map making, dissemination of data and business expertise in transportation-related GIS. Knowledge of Transportation and Roads programs and business needs are crucial to the success of GIS in the Roads Services Division.

3.7A.1 Business Functions

Below are listed some of the business functions within the Road Service Division that rely upon geographic information.

Capital Improvement Program – Identify, program, design and construct roadway, bridge projects, intersections and traffic flow improvements, including intelligent transportation systems. Projects are mapped, reported, and analyzed using GIS.

Road, Bridge and Traffic Maintenance and Operations – regular ongoing maintenance, operations and repair activities to ensure a safe, quality roadway system in unincorporated King County. GIS tools are used for tracking facility inventories that are maintained and managed using the division's Maintenance Management Systems (MMS).

Inter-jurisdictional Service Contracts – Reimbursable road maintenance, traffic operations, bridge inspection and maintenance, road design, project management, and sign fabrication provided to suburban cities, other jurisdictions, other county agencies and private developers on a scheduled, emergency and as needed basis. Snow and Emergency lifeline routes using GIS are integral to this service.

Engineering Technical Support Services – In house services that support Roads CIP including, but not limited to, field surveying using GPS, materials lab analysis, computer aided drafting design and mapping, and record management and archival support.

Transportation Planning – Identify and prioritize transportation needs as required by the Comprehensive Plan using GIS for analytical and reporting purposes.

Environmental Compliance – GIS is a critical tool in complying with federal, state, and local environmental laws, regulations and policies. The federal Endangered Species Act, as well as the Clean Water Act, requires detailed geographical data regarding waterways habitat and storm water. Compliance with other federal environmental regulations, such as Army Corps of Engineer permit requirements, is greatly enhanced with accurate GIS data and applications. At the state level, fish and wildlife code and state water quality laws necessitate accurate geographical data in terms of roadways, fish habitat, and storm water. Adherence to the state Growth Management Act is also more easily accomplished with accurate geographic environmental data. King County codes such as the Sensitive Areas Ordinance also require the Road Services Division to use and update accurate GIS information and applications. The GIS data, tools, and applications necessary for the Road Services Division to achieve environmental compliance require constant update and evaluation by staff with technical expertise in roadway construction, maintenance, and engineering.

Cultural Resources Protection – The Road Services Division and the Office of Cultural Resources are developing a GIS planning tool that will significantly increase King County's ability to manage and protect archaeological and other cultural resources.

3.7A.2 GIS Program Overview

Staff assigned GIS related responsibilities are located throughout the Sections of the Road Services Division, which include Administration, Traffic Engineering, Maintenance, Engineering Services (including

Survey Services) and Transportation Planning. Each of these Sections within the Road Services Division has specific expertise required to accomplish business functions. To the extent that this specific expertise is required to collect/acquire GIS data, maintain data, and develop meaningful GIS applications, GIS staff are decentralized within the Division. Additionally, the Division has office space and field operations in multiple locations including two floors of the King Street Center, multiple buildings at the Renton Maintenance Complex and 12 satellite maintenance offices spread throughout the County, which has contributed to the decentralized structure.

Staff located throughout the Division are responsible for data maintenance and development, data analysis, applications support, and internal work requests that can originate outside of their work unit.

Division-wide coordination, development and implementation of GIS related activities are a crucial part in improving division efficiency.

GIS coordination in the Division is accomplished through committee structures led by the GIS Technical Lead, who is one of two central division-wide GIS positions within the Division. The Division's GIS Technical Lead is a member of the Roads Division IT Coordination Team and reports to the Division's Budget and Systems Manager. The Budget and Systems Manager reports to the Division Manager. The mission of the IT Coordination Team is to lead and facilitate Division-wide IT coordination, development and implementation in the areas of GIS, web development, database management, infrastructure and new technology in order to improve Division efficiency. A primary work item assigned to the GIS Technical lead is to improve division coordination of the Division's decentralized GIS network.

The GIS Technical Lead chairs the Division's GIS Technical Committee to facilitate and coordinate GIS activities in the Division. The committee meets bi-monthly. Coordination activities currently underway include development of the annual division-wide GIS work program, metadata library improvements, data inventory, GIS resource identification, licensing standardization, and equipment standardization. The Division committee also coordinates hardware purchases, data development, application development resources, software support, software licensing compliance, and hardware support. The Division's GIS Technical Committee meets twice a month and on an as needed basis with the Division's GIS Oversight Committee comprised of Section managers or their designees to coordinate Division GIS work items and priorities.

The second central GIS position in the division is a TLT Information Systems Analyst assigned to the GIS Technical Lead to serve in a Division-wide GIS support and coordination role.

Section GIS staff support end users with GIS software applications, in the development of new GIS datasets (a listing of all available relevant GIS datasets is provided in this document), through maintenance of existing GIS datasets and by responding to GIS related work requests. There are currently around 45 GIS end users in the Roads Services Division.

Non-GIS users in the Division seldom need access to data or applications, but are often in need of map production or analysis to support requests from the Council, department directors, managers, supervisors, project managers, field and office staff and the public. Roads CIP project managers are a Division work group that have frequently been supported by Roads GIS staff. They are usually in need of data analysis and/or project specific location maps. This work has been done on a project-by-project basis. Most of these non-GIS user requests will now be directed to GIS Central for their support.

3.7A.2.1 Training

In the past, Transit offered the "Introduction to ArcView" class two times a year taught by an authorized ESRI instructor from within the County. This two-day class was available to all DOT staff on a first come-first-served basis and was taught in the King Street Center training facility. It was arranged by Transit GIS, which absorbed the $75 cost per student for the manual and coordinated the installation of software on the training room computers. In 2002, the authorized ESRI instructor from within the County was not able to teach the ArcView class for no cost, so this training opportunity was cancelled and staff were redirected to more costly alternatives. In 2003, Roads staff hope to take advantage of KCGIS Center's plan to offer low cost alternatives for ArcView training.

Training for GIS Professionals is primarily accomplished through attendance at GIS conferences, application workshops, technical symposia, and King County sponsored training classes mentioned above. These are arranged and funded within each specific Section in Roads.

In 2003 and 2004, it will be necessary for GIS Professionals to continue to acquire skills with ArcGIS 8.x as the Division upgrades core GIS. User exposure to ArcGIS will be limited and training for these users will be individually arranged and funded within each specific section.

In 2003 and 2004 Transit will be implementing a new Transportation Network. It will be necessary in 2003 that select GIS professionals in the Road Services Division obtain skills with SDE as the Department implements the new transportation network database, maintenance application, and user consortium.

3.7A.2.2 Staffing Requirements

Roads GIS professionals provide primary technical support to end users and systems. They are well trained and highly knowledgeable in GIS and specific Department and Division-level databases, applications and business needs. In addition to supporting existing users, they are responsible for accommodating new users and business systems that require access to geographic information. The GIS professionals also identify potential future users that would benefit from access to such geographic data. As such, GIS professionals must have some knowledge of every part of the business so that they can appropriately recommend the level of GIS integration. GIS professionals are largely responsible for maintenance of agency data layers (e.g., County Road Inventory System), development of customized end user applications, production of sophisticated analysis and map products, and support of out-of-the-box client applications that provide access to data and simple analysis tools. These staff also provide technical expertise, business expertise, low level training, user support, vendor software installation and maintenance and business application support. GIS professionals are also end users themselves, often being called upon for sophisticated data analyses or map products that are beyond the expertise of other end users.

There are eight technical staff assigned GIS roles and responsibilities throughout the Road Services Division. Each of these staff undertakes activities in their jobs encompassing work not directly associated with GIS. One of the Analyst positions listed is matrixed from the King County GIS Center Client Services Group. This position assists with development and ongoing maintenance of the Roads Environmental Species Act (ESA) project. This FTE was moved from Roads to the King County GIS Center as part of the 2001 consolidation effort and represents those work tasks that are specifically Roads oriented. It was recognized, however, that the assignment of tasks and direct supervision of this work effort was more effectively accomplished within Roads Maintenance Section. The position, therefore, was matrixed back into Roads. Working titles, employee classifications and GIS FTE or TLT activity levels are described in the table below.

Funding support for these positions comes from the Roads operating budget, an appropriation unit supported by the Road Fund. The staffing configuration and assignments are appropriate given the organizational structure and different physical locations in the Division. Staff working directly in the Sections have a comprehensive understanding of the business activities of their work units, clear reporting relationships, and efficient communication with end users.

Coordination of Division GIS activities among the eight staff and selected Division management is undertaken with a committee structure that participate in regular work plan status, knowledge sharing and collaboration meetings. Contributing GIS staff are listed in the table below.

Working Title	Focus	Class	Status	%GIS
Budget and Systems Manager(Administration)	Finance & Admin Mgr	MGR	FTE	.05
GIS Technical Lead(Administration)	Division lead	ISA3	FTE	33
GIS Technical Support TLT(Administration)	Map production and data analysis	ISA1	TLT	50

Working Title	Focus	Class	Status	%GIS
Maintenance Section Data Manager(Maintenance)	Maintenance section lead	ISA3	FTE	40
Maintenance Section Data Analyst(Maintenance)	Map production and data analysis	ISA1	FTE	60
Engineering Section Data Mgr(Engineering)	Engineering section lead	Eng3	FTE	60
Engineering Section Data Analyst(Engineering)	Map production and data analysis	Eng2	FTE	40
Traffic Section Data Mgr(Traffic)	Traffic section lead	ISA2	FTE	30

3.7A.2.3 Hardware and Software

The Road Services Division operates mostly in a PC environment. The environment ranges from Dual Processor Pentium 4 machines to Pentium II machines running Windows 95, Windows 98, Windows NT 4.0 and Windows 2000. We will continue running in these environments through 2003.

- JABBA: ALR 9200, Win2000 Server(5.00) SP1, development\production server. This server houses the Division's GIS datasets. This server is a storage area for the Division's GIS related working data. When data is complete it is moved up to the enterprise data server. This server also allows a single place for users to store project files.

Plotting devices used in the Road Services Division include:

- (2) HP Designjet 800's
- (1) HP Designjet 1055CM
- (2) HP Designjet 2500CM color plotter
- (1) HP Designjet 650C's
- (3) HP Inkjet ColorPro Cad's
- (1) HP 4600DN Laserjet

Two ArcGIS 8.2 licenses are run from a license manager on a server called *Denali*. Two standalone ArcGIS 8.2 licenses are also run out of our Renton Maintenance facility. Thirty-five ArcView GIS 3.2 licenses are run from a mix of LAN installation and local installs. Network copies are accessible via license metering by about 45 PCs in the Division. All ESRI software licensing and maintenance is handled in cooperation with KCGIS.

The Roads Services Division GIS currently has the following license structure:

Software	Licenses
ArcInfo 8.2 (NT) Core 3D Analyst Spatial Analyst ArcPress	 4 1 1 1
ArcView Version 3.2	

Software	Licenses
Core	35
3D Analyst	2
Spatial Analyst	3
ArcPress	4

Ancillary software used by the section include AutoCad Map, AutoCAD 14.0, ArcCad, Adobe Illustrator 9.0, Adobe Map publisher, Adobe Acrobat 5.0, Adobe PageMaker 6.5, Adobe Photoshop 6.0, Microsoft Access 97, Microsoft Access 2000 and Cold Fusion.

3.7A.2.4 Budget

The proposed 2003 Roads GIS budget by section is as follows:

Item	Budget	Comments
Labor Costs (salary + benefits)	$251,130	Budget and Systems manager salary not included
Hardware (acquisition and maintenance)	$2,500	Hardware maintenance
Software (acquisition and maintenance)	$9,000	Software maintenance on GIS licenses
Training costs	$7,000	Includes local GIS conferences and SDE training.
Discretionary (consultants, outside services, materials, etc.)	$2,500	Plotter supplies, training manuals, subscriptions, etc.

3.7A.3 Spatial Data

The Roads Division is responsible for a variety of transportation-related data layers. An example of these datasets are Capital Improvement Projects, Bridges, County Road Inventory System (CRIS), average daily traffic counts, accidents, stripping and marking routes, storm drainage, fish blocking culverts and guardrails. These datasets are used throughout the Department.

Maintenance is critical to ensure accurate data is available to the public regarding road/bridge status and other public information systems. Data enhancements and development are usually performed as part of application development efforts within the context of a project. As such these projects are discussed below in their entirety including any application enhancements or development.

3.7A.3.1 Maintenance

GIS staff within the Roads Services Division are responsible for the maintenance of a variety of transportation-related data layers. GIS professionals maintain some data layers directly. Specific end users within division workgroups maintain other layers using tools developed by Road Services Division and Central GIS professionals. These are then submitted to the GIS professionals who publish the data in geographic and corporate data libraries for access by other users.

The following is a list of data layers that are maintained and that will continue to be maintained by Road Services Division staff:

Data Name	Data Description	Update Frequency
PLSS	Polygon shapes representing Road Services Division/Survey Section Public Land Survey System broken down to the ¼ section.	None planned

Data Name	Data Description	Update Frequency
MONUMENT	Point shapes representing Road Services Division/Survey Section surveyed monuments.	Annually
ST_CRIS	Lines shapes representing King County's CRIS (County Road Inventory system).	Daily
KGCO_DS	Soils data for King County. Seamless soils shapefile for entire county.	None planned
LAASETHNSP	Ethnographic place names for King County	Annually
PREHIST_ARCH	Recorded prehistoric archaeological sites for King County	Weekly
HIST_ARCH	Recorded historic archaeological sites for King County	Weekly
HRI_SITES	Historic properties recorded at King County Office of Cultural resources	Monthly
CLP	Recorded Cultural Resources managed by SPU	Annually
BURKEBLUEPOLY	Heretofore unrecorded archaeological sites for King County	Monthly
BURKEGRAYPOLY	Heretofore unrecorded archaeological sites for King County	Monthly
LANDFORM	Paleo-landscape features (late Pleistocene and Holocene)	None planned
LAASTCPSP	Areas of traditional cultural and religious significance for Native American groups in King County	Annually
GLOETHNOTRAIL	Cultural features digitized from GLO maps for use as shape files (feature data sources)	None planned
GLOHISTRD	Cultural features digitized from GLO maps for use as shape files (feature data sources)	None planned
GLOHISTPT	Cultural features digitized from GLO maps for use as shape files (feature data sources)	None planned
GLOETHPOLY	Cultural features digitized from GLO maps for use as shape files (feature data sources)	None planned
GLOHISTPOLY	Cultural features digitized from GLO maps for use as shape files (feature data sources)	None planned
CRREPORTS	Areas of previous cultural resource surveys	Monthly
2002 GUARDRAIL	Line Shapes representing King County countywide Traffic Section 2002 proposed guardrail replacement projects	Monthly
SIG_COMPLETE	Point shapes representing King County countywide Traffic Section 2001 Signal projects completed	Monthly
SIG_EXPECTED	Point shapes representing King County countywide Traffic Section 2001 Signal projects expected to be completed.	Monthly
HARS	Line shapes representing King County countywide High Accident Roadways.	Annually

Data Name	Data Description	Update Frequency
HALS	Point shapes representing King County countywide High Accident Locations.	Annually
CIPPLINE	Line shapes representing King County Capital Improvement Projects.	Daily
CIPPATH	Line shapes representing King County Capital Improvement Sub-Projects.	Daily
CIPPOINT	Point shapes representing King County Capital Improvement Projects.	Daily
ADOPT	Line shapes representing the adopted sections of King County roadways countywide.	Annually
PWAY_DATA	Line shapes representing countywide School Pathway Projects.	Monthly
LIFELINE	Line shapes representing Lifeline Routes, it is a cooperative venture between the Federal Emergency Management Agency (FEMA) and King, Pierce, Kitsap, and Snohomish Counties. Its goal in the identification and coordination of lifeline routes between and among state, County and local emergency managers.	Annually
BRIDGE	Point shapes representing King County maintained Bridges.	Annually
“BY BASIN” MANY THEMES	Point and line shapes that represent King County’s drainage inventory NPDES (National Pollution Discharge Elimination System).	Monthly
3P	Line shapes showing King County Countywide proposed pedestrian improvement projects.	Monthly
NEP LINES	Line shapes representing King County Countywide Neighborhood Enhancement Projects.	Monthly
COUNT_DATA	Point shapes representing Countywide year 2000 Historical Count Location w/ data attached	Annually
RD_EIS	Point shapes representing Roads Environmental Unit’s impact statements.	Monthly
RD_BA	Point shapes representing Roads Environmental Unit’s biological assessments	Monthly
RD_PROP	Point shapes representing Roads Services Division owned properties.	Monthly
FREIGHT_GOODS	Line shapes representing routes designated by the state as roadways that carry freight and goods.	Annually
GUARDRAIL	Line shapes representing the King County Inventory of county-wide guardrail.	Monthly
COUNT_LOCATIONS	Point shapes representing Roads Traffic Section Historical Count Locations w/o data attached.	Annually

3.7A.3.2 Enhancement

Data enhancement efforts for 2003 will primarily be in response to three major projects:

1. Continue to redevelop and combine CARTS and City Discretionary Services database to: Provide a workflow input and tracking system that is accessed by division staff and contract cities on demand through the Internet and Intranet, to perform at a high level of speed and reliability. The system will be developed to be scaleable over time and extendible to other division workflow tracking requirements and opportunities. The new CARTS system will also utilize GIS to support spatial query and reporting capabilities.
2. The Accident Information System inventories and compiles statistics on reported accidents in unincorporated King County. Statistical accident information is used by the Traffic Engineering Section for project programming and design decisions, litigation, and for the annual publication of the Traffic Safety and Accident Rate Reports. New enhancements will be used to consolidate all existing mainframe and Access data into one SQL server application with data input, inquiry, and reporting available over the King County intranet, and will utilize GIS mapping and query capabilities. The application will be designed to generate reports in the Traffic Safety Report format and other often used reporting formats. Ad hoc query capabilities will be provided. Current Route order location data functionality will be migrated from mainframe to SQL server platform in order to support GIS mapping of the data by accident locations. The system will be developed to accommodate State provided data when the State comes back on line in 2003.
3. The Pavement Marking Tracking System is currently being developed by the Traffic Engineering Section that will be used to manage the installation and maintenance of roadway marking features. Currently roadway striping routes are being developed in GIS, that when completed will allow for more efficient project management of the linear routes, easier distribution of information, and map production capabilities for planning purposes. Future additions to the inventory will include roadway buttons and thermo-plastic locations.

3.7A.3.3 Development

Data development efforts for 2003 will primarily be in response to the Cultural Resources Protection Project (described below) as well as the ESA/SAO Data Acquisition project, Road Vacations and Road Improvement Districts, Road Network Street Centerline project already described in this document, County Road Inventory System management and data development in our Traffic Engineering Section.

Cultural Resources Protection Project - Archaeological and other cultural resources are important to Native American groups, and to the other citizens of King County. King County recognizes that cultural resources are non-renewable resources and are in jeopardy due to development brought about by increasing population densities. In light of this importance and resource sensitivity, King County Road Services Division (RSD) and Office of Cultural Resources (OCR) are developing planning tools that will significantly increase King County's ability to effectively identify and manage these resources as it designs and constructs road and bridge rehabilitation and improvement projects in the unincorporated areas of King County. Elements of this project include: gathering all existing and accessible information about cultural resources in King County; developing a GIS-based sensitivity model to assist in the identification of preservation options and planning alternatives; and establishing policies and procedures to guide the use and access to this sensitive information. One of the major obstacles to be overcome was the inaccessibility of cultural resources data, which was spread out across the state, in a variety of incompatible formats. Another issue was the lack of consistent tribal input in project planning. Finally, there were no procedures and policies to guide cultural resource work across the panoply of regulatory regimes under which RSD works.

This project was originally funded by a Transportation Enhancement Act (TEA-21) grant. This grant provided $375,000 in federal funds, and was matched by $250,000 in County funds. The County's contribution consisted of a hard match of $105,000 in cash and $145,000 in in-kind contributions. The project is three years in duration. Data development is expected to be winding down in 2003.

As a pilot project, the Cultural Resource Protection Project includes the following:

1. Development of a digital library of Cultural Resource Management survey reports and archaeological and historic sites in King County, previously on file in various repositories in various formats.
    - Solves immediate access issue.
    - Solves identification issue.
2. Development of an Archaeological Sensitivity Model based on set of GIS data layers identifying cultural resources, and integrated with existing GIS data layers identifying natural resources.
    - Solves long-term planning issue.
    - Incorporates tribal input up front.
3. Development of policies and procedures
    - Solves guidance issue.
    - Solves legal mandates issue.
    - Solves tribal/stakeholder input issue.

Below are a few of the datasets that have been created and/or enhanced through this project:

- Developed
    - Detailed soils data for Western King County - shape files with detailed metadata.
    - Ethnographic place names for King County - 471 shape files with metadata.
    - Recorded archaeological sites for King County – 250+ shape files with metadata.
    - Heretofore unrecorded archaeological sites for King County - 170+ shape files with metadata.
    - Paleo-landscape features (late Pleistocene and Holocene) - shape files with metadata.
    - Areas of traditional cultural and religious significance for Native American groups in King County - shape files - may not be any metadata.
    - Government Land Office (GLO) Plat Maps 1855-1900 as image files.
    - Cultural features digitized from GLO maps for use as shape files (feature data sources) - with metadata.
    - Areas of previous cultural resource surveys – shapefiles with metadata
- Enhancing/Enhanced
    - Historic Resource Inventory (HRI) sites from the King County Office of Cultural Resources - corrected and updated for use in project.

County Road Inventory System – Last year the Engineering Services Section completed a major data conversion project in collaboration with Central GIS associated with the County Road Inventory System (CRIS). CRIS (County Roads Inventory System) is a system used by Roads Services for, among other things, generation of yearly reports to the federal government. This conversion is done and updates are being made for the 2003 submittal.

Road Vacations and Road Improvement Districts – The Engineering Services Section will complete the Road Vacations and Road Improvement Districts(RID) database in the 3rd Quarter of 2003. The dataset will show Road Vacations and RID's in polygon shapefile format.

Environmental Species Act -The ESA Data Acquisition Project is another major effort underway in the Roads Services Division that will improve accuracy, consistency and currency of King County's ESA-related data (including GIS elements), in particular the datasets describing the fundamental habitat and landscape features bearing upon the efforts of County agencies to meet the regulatory mandate to conserve ESA listed species. The datasets that will be developed or purchased are noted below:

- New Digital Elevation Model
- New Contours
- New Digital Aerial Photography

3.7A.3.4 Metadata

Spatial data documentation in the KCGIS Spatial Data Warehouse is regularly maintained using Doctool.

3.7A.4 Spatial Applications

The Road Services Division maintains the following transportation-related GIS application:

Streettool provides an environment for editing, maintaining, quality controlling, and plotting spatial data for the County Road Inventory System (CRIS) in compliance with WAC 136-60 and King County Code. This application was created in an ArcGIS 8.1 environment using Visual Basic for Applications (VBA), Spatial Database Engine (SDE), and Oracle. This was a cooperative project between King County Department of Transportation – Road Services and KCGIS Center.

3.7A.4.1 Maintenance

The following is a list of applications that are maintained and that will continue to be maintained by Roads GIS staff.

Name	Description	Language
Streettool For the CRIS Roadlog	Streettool provides an environment for editing, maintaining, quality controlling, and plotting spatial data for the County Road Inventory System (CRIS) in compliance with WAC 136-60 and King County Code. This application was created in an ArcGIS 8.1 environment using Visual Basic for Applications (VBA), Spatial Database Engine (SDE), and Oracle. This was a cooperative project between King County Department of Transportation – Road Services and KCGIS Center.	VBA/ArcGIS 8
BondTracker	BondTracker is an intranet application that tracks roadway maintenance and defect bonds for newly created King County roads. The application was created using Cold Fusion and MS-SQL database for the Maintenance and Defect Bond Program for King County DOT – Road Services Unit. GIS link will be integrated in 4th quarter of 2003.	
Mapper	Mapper is a customized ArcView 3.x project. The project provides ArcView users with a simple easy-to-use menu interface for adding GIS data to a view in a project. It also gives users a quick interface for creating layouts with a title bar, north arrow, scale bar, disclaimer, legend, date, file name and overview window. It has been updated in the 4th quarter of 2002 to meet the new King County cartographic standards and continue to be maintained by Roads staff.	ArcView

3.7A.4.2 Enhancement

Application enhancement efforts for 2003 will be in response to one project.

Bond Tracker – Bond Tracker database maintenance is performed when a new roadways bond is accepted by King County DDES. Bond Tracker will go through a design change in 4th quarter of 2003. A GIS link will be integrated into this application.

3.7A.4.3 Development

There are no Roads application development efforts scheduled for 2003.

3.7A.4.4 Documentation

Code level documentation including headers for scripts are generally available for all applications. These include history sections that document any application modifications. This documentation will continue to be maintained. No plans exist to provide any further documentation of applications in 2003.

3.7A.5 System Integration

System integration of geographic data within Roads is essential since spatial data is used in conjunction with non-spatial business specific data to drive many transportation information systems. Integration is facilitated through GIS staff participation on teams specifically tasked with coordinating information technology infrastructure. This was addressed in the GIS Program Overview section above.

The Road Services Division data warehousing strategy is the next wave in the evolution of our systems development. The Division is in the process of centralizing selected data on powerful and responsive SQL servers located and operated locally within our organization. Staff will primarily report, provide input to, and access the data internally over the KC Intranet using screens uniquely designed for specific bodies of information. (If there were a need for the public to have ongoing access to the information it could be available over the Internet). Capabilities for ad hoc queries to the SQL server data will be developed. Information with geographical characteristics will be accessed, queried, and reported, where appropriate, using GIS mapping tools available on staff desktops and over the web.

