King County

2004 GIS Production Operations and Maintenance Plan

Document History

Date	Who	Description
12/16/2003	GIS Technical Committee	Document completed and discussed at the GIS Technical Committee meeting.
12/16/2003	GIS Technical Committee	GIS Technical Committee consensus vote for submitting document to the GIS Oversight Committee.
January 2004	Christie Most, Chair	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 December, 2003. It represents the culmination of a collaborative effort by personnel throughout the County to delineate the 2004 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.

The year 2004 marks the beginning of the third 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 policy 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 and 2003 O&M plans. Like the plans for preceding years, the 2004 O&M provides lists of data and applications, descriptions of current work tasks, details of agency GIS programs, and information on GIS budgets. This year's plan refines the improvements made in the 2003 O&M, 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.

Last year's O&M Plan made extensive changes from the previous year, for comprehensiveness and readability. The changes this year are more subtle and more strategic. Several of the chapters identify strengths, weaknesses and challenges faced by departments and divisions as they implement their GIS programs. Several of the chapters have been extensively revised and fortified with new material. One new section, the Facilities Management Division of the Department of Executive Services, has been added (see section 3.4C).

Chapter 2 of the 2004 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 contains appendices with information about the governance committees and work groups, and a more complete "terms and definitions" section. In January, 2004, a list of critical tasks will be distilled from each section of Chapter 3 and distributed as a separate document. This "2004 Task List" will serve as a core working document to identify and track the progress of GIS work program items throughout the year.

This is very much a working document, not a plan to sit on the shelf. The information in this O&M Plan will be used to continue to refine KCGIS through cooperation, coordination, communication, and consensus. Development of the 2004 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 2003 and 2004 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 2004 and beyond. These tasks cover areas of data coordination and resolving data management issues, GIS software migration, cadastral data modeling, and enhancing our parcel maintenance tools. The 2004 O&M will be used in much the same manner to identify and prioritize issues, and address them with planned actions to address in 2004 and the 2005 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 essential to the diverse business functions of King County, and the 2004 O&M Plan 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 GIS end-user agencies, in partnership with the KCGIS Center, the County's provider of designated enterprise GIS services. 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 all 16 participant agencies plus the KCGIS Center. The KCGIS Technical Committee develops the annual GIS O&M plan, addresses programmatic issues, and makes recommendations to the KCGIS Oversight Committee regarding GIS 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 negotiated cost allocation model. 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.