As the selected data is transferred from the many decentralized databases in the division it will be aggressively evaluated and reviewed for standardization, consistency, and integrity. In other words, the data will be or scrubbed (validated as good data) and normalized (made unique) in order that it can be more accurately, easily, and quickly located, shared and reported by multiple users interested in using the information simultaneously from their desktop.

This process is being applied initially to a few sample areas within the division rather than attempting to organize the entire division's information needs into a data warehousing strategy at once.

In 2003, the transportation network must directly support the needs and requirements of other County departments and points to a greater need for system integration between Transit GIS staff, Road Services GIS staff, and GIS staff in other agencies. Furthermore, a greater need for system integration is necessary to incorporate much of the County road-related information with transit, transportation planning, and facilities management data. The new transportation network and maintenance consortium will be the framework on which these data are integrated starting in 2002.

3.7A.5.1 RDBMS Backend Support

Currently Road Services datasets are in a mixed environment of

- Info Tables for coverages
- Dbase files for shapefiles
- Microsoft Access databases – Desktops and workstations
- SQL databases
- Microsoft Excel spreadsheets – Desktops
- Rbase databases –
- Advanced Revelations databases - CRIS

3.7A.5.2 Other Data Management Activity

Road Services coordinates centralized databases for access by information systems throughout the division. GIS is one of these systems that both provides critical geographic data, but also uses core agency-specific data supplied by other workgroups. Major changes in these central databases can have an impact on GIS as a stakeholder.

3.7A.6 Client Services and User Support

Client services and user based support are described under the GIS Program overview section above. A summary of these services are listed below.

Customers:

- Road Services Division staff and management
- Road Services Contract Cities
- King County Executive Office
- King County Council
- King County Residents

Services:

- Create, maintain, analyze and deliver Roads geographic information to support Road Services Division staff.
- Provide FTP site that houses GPS basestation files public use.
- Provide technical application support to users, software installation, maintenance and updates and training.
- Prepare maps and make sure Roads data is available to Road services Division staff.
- Serve as Roads Services Division GIS focal point and represent the Division in regards to GIS matters.

Service Processing:

- Requests are received through e-mail, phone or in person contact to any GIS member.
- Requests are based on knowledge to complete the task, workload and priority.
- Requests are tracked in a Coldfusion/SQL web application.

Service Delivery:

- Requests for information, troubleshooting, training, expertise and other such services are provided via e-mail, phone or in person.
- An e-mail list of users with access to GIS applications and data is maintained to facilitate broadcast communications.
- Long term projects are planned and budgeted for the following year.

3.7B Transit Division

Transit GIS activities are focused on the day-to-day operational needs to provide the County with bus service. These include the ongoing maintenance of GIS data and applications necessary to support Division, Department and County business needs. Transit Division GIS Professionals also provide technical expertise, transit business expertise, training, transit map / data products, user support, vendor software installation and application support. The staff work closely with other regional transit agencies and internal King County Departments / Divisions to share and coordinate GIS and other transportation data. Specific knowledge of Transportation and Transit related programs and business systems is critical to effective delivery of GIS functionality to end-users. Staff supporting this function are experts in the application of GIS as a tool to address Transportation and Transit issues.

3.7B.1 Business Functions

Below are listed some of the business functions within the Transit Division that rely upon geographic information.

Service Planning – Service planning refers to the determination of changes to transit services including types of service, routing, time periods and frequency of operation. This function is also responsible for developing technical and policy analyses supporting longer-range transit planning efforts. GIS analytical tools and data are used to assist this function and are essential to create proposed alternatives for presentation to elected officials and communities to build consensus and support for proposals to change or add service.

Service Development – This function writes and updates schedules and creates the data structures for routes and stops necessary to implement service and feed to a variety of Transit information systems. The primary input to this function is the work accomplished in the *Service Planning* function. GIS Tools developed and maintained by Transit GIS are used to create the primary GIS data structures (space) that complement the schedule data structures (time). These spatial data structures are supplied to a variety of transit systems that require knowledge of the location of transit routes, stops, and facilities. GIS Tools are also used to assist this function in the visualization of routes, stops, time points, park and rides and other transit facilities.

Service Quality – Service Quality's primary responsibility is to provide 24-hour daily support and on-street supervision of Transit services. This includes response to transit emergencies and service disruptions, customer and employee assistance requests, adverse weather service management, short/long term route planning, construction impact mitigation, operator comfort station program (restroom) management, special event planning and response, Metro tunnel service management, and other service related investigations and activities. Staff within service quality use GIS tools and data to assist in many of these functions. In particular, a spatial database is maintained of comfort station locations and is used to identify potential new locations in areas of new transit service.

Service Communications – This function provides a daily communications link to transit operators. Staff direct operators, make decisions regarding service, provide information such as procedures, fares, transfers and schedules, and coordinate security and safety management with emergency response personnel. Staff use the transit AVL/CAD system which operates 24 hours a day, seven days a week and provides emergency alarm processing, call management, real time bus location information for as many as 1,800 buses at any given time throughout the service area, incident logging and schedule adherence monitoring. Expected vehicle locations are determined using geographic data supplied from Transit GIS and compared with actual locations supplied by 200+ radio-based emitters that are used in tracking vehicle location. GIS analytical tools developed and supported by Transit GIS are used to assist in optimizing the placement of these emitters across King County. Also, the real-time vehicle-tracking application includes a map interface supplied with data from Transit GIS.

Safety Program – The Transit Safety office is tasked with assuring the safe operation of fleet vehicles and providing a safe and healthy environment for employees. Responsibilities for this group include the review, investigation and determination of the cause of all accidents, identifying ways to reduce similar accidents, and insuring employee safety by conducting facility inspections. The interface, database and

reporting tools used by Safety staff were developed and are supported by Transit GIS. It includes functions that allow staff to place and view an accident on the map. A spatial dataset of accident locations is automatically updated nightly with accidents from that day and made available to staff for visualizing and reporting purposes. Safety staff also use GIS tools and data to identify spatial patterns in accidents to aid in identifying strategies to reduce occurrences at accident-prone locations.

Security Program – The Metro Transit Police group is charged with providing 'reasonable security' for all transit passengers, transit operators, and all other transit employees. This group consists of Metro Police Officers, Seattle Police Officers, the King County Sheriff's Office and contract security personnel, all of which are deployed to provide tunnel security, bike teams, boarding teams, park and ride lot security teams and transit center security teams. The interface, database and reporting tools used by Security staff were developed and are supported by Transit GIS. It includes functions that allow staff to place and view an incident on the map. A spatial dataset of incident locations is automatically updated nightly with incidents from that day and made available to staff for visualizing and reporting purposes. Security staff also use GIS tools and data to identify spatial patterns in security incidents to optimize the deployment of resources.

Paratransit Operations – This function provides transportation services to people with disabilities and low-income seniors. It is required by King County Code, Americans with Disabilities Act (ADA), and other local, state and federal law regarding persons with disabilities and public accommodation. Failure to meet the ADA'a paratransit requirements could lead to lawsuits or loss of federal funding. GIS analytical tools and data are used within this function to identify the service area based on fixed route transit service. Also, the scheduling software includes a map interface that helps identify the eligibility of potential riders based on their home address.

Design and Construction Program – This function provides project management, in-house design or management of design consultants, construction management activity and facilities inspections with the necessary support such as permitting, environmental planning and contract administration. Staff use GIS tools and data to assist in this function.

Transit Speed and Reliability – This function implements low to moderate cost improvements that improve transit speed, safety and reliability along major transit corridors. Work examples include transit signal priority, intersection improvements, re-channelization, bus stop consolidation, transit lanes, transit queue jumps and signal optimization. Staff use GIS tools and data to assist in this function. In particular, this function is responsible for maintaining a spatial inventory of traffic signals within King County.

Automatic Passenger Counters – The Automatic Passenger Counter (APC) program executes the planning, data collection, data processing, data analysis and reporting of bus ridership, travel time and schedule adherence information for a wide variety of programs and purposes. Information on passenger boardings and alightings is collected at the bus stop level and is a primary data source used for route planning, facilities planning, ridership reporting, service guidelines conformance, program evaluations, policy analysis and required federal Section 15, National Transit Database and Title VI reporting. The APC system is also a secondary source of schedule adherence information besides the Automatic Vehicle Location (AVL) system. Both actual and expected vehicle locations necessary for assigning ridership to the correct stop are determined using geographic data supplied from Transit GIS. GIS analytical tools and data are used to optimize the placement across King County of 200+ radio-based emitters that are used in tracking vehicle location.

Customer Information – This function is critical to communicating information to customers about services and changes to services. It includes: automated "next bus" information by phone; real-time bus tracking on the Internet; trip planning services by phone and on the Internet; finding carpools, vanpools and custom bus routes for commuters interested in ridesharing; and production of a transit service map. All of these use GIS data to assist in providing this function. Many of them have map interfaces to assist call takers in providing information. Several use GIS analytical tools to evaluate spatial data or to create transfer files for input into their system.

Equity in Transit and Section 15 Reporting – Although reporting is a function performed throughout the agency for a variety of purposes, National Transit Database/Section 15 and Equity in Transit reports are required by the Federal Transit Act and Title VI in order to apply for federal funds, including all federal

grants. The Federal Transit Administration mandated equity in transit report ensures equitable service to minority and non-minority areas, and necessitates the management of data collection, analysis, map production, writing and report production. The National Transit Database Section 15 Report is also federally mandated and documents a variety of operational statistics about the agency during the previous calendar year, including numbers of safety and security incidents and miles driven on HOV lanes. Transit GIS staff use GIS data and tools to contribute to these reports.

3.7B.2 GIS Program Overview

The Management Information and Transit Technology (MITT) section of Transit houses Transit GIS. This section is responsible for a set of core Transit functions that support management decision making, ensure the daily operation of business systems necessary to run the transit system, and guarantee the integration of technology projects into Transit's business process and operating environment (http://dot.metrokc.gov/mitts/mitthome/default.htm). The workgroups within MITT including Transit GIS form a comprehensive team for supporting Transit's information systems infrastructure. The Transit GIS team in MITT represents the Transit Division focal point for all spatial services, data, applications, and support requests originating from within and from outside the Division.

Transit GIS is led by a program manager who is responsible for coordinating all operations including maintenance of existing production applications and data, development and implementation of new GIS applications, serving as the Transit GIS liaison to other information systems staff within the Division and at other agencies, and supervising Transit GIS staff. The Program Manager reports directly to the supervisor of the Infrastructure and Integration business unit within MITT, the supervisor reports to the MITT Manager, and the Manager reports to the Transit Division General Manager. Five analysts report to the GIS Program Manager and are directly responsible for data and application maintenance and development, and user support services. This includes one database administrator, two application programmers and two GIS analysts.

Transit GIS' primary responsibility is to provide GIS users a healthy, functioning system ensuring that the necessary infrastructure is in place and accessible for staff throughout the Division to use as required. This includes providing access to data and applications, installation of GIS tools on the desktop, training, ad hoc support, data and application maintenance, license management, and participating in server management with shared systems and server support staff. Transit's GIS team has also successfully competed for several federal grants that allow the team to keep pace with advances in technology and changing business needs. These grants provide seed money to fund new application development and to enhance existing Transit applications with spatial interfaces. Finally, Transit GIS staff perform high-level analyses and produce some maps for management and staff, although users are largely responsible for their own map production.

Primarily, Transit GIS supports the Transit Division users of desktop GIS software, existing and planned information systems requiring geographic data, and Transit management for decision support. A historical organizational relationship exists between Transit GIS and DOT's Transportation Planning Division, which was absorbed in the Road Services Division and the DOT Director's Office. Transit continues to support these users. Also, recent reorganization efforts within the County have led to the inclusion of the King County Airport and staff within DOT. Transit GIS will provide GIS support services and access to these staff as needed.

Customers and potential customers of Transit GIS obtain services by contacting any GIS team member by phone, e-mail or in-person. These requests are prioritized and distributed to the appropriate team member who can most effectively provide the service. Typically:

- *New users* are provided an account, have their desktop installed with GIS software and tools, and are given a brief introduction to available data, training, and basic services provided.
- *Existing users* usually require technical assistance regarding server connections, application usage, or specific data layers. At the end of 2002, there were approximately 130 existing users supported by Transit GIS. These users range in expertise from occasional users of desktop software to power users who are developing their own data and scripts to support specific work tasks.

- *Project Managers* often require project participation by GIS staff to provide necessary expertise on geographic data or functions. This task usually requires significant commitment and must be budgeted for during the prior budget cycle.
- *Non-users* usually do not need access, but require one-time-only map products or analyses. These requests come from Division staff and management, but may originate in response to requests from the DOT Director, the King County Executive or the King County Council. A challenge for Transit GIS staff is to coordinate external requests that do not require business specific expertise with KCGIS Center staff that are tasked with providing these services.

3.7B.2.1 Training

In the past, Transit offered the "Introduction to ArcView" class two times a year taught by an authorized ESRI instructor from within the County. This two-day class was available to all DOT staff on a first come-first served basis and was taught in the King Street Center training facility. It was arranged by Transit GIS, which absorbed the $75 cost per student for the manual and coordinated the installation of software on the training room computers. In 2002, the authorized ESRI instructor from within the County was not able to teach the ArcView class for no cost, so this training opportunity was cancelled and staff were redirected to more costly alternatives. In 2003, Transit staff hope to take advantage of KCGIS Center plans to offer low cost alternatives for ArcView training to County staff in exchange for coordination and hardware setup by Division GIS staff.

A second formal class offered by Transit GIS is "Introduction to the GIS Toolbox" – a Transit GIS application primarily geared to Transit staff. This one-day class is arranged and taught as many as six times a year by Transit GIS to existing and prospective users of the application. It is taught in the King Street Center training facility at no cost.

An ad hoc training opportunity also available to Transit staff is a class centered on ArcView or the GIS Toolbox and specifically tailored to the individuals taking the class. This usually takes several hours or a full day and addresses topics, questions, functions, and data of specific interest to the workgroup that have been agreed upon in advance. No special presentations, applications, or data are developed, and the class often deviates from the prepared agenda based on the needs of the attendees.

Training for GIS Professionals is primarily accomplished through attendance at GIS conferences, application workshops, technical symposia, and King County sponsored training classes. These are arranged and funded within MITT. Training for users other than discussed above is individually arranged and funded within each specific section.

In 2002 and 2003, it will be necessary for Transit GIS professionals to acquire skills with SDE as the Division implements the new transportation network database, maintenance application, and user consortium.

3.7B.2.2 Staffing Requirements

Transit GIS professionals provide primary technical support to end users and systems. They are well trained and highly knowledgeable of GIS and specific Department and Division-level databases, applications and business needs. In addition to supporting existing users, they are responsible for accommodating new users and business systems that require access to geographic information. The GIS professionals also identify potential future users that would benefit from access. As such, GIS professionals must have some knowledge of every part of the business so that they can appropriately recommend the level of GIS integration.

GIS professionals are largely responsible for maintenance of agency data layers (e.g., transportation network), development of customized end user applications, production of sophisticated analysis and map products, and support of out-of-the-box client applications that provide access to data and simple analysis tools. These staff also provide technical expertise, business expertise, training, user support, vendor software installation and maintenance and business application support. Transit GIS professionals are end-users themselves, often being called upon for sophisticated data analyses or map products that are beyond the expertise of other end-users.

There are six GIS Professionals that primarily make up Transit GIS and are documented in the table below. One of the Analyst positions listed is matrixed from the King County GIS Center Client Services to assist with development and ongoing maintenance of the Transportation Network. This FTE was moved from Transit to the King County GIS Center as part of the 2001 consolidation effort and represents those work tasks that are more "enterprise" oriented. It was recognized, however, that the assignment of tasks and direct supervision of this work effort was more effectively accomplished within the Transit GIS and Transportation network development team environment. The position, therefore, was matrixed back into Transit. Several other staff that contribute to Transit GIS are documented below.

Working Title	Focus*	Class	Status	% GIS
GIS Program Manager	Team lead, operations coordination, Transit Division liaison, training	ISP V	FTE	90
GIS Database Administrator	INFO, geodatabase, shape, SDE administration and GIS-to-Oracle interfacing	ISP IV	FTE	90
GIS Senior Application Developer	Application development and coordination	ISP IV	FTE	90
GIS Application Developer	Application development	ISP IV	FTE	90
GIS Analyst	Map production, data analysis, software installation	ISP III	FTE	90
GIS Analyst	Map production, data analysis, software installation	ISP III	FTE	90
MITT, Infrastructure and Integration Supervisor	GIS Team Supervisor, GIS Oversight Representative	ISP V	FTE	15
MITT Systems Analyst	Hardware and operating system support (NT, Web)	ISP V & IV	FTE	10
ITS Systems Analyst	Hardware and operating system support (UNIX)	?	FTE	5
MITT Oracle DBA	Oracle Database Administration	ISP V	FTE	15

* See discussion below

The matching of staff to focus is not straightforward in the Transit GIS team. Although these staff have working titles that suggest specific job duties, there is a significant amount of overlap in expertise among these individuals. Issues are often resolved collectively as a team and the workload is distributed evenly throughout the group. Certain tasks and projects assigned to the team require management, database, application and analyst expertise, and thus all team members contribute. Although one FTE of work is funded by federal grants, another is dedicated to supporting the Paratransit function, and another is dedicated to transportation network development and maintenance, all staff members participate on these projects.

In addition to permanent staff listed above, Transit GIS takes advantage whenever possible of the use of interns from the King County Intern Program. These individuals are typically students from local colleges and the University of Washington who wish to acquire GIS expertise within the transportation industry. Interns are quickly trained in the use of menu driven applications for data maintenance. As they obtain additional knowledge and expertise of Transit systems and databases, they are assigned analytical tasks that challenge their capabilities.

Server support is provided by ITS staff for DEC UNIX hardware and will continue until the NT migration is complete. An unsigned service level agreement is in place. Transit's Management Information and Transit Technology Section Server Group maintain NT servers. A signed service level agreement is in

place. Transit GIS staff have much greater direct support control on the NT servers including the ability to create, maintain, and remove user accounts, install software, and monitor performance. Transit GIS staff also directly maintain several special output devices (see below).

3.7B.2.3 Hardware and Software

The Division maintains several production and development servers that include GIS software, data and applications. These are necessary to ensure uninterrupted access to users and professionals, critical linkages to other department and division information systems, connectivity between geographic and corporate business databases, and adequate processing capacity for core applications and data access.

During 2001-2003, Transit GIS is migrating all data, applications and users from UNIX to NT. This move will benefit the Division by significantly reducing hardware replacement costs and both internal (ITS) and external (Compaq) support costs. Moving to the NT platform also positions the Division appropriately within the direction of the GIS industry as indicated by the latest software releases from ESRI. This move also gives greater control and flexibility for user account maintenance to the GIS professional rather than systems support staff allowing the GIS professional to better and more quickly serve end users.

The move to an NT platform will occur in stages throughout this time frame and therefore requires access to a production and development/test platform in both environments. After this migration, Transit GIS will no longer need access to the UNIX servers *COUGAR* and *MAZAMA*, although data will continue to be published to the Oracle Corporate data warehouse on *ORASERV1*. All servers were purchased with capital dollars as part of Transit's capital improvement program. Capitalized assets for the Transit Division used by GIS include four production and three development servers. All servers used by Transit GIS are shared with other information systems to maximize server capacity. Requirements for access to GIS data and applications and access to the shared systems on these servers are comparable (weekdays during business hours).

- *COUGAR*: DEC 2100, UNIX (4.0D), production, spatial database, application, and ArcInfo license server. Transit's GIS and Automatic Passenger Counter systems share this server. For GIS, it acts as the data warehouse and it is used for all legacy ArcInfo UNIX applications including street network editing, bus route tracing, and bus stop placement. It is also used for nightly batch processing of data prior to publication in the production spatial library and the Oracle corporate database.
- *MAZAMA*: DEC 4100, UNIX (4.0D), development/test server. Transit's GIS, Oracle corporate database, and Automatic Passenger Counter systems share this server for development and testing of applications and data prior to deployment in a UNIX production environment.
- *ORASERV1*: Compaq ES 40, UNIX (5.1A), production, Oracle database. This server houses Transit's corporate data warehouse including geographic data stored as coordinates. Most information systems publishing data for the Division post to this server, and many of Transit's information systems use this database, including GIS desktop data access applications querying spatial and non-spatial attribute data.
- *KCMOLYMPUS*: Compaq Proliant 8000, Win2000 Server, production, spatial database, application, and ArcGIS license server. Transit's GIS and route scheduling systems share this server. For GIS, it stores a copy of the GIS production library from *COUGAR* and is used for primary data and application access by GIS users. After the NT migration is complete, *KCMOLYMPUS* will be the Transit GIS production data and application server running core GIS software, data access tools, batch processing applications, and storing the spatial production data warehouse.
- *KCMBRUTUS*: Compaq Proliant 8000, Win2000 Server, development/test server. Transit's GIS and route scheduling systems share this server for development and testing of applications and data prior to deployment in a NT Server production environment. In addition, the GIS team uses this server as a file server for source code, shared files and individual backups.
- *KCMRAINIER*: Compaq Proliant DL380 G2, Windows2000 Server (SP3), production, database, file server, and web server. Transit's GIS and TSS teams share this server. For GIS, it acts as

an intranet web application server for two production applications, Safety Accident Tracking and Security Incident Reporting.

- *KCMSTHELENS*: Compaq Proliant DL380 G2, Windows2000 Server (SP3), development/test, database, file server, and web server. Transit's GIS and TSS teams share this server for development and testing of intranet web applications.

Access to UNIX servers is generally limited to GIS professionals and users of legacy ArcInfo applications through Exceed emulation software. Access to shape files and applications is obtained using the SMB protocol to map a network drive to the production library or personal areas on the UNIX server. SMB is free software that makes a UNIX server appear on the network as an NT server (http://us1.samba.org). Most GIS users access data and applications on the NT production server through standard TCP/IP protocol. Supported desktop configurations include Windows 95, 98, NT 4.0, and 2000. Testing of production applications and applications in development on the Windows XP platform will occur in 2003 in anticipation of agency-wide deployment of that platform later that year.

Transit GIS also supports two specialized output devices:

- HP 2500 Plotter (large format)
- Tally 8500 Color Printer (small format)

Users have access to the plotter for map production. Usage is tracked and individual sections are charged for paper usage. In 2003, Transit will asset replace its 3-year old HP 2500 Plotter using capital dollars from the asset replacement program

Transit GIS currently has the following license structure:

Software	Licenses
ArcInfo	
7.2.1 (UNIX)	
Core	3
Network	2
8.2 (NT)	
Core	2
Network	1
TIN	1
ArcView	
Version 8.2	
Core	5
3D Analyst	1
Spatial Analyst	1
Version 3.1	
Network Installs	20
Local Installs	6
UNIX	1
Version 2.1 (unused)	15

Software	Licenses
SDE	
8.x Server	1
8.x read/write connects	10
8.x read-only connects	2
MapObjects	
Developers Kits	
Version 1.x	1
Version 2.x	3
Deployment Licenses 2.x	40
Visual Studio Pro	1
Visual Basic	2
Exceed	6
RoboHelp Office 9.1	1

Although there are only 20 network installs for ArcView 3.1 and 40 deployment licenses for MapObjects applications, Transit GIS has a concurrent license use agreement with ESRI. This allows Transit GIS to deploy any number of network ArcView 3.1 installs and any number of MapObjects applications launched from a server as long as the total concurrent usage for each does not exceed the number of network licenses purchased. License usage is monitored using SoftTrack software and these applications are installed on more than 100 desktops.

3.7B.2.4 Budget

The proposed 2003 Transit GIS budget is as follows:

Item	Budget	Comments
Labor Costs (salary + benefits)	$439,107	Operating (3.7 FTE) and Grant (.95 FTE) only; $95,000 estimated grant reimbursement from FTA
Hardware (acquisition and maintenance)	$22,500	Hardware maintenance (½ for shared servers) including ITS charges
Software (acquisition and maintenance)	$15,000	Software maintenance on GIS licensing and license monitoring software
Training costs	$15,000	Includes GIS International and local conferences, SDE training, .NET training, etc.
Discretionary (consultants, outside services, materials, etc.)	$90,500	Plotter supplies, training manuals, subscriptions, etc. $87,500 for matrixed position from KCGIS Center

Staff funding is supplied from a variety of sources: 3.7 FTE from Operating, 0.95 from federal grants, 0.35 from capital projects.

3.7B.3 Spatial Data

The Transit Division is responsible for a variety of transportation-related data layers. Most notably, these include transit objects such as routes, stops and timepoints, as well as the street network used by the Department and other King County departments. These data are used within map based applications and as coordinate input to applications that do not use a map.

Maintenance is critical to ensure accurate data is available to the public regarding road/bridge status, transit routes and stops, and other public information systems. In particular, configuration and addressing improvement requests for the street network are received regularly from staff within DOT and from other departments.

Data enhancements and development are usually performed as part of application development efforts within the context of a project. As such these projects are discussed below in their entirety including any application enhancements or development. In 2003, application development, and hence some data enhancements and development, are being driven by the NT migration target and the implementation of the new Transportation Network. This migration has prompted the rewrite of several applications including core data maintenance programs for transit objects and the transportation network as well as batch related nightly processing applications. Spatial data development and enhancement efforts accompany these application rewrites.

3.7B.3.1 Maintenance

GIS staff within the Transit Division are responsible for the maintenance of a variety of transportation-related data layers. GIS professionals maintain some data layers directly. Specific end users within department workgroups maintain other layers using tools developed by Division GIS professionals. These are then submitted to the GIS professionals who publish the data in geographic and corporate data libraries for access by other users. Corporate libraries store business-specific data from throughout the agency including GIS and non-spatial information. Corporate data are usually data that are for general use throughout the agency and not geared toward any specific information system. For example, spatial and non-spatial bus stop attributes are corporate data because these data are necessary throughout the agency for a variety of functions. Lost and found tracking information is not corporate data because they are really only useful to one very specific information system. So “corporate” also implies a broader use for the data in the agency.

The following is a list of data layers that are maintained and that will continue to be maintained by Transit staff:

Enterprise Data

Data Name	Data Description	Update Frequency
BENLINE	Line shapes representing The George Benson Waterfront Streetcar Line derived from REVSERV as an ordered set of timepoint intervals.	As Needed
BUSBASE	Point shapes representing bus base locations (also called depots or garages). BUSBASE attributes include name, on street, cross street, and address.	None Planned
BUSSTOP	Point shapes representing Transit bus stops derived from street as a distance from an intersection along a link. BUSSTOP attributes include on street, cross street, stop type, accessibility, authorization, jurisdiction, date activated, date deactivated, bearing, distance from cross street, attributes pertaining to the stop sign and schedule holder and how they are affixed, usage by other transit properties, number of shelters, paint length, ride free area flag, side of the street, length of stop, fare zone, and zip code.	Daily
COLLECTOR	Line shapes representing collector arterials derived from STREET and King County road classification.	Daily
DEADHEAD	Line shapes representing Transit non-revenue service route footprint derived from STREET as an ordered set of links.	Daily
EMITTER	Point shapes representing Transit radio frequency emitters in support of Automatic Passenger Counter and Automatic Vehicle Location systems. EMITTER attributes include on street, cross street, associated link id, and associated bus stop id.	Daily
FREESTRT	A polygon shape representing the Transit ride-free-area derived from STREET.	Annually
FREEWAY	Line shapes representing freeways derived from STREET and King County road classification.	Daily
LANDMARK	Point shapes representing landmark locations. This layer directly supports Transit's trip planning system. LANDMARK attributes include name, abbreviated name, address, symbolization characteristics, classification, on street, cross street, and address. LANDMARK also has an associated alias table permitting a location to be referenced by multiple names.	Monthly
LOCAL	Line shapes representing local roads derived from STREET and King County road classification.	Daily
MINOR	Line shapes representing minor arterials derived from STREET and King County road classification.	Daily
NHOOD	Polygon shapes representing neighborhoods. This layer directly supports Transit's trip planning system. NHOOD attributes include the name of the neighborhood.	None Planned

Data Name	Data Description	Update Frequency
NHOODCTR	Point shapes representing the business centers for neighborhoods. This layer directly supports Transit's trip planning system. NHOODCTR attributes include the name of the neighborhood and the address of the business center.	None Planned
PARKRIDE	Point shapes representing park and ride lot locations. PARKRIDE attributes include name, on street, cross street, address, zip code, district, ownership (permanent or leased), and owner.	Monthly
PLANDIST	Polygon shapes representing Transit Planning District as defined by Facility Planners.	As Needed
PRIMARY	Line shapes representing primary arterials derived from STREET and King County road classification.	Daily
REVSERV	Line shapes representing Transit revenue service route footprint derived from STREET as an ordered set of links.	Daily
SIGNAL	Point shapes representing traffic signal locations derived from STREET (nodes) and traffic signal key.	Annually
STREET (edges)	Line shapes representing the Countywide road and street network, including such related transportation links as selected driveways, transit connections, alleys, pedestrian walkways, etc. The street network is key to the Division's business. STREET (line) attributes include name, two alias designations, address (theoretical), zip code, King County road classification, HOV, barrier (to pedestrian traversal), grade (> 6%), and overhead trolley wire.	Daily
STREET (junctions)	Node shapes representing intersections of line shapes. STREET (junction) attributes include transit timepoint key and traffic signal.	Daily
SUBSTATN	Point shapes representing electrical distribution nodes for overhead wire trolley system. SUBSTATN attributes include name, address, type, supplier, label, and kilowatt-hours.	Annually
TIMEPT	Point shapes representing Transit timepoints derived from STREET (nodes) and timepoint key. These are locations where expected bus arrival times are calculated.	Daily
TRNSAREA	Polygon shapes representing Transit planning districts as defined by Service Planners.	None Planned
TRNSCNTR	Point shapes representing transit center locations. TRNSCNTR attributes include name, on street, cross street, and address.	Annually
TRNSFACL	Point shapes representing transit facilities other than P&R, bus bases, and transit centers. TRNSFACL attributes include name.	None Planned
TROLLEY	Line shapes representing streets that have overhead trolley electrical lines derived from street. TROLLEY attributes include those attributes found on STREET shapes.	Annually
TUNLSTN	Polygon shapes representing transit tunnel stations. TUNLSTN attributes include the name of the tunnel station.	None Planned
TUNNEL	A polygon shape representing the Transit tunnel.	None Planned

Data Name	Data Description	Update Frequency
WTRTAXI	Line shapes representing the Water Taxi route derived from REVSERV as an ordered set of timepoint intervals.	As Needed

The following layers are not distributed to the KCGIS Spatial Data Warehouse because they contain sensitive business information, personal employee information, or are used for internal business purposes only:

Agency Data

Data Name	Data Description	Update Frequency
INCIDENT	Point shapes representing transit security incidents. INCIDENT attributes include date, route characteristics, on street, cross street, and items describing the incident type.	Daily
ACCIDENT	Point shapes representing transit accident locations. ACCIDENT attributes include date, time, status, reviewed, road conditions, weather, judgment, severity, route and vehicle characteristics, FTA codes, on street, and cross street.	Daily
COMFSTN	Point shapes representing transit comfort stations (driver restroom facilities). COMFSTN attributes include owner and contact information, availability during the day, routes that have access on street, cross street, and address.	Monthly
DART	Polygon shapes representing Dial-a-Ride service area for Transit.	Monthly
FAREZONE	Polygon shapes representing Transit fare zones for King County Metro, Community Transit, Pierce County Transit, and Sound Transit.	Annually

3.7B.3.2 Enhancement

Data enhancement efforts for 2003 will primarily be in response to three major projects:

1. The first project is a data enhancement project and application rewrite for Transit Security (started in 2002 and to be completed in 2003). Transit GIS originally developed this database, data entry application, and intranet reporting tools in a VB environment. Transit Operations has requested enhancements to the database to add specific functionality for tracking security incidents. Enhancements to the database will necessitate modification to the data entry application and intranet reporting tools. Transit GIS is taking this opportunity to rewrite the data entry application using web-based technology. This will simplify deployment and ongoing maintenance of the application since Transit Security staff are located at Central Base and support staff are in the King Street Center. The existing web reporting tools will also require significant development to incorporate changes in reporting needs of the agency including charts and graphs comparing incident counts for different times. The funding sourced for this effort is Transit capital dollars. There are no significant internal or inter-departmental coordination issues for this effort.
2. The second project is the development of a bus stop information system (SIS) (started in 2001 and to be completed in 2003). The spatial database for stops is currently an ArcInfo route system and the maintenance application was written using AML. Both of these environments are antiquated and require rewrite as part of the NT migration target. Stop attribution and sequencing tools are also antiquated and staff requirements have grown beyond the capacity of the technology used in these systems. This project will merge stop attribution and stop sequencing along a route with stop placement into a single map-based application. A new database design is required to support the system. Transit GIS is working with the Transit Systems Support Unit

(Oracle DBAs and database architects) to develop the database. The application is being developed in a modern Microsoft Visual Basic development environment and the database is being migrated into Oracle with new tools and a significantly improved mechanism for placing stops on the street network. This data and application development effort is being funded by Transit capital dollars largely for the database design and federal grant dollars for application development. There are no significant internal or inter-departmental coordination issues for this effort.

3. The third project is a major development effort to create a new high-resolution transportation network and a maintenance plan to ensure the continued accuracy and completeness of the data layer (started in 2002 and to be completed in 2003—code named TNET). The current GIS Street Network was created in 1993 by a consortium of agencies throughout King County. This fundamental data layer supports critical Transportation business needs for almost all core business functions. When first created, the GIS Street network was the best data source available at the time. Based on the free Census Tiger files, this network still contains numerous errors in street locations, names, addresses, as well as missing streets. Although minimally suitable for the applications at that time, this critical data layer has been steadily deteriorating in terms of accuracy and coverage/completeness as King County has experienced rapid growth. At the same time, new business needs and advances in technology have created greater demands for a higher quality, more comprehensive transportation network. The new network will provide multi-modal transportation analysis capabilities including ferry, rail, vehicular, pedestrian, bike, and equestrian modes of travel. It will also support the next generation of GPS technology used within Road Services now and expected to be used by Transit for Automatic Vehicle Location (AVL) systems. The project will solicit input on data and application requirements from expected participants of a maintenance consortium. Initially this will be several King County Departments including DDES, Emergency Services, and Road Services, but will eventually include King County cities and possibly neighboring counties. Transit GIS will coordinate the effort among the participants with assistance from the KCGIS Center. The KCGIS Center will also be requested to assist in writing a sole source argument and contract with ESRI to perform much of the work. King County ITS will be involved as we expect to deliver data to participating agencies for maintenance using INET. It is expected that the maintenance application will use ArcGIS 8.3, SDE, and Oracle. This data and application development effort is being funded by Transit and Road Services capital dollars.

3.7B.3.3 Development

There are no Transit data development efforts scheduled for 2003.

3.7B.3.4 Metadata

Spatial data documentation in the KCGIS Spatial Data Warehouse is regularly maintained using Doctool.

3.7B.4 Spatial Applications

The Transit Division is responsible for a variety of transit-related spatial applications. Most notably, this includes data maintenance applications for transit objects and the transportation network. Applications for nightly batch processing are also critical to ensure timely data availability to end users, integrity and comparability between the spatial data warehouse and the Corporate Oracle databases. Application maintenance, enhancements and development are generally performed on a test/development server before being deployed into production.

Maintenance of AML, UNIX script, other interpreted language applications, and web-tools can generally be performed in real time after testing is complete. Compiled applications, given the time required to reinstall on users' desktops, require staged implementation of bug fixes. Bugs and enhancement requests from users for the Transit GIS Toolbox, for example, are tracked in an Access database, implemented as time permits in design code, and redeployed on user's desktops to coincide with major enhancement improvements. Users are notified of bugs that occur in the application.

Application enhancements and development are usually performed as part of data development efforts within the context of a project. As such, some of these projects were discussed in the Spatial Data section above. In 2003, the NT migration target and the transportation network development effort are driving data and application enhancements. The migration of all applications and spatial data off of UNIX servers (see above) has prompted the rewrite of several applications including core data maintenance programs for transit objects and the transportation network. Spatial data development and enhancement efforts often accompany these application rewrites.

3.7B.4.1 Maintenance

The following is a list of applications that are maintained and that will continue to be maintained by Transit GIS staff:

Front-End Applications

Name	Description	Language
AS	This application is an ArcView 3.x extension. It provides Accessible Services staff with an simple easy-to-use menu interface for creating transit fixed route service footprints based on time of day.	Avenue
Avmaps	This application is an ArcView 3.x extension. It provides all ArcView end users with a simple easy-to-use menu interface for adding layers to a view from the Transit public library. It also provides end users with a simple easy-to-use interface for creating a layout with title, north arrow, disclaimer, scale bar, date, legend and view that adhere to the King County GIS Cartographic Standards.	Avenue
Avtabs	This application is an ArcView 3.x extension. It provides customer information analysts with a simple easy-to-use menu interface for graphically showing bus stop signage installation routes.	Avenue
Btreport	This application provides Customer Information analysts with reports identifying data integrity and missing data issues. These reports are typically reviewed prior to an extract of data from the corporate database to downstream information systems.	AML
Transit GIS Toolbox	This application provides users an easy-to-use menu interface for accessing the vast array of geographic data available in Transit's GIS and corporate data available in Transit's Oracle distribution database. Together, these databases store the agency's spatial and non-spatial information for future, current and past service changes. Although designed for all Transit staff, the *Transit GIS Toolbox* has several modules with functionality designed for specific work groups. These include: • Ridership – Calculates Transit ridership at user specified locations. • Stop Editor – Bus stop placement tool. • TOE -- Maintaining route paths and time point locations.	VB
Gis2atis	This application converts data from the GIS production library for use in the Automated Traveler Information System or Trip Planning application by customer information analysts. It is scheduled to be replaced in 2003.	AML
Moemitter	This application provides Radio Maintenance staff with an easy-to-use menu interface for maintaining vehicle location emitters. These emitters are used within the Automatic Passenger Counter (APC) system and the Automatic Vehicle Location (AVL) system. It is scheduled to be replaced in 2003.	VB

Name	Description	Language
Safety DMS	This application provides safety and operations staff with a tool for entering accident information, tracking accidents through the legal process and reporting on accidents.	HTML
Security DMS	This application provides security and operations staff with a tool for entering security incident information, tracking incidents through the legal process and reporting on incidents. It is scheduled to be replaced in 2002/2003 as part of the Security project.	VB
Security Reports	This application provides agency staff with the ability to generate reports on security incidents. It is scheduled to be replaced in 2002/2003 as part of the Security project.	HTML

Back End Applications

Name	Description	Language
Kcsnedit	King County Street Network Editor. This application is the primary tool used by Transit GIS staff for maintaining the street network links, nodes and attributes. It is scheduled to be replaced in 2003 as part of the transportation network project and as part of the NT migration target.	AML

Utility Applications

Name	Description	Language
Aspmail4	This application is a remote mailing application used to notify clients and support analysts of data issues and nightly process status.	ASP
Avl_tpiupdate	This application updates several object tables in Oracle as a result of edits to those objects in GIS. These tables are specifically used by interface applications such as the GIS Toolbox to improve functionality and are not part of the corporate data. It is scheduled to be replaced in 2003.	AML
Avlschedbuild	This application creates transfer files for the interface application used by Automatic Vehicle Location (AVL) Coordinators. These files are necessary for the AVL application to track bus locations on a daily basis.	VB/SQL
DataConn	This is a COM object that provides a centralized ODBC data connection for use by various applications that connect to the Transit Oracle database.	VB
Dbcompar	This application compares data in GIS with data in the Oracle corporate database and reports on any inconsistencies to Transit GIS staff. It is scheduled to be replaced in 2003.	AML
Emit_chg	This application compares emitters from the previous day and reports on any changes (inserts, updates or deletes) made by Radio Maintenance staff to APC staff. It is scheduled to be replaced in 2003.	AML
Kctran2nat	This application transfers Transit and street network related coverages to the KCGIS Spatial Data Warehouse. It is scheduled to be replaced in 2003.	AML

Name	Description	Language
Mnt2prd	This application transfers transit objects and the street network in the maintenance area, which has restricted access, to the production library for access by end users. The application also creates derived data layers from core data (e.g., freeways from the street network). It is scheduled to be replaced in 2003.	AML
Plib2prd	This application transfers data from the KCGIS Spatial Data Warehouse to the Transit GIS library. It is scheduled to be replaced in 2003.	AML
Toeddb	This application processes inserts, updates and deletes made using the *TOE* and *Kcsnedit* applications and sends them into the Oracle Transit corporate database for access by other systems. It is scheduled to be replaced in 2003 as part of the NT migration target.	AML
Toetow	This application merges transit objects modifications/additions/deletions using the *TOE* application with street network edits maintained using the *Kcsnedit* application. These applications work on copies of the street network and it is necessary to combine the separate edits onto a single network at the end of the day. It is scheduled to be replaced in 2003 as part of the NT migration target.	AML

3.7B.4.2 Enhancement

Application enhancement efforts for 2003 will primarily be in response to four major projects.

1. The first project is a data enhancement project and application rewrite for Transit Security. Transit GIS developed this database, data entry application, and intranet reporting tools. Transit Operations has requested enhancements to the database to add specific functionality for tracking security incidents. Please see the discussion in the Transit Data Enhancement section of this chapter.
2. The second project is the development of a bus stop information system (SIS). This project is currently underway and is expected to be completed in 2003. It will merge stop attribution and stop sequencing along a route with stop placement into a single map-based application. Please see the discussion in the Transit Data Enhancement section of this document.
3. The third project is a major development effort to create a new high-resolution transportation network and a maintenance plan to ensure the continued accuracy and completeness of the data layer. Please see the discussion in the Transit Data Enhancement section of this document.
4. The fourth project is the rewrite of all legacy ArcInfo AML and UNIX scripts as part of the NT migration target. This includes the following applications: *Btreport, Gis2atis, Kcsnedit, TOE, Avl_tpiupdate, Dbcompar, Emit_chg, Kctran2nat, Mnt2prd, Plib2prd, Toeddb,* and *Toetow*. See above for descriptions of these applications. These applications include utility and front-end interfaces. They will probably be written as COM objects and scheduled in the NT server environment using the Microsoft scheduling tools. See above for more information on the NT migration target. Transit GIS has secured assistance from GIS Center analysts to assist in completing this task.

It should be noted that the SIS application will be a module of the Transit GIS Toolbox. This application will require some functionality change to accommodate the requirements of this new module.

3.7B.4.3 Development

In late 2002, Transit GIS started development of a new application for the Transit Accessible Services workgroup. This application is being written in Avenue and will be deployed as an extension, as the client is already familiar with ArcView 3.1. It is designed to facilitate the creation of fixed route transit service

footprints based on time of day and service type (day of week). These are used to identify the service area for paratransit services. This application will be completed in early 2003.

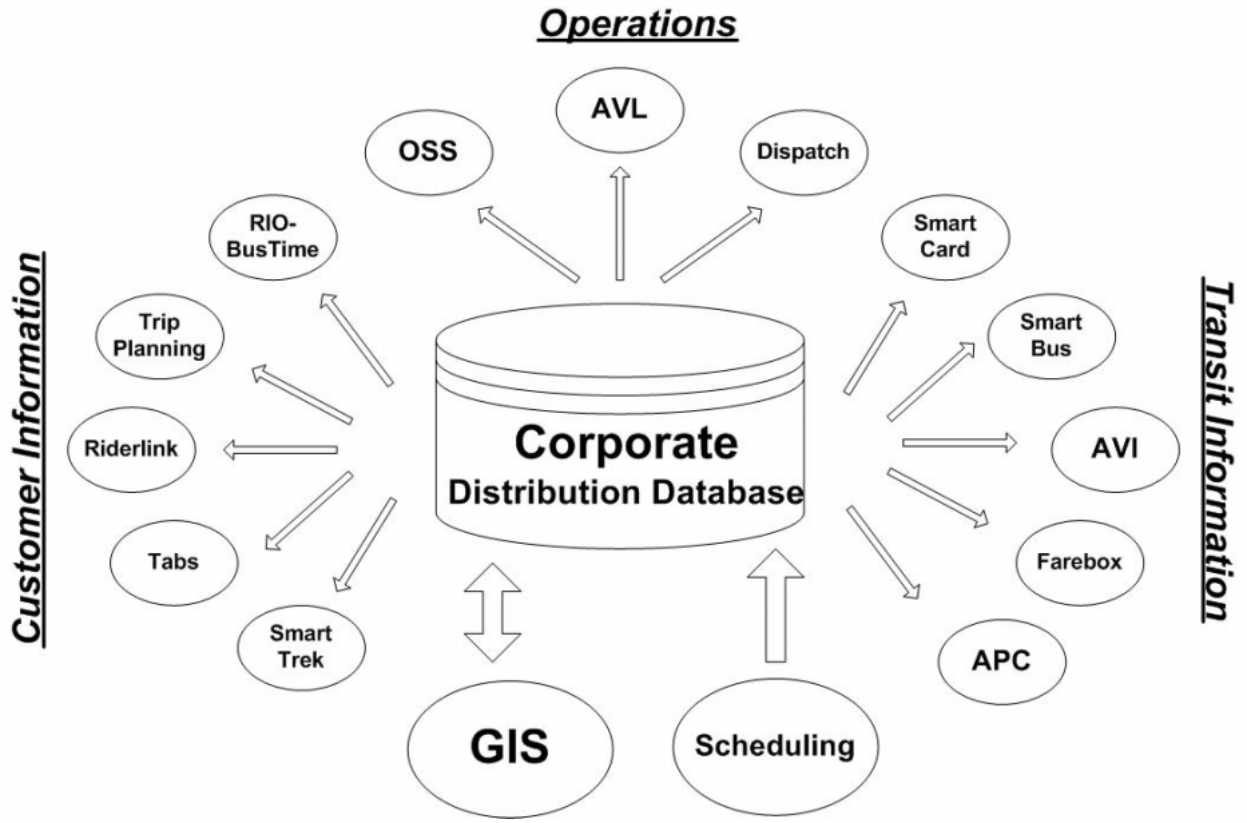
3.7B.4.4 Documentation

Code level documentation including headers for scripts are generally available for all applications. These include history sections that document any application modifications. User help files have been developed using Robohelp for the Transit GIS Toolbox and all modules. This documentation will continue to be maintained. User help for applications with user interfaces that are being rewritten as part of the NT migration target and the transportation network will be created as part of application development efforts using Robohelp. No plans exist to provide any further documentation of applications in 2003.

3.7B.5 System Integration

System integration of geographic data within Transit is essential since spatial data is used in conjunction with non-spatial business specific data to drive many transportation information systems. Integration is facilitated through GIS staff participation on teams specifically tasked with coordinating information technology infrastructure. This was addressed in the GIS Program Overview section above.

Data coordination is further facilitated by publication of data to an Oracle corporate distributed database that allows for the synchronization, validation, and delivery of data from disparate sources, including GIS. This database is maintained outside of the GIS workgroup by fulltime database administrators that coordinate the transfer of data between systems throughout the agency. GIS and Transit Scheduling are primary stakeholders of this database and provide the core information used by many "downstream" systems (see schematic below).



Schematic showing flow of information primarily from GIS and Scheduling to Transit "downstream" systems (Operations, Customer Information, and Transit Information) through the corporate distribution database.

GIS works very closely with all of these clients and database administrators of the corporate database to ensure that information is accurate, timely, and available. Spatial data is only one piece, but essential for the operation of these systems. Also, given GIS' unique capability to provide a spatial framework, many business data management systems are incorporating interfaces to geographic data to maintain Transit data. Transit's security and safety data maintenance systems access on-street and cross-street data for geocoding incident locations. Route tracing and bus stop placement applications use a map to assist in the placement and handling of these objects. In almost all cases, the transportation network is fundamental to providing that spatial framework. Much of Transit GIS is centered on real-time transportation network data maintenance activities, other data maintenance activities that depend upon the transportation network, applications that deliver transportation network data for use in other systems, etc. This effort is justified given the importance of the transportation network for information systems within Transit, the Department of Transportation, and beyond. The new transportation network must directly support the needs and requirements of other County departments and points to a greater need for system integration between Transit GIS staff, Road Services GIS staff, and GIS staff in other agencies. Furthermore, a greater need for system integration is necessary to incorporate much of the County road-related information with transit, transportation planning, and facilities management data. The new transportation network and maintenance consortium will be the framework on which these data are integrated starting in 2003.

3.7B.5.1 RDBMS Backend Support

Until very recently, Transit spatial data was solely maintained in ArcInfo coverages. These data were converted to static shapefiles for use in ArcView to enhance performance, and loaded to the Oracle distribution database for use by other systems. The flow of edits was always from ArcInfo to shapes and Oracle tables; changes were never made directly in Oracle or to the shapefiles.

This maintenance structure has resulted in a significant effort to synchronize coverages and shapefiles as well as Oracle tables. Technical problems with this synchronization have led to the occasional delivery of bad data to client systems. Furthermore, the maintenance of spatial business data often depends on information from other systems, which must first be loaded into the distributed database, and then downloaded into GIS before spatial attributes can be assigned and loaded into the distributed database to complete the picture. This process can take days because of the need to deliver information back and forth between proprietary systems.

Over the last several years with a shift in development platforms from AML to MapObjects, Transit spatial point data maintenance (safety incidents, security incidents, emitters, timepoints completed; bus stops in 2003) has been migrated from Info to transactional processing directly in Oracle. This has allowed for real-time updates or a single nightly load to update production data. Furthermore, information in the distribution database loaded from other systems is immediately available to these applications. Maintenance of linear features such as transit routes that simply reference the transportation network has also been moved to an application that manages data directly in Oracle.

As more and more data are maintained directly in Oracle, static shapefiles will continue to be generated in support of ArcView users. Info databases will be phased out for geodatabases where topology or the maintenance of polygonal features is required. Starting in 2003, the Transit GIS team will begin testing SDE with the ultimate goal of moving all primary geoprocessing functions and data storage into Oracle.

3.7B.5.2 Other Data Management Activity

Transit coordinates centralized databases for access by information systems throughout the agency. GIS is one of these systems that both provides critical geographic data, but also uses core agency-specific data supplied by other workgroups. Major changes in these central databases can have an impact on GIS as a stakeholder. GIS-database interfaces may require modification, and real-time GIS applications are dependent upon the stability of central databases and associated hardware.

3.7B.6 Client Services and User Support

Client services and user-based support were described under the GIS Program Overview section above, but are summarized here:

Customers:

- Transit Division staff, management, and systems.
- Transportation Planning staff in the Road Services Division.
- Transportation Planning staff in the DOT Director's Office.
- King County Airport.
- King County Executive.
- King County Council.
- King County residents.

Services:

- Support multiple ongoing Transit business systems and functions.
- Create, maintain, analyze and deliver transit geographic information to support Transit Division staff and automated systems.
- Provide transit map/data products, user support, vendor software installation and maintenance and Transit applications support.
- Ensure Transit GIS tools and data are available to users through troubleshooting and updates.
- Provide Division user support including technical expertise, Transit business expertise, application troubleshooting and training.
- Work closely with Community Transit, Pierce Transit and King County GIS on data/application sharing and coordination.
- Serve as the Transit GIS focal point and represent the Division to all other County work groups regarding GIS matters.