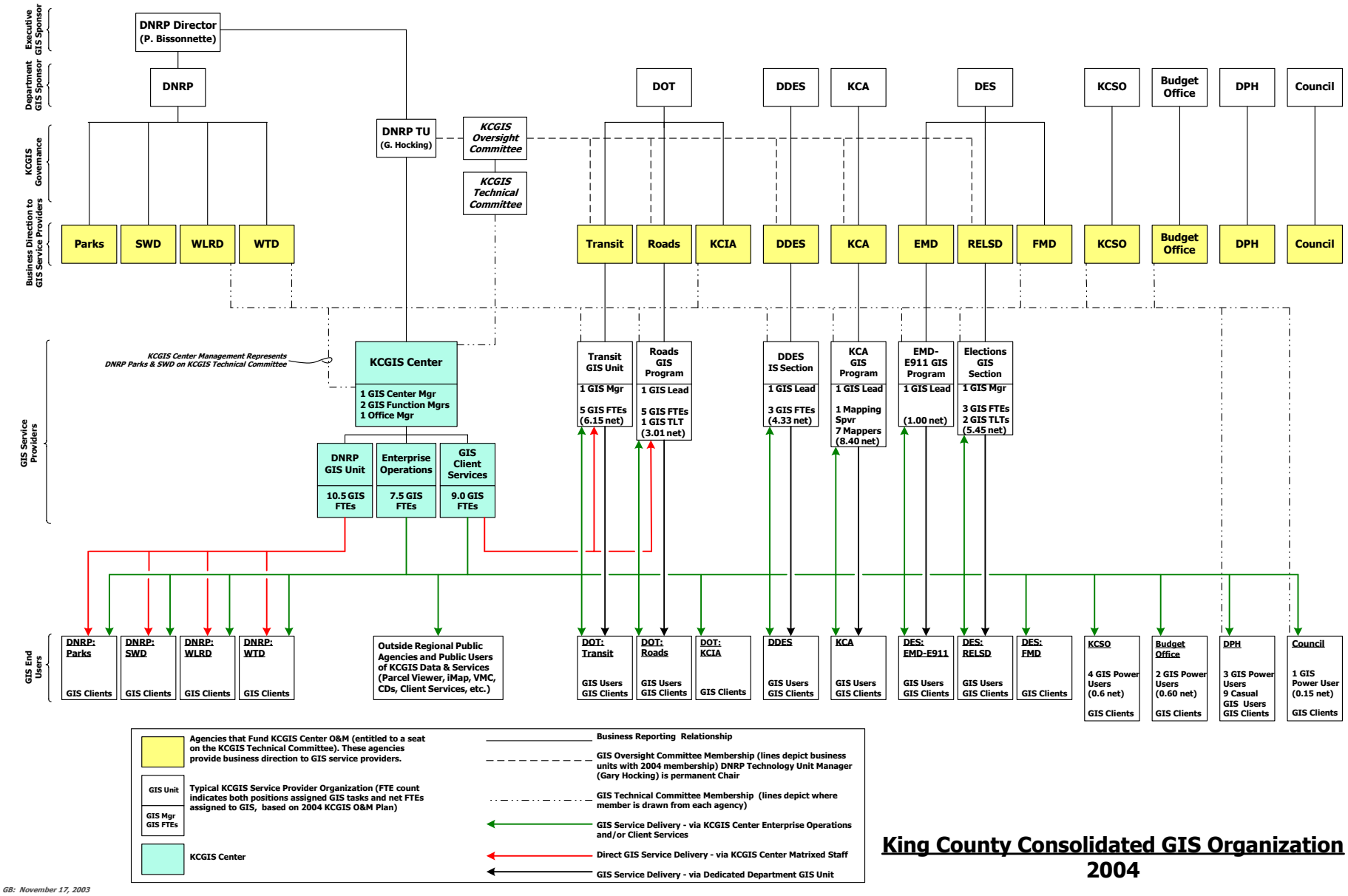
The sections that follow in this chapter outline the roles and responsibilities of the various participants in the KCGIS program. The chart on the next page provides an illustration of the KCGIS governance structure and the relationships of the participants.

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 Directors. 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.

2.2 KCGIS Oversight Committee

The KCGIS Oversight Committee is a chartered committee 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. Committee responsibilities include:



King County Consolidated GIS Organization 2004

GB: November 17, 2003

- Review and approve the annual KCGIS Operations & Maintenance Plan.
- Review and approve 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 approve the annual budget for the KCGIS Center.
- Develop and recommend the cost allocation and funding model for the KCGIS Center.
- Make recommendations to the Technology Management Board as needed.
- Resolve issues escalated from the KCGIS Technical Committee.

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 2004 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 also 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 permanent chair of the KCGIS Oversight Committee.

The KCGIS Oversight Committee charter and 2003 and 2004 committee member listings can be found in the Appendix (see Section 4.1)

2.3 KCGIS Technical Committee

The KCGIS Technical Committee is a chartered committee accountable to the KCGIS Oversight Committee and responsible for developing the annual GIS O&M plan, as well as creating standards and best practices, 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.

At its discretion 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), and one informal discussion group (Cadastral Geodatabase Modeling). Details about these 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 reorganizes or disbands the working groups as needed.

Responsibilities of the KCGIS Technical Committee include:

- Coordinate KCGIS Center and department GIS unit work programs 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.

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 2004. 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 charter and the 2003 and 2004 committee membership can be found in the Appendix (see Section 4.2).

2.4 Departments

Collaboration between department GIS programs has become more extensive as the KCGIS program has matured. 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 Spatial 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 via a matrix management structure delivers department specific GIS services to DNRP and DOT. The KCGIS Center is managed within DNRP for the benefit of all 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 2004 budgeted funding for operation of the KCGIS Center. It shows each agency's contribution to the O&M funding model, as well as each agency's projected budget for fee-based client services. Also included are the DNRP allocations to fund the DNRP GIS Unit that is managed by the KCGIS Center.