Service Processing:

- Requests are received through e-mail, phone, or in-person contact to any GIS team member.
- Requests are evaluated based on knowledge to complete the task, workload/availability, and priority.
- Individual staff receiving the request may complete the task, coordinate with other team members, or consult the Program Manager.
- All service requests are documented in an Excel spreadsheet.

Service Delivery:

- Requests for information, troubleshooting, training, expertise, and other such services are provided via e-mail, phone, or in person as necessary.
- An e-mail list of users with access to GIS applications and data is maintained to facilitate broadcast communications.

- SoftTrack license monitoring software facilitates broadcast messages to users currently accessing the system.
- Requests for map products are generally addressed by training and providing system access to the requesting staff.
- Long-term consultations for projects are planned and budgeted for in subsequent fiscal years.

***Changes for 2003**:*

No specific changes are expected in 2003.

3.7C King County International Airport

The King County International Airport's primary function is to provide a self-sustaining and regulatory compliant system of facilities at which a wide variety of aircraft can operate safely and efficiently. The airport supports commercial, corporate, cargo and military aviation, as well as general aviation and aviation manufacturing. The airport currently uses GIS in its planning and property management functions, but anticipates also using it for engineering, maintenance and administrative functions.

3.7C.1 Business Functions

The airport's business functions, which currently use GIS or plan to do so in the near future, include:

Planning --This function's purpose is to forecast and address future needs. The planning function includes work elements from across the organization. Other planning program functions include financial, program, maintenance and property management planning, as well as legislative and policy planning.

The airport's Planning section, responsible for long-range planning, uses GIS for development and updating of graphical planning materials and is the only work unit currently using GIS. Planning anticipates using a GIS-based application for KCIA's Airport Layout Plan and proposed improvements.

Environmental Management--This program assures that the airport operates in an environmentally safe manner. Elements of the program include ground and surface water management, soils protection and remediation, noise monitoring and reduction and air quality protection. The airport is in the process of developing data layers of environmental information. The airport's noise office uses a non-GIS proprietary mapping system for noise monitoring and tracking. As the airport's noise mitigation program is implemented, the airport may use GIS to track participant data.

Safety--The safety program assures that aircraft and their operators are safe while operating at KCIA. The program is responsible for the airport meeting all federal, state and local safety requirements. In addition, the program coordinates emergency response planning and activities for the airport. This business function also includes law enforcement and fire fighting services (ARFF), which the airport contracts from the King County Sherrif's Office. The airport currently does not use GIS to identify or track safety or security related items, but anticipates adding hazardous materials and emergency response information to its GIS database.

Property Management--The property management program assures that the airport is a self-sustaining and fiscally prudent enterprise. Program services include leasing, tenant relations, and capital development. The airport has developed historical lease data layers going back to the development of the airport in 1928.

This business function also includes capital development, maintenance and repair. Functions related to capital development include planning, property management, engineering and construction management. Engineering is responsible for all engineering and construction management. Airport Maintenance maintains and repairs all airport facilities, including the airfield, utilities, and structures. Design and construction documents are currently developed in CADD; some documents, including drawings and technical reports, have been transferred to the airport's GIS database. Additional current and historical documents will be transferred on an ongoing basis to meet specific program needs. The airport anticipates that information on construction and maintenance of pavement, facilities and utilities will be included in the GIS database and may be integrated with a maintenance management system.

3.7C.2 GIS Program Overview

The KCIA GIS function is divided between the KCGIS Center and the airport. The KCGIS Center staff designed and maintains the airport's current GIS and related database information. The airport anticipates continued use of the KCGIS Center to support and upgrade its GIS data and related database.

The GIS support function falls within the airport's Finance and Administration section. Current KCIA internal GIS support is limited to the WAN Administrator and a GIS Intern. Although some airport

employees have received ArcView training, they rely primarily on the KCGIS Center, the KCIA WAN Administrator and the GIS intern for map production.

To date, the KCIA GIS program has been primarily focused on providing planning and property management information, specifically property use and assessment data, lease and structures data, and environmental data. Starting in 2003, the airport anticipates adding safety and facility information.

3.7C.2.1 Training

The Airport relies on the KCGIS Center for the majority of GIS related development work, which has reduced internal training requirements. The KCIA WAN Administrator has attended the ESRI introductory and advanced classes, and training for the GIS-related Oracle database. The GIS Intern received training as a GIS student at the University of Washington. KCIA administrative, planning and engineering staff members have taken ESRI's ArcView 3.x introductory course. The airport anticipates providing additional training to staff in 2003, including KCGIS Center user training for migrating to Arcview 8 and for ArcGIS I, and ESRI training for Airport technical staff.

3.7C.2.2 Staffing Requirements

KCIA GIS development and maintenance support is primarily provided by KCGIS Center staff. User support is provided at times by the KCGIS Center, but the airport's WAN Administrator and GIS intern provide general and project on-site support. This level of support meets KCIA's current needs.

3.7C.2.3 Hardware and Software

KCIA hardware used for GIS includes two personal computers specified for GIS support. Three other PC's are used occasionally for GIS work. The airport currently has two Arc 8 licenses and two ArcView 3.2 licenses. These are managed by the airport's Finance and Administration section. The KCGIS Center utilizes the ARC/Info 7.02 enterprise license for production work.

The airport's GIS data is stored on the KCGIS Center's Orca server at the King Street Center. The airport utilizes the County's WAN/INET Network via a router at KCIA to connect to the Orca server located at King Street Center. KCIA staff occasionally uses the Wildfire server and the county's ArcInfo 7.0 enterprise license for production work. At this time all the airport's GIS data resides on Orca. This data supports one of the airport's critical projects. During 2003 airport staff will work with the KCGIS Center to determine if a separate server or Network Attached Storage device should be located at the airport. Center staff will also assist in identifying options for other hardware and software document management support.

3.7C.2.4 Budget

The 2003 Proposed budget includes $97,620 for ITS-GIS Development. Funding for the airport's internal GIS costs is included in the airport's Finance and Administration budget or specific project budgets.

3.7C.3 Spatial Data

The KCGIS Center has developed a number of data layers for specific projects. This data is maintained by the KCGIS Center, but is not included in the public library due to its sensitive nature.

The following table details the current KCIA data layers that are co-maintained by the KCGIS Center and KCIA.

Layers in SDE (all within the PROPERTY.Airport documentation dataset) include the following:

Layer Description	Layer Name	Maintenance and Update Frequency
building footprints digitized from imagery	BUILDINGS	irregularly as needed
leaseholds digitized from imagery	LEASEHOLDS	irregularly as needed

Layer Description	Layer Name	Maintenance and Update Frequency
leaseholds COGO'ed from legal descriptions in other documentation	LEASEHOLDS_COGO	irregularly as needed
adjunct layer for leaseholds_cogo to define true points of beginning	LEASE_TIELINES	irregularly as needed
spatial extent of rectified map imagery	MAP_SOURCE	none planned
extents of airport property acquisition in historical context	OWNERSHIP_HISTORY	irregularly as needed

Associated project shapefiles include:

Layer Description	Layer Name	Maintenance and Update Frequency
Surface water drainage basin for Slip 4: digitized from multiple sources, including existing imagery and CAD drawings. Located on Orca.	swdbslip4.shp	none planned

3.7C.3.1 Maintenance

Maintenance of the data layers is provided by the KCGIS Center.

3.7C.3.2 Enhancement

Data enhancements are done as part of specific GIS projects by KCGIS Center staff. Data enhancements to be completed by the KCGIS Center in 2003 may include:

- Addition of engineering technical document analysis data to the Oracle database,
- Addition of business and technical document images to the database,
- Addition of hazardous materials and other safety and security data,
- Review, identification and addition of new lease data.

3.7C.3.3 Development

Other than development of a new survey layer and safety/security data, 2003 development will be limited to specific project needs. The KCGIS Center will assist the airport in developing an overall data structure for document management, as well as responding to currently unidentified project requirements.

3.7C.3.4 Metadata

No metadata is currently attached, but will be developed at a later time.

3.7C.4 Spatial Applications

KCIA utilizes a limited number of spatial applications. These are LeaseEdit and LeaseQuery. These applications were developed and are maintained by the KCGIS Center and used almost exclusively by four airport staff members. LeaseEdit is not specifically a spatial application, but is rather a database-driven document management tool for lease information that is directly related to the spatial layers listed above. LeaseQuery is an Arc8 application that displays spatial information, relates the spatial layers to the document management information and displays maps and reports.

3.7C.4.1 Maintenance

The KCIA spatial applications are maintained by the KCGIS Center.

3.7C.4.2 Enhancement

The airport will continue development of its Information Management system in 2003. This will require modifying edit and query tools for other types of documents. The Airport has identified development of a new user interface to allow broader use of data throughout the airport and the addition of data from more Airport sections to be priority projects in 2003.

3.7C.4.3 Development

New application development will include an improved user interface to allow users to easily create layouts and add layers, as well as creating reports from the data-base with or without a GIS reference.

The airport and the KCGIS Center will also review existing KC applications to see if they may be used or modified for airport use.

3.7C.4.4 Documentation

The KCGIS Center provides documentation for KCIA GIS data and processes.

3.7C.5 System Integration

Currently, there is no integration of GIS with other KCIA systems, but new applications will likely incorporate data from multiple sources (accounting, maintenance, and engineering). During 2003, the airport will work with the KCGIS Center to ensure that required interfaces are developed to support integration with other airport systems as necessary.

3.7C.5.1 RDBMS Backend Support

KCIA's current GIS database is managed by the KCGIS Center and resides on Wildfire in the Oracle Database. At this time, KCIA anticipates continuing to use these services.

3.7C.5.2 Other Data Management Activity

KCIA uses KC personnel, payroll, procurement and financial management systems. The KCIA maintenance section currently uses an unsupported PC- based maintenance management system, which is not integrated with any county systems. The airport anticipates replacing this system within the next two years.

3.7C.6 Client Services and User Support

The airport will use KCGIS Center as required for projects. KCIA staff members will continue to provide basic user support for regular GIS activity. The airport will continue to provide GIS training to staff members who regularly use GIS to reduce general user support needs.

3.8 King County Sheriff's Office

King County Sheriff's Office Geographic Information System

Vision

To create a Geographic Information System (GIS) with advanced mapping capabilities to serve the citizens of King County, the King County Sheriff's Office and its contract cities.

Mission

To work collaboratively with other King County departments and their GIS units to stay aware of GIS standards and to produce and provide data and applications that are as accurate as possible, consistent, accessible, affordable and comprehensive for both internal and external customers, while meeting the unique business needs of the King County Sheriff's Office.

Objective

To demonstrate to staff and customers that GIS is an important tool for a modern law enforcement agency, by delivering/providing tools/products that are powerful, flexible and relevant to the mission of the King County Sheriff's Office.

3.8.1 Business Functions

Primary responsibility for GIS in the King County Sheriff's Office is vested with the Supervisor of the Research, Planning & Information Services Unit (RP&IS). RP&IS is an important part of the Technical Services Division and is a multidisciplinary unit with crime analysis being a key responsibility. While KCSO and RP&IS do not have any personnel with full-time GIS responsibilities, 4 RP&IS Unit staff members are well versed in ArcView 3.2 and use it on a regular basis.

3.8.2 GIS Program Overview

The KCSO has been using ArcView software for the last 4 years. The primary use is for crime mapping. Several members of the RP&IS Unit are power users and have produced a variety of map products.

3.8.2.1 Training

4 RP&IS power users have received ArcView training. KCGIS Center Client Services training has been used as a training source.

3.8.2.2 Staffing Requirements

The KCSO and RP&IS do not have any personnel with full-time GIS responsibilities. The RP&IS Supervisor coordinates the use of GIS and related technology within KCSO. Currently there are 4 RP&IS crime analysts who are power GIS users.

3.8.2.3 Hardware and Software

ArcView 3.1, 4 licenses in regular use

Spatial Analyst extension, 4 licenses in regular use

CrimeView extension, 4 licenses in regular use

3.8.2.4 Budget

Item	Budget	Comments
Labor Costs (salary + benefits)		
Hardware (acquisition and maintenance)		

Item	Budget	Comments
Software (acquisition and maintenance)		
Training costs		
Discretionary (consultants, outside services, materials, etc.)	$20,000	Item(s)/project(s) to be determined – once identified KC G.I.S. Center Client Services will be utilized

3.8.3 Spatial Data

Current data sources include computer aided dispatch information, follow-up/investigative data and registered sex offender information. KCSO & RP&IS are very much involved in regional information sharing with other law enforcement agencies. Data from these agencies is becoming available and will also be used.

3.8.3.1 Maintenance

Data and applications are backed up on a regular interval.

3.8.3.2 Enhancement

KCSO would benefit greatly from improved accuracy and completeness in the KCGIS street network data. To that end, KCSO & the KC G.I.S. Center are collaborating on updating and keeping the ST_ADDRESS layer current.

3.8.3.3 Development

No internal KCSO GIS data development is currently planned.

3.8.3.4 Metadata

N/A

3.8.4 Spatial Applications

Web-based applications may be possible - potentially a site that can be used by the public for basic crime information. This will likely be based on an ArcView extension called CrimeView.

3.8.4.1 Maintenance

N/A

3.8.4.2 Enhancement

N/A

3.8.4.3 Development

N/A

3.8.4.4 Documentation

N/A

3.8.5 System Integration

N/A

3.8.5.1 RDBMS Backend Support

Primary data sources are SQL Server or Oracle, supported by RP&IS or other KCSO staff.

3.8.5.2 Other Data Management Activity

N/A

3.8.6 Client Services and User Support

RP&IS provides the following types of services to a variety of clients. (The client list includes Field Operations Division (patrol), Criminal Investigations Division (major crimes), 13 contract cities and other law enforcement agencies.)

- Custom map product development
- Custom data development (non-G.I.S.)
- Crime statistics and analysis
- End-user training

3.9 Metropolitan King County Council

The 13 member Metropolitan King County Council is the policy determining body of the County and exercises all legislative powers authorized under the King County Charter. These include, but are not limited to: the adoption and enactment of ordinances, levying of taxes, appropriation of funds, establishment of compensation levels for County employees, and the organization of administrative offices and executive departments.

GIS services for the Council are provided by its committee staff, a group of professionals that support the Council's legislative committees.

3.9.1 Business Functions

The Committee staff uses GIS to support the Council in its policymaking role by manipulating and presenting geographic data in the form of maps, graphics, data files, reports, and spatial analysis. The objective is to provide data and information that will assist Councilmembers in their roles as policymakers in a host of issue areas, including but not limited to: land use, transportation, public health and safety, human services, utilities, technology, and the environment.

3.9.2 GIS Program Overview

The Council does not have a stand-alone GIS unit, but uses a GIS Coordinator to assist the Committee staff in utilizing GIS. The Coordinator serves as a liaison between Committee staff and the broader GIS community, and is responsible for coordinating training, procuring data, routing requests, and enlisting the help of other departments on complex projects. The GIS Coordinator also serves as the Council representative to the GIS Technical Committee.

3.9.2.1 Training

Council staff utilizing GIS participate in training offered through the KCGIS program. Anticipated training needs for 2003 include refresher courses in the latest version of ArcView for the GIS Coordinator and for 1 or 2 additional staff. The Council anticipates similar training needs for the next few years beyond 2003. The Council pays for GIS training with resources from its general training fund. There is currently no in-house training of GIS end-users.

3.9.2.2 Staffing Requirements

The Council has one GIS Coordinator who devotes approximately 15 percent of her time to this function (this includes time spent creating maps and performing GIS analysis). Additionally, a limited number of the Committee staff have received GIS training and utilize GIS on an as-needed basis. This has proven an adequate level of staffing to this point.

3.9.2.3 Hardware and Software

ArcView 3.2 is loaded locally on two Gateway 2000 workstations; correspondingly, the Council maintains two ArcView licenses. The Council GIS operates in a PC environment running on Windows 2000, and includes one plotter (HP DesignJet 755CM). No new licenses are anticipated in 2003. The Council utilizes the KCGIS Spatial Data Warehouse for its data needs, and does not store GIS data locally.

3.9.2.4 Budget

Item	Budget	Comments
Labor Costs (salary + benefits)	$0	See comments below
Hardware (acquisition and maintenance)	$0	See comments below
Software (acquisition and maintenance)	$0	See comments below

Training costs	$0	See comments below
Discretionary (consultants, outside services, materials, etc.)	$12,500	KCGIS Center Client Services budget

Because GIS represents a relatively small part of the Council's budget, resources are not allocated at the line-item level. Rather, GIS labor, hardware, software and training costs are funded on an as-needed basis from the Council's overall budget. The exception to this is the dollar amount budgeted for KCGIS Center Client Services.

3.9.3 Spatial Data

The Council does not have responsibility for developing, maintaining, or enhancing spatial data or metadata, but utilizes data and information housed in the KCGIS Spatial Data Warehouse to create maps and conduct spatial analysis. The most frequently used data layers include parcels, land use and zoning, sensitive areas, council district boundaries, voting precincts, city boundaries, potential annexation areas, street network and annotation, parks trails and open space, natural resources (agriculture, mining and forestry), hydrology, urban growth area boundary, and assessor tables.

3.9.3.1 Maintenance

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.3.2 Enhancement

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.3.3 Development

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.3.4 Metadata

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.4 Spatial Applications

As of the date of this document, the Council staff has not developed any spatial applications. They do, however, make use of Internet applications and other customized applications developed by departments. Access to these applications brings GIS to a group of professionals who may not have time to attend training sessions, or who use GIS so infrequently that a 1 or 2 day training course might constitute a less than prudent use of resources. Additionally, they allow the staff quick access to important data and information via a "friendly" GUI. The most frequent use is by staff for whom access to land use and parcel information is necessary in their day to day work.

3.9.4.1 Maintenance

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.4.2 Enhancement

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.4.3 Development

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.4.4 Documentation

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.5 System Integration

As noted above in the Spatial Data section, the Metropolitan King County Council has no maintenance or management responsibilities for any GIS data layers. Currently, there is no integration of GIS with other Council systems.

3.9.5.1 RDBMS Backend Support

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.5.2 Other Data Management Activity

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.6 Client Services and User Support

The Committee staff provides GIS services to the Council on an as-needed basis, manipulating geographic data for the purposes of producing maps, graphics, data files, reports, and spatial analysis. These services are provided in order to:

1. Support the Council in its policymaking role (e.g., using ArcView to create a map showing the number, size and location of properties that would be affected by a proposed change to a King County Comprehensive Plan policy);
2. Provide information to Councilmembers regarding their constituencies (e.g., using ArcView to create a map illustrating all voting precincts within the new King County Council District boundaries); and
3. Ensure the Council is adhering to state and local laws regarding public notification of proposed Council actions (e.g., using ArcView and the Assessor database to create a mailing list of all property owners within a 500 foot radius of a proposed zoning change).

The Council manages its GIS workload by distinguishing between five types of information requests:

1. **Requests for data and information that are directly related to the Council's review of an executive proposal.** Responses to such requests are generally provided by the appropriate department(s) as a cost of doing business. This includes responding to issues raised during Committee and Council meetings, at public hearings, and in meetings with staff, major stakeholders, and community groups.
2. **Requests for data and information that are indirectly related to the Council's review of an executive proposal, or where the relationship is unclear.** In the past, responses to requests where responsibility is unclear have been negotiated between the GIS Coordinator and the appropriate department, with ultimate responsibility dependent upon the extent of the request, time required for preparation of a response, access to data and information, current workload and level of expertise required.
3. **Requests for data and information that are unrelated to the Council's review of an executive proposal but provided as a courtesy by an executive department** (e.g., Records and Elections providing maps of the new Council Districts to each Councilmember). These requests are passed on to the appropriate department.
4. **Requests for data and information that are unrelated to the Council's review of an executive proposal.** These requests are handled by Council staff. When the level of expertise required to process such requests exceeds the capabilities of the Council staff, the GIS Coordinator contacts the KCGIS Center for assistance.
5. **Public information requests.** Generally, simple requests are handled by Council staff. Complex requests, or requests that fall within the purview of a department or that exceed the capabilities of Council staff are passed on to the appropriate department or to the KCGIS Center.

As a result of the GIS reorganization, requests that fall under category 4 or 5 that exceed the capabilities of Council staff will be referred to the KCGIS Center on a cost reimbursable basis.

3.10 Office of Budget

The Office of Management and Budget (OMB), often referred to as the "Budget Office," is a branch of the King County Executive Office. The Budget Office provides broad policy and fiscal direction analysis for King County government through development of the annual Executive Proposed Operating Budget and Capital Improvement Program (CIP). OMB also monitors compliance with the adopted Budget and performs related information functions. The mission of the Budget Office is to develop, administer and monitor the annual operating budget and capital improvement program, and perform related tasks.

3.10.1 Business Functions

OMB has approximately 40 FTEs distributed in several sections and programs. One information services analyst serves half-time as a GIS analyst. GIS provides support in accomplishing all of OMB's business functions. In addition, the GIS analyst provides GIS support to other parts of the King County Executive Office including the Business Relations and Economic Development office.

The core business components are:

- ***Operating Budget*** – The primary function of the Budget Office is to prepare the Operating Budget in five broad areas: Natural Resources, Health and Human Services, Transportation, Criminal Justice, and General Government. Budget analysts perform analysis and prepare budget documents for the Current Expense and other operating funds.
- ***Capital Improvement Program*** – A separate section prepares the annual Capital Improvement Program (CIP) to provide and manage capital construction of roads, transit facilities, parks, criminal justice facilities, health centers, wastewater treatment facilities and other physical construction to serve residents of King County.
- ***Budget Monitoring*** – Throughout the year after adoption of the annual Budget, OMB staff monitor expenditures and accomplishments under each of the program areas. This component includes Performance Measurement of selected operating departments, a new program in 2003.
- ***Growth Information Team (GIT)*** – The GIT is a team of three people including the GIS analyst. GIT prepares supporting data and documents about growth issues in King County including construction, land development, demographics and economics. Products include the King County Annual Growth Report, King County Benchmark Report and the Affordable Housing Bulletin. These documents are also published on the King County Web site. GIS is utilized for research, analysis and to present clear and reliable information on growth trends and issues in King County, and to provide public information on Growth Management issues. GIS is also a key tool in responding to up to 2,000 ad hoc data requests from the Executive, the Council, King County departments, cities, businesses, media and the public. Among these requests are many for Census data, both tabular and spatial.
- ***Economic Forecasting*** – Support for the other Budget Office functions include revenue and economic forecasts for King County and unincorporated King County. The lead Economist is also a GIS user.
- ***Governance Transition Team*** – Analyzes annexation and incorporation of all land within the Urban Growth Area and assists cities in providing urban services. GIS is a key tool to help decision makers to negotiate efficient service delivery relationships between cities and other jurisdictions.

3.10.2 GIS Program Overview

OMB does not have a separate GIS section with a dedicated budget. The GIS work program is integrated or "weaved-in" into the office's work plan as support to all on-going projects. The GIS Analyst prepares maps or analysis upon request by OMB staff, or refers the request to the KC-GIS Center to provide more complex services. The OMB budget does include a client services allocation for GIS Center

services. OMB does not prepare or maintain any major KC-GIS coverages. We prepare ad-hoc maps and ArcView projects primarily for internal use.

3.10.2.1 Training

OMB's GIS Analyst participates in the KC-GIS Center training program. The analyst receives training in specific GIS applications each time there are significant upgrades/changes to the application, to make the work more efficient and be current on technology. OMB also seeks opportunities to provide broader training to staff. OMB staff have requested introductory training in ArcView and opportunities to use it, but resource limitations prevent extensive training in 2003.

3.10.2.2 Staffing Requirements

Currently, OMB only has 0.5 FTE dedicated for GIS plus two other staff persons who know ArcView and act as a back up for the GIS Analyst. These persons are CX-overhead funded in Program Manager or Budget Analyst job classifications. Two persons whose formal job assignments include GIS are listed:

Working Title	Focus	Class	Status	% GIS
Analyst/GIS Coordinator	Data Analysis	Pgm-Proj Mgr II	FTE	50%
Benchmark Pgm Coord'r	Report Project Mgmt	Pgm-Proj Mgr II	FTE	10%

In past years, DDES has provided a large proportion of planning related GIS service needs through interdepartmental agreements with the Office of Regional Policy and Planning. As of 2003, DDES is no longer able to provide these services and the Office of Regional Policy and Planning no longer exists. Budget cuts prevent OMB from expanding its own GIS program. Some of OMB's 2003 GIS needs will be referred to the GIS Center; some will be performed by DDES, and some simply will not be done.

3.10.2.3 Hardware and Software

There is one workstation dedicated for GIS use. The station operates on a PC environment running on Windows NT 4.0.

OMB currently has one ArcView 3.2 license, including an upgrade to ArcGIS8.

The primary output device is an HP Designjet 2800CP. A small EPSON color printer is used occasionally when small working drafts are needed.

3.10.2.4 Budget

OMB does not separately budget for GIS within its Growth Information Team Section. At 0.5 FTE, salary and benefit costs are approximately $36,000. OMB budgets approximately $22,600 for its support share of the KC-GIS program, plus a $32,500 in-kind allocation of discretionary client services funds in the KC-GIS Center. Approximately half of the Growth Information Section's $1,800 training budget is allocated to GIS training -- allowing about one course per year for one part time GIS professional.

3.10.3 Spatial Data

OMB does not have responsibility to develop and maintain any primary KC-GIS coverages. However, the Office does make use of coverages available in the KC-GIS Spatial Data Warehouse to prepare maps and analyze growth management and budget issues. We create, plot and maintain shapefiles and maps derived from other departments' coverages. Although OMB is responsible for the creation of some GIS data, we have no specific authority to save files back to the Spatial Data Warehouse. These data reside and are maintained in OMB's server; they can be posted in the KC-GIS Spatial Data Warehouse as need arises.

OMB relies heavily on the KC-GIS Center and other King County departments for development, maintenance and enhancements of the spatial data we use.

3.10.3.1 Maintenance

The following are data OMB maintains:

Layer Name:	Layer Description:	Derived From:	Notes:	Update:
URB-V&R	King County Vacant and Redevelopable Urban Land	• PARCEL • ASSESSOR'S DATABASE • PARKS and OPEN SPACE • SENSITIVE AREAS	Analysis as defined by the Buildable Lands Amendment to Growth Management Act	None Planned
RUR-V&R	King County Vacant and Redevelopable Rural Land	• PARCEL • ASSESSOR'S DATABASE • PARKS and OPEN SPACE • SENSITIVE AREAS	Analysis as defined by the Buildable Lands Amendment to Growth Management Act	None Planned
KC-MIC	King County Manufacturing and Industrial Center Boundaries	• City of Seattle • City of Kent • City of Tukwila	On behalf of BRED section	
REC-LOTS	Recorded number of Formal plat lots in King County by Section Township and Range, and by City		Data taken as recorded from the King County Recorders Office	Annually
NEWUNITS	New Housing Units Permitted in King County		Data taken as permitted from KC DDES	Annually
HSESALES	House Sales	• Multiple Listing Service	Geocoded Addresses	Annually

3.10.3.2 Enhancement

- **Land Capacity Analysis** – A major work program item in 2002 was the Buildable Lands amendment to Growth Management. Residential and commercial-industrial capacity for growth on vacant and redevelopable land were identified and reported in 2002. Layers used for Land Capacity Analysis have added another column calculating the conversion of the area square footage to acres, potential employment, and housing that can be accommodated. OMB maintains this shapefile in conjunction with DDES.
- **Recorded Lots and New Units** – OMB's GIS analyst updates Countywide land-subdivision data and counts of new housing units authorized by building permits in every jurisdiction. These are reported in the Annual Growth Report each year.

- **House Sales** – Single family house sales transactions by parcel and address are acquired from the Pacific Northwest Multiple Listing Service and analyzed for the annual Benchmark Report.

3.10.3.3 Development

No development of new GIS data is planned by OMB for 2003. OMB has interest in development of data and applications to report the 2000 Census results in King County, and would participate with other departments in KC-GIS on this subject.

3.10.3.4 Metadata

N/A

3.10.4 Spatial Applications

No spatial applications are currently maintained by OMB.

3.10.4.1 Maintenance

N/A

3.10.4.2 Enhancement

N/A

3.10.4.3 Development

N/A

3.10.4.4 Documentation

N/A

3.10.5 System Integration

Does not apply, because OMB does not develop or maintain its own applications.

3.10.5.1 RDBMS Backend Support

N/A

3.10.5.2 Other Data Management Activity

N/A

3.10.6 Client Services and User Support

Every year, the King County Annual Growth Report and Benchmark Report are published on the King County website. Both documents contain maps created through GIS in OMB.

4 Appendices

The appendices in this section provide additional information for the KCGIS governance committees, and the terms and definitions used in this document. Also provided are summary tables of data and applications that are presented separately in the agency discussions in Section 3, and the 2003 GIS work task lists that were developed in parallel with the agency work plans.

4.1 Oversight Committee

Details regarding the roles, responsibilities, and structure of the KCGIS Oversight Committee are provided in Section 2.2. Presented here is the membership history for the committee and the committee's current charter.

4.1.1 Membership History

2003 GIS Oversight Committee Representatives

Agency	Sub-Agency	Representative	Term
Dept. of Assessments	--	John Sweetman	Jan-Dec
Dept. of Development and Environmental Services	--	Michael Frawley	Jan-Dec
Dept. of Executive Services**	Records, Elections and Licensing	Bob Roegner	Jan-Dec
Dept. of Natural Resources & Parks	--	Gary Hocking*	Jan-Dec
Dept. of Transportation	Road Services Transit	Greg Scharrer Wayne Watanabe	Jan-Dec Jan-Dec

* Chair
** Rotating Agency

2002 GIS Oversight Committee Representatives

Agency	Sub-Agency	Representative	Term
Dept. of Assessments	--	John Sweetman Jerry Crossler	May-Dec Jan-Apr
Dept. of Development and Environmental Services	--	Michael Frawley	Jan-Dec
Dept. of Executive Services**	Records, Elections and Licensing	Bob Roegner	Jan-Dec
Dept. of Natural Resources & Parks	--	Gary Hocking*	Jan-Dec
Dept. of Transportation	Road Services Transit	Greg Scharrer/ Kathy Brown Wayne Watanabe	Jan-Dec Jan-Aug Jan-Dec

* Chair
** Rotating Agency

2001 GIS Oversight Committee Representatives

Agency	Sub-Agency	Representative	Term
Dept. of Assessments	--	Jerry Crossler	Jun-Dec

Agency	Sub-Agency	Representative	Term
Dept. of Development and Environmental Services	--	Michael Frawley	Jun-Dec
Dept. of Executive Services**	Records, Elections and Licensing	Bob Bruce	Jun-Dec
Dept. of Natural Resources & Parks	--	Gary Hocking*	Jun-Dec
Dept. of Transportation	Road Services Transit	Kathy Brown Wayne Watanabe	Jun-Dec Jun-Dec

* Chair
** Rotating Agency

4.1.2 Charter

King County
GIS STAKEHOLDER/OVERSIGHT COMMITTEE
April 13, 2001

Purpose:
This charter establishes roles, membership, and guidelines for the GIS Oversight Committee

Role:
As the GIS Oversight Committee, the committee will:
- Review and approve GIS related budgets for all agencies;
- Review and approve the countywide GIS Business Plan;
- Review and approve all GIS work programs, including operations and maintenance plans, with associated costs identified;
- Review and approve King County GIS Standards;
- Review and approve technical and policy recommendations from GIS Technical Committee;
- Provide annual report on work program status to the Technology Management Board;
- Recommend cost allocation model for Central GIS services;
- Make recommendations to the Technology Management Board as needed;
- Resolve issues referred to GIS Oversight Committee as needed.

Leadership:
The representative from the Department of Natural Resources will chair the committee.

Membership:
GIS Oversight Committee membership shall consist of a representative from the following County Departments: DNR, DOT, DDES, and Assessments. Members must have authority for: Budget approval; GIS programs within their department; representation of customers and end users; and policy decisions. GIS Oversight Committee will appoint at least two rotating members for a one-year term from agencies and programmatic areas that have significant involvement in GIS. Members will not serve on both the GIS Technical Committee and the GIS Oversight simultaneously.

Operating Assumptions and Guidelines:
- Meetings will be held no less than quarterly and more often if necessary.
- Decisions will be made by consensus. If consensus cannot be reached within the GIS Oversight Committee, the issue will be referred to the Director of the Department of Natural Resources.
- The GIS Oversight Committee will establish ground rules.

4.2 Technical Committee

Details regarding the roles, responsibilities, and structure of the KCGIS Technical Committee are provided in Section 2.3. Presented here is the membership history for the committee and the committee's current charter.

The KCGIS Technical Committee publishes agendas, minutes, quarterly reports, and other documents it generates to the Public Folders on the KC WAN and available through the county's e-mail system. The path to the KCGIS Technical Committee documents is Public Folders – All Public Folders – Inter-Agency – GIS – GIS Technical Committee.

4.2.1 Membership History

2003 GIS Technical Committee Representatives

Agency	Sub-Agency	Representative	Term
Budget Office	--	Chandler Felt**	Jan-Dec
Dept. of Assessments	--	Christie Most*	Jan-Dec
Dept. of Development and Environmental Services	--	Paul McCombs	Jan-Dec
Dept. of Executive Services	Office of Emergency Management	Khalid Khan	Jan-Dec
Dept. of Executive Services	Records, Elections and Licensing	Harry Sanders	Jan-Dec
Dept. of Executive Services	Facilities Management	Larry Wright	Jan-Dec
Dept. of Natural Resources & Parks	GIS Center	George Horning	Jan-Dec
Dept. of Natural Resources & Parks	Parks	Greg Stought	Jan-Dec
Dept. of Natural Resources & Parks	Solid Waste	Greg Stought	Jan-Dec
Dept. of Natural Resources & Parks	Wastewater	Bob Swarner	Jan-Dec
Dept. of Natural Resources & Parks	Water and Land Resources	Ruoxi Zhang	Jan-Dec
Dept. of Public Health	--	Dmitry Sharkov	Jan-Dec
Dept. of Public Safety	--	Jim Hilmar	Jan-Dec
Dept. of Transportation	Road Services	Harry Clark	Jan-Dec
Dept. of Transportation	Transit	Mike Berman	Jan-Dec
Dept. of Transportation	Airport	Christa Little	Jan-Dec
King County Council	--	Lauren Smith	Jan-Dec

* Chair
** Vice-Chair

2002 GIS Technical Committee Representatives

Agency	Sub-Agency	Representative	Term
Dept. of Assessments	--	Christie Most	Jan-Dec
Dept. of Development and Environmental Services	--	George Horning* Paul McCombs	Jan-May Jun-Dec
Dept. of Executive Services	Office of Emergency Management	Khalid Khan	Jan-Dec

Agency	Sub-Agency	Representative	Term
Dept. of Executive Services	Records, Elections and Licensing	Harry Sanders	Jan-Dec
Dept. of Natural Resources & Parks	GIS Center	Greg Babinski George Horning*	Jan-Dec Jun-Dec
Dept. of Natural Resources & Parks	Parks	Dennis Higgins	Jan-Dec
Dept. of Natural Resources & Parks	Wastewater	Bob Swarner	Jan-Dec
Dept. of Natural Resources & Parks	Water and Land Resources	Ruoxi Zhang	Jan-Dec
Dept. of Public Health	--	Dmitry Sharkov	Jan-Dec
Dept. of Public Safety	--	Gina Chatterson Jim Hilmar	Jan-Mar Apr-Dec
Dept. of Transportation	Road Services	Harry Clark	Jan-Dec
Dept. of Transportation	Transit	Mike Berman**	Jan-Dec
King County Council	--	Lauren Smith	Jan-Dec
Office of Regional Policy and Planning	--	Chandler Felt	Jan-Dec

* Chair
** Vice-Chair

2001 GIS Technical Committee Representatives

Agency	Sub-Agency	Representative	Term
Dept. of Assessments	--	Christie Most	Jun-Dec
Dept. of Development and Environmental Services	--	George Horning*	Jun-Dec
Dept. of Executive Services	Emergency Management	Khalid Khan	Jun-Dec
Dept. of Executive Services	Records, Elections and Licensing	Harry Sanders	Jun-Dec
Dept. of Natural Resources & Parks	GIS Center	Greg Babinski	Jun-Dec
Dept. of Natural Resources & Parks	Parks	Dennis Higgins	Jul-Dec
Dept. of Natural Resources & Parks	Wastewater	Bob Swarner	Jun-Dec
Dept. of Natural Resources & Parks	Water and Land Resources	Ruoxi Zhang	Jun-Dec
Dept. of Public Health	--	Dmitry Sharkov	Jun-Dec
Dept. of Public Safety	--	Gina Chatterson	Jun-Dec
Dept. of Transportation	Road Services	Gary Grieve Harry Clark	Jun-Sep Oct-Dec
Dept. of Transportation	Transit	Mike Berman**	Jun-Dec
King County Council	--	Lauren Smith	Jun-Dec
Office of Regional Policy and Planning	--	Chandler Felt	Jun-Dec

* Chair
** Vice-Chair

4.2.2 Charter

The GIS Technical Committee charter was modified to reflect changes in department membership and submitted to the GIS Oversight Committee for approval in January 2003.

GIS TECHNICAL COMMITTEE
Charter
Revised: 1/16/2003

Purpose:
This charter establishes roles, membership, and guidelines for the GIS Technical Committee.

Role:
As the GIS Technical Committee, the committee will:
- Report to the GIS Oversight Committee;
- Recommend policy for Countywide GIS technology to GIS Oversight Committee;
- Develop an annual GIS Business Plan and work program;
- Develop and recommend GIS templates and standards for the Countywide GIS program;
- Educate departments about the value GIS will add to business practices;
- Maintain an inventory of Countywide GIS data and applications;
- Prepare quarterly reports on the status of the Countywide GIS program.

Leadership:
The committee will vote annually for chair and vice-chair positions.

Membership:
Membership will consist of one representative from the following King County GIS user agencies:

Assessments	DDES	DOT-Airport
Budget Office	DNRP-Parks and Recreation	DOT-Road Services
County Council	DNRP-Solid Waste	DOT-Transit
DES-Facilities Management	DNRP-Wastewater Treatment	Public Health
DES-REALS	DNRP-Water & Land Resources	Sheriff's Office
DES-E911 Program	KCGIS Center	

The list of participating GIS user agencies will be reviewed and updated yearly. Members will not serve on both the GIS Technical Committee and the GIS Oversight Committee simultaneously.

Operating Assumptions and Guidelines:
- Meetings will be held at least monthly, and more often if necessary.
- Decisions will be made by consensus of members or designated alternates present. If consensus cannot be reached within the GIS Technical Committee, the issue will be referred to the GIS Oversight Committee.
- GIS Technical Committee will establish ground rules.

4.2.3 Work Groups

The KCGIS Technical Committee may at its discretion form working groups to address technical and programmatic issues. The KCGIS Technical Committee currently has three such working groups (Best Practices, Cartographic Standards, and Operations and Maintenance). Working groups are given clear objectives by the KCGIS Technical Committee, which are intended to focus and guide their efforts.

4.2.3.1 Best Practices

Objectives Statement:

The objective of the Best Practices Work Group is to identify and develop GIS best practices to 1) improve communication within the KCGIS community; 2) tighten data procedures and requirements; and 3) coordinate changes to hardware, software and applications.

In 2002 the Best Practices Work Group completed the "Best Practices for GIS Within King County" document and forwarded it for approval to the KCGIS governance committees. The KCGIS Oversight Committee approved the document on August 30, 2002. See http://www.metrokc.gov/gis/kb/Content/BestPractices.htm for the complete text of the King County GIS best practices.

In 2003 the work group will meet periodically to consider recommendations for changes or additions to the adopted best practices.

4.2.3.2 Cartographic Standards

Objectives Statement:

The GIS Cartographic Standards Workgroup will propose standards and guidelines that enable staff to produce high-quality, consistent map products for King County.

In 2002 the Cartographic Standards Work Group completed the "GIS Cartographic Standards" document and forwarded it for approval to the KCGIS governance committees. The KCGIS Oversight Committee approved the document on April 29, 2002. See http://www.metrokc.gov/gis/kb/Content/CartoStandards.htm for the complete text of the King County GIS cartographic standards.

In 2003 the work group will meet periodically to consider recommendations for changes or additions to the adopted cartographic standards.

4.2.3.3 Operations and Maintenance

The GIS Operations and Maintenance Workgroup will produce an annual working document which: 1) Outlines the roles and responsibilities for the Countywide GIS program; 2) Describes the current status of GIS services, applications, data and hardware; 3) Delineates the coordinated department level work plans for the coming year; and 4) Sets goals for the future technical direction of the Countywide GIS program.

In 2002 the Operations and Maintenance Work Group completed the "2002 King County GIS Production Operations and Maintenance Plan" and forwarded it for review to the KCGIS governance committees on April 5, 2002. The document was subsequently amended by the work group on May 28, 2002. The document was approved for posting to the Internet by the KCGIS Oversight Committee on August 30, 2002. See http://www.metrokc.gov/gis/kb/Content/OandM.htm for the complete text of the 2002 King County GIS operations and maintenance plan.

With the publishing of this document the work group has completed the "2003 King County GIS Production Operations and Maintenance Plan". In the later half of 2003 the work group will begin efforts to draft the 2004 operations and maintenance plan.

4.3 Terms and Definitions

This section defines various terms that occur throughout this document.

AIRS form: A form required for the processing of monetary inter-fund transfers between King County budget units

ALI: Automatic Location Identifying

AML: Arc Macro Language

APC: Automatic Passenger Counting, a Transit GIS application

ArcIMS (Internet Map Service): An ESRI solution for distributing mapping and GIS data and services on the Web

AVL: Automatic Vehicle Location, a Transit GIS application

Best Practices: See section 4.2.3.1 for a detailed discussion of the term's meaning in the King County GIS context

Cadastral Base: Layer depicting the extent and ownership of land

CASE: see *ESRI CASE extension*

CIP: Capital Improvement Projects

Clustering: linking together two or more computers to work together on performing functions

CRIS: County Road Inventory System

CX: The county's Current Expense fund; provides budget for various programs and departments that do not have their own revenue streams

DCHS: Department of Community and Human Services

DDES: Department of Development and Environmental Services

DEM: Digital Elevation Model; digital cartographic/geographic data in raster form, in which the terrain elevations for ground positions are sampled at regularly spaced horizontal intervals

DES: Department of Executive Services

DMS (SafetyDMS, SecurityDMS): Data Management System

DMZ: A network added between a protected network and an external network to provide an additional layer of security

DNRP: Department of Natural Resources and Parks

DOT: Department of Transportation

DPH: Department of Public Health

EH: Environmental Health

EMS: Emergency Medical Services

EOC: Emergency Operations Center

EPE: Epidemiology, Planning and Evaluation

ESA: Environmental Species Act

ESRI CASE extension: Computer Aided System Engineering tools, used to assist in application development with ESRI products

ESRI: Environmental Systems Research Incorporated; a vendor of GIS tools and applications

FEMA: Federal Emergency Management Agency

FGDC: Federal Geographic Data Commission, responsible for identifying policies, standards, and procedures for organizations to cooperatively produce and share geographic data

FIRS: Facility Information Retrieval System

FTE: Full-time Equivalent; representing a single full-time employee

GIS Oversight Committee: See section 4.1.2 for a detailed discussion

GIS Technical Committee: See section 4.2.2 for a detailed discussion

GLO: Government Land Office

GWMA: Groundwater Management Areas

HRI: History Resource Inventory

ISA: Information Systems Analyst

KCEGIS: King County Elections GIS

KCIA: King County International Airport

KCSO: King County Sheriff's Office

LIMS: Laboratory Information Management System; a large database and access tools for the King County Department of Natural Resources and Parks

Matrixed, Matrix management structure: A management structure in which two or more supervisors share the responsibilities of management of the same people or groups

MMS: Maintenance Management Systems

Mylars: Thin strong polyester film used primarily for ink-drawn maps and graphics

NIES: A Western Washington mapping group that provides photogrammetry services and digital orthophotography products to many Puget Sound organizations

OCR: Office of Cultural Resources

OEM: Office of Emergency Management

OMB: Office of Management and Budget

ORPP: Office of Regional Policy and Planning (disbanded at the end of 2002, with many functions including GIS distributed into the Budget office)

Oversight Committee: See *GIS Oversight Committee*

POCA: Public Land Survey, Ownership, County, and Administration boundaries; an office of the Washington State Department of Natural Resources

PSAFI: Park Site and Facilities Information

PSAP: Public Safety Answering Point

P-Suffix: A property-specific zoning or land-use condition that is applied to a parcel or a group of parcels

PUD: Public Utility District; an agency that provides electrical power, water, or other utility services to residents and businesses in defined districts of Washington State

RAID array: Redundant Array of Independent Disks; a strategy for organizing physical disks for a server

RDBMS: Relational Database Management System; a program that allows users to create, update and administer a relational database

REALS: Records, Elections and Licensing Services

RECDANNO: Abbreviation for Record Annotation, the countywide cadastral annotation layer

RECDNET: Abbreviation for Record Network, the layer name for the King County cadastral base

RP&IS: Research, Planning & Information Services

RSD: Road Services Division

SafetyDMS: Safety Data Management System, an application for recording and tracking bus accidents and transit operator safety records

SAN: Storage Area Network

SAO: Sensitive Areas Ordinance

SDE: Spatial Database Engine

SecurityDMS: Security Data Management System, an application for recording and tracking incidents that occur on or around transit coaches

SF1 (SF2, SF3…): Summary files available from the US Census Bureau

SIS: Stop Information System; an application that will allow the placing, sequencing, and attribution of bus stops

SMDM: Science, Monitoring and Data Management

SWD: Solid Waste Division

Technical Committee: See *GIS Technical Committee*

Technology Management Board: Part of the King County Technology Governance Structure that oversees technology projects

TLT: Term-limited Temporary; a position with an end date

TOE: Transit Object Editor; an application for placing and editing Timepoints and TPIs in the Transit GIS network

Two-cluster system: see *Clustering*

WLRD: Water and Land Resources Division

WRIA: Water Resource Inventory Areas

WSDNR: Washington State Department of Natural Resources

WTD: Wastewater Treatment Division

4.4 Summary Tables

The summary tables for data and applications below were constructed by copying information from within the various subsections of section 3. The task list summary table was extracted from the full task list table that is maintained in a separate document.

4.4.1 Data

This section contains a table of all data that are being maintained, developed or enhanced throughout King County and was compiled from the tables in each subsection of Section 3. Data Type is Corporate, Agency (Department or Division), or Not Specified:

Name	Description	Data Type	Organization
City of Bellevue	2 foot contours; Parcel boundaries; Lake shorelines; Streams; Street centerlines; Zoning boundaries.	Corporate	KC GIS Center
City of Kent	Past annexations; Potential annexation areas; Building footprints; City limits; 5-foot contours; 25-foot contours; Spot elevations; Comprehensive plan; Driveways; Parks; Public facilities; FEMA flood zones; Fences; Hydrographic features; Tax parcels; Wetlands; Zoning; Survey points; Horizontal control; Utility poles and streetlights; Pavement edge; Major arterials; Street centerlines; Railroad tracks; Sanitary and storm sewer systems; Waterlines, mains, and fire hydrants; Drainage basins; Voter precincts.	Corporate	KC GIS Center
City of Seattle	Political and administrative boundaries; Tax parcels; Legal lots; Survey points; Control; Street network; Drainage and Wastewater Utility (DWU) database; Water distribution system; Hydrographic features; 2-foot contours; Break lines; Elevations; Known wildlife areas and corridors; Zoning classifications; Potential landslide areas and liquefaction zones; 100-year-flood hazard areas; Combined sewer overflow basin areas; Ditches; Former sanitary landfill areas.	Corporate	KC GIS Center
City of Tukwila	Building footprints; Paved roads; Parking lots; Driveways; Gravel roads and driveways; Sidewalks; 2 foot contours; Areas where contours were interpolated due to dense vegetation; Drainage swales, streams, and wetlands. All of these were interpreted from 1999 Triathlon digital orthophotos.	Corporate	KC GIS Center
Pierce County	Political and administrative boundaries; Urban growth and urban service area boundaries; Tax parcels for all non-federal lands; Street centerline network; 100-foot contours; 20-foot contours for Western Pierce County; Basin boundaries for WRIA 10.	Corporate	KC GIS Center
Snohomish County	Political and administrative boundaries; Integrated land records (including parcels); Street centerline network; Freeways and major roads; Hydrographic features; Public Land Survey (including township, range, section, and quarter section); USGS map index; Building footprints; Major rail lines; Paved airport runways; Urban growth boundary; Fire stations and schools; Park properties and recreational trails; Zoning regulations for unincorporated areas;	Corporate	KC GIS Center

Name	Description	Data Type	Organization
	Locations of known/protected mineral deposits.		
Washington Department of Fish and Wildlife (WDFW)	Priority Habitats and Species (PHS) Marine Resources database; PHS Streamnet database; National Wetlands Inventory (NWI); Hydrologic Unit Boundaries; Marbled Murrelet and Spotted Owl Locations; Old Growth Timber Types.	Corporate	KC GIS Center
Washington Department of Natural Resources (WDNR)	Non-DNR major public lands; Soils.	Corporate	KC GIS Center
WDNR	Shorezone Inventory database.	Corporate	KC GIS Center
Washington Department of Revenue (WDOR)	Regional Transit Authority boundary.	Corporate	KC GIS Center
Census Bureau	Census tracts, blocks, and block groups; Political and administrative boundaries; Tribal lands; Hydrographic features; Landmarks and key geographic locations; Streets, railroads, and utility lines; Population Forecast Analysis Zones (FAZ); Traffic Analysis Zones (TAZ); Urban Growth Area boundary; Urban/rural area designations.	Corporate	KC GIS Center
Mt. Baker-Snoqualmie National Forest (MB-SNF)	Administrative boundaries; Roads; Trails; Hydrographic features; Developed recreation sites; Permitted alpine ski areas; Soils mapped for use and disturbance limits; Possible unstable soils affecting timber harvest or road building; Plant associations based on environment; Potential vegetation/plant development zones.	Corporate	KC GIS Center
US Forest Service	Forest production districts.	Corporate	KC GIS Center
US Geological Survey	Faults of the Seattle Fault Zone; Soils.	Corporate	KC GIS Center
GDT	5-digit ZIP Code boundaries, based on TIGER line files.	Corporate	KC GIS Center
Olympic Pipe Line Company	Pipeline right-of-way through King County.	Corporate	KC GIS Center
POCA	Public ownership and administrative boundaries	Corporate	KC GIS Center
RTABNDRY	Regional Transit Authority Boundary (approximate)	Corporate	KC GIS Center

Name	Description	Data Type	Organization
ZIPCODE	King County ZIP Code boundaries	Corporate	KC GIS Center
CANOPY	Forest canopy	Corporate	KC GIS Center
FAULTS	Faults of the Seattle Fault Zone	Corporate	KC GIS Center
SOIL	Obsolete soils coverage	Corporate	KC GIS Center
SOILUSGS	Soils coverage from USGS	Corporate	KC GIS Center
BIGWATER	Largest water bodies in King County	Corporate	KC GIS Center
MUN_WSHD	Municipal watersheds	Corporate	KC GIS Center
PRECIP	Precipitation	Corporate	KC GIS Center
RAINSNOW	Rain on snow zones	Corporate	KC GIS Center
STORM10	10 year storm events	Corporate	KC GIS Center
FPD_USFS	US Forest Service Production Districts	Corporate	KC GIS Center
BIKEMET	Bicycle/non-motorized vehicle paved and unpaved routes	Corporate	KC GIS Center
E911_ESN	Emergency service areas	Corporate	KC GIS Center
NAVAID		Corporate	KC GIS Center
ANTSITE	Antenna sites leased out by King County Property Services	Corporate	KC GIS Center
LD_NAMES	Annotation from RECDNET for lot dimensions in map portal parcels	Corporate	KC GIS Center
REALPROP	Property Services King County owned parcels	Corporate	KC GIS Center
ROW	Street right of way with PIN	Corporate	KC GIS Center
SCSTREET	Snohomish County street network	Corporate	KC GIS Center
ST_ADDRESS	King County streets derived from RECDNET with address ranges.	Corporate	KC GIS Center
BASENET	King County centerline network.	Corporate	KC GIS Center
ST_NAMES	Street name annotation from RECDNET	Corporate	KC GIS Center
AIRINDEX	Center points of WSDNR aerial photos	Corporate	KC GIS Center
AIRPHOTO	Flight Lines for WSDNR aerial photos of King County	Corporate	KC GIS Center

Name	Description	Data Type	Organization
ARTCLUST	Polygon coverage of clusters of public art sites in King County	Corporate	KC GIS Center
ARTSITES	Point coverage of public art sites in King County	Corporate	KC GIS Center
BASEADJ	Control points for adjustments of the cadastral base	Corporate	KC GIS Center
CONT20	20 foot contours from 10 meter DEM	Corporate	KC GIS Center
CONT50	50 foot contours from 10 meter DEM	Corporate	KC GIS Center
CONT100	100 foot contour lines from 10 Meter DEM	Corporate	KC GIS Center
INDEX	Index of RECDNET tiles	Corporate	KC GIS Center
INDEX_QT	Copy of the tiled index with township, range and 1/4 tile lines only	Corporate	KC GIS Center
INDEX_TR	Copy of the tiled index with township and range lines only	Corporate	KC GIS Center
MAPNUM	Map number index	Corporate	KC GIS Center
MAPNUMOK	Map number index	Corporate	KC GIS Center
MTPEAKS	Mountain peaks with elevations	Corporate	KC GIS Center
ORTHOIDX	Index for NIES orthophotos	Corporate	KC GIS Center
PLSS	Public Land Survey System	Corporate	KC GIS Center
POINOPUB	Points of interest owned or operated by non-public agencies	Corporate	KC GIS Center
POIPUB	Points of Interest owned or operated by public agency	Corporate	KC GIS Center
PS_BATH	Puget Sound bathymetry	Corporate	KC GIS Center
REFGRD16	Reference grid (1/16 sections)	Corporate	KC GIS Center
SOUNDING	Puget Sound soundings	Corporate	KC GIS Center
THOM_BROS	Thomas Guide page index	Corporate	KC GIS Center
WASHCO	County boundaries for all of Washington State	Corporate	KC GIS Center
RECDNET	Countywide Cadastral Data. Includes streets and other features necessary for describing property boundaries. Based on the legal description of the property.	Corporate	Assessments
PARCEL	Countywide parcel boundaries derived from RECDNET.	Corporate	Assessments

Name	Description	Data Type	Organization
RECDANNO	Countywide Cadastral Annotation. Includes street names and other features necessary for describing property boundaries.	Corporate	Assessments
PARCEL	Seattle Parcel Data. As part of a MOU with the City of Seattle, Assessments maintains the parcel data for the City service area in accordance with standards defined by the City. Because the Seattle data is not integrated with the rest of the County, the current parcel data exists only on Assessments Unix servers.	Department	Assessments
PLAT	Plats. New plats are added to this layer when the positional accuracy of RECDNET is in question or when a plat is so large that using the Maint_Rec tools is inefficient.	Department	Assessments
COMAREAS	Commercial Area boundaries.	Department	Assessments
RESAREAS	Residential Areas boundaries – under construction.	Department	Assessments
KCASURV	Survey data necessary for building new plats or redrawing cadastral data.	Department	Assessments
CITY ZONING – VARIOUS COVERAGES	Zoning for incorporated cities. Incorporated zoning data is generated (but not necessarily maintained) as a means for updating the server tables.	Department	Assessments
KCAWET	Wetland boundaries taken from department overlays and updated wetland information.	Department	Assessments
KCACODE	Levy Code Boundaries.	Department	Assessments
KCACITY	City boundaries for Assessments purpose	Department	Assessments
ZONING	Polygons representing zoning classifications for unincorporated King County as well as portions of the County annexed or incorporated since 1993 (King County zoning is no longer in effect in annexed areas, information is retained for historic purposes only). Attributes include current and potential zoning.	Corporate	DDES
COMPLU02	Polygons representing King County Comprehensive Plan land use designations for unincorporated King County as well as portions of the County annexed or incorporated since 1993 (King County planned land use is no longer in effect in annexed areas, information is retained for historic purposes only). Archival versions of planned land use are retained on an annual basis (e.g., Complu00, Complu99, etc.)	Corporate	DDES
GRWTHPAT	Polygons representing King County generalized land use pattern, which is a simplification and grouping of the Comprehensive Plan land use designations.	Corporate	DDES
UGLINE02	Lines representing the King County Urban Growth Area (UGA) boundary. Archival versions of the UGA boundary are retained on an annual basis (e.g. Ugline00, Ugline99, etc.)	Corporate	DDES

Name	Description	Data Type	Organization
CLRESTR	Polygons representing clearing and grading restrictions as defined by Title 16 Building and Construction Standards – 16.82.150 of King County Code.	Corporate	DDES
DPA	Polygons representing demonstration project areas as defined by Title 21A Zoning – 21A.55 of King County Code.	Corporate	DDES
PSC	Polygons representing areas with property specific development standards (also known as P-suffix conditions) as defined by Title 21A Zoning – 21A.38 of King County Code.	Corporate	DDES
SDO	Polygons representing areas with special district overlay designations as defined by Title 21A Zoning – 21A.38 of King County Code.	Corporate	DDES
SDR	Polygons representing areas with special drainage requirements as previously defined by Title 9 Surface Water Management – 9.04 of King County Code. These requirements have been repealed but the layer is retained for historical purposes.	Corporate	DDES
SHORELINEMMP	Polygons representing Shoreline Management Master Program designations as defined by Title 25 Shoreline Management of King County Code.	Corporate	DDES
COALMINE	Polygons representing Sensitive Area Ordinance coal mine hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Corporate	DDES
ERODE	Polygons representing Sensitive Area Ordinance erosion hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Corporate	DDES
SLIDE	Polygons representing Sensitive Area Ordinance landslide hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Corporate	DDES
SEISM	Polygons representing Sensitive Area Ordinance seismic hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Corporate	DDES
WETLD	Polygons representing Sensitive Area Ordinance wetlands as defined in Title 21A Zoning – 21A.24 of King County Code. Attributes include wetland ID and wetland rating (also known as class). An Access database linked by wetland ID provides detailed wetland inventory data.	Corporate	DDES
FEMAFLDP OR FLDPLAIN	Polygons representing Sensitive Area Ordinance flood plains Flood Plains (may be owned by DNRP)	Corporate	DDES
AGRPDDST	Polygons representing the Agricultural Production District (APD) as defined by Chapter 3 of the King County Comprehensive Plan.	Corporate	DDES
FORPDDST	Polygons representing the Forest Production District (FPD) as defined by Chapter 3 of the King County Comprehensive Plan	Corporate	DDES

Name	Description	Data Type	Organization
	King County Comprehensive Plan.		
RFFA	Polygons representing the Rural Forest Focus Area (RFFA) as defined by Chapter 3 of the King County Comprehensive Plan.	Corporate	DDES
HORSE_COMM	Polygons representing Equestrian Communities as defined by Chapter 3 of the King County Comprehensive Plan.	Corporate	DDES
CITYMAST	Polygons representing city annexation boundaries, including pending annexations. Includes current corporate boundaries and annexation and incorporation activity since mid-1980's. Key attributes include jurisdiction, annexation status and annexation effective date. The layer City is a derivative of Citymast.	Corporate	DDES
CITY	Polygons representing current city boundaries. Layer City is a simplified derivative of Citymast.	Corporate	DDES
CPAREA	Polygons representing Community Planning Areas as defined by various planning documents.	Corporate	DDES
KCADDRGRID	Lines representing King County addressing grid as adopted by Resolution 16622.	Corporate	DDES
MUCKL_IR	Polygons representing Muckleshoot Indian Reservation boundary.	Corporate	DDES
SCHSITE	Points representing school sites.	Corporate	DDES
DRAINCAR	Polygons representing parcels associated with drainage incident citizen action requests (formerly known as drainage complaints). Derived periodically from drainage incident database maintained by DNRP-WLRD.	Corporate	DDES
UAC	Polygons representing Unincorporated Area Councils (UAC).	Corporate	DDES
ASGWC95	Polygons representing areas susceptible to ground water contamination as defined by Chapter 4 of the King County Comprehensive Plan.	Corporate	DDES
FARMLAND	Polygons representing properties participating in the Farmland Preservation Program.	Corporate	DDES
FIRESTN	Points representing fire station sites.	Corporate	DDES
FPD_LINE	Lines representing the Forest Production District (FPD) boundary as defined by Chapter 3 of the King County Comprehensive Plan.	Corporate	DDES
MPS	Polygons representing road mitigation payment system zones, which are derived from Small Area Zones (SAZ).	Corporate	DDES

Name	Description	Data Type	Organization
TDR	Polygons representing parcels receiving or sending Transfer of Development Rights (TDR).	Department	DDES
JPA	Polygons representing joint planning areas as defined by the King County Comprehensive Plan.	Department	DDES
BOG_DA	Polygons representing bogs as regulated by the Surface Water Design Manual	Department	DDES
ERS_DA	Polygons representing erosion drainage as regulated by the Surface Water Design Manual.	Department	DDES
LH_DA	Polygons representing landslide hazard drainage areas as regulated by the Surface Water Design Manual.	Department	DDES
MDPA	Master Drainage Plans Areas as defined and regulated by the Surface Water Design Manual.	Department	DDES
MRWATERS	Polygons representing major receiving water bodies as regulated by the Surface Water Design Manual.	Department	DDES
BSNWIDE	Polygons representing basin wide drainage conditions as defined by Surface Water Design Manual.	Department	DDES
AREASPFC	Polygons representing area specific drainage conditions as defined by the Surface Water Design Manual.	Department	DDES
HISTSITE	Parcel specific database of historic sites as defined by the King County Historic Resource Inventory.	Department	DDES
INTERLOC	Polygons representing DDES interlocal agreements with various cities and agencies.	Department	DDES
CITYIMP	Polygons representing impact areas (areas of interest) as defined by various cities.	Department	DDES
SCHDIST	Polygons representing school districts. A derivative of Election's schdist with additional attributes.	Department	DDES
CDIST96	Polygons representing King County Council Districts. A derivative of Election's kccdst with additional attributes.	Department	DDES
BLDG_IA	Polygons representing building inspection areas.	Department	DDES
LU_IA	Polygons representing land use inspection areas.	Department	DDES
CODE_IA	Polygons representing code enforcement areas.	Department	DDES
GRAD_IA	Polygons representing grading inspection areas.	Department	DDES

Name	Description	Data Type	Organization
ESA_IA	Polygons representing Environmental Species Act (ESA) inspection areas.	Department	DDES
CLEAR_IA	Polygons representing clearing inspection areas.	Department	DDES
ESC_IA	Polygons representing erosion and sediment control inspection areas.	Department	DDES
Z_XXXXX	A series of polygon layers representing zoning changes per various King County ordinances. Each layer shows the before and after zoning for a given ordinance. Layer name provides ordinance number (e.g. Z_11353).	Department	DDES
LU_XXXXX	A series of polygon layers representing Comprehensive Plan land use changes per various King County ordinances. Each layer shows the before and after planned land use for a given ordinance. Layer name provides ordinance number (e.g. LU_11353).	Department	DDES
SANT.MDB	Parcel specific database for Sensitive Area Notice on Title (SANT) information.	Department	DDES
UGAREA01	Polygons representing the Urban Growth Area (UGA).	Department	DDES
STREAM	Lines representing the Sensitive Area Ordinance streams as defined in Title 21A Zoning – 21A.24 of King County Code.	Department	DDES
SNOWLOAD	Polygons representing ground snow load zones.	Department	DDES
INTRMPAA	Polygons representing interim Potential Annexation Areas (PAA) for cities in King County.	Department	DDES
KINGADDR.MDB	Parcel specific database of situs addresses as recognized by DDES for properties in unincorporated King County.	Department	DDES
PERMPAR	Polygons representing parcels associated with DDES permits. Includes historical parcels that no longer exist.	Department	DDES
PARCELS.MDB	Parcel specific database for development conditions information.	Department	DDES
CHINOOK	Polygons representing 500-foot buffer from streams identified by Chinook distribution analysis.	Department	DDES
MINE97	Polygons representing mineral resource sites as defined by Chapter 3 of the King County Comprehensive Plan.	Department	DDES
FCCTELCO	Points representing locations of existing and planned telecommunication facilities as registered with the Federal Communication Commission (FCC).	Department	DDES
ARSONSXX	Points representing the locations of fire investigations for the given year. Layer name provides the year (e.g. ARSONS08)	Department	DDES

Name	Description	Data Type	Organization
	provides the year (e.g. ARSONS98).		
POLICE, FIRE AND EMS ZONES	PSAP specific data layers boundaries that PSAPs refer to when dispatching specific emergency services to locations.	Not Specified	DES-OEM
CARRIER CELL TOWER LOCATIONS	Points of cell towers in King County that is regularly updated and added.	Not Specified	DES-OEM
SECTOR COVERAGE AREAS	Polygons of cell towers that cover specific areas in King County, attached to cell towers.	Not Specified	DES-OEM
CITYDST	Boundaries of incorporated cities and towns	Corporate	DES-REaLD
CONGDST	Congressional District boundaries in King County	Corporate	DES-REaLD
DIRDST	Director districts within the Seattle School District	Corporate	DES-REaLD
DSTCODE	Unique Voting Levy Description Polygons (unique ballot styles)	Corporate	DES-REaLD
FIRDST	King County Fire Protection Districts	Corporate	DES-REaLD
HSPDST	King County Hospital Districts	Corporate	DES-REaLD
JUDDST	King County Court Electoral Districts	Corporate	DES-REaLD
KCCDST	Current King County Council Districts	Corporate	DES-REaLD
LEGDST	Legislative Districts in King County	Corporate	DES-REaLD
LIBDST	King County Library District	Corporate	DES-REaLD
MS1DST	Proposed Electoral Districts group 1 (temporary ballot measures such as the merger of 2 water districts)	Corporate	DES-REaLD
MS2DST	Proposed Electoral Districts group 2 (temporary ballot measures)	Corporate	DES-REaLD
MUNDST	County recognized Municipal Incorporation Districts (explain)	Corporate	DES-REaLD
PRKDST	King County Park Districts / Special Park authorities	Corporate	DES-REaLD
SCHDST	Public School Districts in King County	Corporate	DES-REaLD
SWRDST	King County Sewer Districts	Corporate	DES-REaLD
VOTDST	Voting Districts (commonly referred to as Precincts)	Corporate	DES-REaLD

Name	Description	Data Type	Organization
WSDST	Combined Water and Sewer Utility Districts	Corporate	DES-REaLD
WTRDST	King County Water Districts	Corporate	DES-REaLD
STREETSEG	Street centerline master address file (MAF)	Department	DES-REaLD
PRECINCT	Voting precinct assignment	Department	DES-REaLD
LEVY	Minor taxing district assignment	Department	DES-REaLD
COMBO	Unique Ballot style	Department	DES-REaLD
POLLPLACE	Election polling place assignment	Department	DES-REaLD
ROUTE	Election supply delivery routes	Department	DES-REaLD
ZONE	Election day trouble shooter assignments	Department	DES-REaLD
FACILITY	Manholes, pump stations, regulator stations, treatment plants. The Facility point coverage is generated from coordinate locations in the Facility Information Retrieval System (FIRS). It represents all facilities in the King County Wastewater Treatment System.	Corporate	DNRP-WTD
IWPERMIT	Industrial Waste Permits	Corporate	DNRP-WTD
PLANT	Regional Wastewater Treatment plants. It contains the location of regional wastewater treatment plants, including King County owned plants and others in King, Pierce, and Snohomish Counties.	Corporate	DNRP-WTD
SERVAREA	Sewer service basins contributing flow to KC WTD facilities. It depicts the King County Wastewater Service Area. Sewer service basins, not political boundaries, define it. It represents the area from which local component agency sewer utility districts collect flow that is eventually conveyed and treated by King County. Additionally, it is defined by the Urban Growth Boundary to encompass potentially sewerable area for planning flow projections.	Corporate	DNRP-WTD
SEWER	Major sewage conveyance system. This coverage depicts King County Wastewater Treatment Division's conveyance system. It is generated from the Facility Information Retrieval System (FIRS), a database maintained by the Wastewater Treatment Division, Facility Inspection Section. Arc segments represent sections of conveyance pipe between manholes or other facilities (see FACILITY point coverage).	Corporate	DNRP-WTD
SITEPLAN	Facility footprints. Building footprints of treatment plants or other facilities	Corporate	DNRP-WTD
SWRBASIN	WPCD defined boundaries for sewer basins including planning basins (PATPLA). SWRBASIN shows sewer infrastructure flow basins in King, Pierce, and Snohomish Counties. This coverage is used for modeling and planning wastewater flows. This coverage	Corporate	DNRP-WTD

Name	Description	Data Type	Organization
	does NOT represent the King County Wastewater Treatment Service Area (see coverage SERVAREA).		
WTRSAMP	Water Sampling sites. Sampling locations from LIMS database. WTRSAMP is a point coverage representing the location of water quality sampling sites. The coverage is generated weekly from the LIMS oracle database maintained by the King County DNR Environmental Lab. Each point has an attribute identifying its LIMS locator ID.	Corporate	DNRP-WTD
FLOWMNTR	Contains depictions current and historic monitors used in in a variety of projects from day to day system flow monitoring to I/I project monitoring.	Division	DNRP-WTD
SWR_AGEN	A depiction of the sewer agencies that provide flow to WTD. This data set is for cartographic and planning purposes only and does not show individual service areas or district boundaries. It should not be confused with sewer_dist maintained by Records and Elections.	Division	DNRP-WTD
LOCALLN	Contains depiction of local sewer pipes with available attribute information	Division	DNRP-WTD
LOCALMH	Contains depiction of local sewer facilities with available attribute information	Division	DNRP-WTD
CSO	Combined Sewer Overflow discharge locations.	Division	DNRP-WTD
WTDBSN	Basins used by WTD to plan and manage wastewater flow.	Division	DNRP-WTD
SWRLND00	Areas of sewered land delineated using local line sewer information, Emerge imagery, and parcel lines based on 2000 data	Division	DNRP-WTD
SWRLND	Areas of sewered land delineated using local line sewer information, Emerge imagery, and parcel lines based on 2001 data	Division	DNRP-WTD
MDLBSN00	Basins developed for WTD modelers through the Inflow and Infiltration project based on 2000 data.	Division	DNRP-WTD
MDLBSN	Basins developed for WTD modelers through the Inflow and Infiltration project based on 2001 data.	Division	DNRP-WTD
MNIBSN00	Basins developed for flow monitoring efforts through the Inflow and Infiltration project based on 2000 data.	Division	DNRP-WTD
MNIBSN	Basins developed for flow monitoring efforts through the Inflow and Infiltration project based on 2001 data.	Division	DNRP-WTD
CHNLMIGR	River channel migration hazards	Corporate	DNRP-WLRD
DRNBASIN	Drnbasin is King County Department of Natural Resources, Water & Land Division's (KC WLRD) version of Water Resource Inventory Areas (WRIA) and watersheds in King County.	Corporate	DNRP-WLRD

Name	Description	Data Type	Organization
	Please note that KC's version differs from the supposed "official" version that the Washington State Department of Ecology (WA DOE) produces (available on their web site). Most notably, in the KC version, WRIA 9 includes Vashon Island and Elliott Bay basin, and the Rock Creek area is included in WRIA 8, not WRIA 9. For the King County area, drnbasin is generally considered to be more correct than the WA DOE version, and is what KC WLRD uses in all planning efforts.		
DRNSTUDY	SWES Engineering Studies	Corporate	DNRP-WLRD
FISH9	Dist. of 7 salmon spp. in WRIA 9 streams, 5 presence classes. FISH9 contains fish distribution information in Water Resource Inventory Area 9 for seven fish species: chinook *(Oncorhynchus tshawytscha)*, coho *(Oncorhynchus kisutch)*, sockeye *(Oncorhynchus nerka)*, chum *(Oncorhynchus keta)*, pink *(Oncorhynchus gorbuscha)*, steelhead *(Oncorhynchus mykiss)*, & cutthroat trout *(Oncorhynchus clarki)*.	Corporate	DNRP-WLRD
FISH9_PT	Point observations of 7 salmon spp. In WRIA9, 7 observ. Classes. FISH9_PT contains fish observation information in Water Resource Inventory Area 9 for seven fish species: chinook *(Oncorhynchus tshawytscha)*, coho *(Oncorhynchus kisutch)*, sockeye *(Oncorhynchus nerka)*, chum *(Oncorhynchus keta)*, pink *(Oncorhynchus gorbuscha)*, steelhead *(Oncorhynchus mykiss)*, & cutthroat trout *(Oncorhynchus clarki)*.	Corporate	DNRP-WLRD
FISHV	Dist. of 5 salmon spp. in Vashon streams, 1 presence class. FISHV contains fish distribution information on Vashon Island for five fish species: chinook *(Oncorhynchus tshawytscha)*, coho *(Oncorhynchus kisutch)*, chum *(Oncorhynchus keta)*, steelhead *(Oncorhynchus mykiss)*, & cutthroat trout *(Oncorhynchus clarki)*.	Corporate	DNRP-WLRD
FISHV_PT	Point observations of 5 salmon spp. On Vashon. FISHV_PT contains fish observation information on Vashon Island for five fish species: chinook *(Oncorhynchus tshawytscha)*, coho *(Oncorhynchus kisutch)*, chum *(Oncorhynchus keta)*, steelhead *(Oncorhynchus mykiss)*, & cutthroat trout *(Oncorhynchus clarki)*.	Corporate	DNRP-WLRD
FLDPLAIN	A digital representation of the paper FEMA flood maps. This coverage details the locations of 100 year floodplains and floodways as defined by the Federal Emergency Management Agency.	Corporate	DNRP-WLRD
GWMA	Groundwater Management Areas. GWMA depicts the boundaries of areas that have undergone groundwater management planning according to a Washington state program	Corporate	DNRP-WLRD
HABITAT	King County Wildlife Network. The Wildlife Habitat Network was designed to link high quality streams, wetlands, and open space lands, and to minimize habitat fragmentation. The goal of the network is to make sure that habitats remain connected across the landscape after	Corporate	DNRP-WLRD

Name	Description	Data Type	Organization
	development occurs.		
HYDROGAUGE	King County Hydrological Gauges	Corporate	DNRP-WLRD
KC_WHPA	Well Head Protection Areas are designed to show where contamination can flow into a well. Delineation of these zones is part of EPA's Source Water Protection Program. “Time-of-travel” zones define how long it would take contamination to reach the well at 6 month, 1 year, 5 year, and 10 year intervals.	Corporate	DNRP-WLRD
SURFGEOL	KC Surface Geology	Corporate	DNRP-WLRD
WELL_A	Water supply wells, group A. Public Water System wells with 15 or more connections, as recorded by the WA Department of Health. See also related datasets WELL_B and WELL_ALL.	Corporate	DNRP-WLRD
WELL_ALL	All well locations from King County groundwater database. This dataset shows the locations of all wells listed in the King County Groundwater database. These are mainly private wells of individual homeowners, but some Public Water Supply group A or group B wells are also included. See also related datasets WELL_A and WELL_B.	Corporate	DNRP-WLRD
WELL_B	Water supply wells, group B. Public Water System wells with 2 to 14 connections, as recorded by the WA Department of Health. See also related datasets WELL_A and WELL_ALL	Corporate	DNRP-WLRD
WTRBODY	Open Water	Corporate	DNRP-WLRD
WTRCRS	Streams - topological network. This coverage contains watercourses for King County drainage basins, including some areas in adjoining counties. WTRCRS is designed as a topologically complete network of stream centerlines, with extensive related attribute tables. This data set is integrated from numerous sources, primarily at 1:24,000 scale. WTRCRS cross-references other commonly used hydrographic data inventories, and is also suitable for medium to small-scale map displays and generalized analyses.	Corporate	DNRP-WLRD
WTR_SERV	Water Service Areas	Corporate	DNRP-WLRD
WQ_LOCS	Sampling locations for groundwater quality. These data show the well and spring locations where King County has sampled for groundwater quality. More detailed information about the sampling points is found in the additional related table, wq_locs.smp, which has a many to one relationship with the coverage.	Corporate	DNRP-WLRD
PARK	All parks in King County, including those which are owned and/or maintained by other agencies and jurisdictions	Corporate	DNRP-P&RD

Name	Description	Data Type	Organization
	agencies and jurisdictions		
TRAIL	Trails in King County	Corporate	DNRP-P&RD
ATLASANNO	Various annotation layers designed for 39-page parks atlas	Division	DNRP-P&RD
CIP	Yearly Parks CIP projects mapped	Division	DNRP-P&RD
HWYSIGN	Points for Highway Signs, for Atlas Mapping	Division	DNRP-P&RD
MAINTDIST	Maintenance Districts	Division	DNRP-P&RD
OPSPASYS	Open Space Systems polygons from Open Space Plan	Division	DNRP-P&RD
PARKPLAN	PARK layer with planning information attached	Division	DNRP-P&RD
PARKS_P	Parks Property	Division	DNRP-P&RD
PSAFI_FACILITIES	Facilities	Division	DNRP-P&RD
RESCOORD	Resource Coordinator Districts	Division	DNRP-P&RD
STRGRID	Section grid for Parks Atlas Mapping	Division	DNRP-P&RD
WTANNOAT	Water features annotation used for Parks and by others	Division	DNRP-P&RD
PLSS	Polygon shapes representing Road Services Division/Survey Section Public Land Survey System broken down to the ¼ section.	Not Specified	DOT-RSD
MONUMENT	Point shapes representing Road Services Division/Survey Section surveyed monuments.	Not Specified	DOT-RSD
ST_CRIS	Lines shapes representing King County's CRIS (County Road Inventory system).	Not Specified	DOT-RSD
KGCO_DS	Soils data for King County. Seamless soils shapefile for entire county.	Not Specified	DOT-RSD
LAASETHNSP	Ethnographic place names for King County	Not Specified	DOT-RSD
PREHIST_ARCH	Recorded prehistoric archaeological sites for King County	Not Specified	DOT-RSD
HIST_ARCH	Recorded historic archaeological sites for King County	Not Specified	DOT-RSD
HRI_SITES	Historic properties recorded at King County Office of Cultural resources	Not Specified	DOT-RSD
CLP	Recorded Cultural Resources managed by SPU	Not Specified	DOT-RSD

Name	Description	Data Type	Organization
BURKEBLUEPOLY	Heretofore unrecorded archaeological sites for King County	Not Specified	DOT-RSD
BURKEGRAYPOLY	Heretofore unrecorded archaeological sites for King County	Not Specified	DOT-RSD
LANDFORM	Paleo-landscape features (late Pleistocene and Holocene)	Not Specified	DOT-RSD
LAASTCPSP	Areas of traditional cultural and religious significance for Native American groups in King County	Not Specified	DOT-RSD
GLOETHNOTRAIL	Cultural features digitized from GLO maps for use as shape files (feature data sources)	Not Specified	DOT-RSD
GLOHISTRD	Cultural features digitized from GLO maps for use as shape files (feature data sources)	Not Specified	DOT-RSD
GLOHISTPT	Cultural features digitized from GLO maps for use as shape files (feature data sources)	Not Specified	DOT-RSD
GLOETHPOLY	Cultural features digitized from GLO maps for use as shape files (feature data sources)	Not Specified	DOT-RSD
GLOHISTPOLY	Cultural features digitized from GLO maps for use as shape files (feature data sources)	Not Specified	DOT-RSD
CRREPORTS	Areas of previous cultural resource surveys	Not Specified	DOT-RSD
2002 GUARDRAIL	Line Shapes representing King County countywide Traffic Section 2002 proposed guardrail replacement projects	Not Specified	DOT-RSD
SIG_COMPLETE	Point shapes representing King County countywide Traffic Section 2001 Signal projects completed	Not Specified	DOT-RSD
SIG_EXPECTED	Point shapes representing King County countywide Traffic Section 2001 Signal projects expected to be completed.	Not Specified	DOT-RSD
HARS	Line shapes representing King County countywide High Accident Roadways.	Not Specified	DOT-RSD
HALS	Point shapes representing King County countywide High Accident Locations.	Not Specified	DOT-RSD
CIPPLINE	Line shapes representing King County Capital Improvement Projects.	Not Specified	DOT-RSD
CIPPATH	Line shapes representing King County Capital Improvement Sub-Projects.	Not Specified	DOT-RSD
CIPPOINT	Point shapes representing King County Capital Improvement Projects.	Not Specified	DOT-RSD
ADOPT	Line shapes representing the adopted sections of King County roadways countywide.	Not Specified	DOT-RSD

Name	Description	Data Type	Organization
PWAY_DATA	Line shapes representing countywide School Pathway Projects.	Not Specified	DOT-RSD
LIFELINE	Line shapes representing Lifeline Routes, it is a cooperative venture between the Federal Emergency Management Agency (FEMA) and King, Pierce, Kitsap, and Snohomish Counties. Its goal in the identification and coordination of lifeline routes between and among state, County and local emergency managers.	Not Specified	DOT-RSD
BRIDGE	Point shapes representing King County maintained Bridges.	Not Specified	DOT-RSD
"BY BASIN" MANY THEMES	Point and line shapes that represent King County's drainage inventory NPDES (National Pollution Discharge Elimination System).	Not Specified	DOT-RSD
3P	Line shapes showing King County Countywide proposed pedestrian improvement projects.	Not Specified	DOT-RSD
NEP LINES	Line shapes representing King County Countywide Neighborhood Enhancement Projects.	Not Specified	DOT-RSD
COUNT_DATA	Point shapes representing Countywide year 2000 Historical Count Location w/ data attached	Not Specified	DOT-RSD
RD_EIS	Point shapes representing Roads Environmental Unit's impact statements.	Not Specified	DOT-RSD
RD_BA	Point shapes representing Roads Environmental Unit's biological assessments	Not Specified	DOT-RSD
RD_PROP	Point shapes representing Roads Services Division owned properties.	Not Specified	DOT-RSD
FREIGHT_GOODS	Line shapes representing routes designated by the state as roadways that carry freight and goods.	Not Specified	DOT-RSD
GUARDRAIL	Line shapes representing the King County Inventory of county-wide guardrail.	Not Specified	DOT-RSD
COUNT_LOCATIONS	Point shapes representing Roads Traffic Section Historical Count Locations w/o data attached.	Not Specified	DOT-RSD
BENLINE	Line shapes representing The George Benson Waterfront Streetcar Line derived from REVSERV as an ordered set of timepoint intervals.	Corporate	DOT-Transit
BUSBASE	Point shapes representing bus base locations (also called depots or garages). BUSBASE attributes include name, on street, cross street, and address.	Corporate	DOT-Transit
BUSSTOP	Point shapes representing Transit bus stops derived from street as a distance from an intersection along a link. BUSSTOP attributes include on street, cross street, stop type, accessibility, authorization, jurisdiction, date activated, date deactivated, bearing, distance from cross street, attributes pertaining to the stop sign and schedule holder and how they are affixed, usage by other transit properties, number of shelters, paint length, ride free area flag,	Corporate	DOT-Transit

Name	Description	Data Type	Organization
	side of the street, length of stop, fare zone, and zip code.		
COLLECTOR	Line shapes representing collector arterials derived from STREET and King County road classification.	Corporate	DOT-Transit
DEADHEAD	Line shapes representing Transit non-revenue service route footprint derived from STREET as an ordered set of links.	Corporate	DOT-Transit
EMITTER	Point shapes representing Transit radio frequency emitters in support of Automatic Passenger Counter and Automatic Vehicle Location systems. EMITTER attributes include on street, cross street, associated link id, and associated bus stop id.	Corporate	DOT-Transit
FREESTRT	A polygon shape representing the Transit ride-free-area derived from STREET.	Corporate	DOT-Transit
FREEWAY	Line shapes representing freeways derived from STREET and King County road classification.	Corporate	DOT-Transit
LANDMARK	Point shapes representing landmark locations. This layer directly supports Transit's trip planning system. LANDMARK attributes include name, abbreviated name, address, symbolization characteristics, classification, on street, cross street, and address. LANDMARK also has an associated alias table permitting a location to be referenced by multiple names.	Corporate	DOT-Transit
LOCAL	Line shapes representing local roads derived from STREET and King County road classification.	Corporate	DOT-Transit
MINOR	Line shapes representing minor arterials derived from STREET and King County road classification.	Corporate	DOT-Transit
NHOOD	Polygon shapes representing neighborhoods. This layer directly supports Transit's trip planning system. NHOOD attributes include the name of the neighborhood.	Corporate	DOT-Transit
NHOODCTR	Point shapes representing the business centers for neighborhoods. This layer directly supports Transit's trip planning system. NHOODCTR attributes include the name of the neighborhood and the address of the business center.	Corporate	DOT-Transit
PARKRIDE	Point shapes representing park and ride lot locations. PARKRIDE attributes include name, on street, cross street, address, zip code, district, ownership (permanent or leased), and owner.	Corporate	DOT-Transit
PLANDIST	Polygon shapes representing Transit Planning District as defined by Facility Planners.	Corporate	DOT-Transit
PRIMARY	Line shapes representing primary arterials derived from STREET and King County road classification.	Corporate	DOT-Transit

Name	Description	Data Type	Organization
	classification.		
REVSERV	Line shapes representing Transit revenue service route footprint derived from STREET as an ordered set of links.	Corporate	DOT-Transit
SIGNAL	Point shapes representing traffic signal locations derived from STREET (nodes) and traffic signal key.	Corporate	DOT-Transit
STREET (edges)	Line shapes representing the Countywide road and street network, including such related transportation links as selected driveways, transit connections, alleys, pedestrian walkways, etc. The street network is key to the Division's business. STREET (line) attributes include name, two alias designations, address (theoretical), zip code, King County road classification, HOV, barrier (to pedestrian traversal), grade (> 6%), and overhead trolley wire.	Corporate	DOT-Transit
STREET (junctions)	Node shapes representing intersections of line shapes. STREET (junction) attributes include transit timepoint key and traffic signal.	Corporate	DOT-Transit
SUBSTATN	Point shapes representing electrical distribution nodes for overhead wire trolley system. SUBSTATN attributes include name, address, type, supplier, label, and kilowatt-hours.	Corporate	DOT-Transit
TIMEPT	Point shapes representing Transit timepoints derived from STREET (nodes) and timepoint key. These are locations where expected bus arrival times are calculated.	Corporate	DOT-Transit
TRNSAREA	Polygon shapes representing Transit planning districts as defined by Service Planners.	Corporate	DOT-Transit
TRNSCNTR	Point shapes representing transit center locations. TRNSCNTR attributes include name, on street, cross street, and address.	Corporate	DOT-Transit
TRNSFACL	Point shapes representing transit facilities other than P&R, bus bases, and transit centers. TRNSFACL attributes include name.	Corporate	DOT-Transit
TROLLEY	Line shapes representing streets that have overhead trolley electrical lines derived from street. TROLLEY attributes include those attributes found on STREET shapes.	Corporate	DOT-Transit
TUNLSTN	Polygon shapes representing transit tunnel stations. TUNLSTN attributes include the name of the tunnel station.	Corporate	DOT-Transit
TUNNEL	A polygon shape representing the Transit tunnel.	Corporate	DOT-Transit
WTRTAXI	Line shapes representing the Water Taxi route derived from REVSERV as an ordered set of timepoint intervals.	Corporate	DOT-Transit
INCIDENT	Point shapes representing transit security incidents. INCIDENT attributes include date, route characteristics, on street, cross street, and items describing the incident type.	Division	DOT-Transit

Name	Description	Data Type	Organization
ACCIDENT	Point shapes representing transit accident locations. ACCIDENT attributes include date, time, status, reviewed, road conditions, weather, judgment, severity, route and vehicle characteristics, FTA codes, on street, and cross street.	Division	DOT-Transit
COMFSTN	Point shapes representing transit comfort stations (driver restroom facilities). COMFSTN attributes include owner and contact information, availability during the day, routes that have access on street, cross street, and address.	Division	DOT-Transit
DART	Polygon shapes representing Dial-a-Ride service area for Transit.	Division	DOT-Transit
FAREZONE	Polygon shapes representing Transit fare zones for King County Metro, Community Transit, Pierce County Transit, and Sound Transit.	Division	DOT-Transit
BUILDINGS	building footprints digitized from imagery	Not Specified	DOT-Airport
LEASEHOLDS	leaseholds digitized from imagery	Not Specified	DOT-Airport
LEASEHOLDS_COGO	leaseholds COGO'ed from legal descriptions in other documentation	Not Specified	DOT-Airport
LEASE_TIELINES	adjunct layer for leaseholds_cogo to define true points of beginning	Not Specified	DOT-Airport
MAP_SOURCE	spatial extent of rectified map imagery	Not Specified	DOT-Airport
OWNERSHIP_HISTORY	extents of airport property acquisition in historical context	Not Specified	DOT-Airport
SWDBSLIP4.SHP	Surface water drainage basin for Slip 4: digitized from multiple sources, including existing imagery and CAD drawings. Located on Orca.	Not Specified	DOT-Airport
URB-V&R	King County Vacant and Redevelopable Urban Land	Not Specified	OMB
RUR-V&R	King County Vacant and Redevelopable Rural Land	Not Specified	OMB
KC-MIC	King County Manufacturing and Industrial Center Boundaries	Not Specified	OMB
REC-LOTS	Recorded number of Formal plat lots in King County by Section Township and Range, and by City	Not Specified	OMB
NEWUNITS	New Housing Units Permitted in King County	Not Specified	OMB
HSESALES	House Sales	Not Specified	OMB

4.4.2 Applications

This section contains a table of all applications that are being maintained, developed or enhanced throughout King County and was compiled from the tables in each subsection of Section 3. App Type is Front End, Back End, Utility, or Not Specified:

Name	Description	App Type	Organization
AvLib	This ArcView extension (ArcView Library) provides users with streamlined methods to access and display layers in the KCGIS Spatial Data Warehouse. The application enables users to: browse spatial data layers by subject and feature type, with data layers identifiable by alias, filename, or description; add themes to a map view and automatically set various theme properties, such as symbology, which normally are randomly generated by ArcView; link data to metadata via an HTML browser; access image data, which is difficult to organize and retrieve by providing the user with menu choices for one click access to any image data on the system; load a standard view from a library of user defined views; store a map view locally or submit a view to the KCGIS Spatial Data Warehouse so that other users may access it; and generate maps using standard layouts.	Front End	KC GIS Center
KC Parcel Tools	This ArcView extension provides users with an easy to use interface to selected Assessor's data in the KCGIS Spatial Data Warehouse. There are five main functions of this application, which include: queries based on a known PIN or taxpayer name; information lookups on previously selected parcels; access to the RECDNET framework layer LIBRARIAN tiles with tools for loading and managing arc and annotation features; generating quarter section maps of RECDNET data with minimal user input; and generating formatted mailing labels for selected parcels.	Front End	KC GIS Center
iMap	iMap is a web browser based map viewer that provides online access to map layers and other related information. The map viewer generally requires a fast Internet connection. Data sets are grouped into Map Sets that present data from different subject areas. iMap includes a property search tool that is fully integrated with the basic application and thus accessible in all Map Sets. A variety of other data query tools are also part of the standard iMap user toolbox, including buffering, geocoding, query builder, and more. When a parcel is selected, URL links are presented linking to the Districts and Developments Conditions Report, the Property Report, and DDES Permits reports. A map output functions is also included.	Front End	KC GIS Center
Parcel Viewer	The Parcel Viewer is an application targeting property searches. This application does not require a fast Internet connection. Users can navigate the map and select parcels, or search for properties using address, cross streets or parcel number as input. Buffering and map output features are also included. Like iMap, when a parcel is selected URL links are presented linking to the Districts and Developments Conditions Report, the Property Report, and DDES Permits reports.	Front End	KC GIS Center

Name	Description	App Type	Organization
Districts and Development Conditions Report	The King County Districts and Development Conditions Report provides information on a property's characteristics, such as: parcel number, school district, zoning designation, jurisdiction, water district, comprehensive plan designation, ZIP code, sewer district, agricultural production district, county council district, council member, and watershed. Written in ASP and utilizing ArcIMS, it allows anyone with a web browser to access the page and enter either an address or a parcel number. If a matching record is found, the user is then given a full report of associated data for that property. This page will also take a parcel number as an argument in the URL, so other sites or applications can link into the report. iMap and the Parcel Viewer provide links to this report.	Front End	KC GIS Center
KC Property Report	KC Property Report is an on-line query tool into the tabular data from the King County Assessor stored in the KCGIS Oracle RDBMS. Written in ASP, it allows anyone with a web browser to access the page and enter either an address or a parcel number. If a matching record is found, the user is given a full report of associated Assessor data for that property. This page will also take a parcel number as an argument in the URL, so other sites or applications can link into the report. iMap and the Parcel Viewer provide links to this report.	Front End	KC GIS Center
Doctool	Doctool allows data stewards to create and maintain metadata for spatial objects and their associated features. Users may document various aspects of the chosen object, including (but not limited to) abstract information, spatial descriptions, usage limitations, relates, and descriptions of specific spatial, tabular, and attribute features. The documentation is stored in a set of Oracle tables, which are accessed during the periodic update of the HTML pages used for the Spatial Data Catalog.	Back End	KC GIS Center
Inview	Inview (INtegration VIEWer) is designed to allow users to view edits applied to the cadastral base (RECDNET) and cadastral base annotation coverages (RECDANNO). Use of Inview increases the overall efficiency of the submittal and integration procedure by decreasing the time necessary to perform QA checks and replacing the need for QA plots. Inview facilitates communication between agency users and the KCGIS Center integration application maintenance staff by providing a consistent, onscreen, visual checking device to quickly identify and document problems with submittals.	Back End	KC GIS Center
Keytool	Keytool allows users to create and maintain polygon keyfiles that describe GIS datasets conflated to the KCGIS cadastral superset coverage, RECDNET. A keyfile is an INFO table that describes the relationship between KEY, the unique polygon identifier for RECDNET, and a user-defined item that describes the user's feature that is derived from RECDNET. Using a choice of processing techniques, the necessary spatial data is extracted from RECDNET to form the desired polygon information. A GUI allows users to compare RECDNET with the original coverage line work and choose the correct polygons from RECDNET required to build	Back End	KC GIS Center

Name	Description	App Type	Organization
	the new coverage.		
Sitetool	Sitetool allows KCGIS members to maintain and update their spatial and organizational information. It consists of a set of applications that allow users to: register coverages and tables to the data warehouse; change the name, library, or data steward for existing data; and enter organization and staff contact information.	Back End	KC GIS Center
Eventlog Reader	Eventlog Reader is a web-based application located on the intranet web server so only King County employees have access: http://badinov.metrokc.gov/eventlogform.asp. This application is used for building queries and viewing records from the "EVENTLOG" table in the Oracle database. Other applications, such as the nightly coverage posting routines, integration routines, and shapefile conversion routines write information about their actions to the EVENTLOG table. Users can use the Eventlog Reader to easily review these records using their web browser.	Back End	KC GIS Center
MaintRec	The MaintRec tool provides King County agencies with a set of tools to populate tiled edit coverages with new or updated features. The edit coverages provide the KCGIS Center and the KC Assessor with the necessary information to perform their shared duties of maintenance and integration for the RECDNET and the RECDANNO layers. MaintRec includes the following interactive tools: extract RECDNET and RECDANNO features by user specified extents; import ArcInfo coverages, and translate DXF files and ArcInfo export files into coverages; display, select, add and edit arc and polygon labels and their associated attributes; display, select, add and edit subclass annotation and their associated symbol markers and leaders; execute quality assurance checks on edits, facilitate error detection and resolution, generate quality assurance check plots and error reports and generate finish plots; submit finalized edits to the proper submittal directory.	Back End	KC GIS Center
ArcSDE scripts	The ArcSDE scripts load spatial data layers from source coverages into Oracle schemas or libraries. The scripts provide consistent fieldname mapping and keywords for database storage parameters for each layer so that handling of a given layer is consistent from one load to the next. The SDE.DBTUNE table is the mechanism for tuning storage for a given layer. The DBTUNE table maps a keyword to a storage clause that specifies where specific resources for a particular table will reside. These scripts are slated for eventual replacement by ArcObjects applications.	Utility	KC GIS Center
Docgen	The Docgen routine creates content for the Spatial Data Catalog. There are two output formats: a simple KCGIS format and FGDC compliant. Docgen currently does not write directly to the KCGIS website. Instead it creates the necessary files on *WILDFIRE*, which must subsequently be processed through Microsoft FrontPage in order to have the appropriate borders attached. Docgen is slated for replacement when the new metadata regime comes	Utility	KC GIS Center

Name	Description	App Type	Organization
	online.		
Integrate	The Integrate routines provide multi-user editing capabilities in a LIBRARIAN environment. These routines test and incorporate the updates generated by King County agencies for their layers derived from the framework RECDNET and RECDANNO layers. The routines are called from the cron_update script as a part of the nightly database update processing. Two types of updates can be submitted from KCGIS agencies: manual updates and those generated from the MaintRec tool. The manual updates are submitted in the form of three coverages called: RECARC, RECPNT and RECANNO. Updates generated from the MaintRec tool use a different naming convention for the same three coverages so many edits can be submitted for a single tile. The name format is as follows: arc_<submit-id>; pnt_<submit-id>; ann_<submit-id>. They are in the identical data format as the RECARC, RECPNT and RECANNO coverages respectively. RECDNET Integrations – During integration all RECARC and RECPNT submittal coverages (includes MaintRec generated covers) for each tile are combined into one corresponding RECARC and RECPNT coverage. The combined coverage name format is arc<integrateid> and pnt<integrateid>. Using the combined coverages all changes are made to a copy of RECDNET. Data integrity checks are made to the new RECDNET coverage and if it passes, it is positioned for the update cycle to post into the KCGIS Spatial Data Warehouse. Upon failure of tests the tile will be "hung" (no updates integrated) until the manual intervention rectifies the errors and allows for integration. RECDANNO Integrations – RECDANNO submittal coverages are not combined for each tile and many RECDANNO submittals may be integrated into a copy of RECDANNO. Upon integration into the tiled RECDANNO coverage it is placed in the post directory structure for the update cycle to upload it into the KCGIS Spatial Data Warehouse. Complicated updates to RECDNET topology and all edits to RECDANNO are best handled using the MaintRec tool. Manual submittals should be limited to addition and deletion of arcs.	Utility	KC GIS Center
LibTool Utilities	Unlike most other applications, LibTool is not a discrete tool (thus is misnamed), but rather a set of utility routines that are called from other enterprise AML applications. Currently used routines manage database connections, restore data structures in case of system crash, and manage the eventlog. (This "LibTool" is not to be confused with the in-development front-end ArcGIS application of the same name.)	Utility	KC GIS Center
RDBMS scripts	RDBMS scripts are primarily used to support two processes, batch data loads and Oracle administration. Those that support batch data loads include: Legal Descriptions Data Load (cron_legal) – A scheduler process calls the shell script which	Utility	KC GIS Center

Name	Description	App Type	Organization
	transfers an ASCII extract file from the Recorder's Office mainframe and then uses Oracle's SQL Loader utility to load the data into an Oracle table. Assessor Tables Data Load (cron_kcaload_batch) – A scheduler process calls the shell script cron_kcaload_batch to preprocess the ASCII input files and load them into Oracle tables. Those that support Oracle administration include: Add_user – fPL/SQL scripts are used to streamline the task of adding database user accounts and to maintain duplicate data in different structures during migration of database structure or applications. New_regime – A PL/SQL stored procedure runs nightly to replicate tables used by the current control mechanisms (Sitetool, Update) to new tables for the coming control mechanism currently in design.		
Update	The Update routines are varied and perform many functions to update the data warehouse files for KCGIS sites. The routines are called from the cron_update script as a part of the nightly database update processing. The routines find submitted keyfiles (tiled and untiled), ArcInfo Export files, and coverages (tiled and untiled) in the posting directories; perform validation tests on the files; and post them to the public library. Corresponding shapefiles are generated and posted to plibrary2. Various lookup tables are updated to reflect the posted changes to the public data library.	Utility	KC GIS Center
KingView	This application was developed by Assessments' Information Services Division for appraisers to use in valuing property and defending appeals. Additionally, it can be used by other staff as a tool for running quality assurance checks against the spatial and tabular data.	Not Specified	Assessments
KC Appraiser	This ArcView extension streamlines setup steps necessary for appraisers to access tabular and GIS data in addition it contains utility for making standard map products. This application was written by the KCGIS Center with Client/Services funding.	Not Specified	Assessments
ViewControl	This application was designed for the data administrator to set up and control the display of layers available to the KC Appraiser extension. This application was written by the KCGIS Center with Client/Services funding.	Not Specified	Assessments
County2002	This is an ArcView project designed to jumpstart users into the use of ArcView. While not technically an application it is used throughout the commercial appraisal division for the annual appraisal process.	Not Specified	Assessments
Plot	Used for generating the King County Assessor map.	Not Specified	Assessments
LotSqft	Used for updating lot size information in the SQL server tables from annotation placed during the cadastral maintenance	Not Specified	Assessments

Name	Description	App Type	Organization
	the cadastral maintenance.		
Plat	A series of routines used for adding new plats to the Assessor GIS plat library as well as transferring data to Wildfire for incorporation in RECDNET.	Not Specified	Assessments
Seaqsmap Nonseaqsmap	Standard plotting applications based on server data for Commercial and Residential appraisers.	Not Specified	Assessments
Newuntar	Data transfer routines for replication of Wildfire data on Assessments servers.	Not Specified	Assessments
Modchoose	Generates a map patch and list of parcels that fall within a particular annexation.	Not Specified	Assessments
Planning Maps	Planning Maps is a map set incorporated into *iMAP*, King County's ArcIMS Internet application. It primarily used to obtain information on zoning classifications and land use designations for unincorporated King County. The map set is designed to provide DDES staff and its customers with quick and easy access to this basic planning information. Planning Maps was developed in collaboration with the KCGIS Center.	Front End	DDES
Sensitive Areas	Sensitive Areas is a map set incorporated into *iMAP*, King County's ArcIMS Internet application. It primarily used to obtain information on various types of sensitive areas and environmental layers in unincorporated King County. Because of the large number of layers needed for the Sensitive Areas they have been composed into two subsets -wet themes and dry themes. The map sets are designed to provide DDES staff and its customers with quick and easy access to environmental information. Sensitive Areas was developed in collaboration with the KCGIS Center.	Front End	DDES
Base2	"Base2" is a customized ArcView project used by staff at DDES to locate and determine the characteristics of a parcel and its vicinity. "Base2" has been the primary tool available to GIS end-users at DDES for the last several years. Lagging performance has always been an issue with "Base2" as response times to queries can be frustratingly slow. To reduce end-users reliance on "Base2" much of its functionality and information content has been ported to quicker browser-based applications such as the "Parcel Locator" and now *iMAP*. The adoption of ArcSDE for GIS data storage at DDES gives further incentive to replace "Base2" and the underlying ArcView 3.1 software, which can not access data from ArcSDE. Nevertheless, the application will continue to be supported at DDES for the foreseeable future.	Front End	DDES
Auto Plot	"AutoPlot" is a customized ArcView project that provides a quick and easy method for printing a series of maps that are used during field or site plan review. Each map in the series depicts a different set of environmental or regulatory features that may effect site development.	Front End	DDES

Name	Description	App Type	Organization
Development Conditions Search Engine	The "Development Conditions Search Engine" is an Internet application using Cold Fusion and Microsoft Access. It provides parcel specific development condition information for unincorporated King County in tabular format with access to scanned and indexed map images.	Front End	DDES
Parcel Locator 2	"Parcel Locator 2" is an ArcIMS based internal web application that is designed to be linked from DDES' permitting system, and meet specific attribute reporting needs of DDES staff.	Front End	DDES
SANT Data Entry Module	The "Sensitive Area Notice on Title (SANT) Data Entry Module" is a user interface for the SANT database (SANT.mdb). The interface is designed to aid data entry personnel in collecting the pertinent information from recorded notice on title documents. The collected information is used in DDES parcel finder applications such as "Base2" to inform users about sensitive area features that are associated with a subject parcel.	Back End	DDES
ParkView	Look-up tool to access general information for parks, trails, facilities, and programs.	Not Specified	DNRP-P&RD
PSAFI	Park site and facility information application, which tracks detailed data for all park sites and the facilities within them.	Not Specified	DNRP-P&RD
IMAP Parks System	KCGIS Map Portal map set that provides an overview of the County's park system.	Not Specified	DNRP-P&RD
Streettool For the CRIS Roadlog	Streettool provides an environment for editing, maintaining, quality controlling, and plotting spatial data for the County Road Inventory System (CRIS) in compliance with WAC 136-60 and King County Code. This application was created in an ArcGIS 8.1 environment using Visual Basic for Applications (VBA), Spatial Database Engine (SDE), and Oracle. This was a cooperative project between King County Department of Transportation – Road Services and KCGIS Center.	Not Specified	DOT-RSD
BondTracker	BondTracker is an intranet application that tracks roadway maintenance and defect bonds for newly created King County roads. The application was created using Cold Fusion and MS-SQL database for the Maintenance and Defect Bond Program for King County DOT – Road Services Unit. GIS link will be integrated in 4th quarter of 2003.	Not Specified	DOT-RSD
Mapper	Mapper is a customized ArcView 3.x project. The project provides ArcView users with a simple easy to use menu interface for adding GIS data to a view in a project. It also gives users a quick interface for creating layouts with a title bar, north arrow, scale bar, disclaimer, legend, date, file name and overview window. It has been updated in the 4th quarter of 2002 to meet the new King County cartographic standards and continue to be maintained by Roads staff.	Not Specified	DOT-RSD
AS	This application is an ArcView 3.x extension. It provides Accessible Services staff with an simple easy-to-use menu interface for creating transit fixed route service footprints based on	Front End	DOT-Transit

Name	Description	App Type	Organization
	time of day.		
Avmaps	This application is an ArcView 3.x extension. It provides all ArcView end users with a simple easy-to-use menu interface for adding layers to a view from the Transit public library. It also provides end users with a simple easy-to-use interface for creating a layout with title, north arrow, disclaimer, scale bar, date, legend and view that adhere to the King County GIS Cartographic Standards.	Front End	DOT-Transit
Avtabs	This application is an ArcView 3.x extension. It provides customer information analysts with a simple easy-to-use menu interface for graphically showing bus stop signage installation routes.	Front End	DOT-Transit
Btreport	This application provides Customer Information analysts with reports identifying data integrity and missing data issues. These reports are typically reviewed prior to an extract of data from the corporate database to downstream information systems.	Front End	DOT-Transit
Transit GIS Toolbox	This application provides users an easy-to-use menu interface for accessing the vast array of geographic data available in Transit's GIS and corporate data available in Transit's Oracle distribution database. Together, these databases store the agency's spatial and non-spatial information for future, current and past service changes. Although designed for all Transit staff, the *Transit GIS Toolbox* has several modules with functionality designed for specific work groups. These include: • Ridership – Calculates Transit ridership at user specified locations. • Stop Editor – Bus stop placement tool. • TOE -- Maintaining route paths and time point locations.	Front End	DOT-Transit
Gis2atis	This application converts data from the GIS production library for use in the Automated Traveler Information System or Trip Planning application by customer information analysts. It is scheduled to be replaced in 2003.	Front End	DOT-Transit
Moemitter	This application provides Radio Maintenance staff with an easy-to-use menu interface for maintaining vehicle location emitters. These emitters are used within the Automatic Passenger Counter (APC) system and the Automatic Vehicle Location (AVL) system. It is scheduled to be replaced in 2003.	Front End	DOT-Transit
Safety DMS	This application provides safety and operations staff with a tool for entering accident information, tracking accidents through the legal process and reporting on accidents.	Front End	DOT-Transit
Security DMS	This application provides security and operations staff with a tool for entering security incident information, tracking incidents through the legal process and reporting on incidents. It is	Front End	DOT-Transit

Name	Description	App Type	Organization
	scheduled to be replaced in 2002/2003 as part of the Security project.		
Security Reports	This application provides agency staff with the ability to generate reports on security incidents. It is scheduled to be replaced in 2002/2003 as part of the Security project.	Front End	DOT-Transit
Kcsnedit	King County Street Network Editor. This application is the primary tool used by Transit GIS staff for maintaining the street network links, nodes and attributes. It is scheduled to be replaced in 2003 as part of the transportation network project and as part of the NT migration target.	Back End	DOT-Transit
Aspmail4	This application is a remote mailing application used to notify clients and support analysts of data issues and nightly process status	Utility	DOT-Transit
Avl_tpiupdate	This application updates several object tables in Oracle as a result of edits to those objects in GIS. These tables are specifically used by interface applications such as the GIS Toolbox to improve functionality and are not part of the corporate data. It is scheduled to be replaced in 2003.	Utility	DOT-Transit
Avlschedbuild	This application creates transfer files for the interface application used by Automatic Vehicle Location (AVL) Coordinators. These files are necessary for the AVL application to track bus locations on a daily basis.	Utility	DOT-Transit
DataConn	This is a COM object that provides a centralized ODBC data connection for use by various applications that connect to the Transit Oracle database.	Utility	DOT-Transit
Dbcompar	This application compares data in GIS with data in the Oracle corporate database and reports on any inconsistencies to Transit GIS staff. It is scheduled to be replaced in 2003.	Utility	DOT-Transit
Emit_chg	This application compares emitters from the previous day and reports on any changes (inserts, updates or deletes) made by Radio Maintenance staff to APC staff. It is scheduled to be replaced in 2003.	Utility	DOT-Transit
Kctran2nat	This application transfers Transit and street network related coverages to the KCGIS Spatial Data Warehouse. It is scheduled to be replaced in 2003.	Utility	DOT-Transit
Mnt2prd	This application transfers transit objects and the street network in the maintenance area, which has restricted access, to the production library for access by end users. The application also creates derived data layers from core data (e.g., freeways from the street network). It is scheduled to be replaced in 2003.	Utility	DOT-Transit
Plib2prd	This application transfers data from the KCGIS Spatial Data Warehouse to the Transit GIS library. It is scheduled to be replaced in 2003.	Utility	DOT-Transit

Name	Description	App Type	Organization
Toeddb	This application processes inserts, updates and deletes made using the *TOE* and *Kcsnedit* applications and sends them into the Oracle Transit corporate database for access by other systems. It is scheduled to be replaced in 2003 as part of the NT migration target.	Utility	DOT-Transit
Toetow	This application merges transit objects modifications/additions/deletions using the *TOE* application with street network edits maintained using the *Kcsnedit* application. These applications work on copies of the street network and it is necessary to combine the separate edits onto a single network at the end of the day. It is scheduled to be replaced in 2003 as part of the NT migration target.	Utility	DOT-Transit

4.4.3 2003 Task List

This section contains a summary table of work tasks for all GIS workgroups. Please see previous sections of section 3 for detail on individual tasks.

Work Task Description	Lead Role	Support Role	Expected Completion	Contact
Continue ongoing maintenance of department specific and enterprise data layers and applications.	DOT	--	Ongoing	Mike Berman Harry Clark
Provide GIS Toolbox Training	DOT Transit	--	Ongoing	Mike Berman
Perform Section 15 reporting for federal NTD reporting requirement.	DOT Transit	--	Yearly	Mike Berman
Provide GIS support to Transit Accessible Services workgroup.	DOT Transit	--	Ongoing	Mike Berman
Provide GIS support to On-Board Systems Integration Project.	DOT Transit	--	2006	Mike Berman
Rewrite Transit Security database, data entry application, and intranet reporting tools.	DOT Transit	--	2003	Mike Berman
Develop bus stop information system (application and database).	DOT Transit	--	2003	Mike Berman
Rewrite MoEmitter application	DOT Transit	--	2003	Mike Berman
Deploy new Transit GIS Toolbox to users.	DOT Transit	--	2003	Mike Berman
Create new maintenance consortium for transportation network.	DOT Transit	GIS Center	2003	Mike Berman
Complete testing of TNET maintenance application and nightly processing for transit data	DOT Transit	--	2003	Mike Berman

Work Task Description	Lead Role	Support Role	Expected Completion	Contact
Test SDE.	DOT Transit	--	2003	Mike Berman
Participate in development of customer response tracking sys.	DOT Transit	--	2003	Mike Berman
Migrate data, applications, and users from UNIX to NT.	DOT Transit	--	2003	Mike Berman
Develop sign inventory data layer.	DOT Roads	--	2003	Mike Crippen
Develop citizen action requests data layer.	DOT Roads	--	2003	Mike Crippen
Develop street lighting inventory data layer.	DOT Roads	--	2003	Mike Crippen
Continue development of pavement marking inventory data layer.	DOT Roads	--	2003	Mike Crippen
ESA/SAO Data Acquisition Project.	DOT Roads	--	2003	Michael Kulish
Create Digital Elevation Model	DOT Roads		2003	Michael Kulish
Change design of CRIS and move to SQL environment.	DOT Roads	WA DOT	2003	Jeff Gregg
Combine the ESA Programmatic Permit notification process and mitigation monitoring efforts into a GIS format (2003 completion).	DOT Roads	--	2003	Michael Kulish
Continue ongoing maintenance of division specific data layers	DOT Roads	--	Ongoing	Harry Clark
Apply new technology to roadway feature data collection (RNIS info)	DOT Roads		2003	Michael Kulish
Develop intra- and internet applications to disseminate storm water and water quality/habitat data.	DOT Roads		2003	Michael Kulish
Develop data layers for environmental data.	DOT Roads		2003	Michael Kulish
Work with GIS Center to improve migration of data from Division into the data warehouse	DOT Roads	GIS Center	2003	Harry Clark
Develop coordinated Division effort to collect road feature inventory using advanced(photo-referenced) data-collection technology	DOT Roads		2004	Michael Kulish/ Harry Clark
Set up process for scanning plans/engineering data into database	DOT Roads		2003	Dennis Ghorley
Consolidate and coordinate multiple road inventory databases (RNIS, CRIS, PMS, Traffic features, etc), and associate with the new Transportation Network	DOT Roads	--	2004	Harry Clark

Work Task Description	Lead Role	Support Role	Expected Completion	Contact
Continue ongoing maintenance of County cadastral and department specific data.	KCA	KCGIS Center	Ongoing	Christie Most
Conversion of Seattle Parcel data to KCGIS format	KCA/KCGIS Center	KCGIS Center	2002-2003	Christie Most
Incorporation of better Survey data	KCA		Ongoing	Christie Most
Integration of GIS with Appraisal Process	KCA	KCGIS Center	Ongoing	Christie Most
Coordination with elections levy code and city boundaries	KCA, DES: KCEGIS		Ongoing	Christie Most
Updates to ref_grid survey control layer; determination of stewardship	KCA, KCGIS	Interested depts	Ongoing	Christie Most
Annotation enhancement of converted Seattle data	KCA		Ongoing	Christie Most
Sensitive area data conversion from mylar overlays; identification of comparable source	KCA		When complete	Christie Most
Improvements to maint_rec	KCGIS, KCA	KCGIS	Ongoing	Christie Most
Migrate spatial data for DDES counter application from shape files to SDE and/or SQL Database tables.	DDES		2003	Paul McCombs
Conflate cadastral-based data layers to match Assessments cadastral features.	DDES	--	2003	Paul McCombs
Convert information in parcel specific development condition database to GIS layers and redesign search engine.	DDES	--	2003	Paul McCombs
Develop zoning history layer.	DDES	--	2003	Paul McCombs
Develop fish and wildlife habitat conservation area layers to support Critical Areas Ordinance.	DDES	--	2003	Paul McCombs
Develop land capacity tracking database.	DDES	--	2003	Paul McCombs
Develop reports as requested for the ESA/GIS Chinook Data Work Group.	DDES	--	2003	Paul McCombs
Develop preliminary plat applications layer.	DDES	--	2003	Paul McCombs

Work Task Description	Lead Role	Support Role	Expected Completion	Contact
Continue ongoing maintenance of department specific and enterprise data layers and applications.	DDES	--	Ongoing	Paul McCombs
Enhance fire investigation data entry module.	DDES	--	2003	Paul McCombs
Collaborate with the GIS Center to provide new iMAP functionality that meets DDES staff need.	DDES	KCGIS Center	2003	Paul McCombs
Make Enhancements to Base 2, DDES' Counter Application. (E.g. Optimize logic for faster search query)	DDES	--	2003	Paul McCombs
Develop tools to assist GIS staff transitioning from ArcInfo to ArcGIS software.	DDES	--	2003	Paul McCombs
Continued development and refinement of Parcel Locator 2 internal web application to meet needs of DDES staff.	DDES	--	Ongoing	Paul McCombs
Develop an automated tool for GIS staff to summarize an arbitrarily defined set of permits by an arbitrary set of geographic areas.	DDES	--	2003	Paul McCombs
Consolidation of department-specific data on new data server	DNRP	--	2003	Harkeerat Kang (Parks); Shaun O'Neil (WTD); Collene Gaolach (WLRD)
Ad hoc map/data/analysis requests	DNRP	--	Ongoing	Dennis Higgins (Parks); Bob Swarner (WTD); Ruoxi Zhang (WLRD)
Maintenance of department-specific and enterprise data layers and applications	DNRP	KCGIS Center	Ongoing	Greg Stought
Metadata improvement, procedures, training	DNRP	KCGIS Center	Ongoing	Greg Stought
Intranet maintenance and development	DNRP	--	Ongoing	Harkeerat Kang (Parks); Collene Gaolach (WLRD)

Work Task Description	Lead Role	Support Role	Expected Completion	Contact
Maintain/Enhance ParksInfo	DNRP – Parks	KCGIS Center	Ongoing	Harkeerat Kang
Maintain/Enhance ParkView	DNRP – Parks	--	Ongoing	Dennis Higgins
Maintain/Enhance Cold Fusion web applications: Caller Log, Concessionaires, Inspections, and Training	DNRP – Parks	--	Ongoing	Harkeerat Kang
Create Facility Inspections Team pipeline survey video data access application	DNRP - WTD	KCGIS Center	2003	Shaun O'Neil
CIP project and database support	DNRP – WTD	KCGIS Center	Ongoing	Peter Keum
Link CIP financial data to WTD GIS data sets	DNRP – WTD	KCGIS Center	2003	Peter Keum
Design application requirements to view and analyze rain gauge and flow monitor data	DNRP – WTD	KCGIS Center	2003	Shaun O'Neil
Support Conveyance System Improvement Project	DNRP – WTD	KCGIS Center	Ongoing	Peter Keum
Support Inflow/Infiltration (I/I) Project	DNRP – WTD	KCGIS Center	2005	Mary Barrett
Build Application for I/I Reduction Analysis	DNRP – WTD	KCGIS Center	2003	Mary Barrett
Local System Pipe attributes (flow direction)	DNRP – WTD	KCGIS Center	2003	Mary Barrett
Support WTD offsite and inspection needs	DNRP – WTD	KCGIS Center	Ongoing	Shaun O'Neil
Support Brightwater siting	DNRP – WTD	KCGIS Center	2010	Shari Cross
Support Brightwater Outfall siting and analysis	DNRP – WTD	KCGIS Center	2010	Shari Cross
Provide Technical Assistance to WTD ArcView Users	DNRP – WTD	KCGIS Center	Ongoing	Shaun, Peter, Shari, Mary
Support ESA/HCP Efforts	DNRP – WTD	KCGIS Center	Ongoing	Peter Keum
Resource Lands Management database	DNRP - WLRD	KCGIS Center	Ongoing	Todd Klinka
Resource Lands Program Participation database	DNRP - WLRD	KCGIS Center	Ongoing	Todd Klinka
Major Land Owners database	DNRP - WLRD	KCGIS Center	Ongoing	Todd Klinka
Land Cover Change – temporal analysis	DNRP - WLRD	KCGIS Center	2003	Todd Klinka
Consolidated data model for fish distribution	DNRP - WLRD	KCGIS Center	2003	Ken Rauscher

Work Task Description	Lead Role	Support Role	Expected Completion	Contact
Update hydrography data layers	DNRP – WLRD	KCGIS Center	Ongoing	Ken Rauscher
Landsat-based land cover change detection	DNRP – WLRD	KCGIS Center	2004	Ken Rauscher
Event table development for aquatic habitat, fisheries, and hydrologic data	DNRP - WLRD	KCGIS Center	Ongoing	Ruoxi Zhang/ Pava Sivam
Dynamic Segmentation QC and Analysis Tools	DNRP - WLRD	KCGIS Center	2003	Ruoxi Zhang/ Pava Sivam
Maintenance of existing ArcIMS map services	DNRP - WLRD	KCGIS Center	Ongoing	Collene Gaolach
Continue ongoing maintenance of division specific data and applications.	REALS GIS	--	Ongoing	Harry Sanders
Develop application to migrate mainframe data to Elections GIS server	REALS GIS	ITS	2003	Harry Sanders
Make enhancements to DSTCODE to improve accuracy of minor taxing district boundaries	REALS GIS	KCA, External agencies	Ongoing	Harry Sanders
Develop additional Department level coverages.	REALS GIS	--	2003	Harry Sanders
Migrate to ArcInfo 8	REALS GIS	KCGIS	2003	Harry Sanders
Continue ongoing maintenance of District coverages on Wildfire	REALS GIS	KCGIS	Ongoing	Harry Sanders
Enhance REALS Division web site(s) with Addition GIS data.	REALS GIS	ITS	2003	Harry Sanders
Develop GIS tool set for Election staff to assist in customer service requests	REALS GIS	--	2003	Harry Sanders
Finish instillation of map application for display of wireless, wireline, and phase II (x,y) 911 calls at all sixteen PSAPs in King County.	DES (E-911)	--	2003	Khalid Khan
Provide GIS support to PSAPs that are installed with mapping.	DES (E-911)	--	Ongoing	Khalid Khan
Provide maintenance, concurrency, support and upkeep of PSAP map application.	DES (E-911)	--	Ongoing	Khalid Khan
Maintain Emergency Service Number (ESN) GIS layer.	DES (E-911)	--	Ongoing	Khalid Khan
Coordinate deployment of latest and updated GIS layers to the map display application at the PSAP, via the E-911 Program Office	DES (E-911)	--	Ongoing	Khalid Khan

Work Task Description	Lead Role	Support Role	Expected Completion	Contact
display application at the PSAP, via the E-911 Program Office.				
Maintain the existing E-911 Network for GIS layer download to PSAPs from the E-911 Program Office.	DES (E-911)	--	Ongoing	Khalid Khan
Provide support and use of KCDOT (T-NET) project.	DES (E-911)	KCDOT	Ongoing	Khalid Khan/ Mike Berman
Coordinate E-911 GIS work with GIS Center.	DES (E-911)	--	2003	Khalid Khan
Coordinate GIS work with DES Records	DES (E-911)	Records & Elections	Ongoing	Khalid Khan/ Harry Sanders
Begin building site data layer, digital and GIS information of homes in King County for PSAPs.	DES (E-911)		Ongoing	Khalid Khan
Respond to requests for specific GIS data layer by PSAPs.	DES (E-911)	--	2003	Khalid Khan
GPS location of homes, businesses, and various other site layers that could be points of origin of 911 calls. Insert and maintain site data layer in E9GIS application.	DES (E-911)	GIS Center	2003	Khalid Khan
Continue ongoing maintenance of E-911 specific data layers and PSAP map application.	DES (E-911)	--	2003	Khalid Khan
Priority Initiative #1 – Data assessment and inventory	KCGIS Center	Technical Committee	Ongoing	G Horning
Priority Initiative #2 – GIS software migration plan	KCGIS Center	Technical Committee	2003	G Horning
Priority Initiative #3 – Cadastral data enhancement plan	KCGIS Center	Technical Committee	2004	G Horning
Establish an enterprise geoprocessing server	KCGIS Center		2003	G Horning
Transition data warehouse to separate server using ArcSDE and RDBMS, tune database to optimize for retrieval and query operations	KCGIS Center		2003	G Horning
Data modeling for geodatabase	KCGIS Center	Technical Committee	Ongoing	G Horning

Work Task Description	Lead Role	Support Role	Expected Completion	Contact
Transition descriptive metadata storage and maintenance to XML format; integrate with XML based metadata for other data sources and content; provide search and element extraction tools	KCGIS Center		2003	G Horning
Enterprise Support Services – GIS data warehouse maintenance (major enhancement project scheduled for 2003, see GIS Center 5)	KCGIS Center		Ongoing	G Horning
Enterprise Support Services – RECDNET coordination and quality assurance	KCGIS Center	Assessments	Ongoing	G Horning
Enterprise Support Services – GIS spatial data catalog and metadata tools maintenance (major enhancement project scheduled for 2003, see GIS Center 7)	KCGIS Center		Ongoing	G Horning
Enterprise Support Services – Application development and enhancement	KCGIS Center		Ongoing	G Horning
Enterprise Support Services – GIS Internet site maintenance	KCGIS Center		Ongoing	G Horning
Enterprise Support Services – Vendor and consultant contract management for purchase agreements and services	KCGIS Center	Vendors	Ongoing	G Stought
Enterprise Support Services - Regional GIS initiatives and coordination	KCGIS Center	Other jurisdictions	Ongoing	G Babinski
Client Services – GIS training program	KCGIS Center	GIS Tech Committee	Ongoing	D Higgins
Client Services – Application development and maintenance	KCGIS Center	Client agency	Ongoing	D Higgins
Client Services – Data development, maintenance, and analysis	KCGIS Center	Client agency	Ongoing	D Higgins
Client Services – GIS consulting	KCGIS Center		Ongoing	D Higgins
Client Services – Map and report production	KCGIS Center		Ongoing	D Higgins
Support Council with maps showing impact of policy or legislation	Council GIS Coor.	Exec Dep'ts	ongoing	
Provide information on Council members' constituencies	Council GIS Coor.	DES: KCEGIS	ongoing	
Ensure adherence to State notification law	Council GIS Coor.	--	Ongoing	

Work Task Description	Lead Role	Support Role	Expected Completion	Contact
	Coor.			
Respond to public info requests	Council GIS Coor.	Exec dep'ts	Ongoing	
Work on special projects as they arise	DPH	--	Ongoing	
Upgrade ArcView 3.1.	DPH	KCGIS Center	2002-2003	Peter Isaksen
Continue ongoing maintenance and development of department specific data layers and applications	DPH	--	Ongoing	
Support the department with maps	DPH	--	Ongoing	
Provide information to customers	DPH	--	Ongoing	
Respond to public requests	DPH	--	Ongoing	
Maintain department data sources and applications	KCSO	--	Ongoing	
Update ST_ADDRESS file and maintenance of file	KCGIS Center	KCSO	Ongoing	
Respond to department, city and public data requests	OMB	DNRP-KCGISCenter	Ongoing	C Felt
Support Economic Development Program with maps and analysis	OMB for BRED	--	Ongoing	N Morales
Support Governance Transition Program with maps and analysis	OMB	Cities and DDES	Ongoing	N Morales
Maintain "Buildable Lands" countywide land capacity data	OMB and DDES	Other jurisdictions	2002	C Felt