KCGIS Center 2004 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)	175,120	21,000	196,120		196,120
DDES (3419)	175,120	5,250	180,370		180,370
DES: EMD: EOC (2991)	0	10,500	10,500		10,500
DES: EMD: E911 (7543)	121,958	10,500	132,458		132,458
DES: Records & Elections (7250)	43,780	5,250	49,030		49,030
DES: Facilities Management Div (1519)	21,890	15,750	37,640		37,640
DES: ITS: I-Net (4901)	0	2,625	2,625		2,625
DNRP: WTD (7200)	140,200	31,500	171,700	380,446	552,146
DNRP: WLRD (3814)	141,451	0	141,451	487,524	628,976
DNRP: Parks Division (8703)	43,780	0	43,780	97,479	141,259
DNRP: SWD (1454)	53,857	26,250	80,107	48,809	128,916
DPH (Dept: 0800; LowOrg: TBD)	29,058	13,125	42,183		42,183
DPH: EMS (1190)	14,722	0	14,722		14,722
DOT: Roads (1665)	95,169	91,613	186,781		186,781
DOT: Transit (5130M)	203,994	91,613	295,606		295,606
DOT: Airport (1765)	21,890	56,243	78,133		78,133
Sheriff's Office (1933)	21,890	0	21,890		21,890
County Council (1041)	21,890	13,125	35,015		35,015
Budget Office (1063)	21,890	21,000	42,890		42,890
DCHS (5301)	0	15,750	15,750		15,750
Prosecuting Attorney's Office (5028)	0	15,750	15,750		15,750
Boundary Review Board (1596)	0	7,875	7,875		7,875
Superior Court (6631)	0	5,250	5,250		5,250
District Court (6389)	0	5,250	5,250		5,250
Contingent Billing to KC Agencies	0	236,738	236,738		236,738
Billings to Agencies Outside KC	0	307,296	307,296		307,296
Total:	1,347,661	1,009,252	2,356,913	1,014,259	3,371,172

Notes:

1. The LowOrgs indicated are those that the Budget Office reported for KCGIS Center funding for 2004 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 by the KCGIS Center, the department GIS units, and by outside vendors, along with the funding mechanisms for obtaining those services.

2004 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				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

2004 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:

4 KCGIS Center O&M expenses are 'fixed costs' funded by agencies on a share model basis determined annually. The share model is developed by the KCGIS Center and reviewed and approved by the KCGIS Oversight Committee (subject to normal county budget development procedures). O&M costs are billed to agencies by the KCGIS Center at the beginning of the year for fixed quarterly interfund transfer via AIRS form.

5 KCGIS Center Client Services costs are provided on a 'full cost reimbursement basis', billed to agencies as work is completed. Agencies can also prepay for client services to allow budgeted funds to be used in the coming year. 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.

6 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.

7 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 budget information in Section 3 (3.x.2.2) for details.

8 Costs for outside GIS consultants and vendors are billed directly to the appropriate fund. Such costs may include GIS software and hardware purchase and maintenance, specialized GIS-based applications (e.g. E-911, Sheriff), GIS data acquisition or development, GIS consultant or training services, or custom GIS application development.

3 2004 King County GIS Work Plan

Chapter 3 of the 2004 GIS O&M Plan provides details of the GIS work plans for the KCGIS Center and the 16 agencies participating in the KCGIS program. Each agency work plan is described separately in this chapter, using the same outline progression to standardize the work plan descriptions and to ease comparison across agencies.

Work plan descriptions are introduced with background information to clarify the purpose and objectives of the agency's GIS program, and to broadly describe how GIS activities within the agency are coordinated and managed. This introductory section (3.x) also includes description of the agency's mission and primary business responsibilities. The introduction is followed by a discussion of the agency's GIS business strategy (3.x.1). This discussion provides detail about the strategies employed by the agency to deliver GIS services to various business functions, with an emphasis on the opportunities and challenges related to providing GIS services, cross-agency issues and dependencies, long-range goals and initiatives, and the role of the agency in the wider scope of the KCGIS program. This is followed by a detailed GIS program overview (3.x.2), which provides information on the scope of GIS services offered by the agency, the staffing requirements and staffing model, the agency's GIS budget, the training program, and the agency's suite of GIS hardware and software. The sections that follow the program overview are more technical with descriptions of the agency's GIS data (3.x.3), applications (3.x.4), and system integration (3.x.5). Each agency work plan concludes with discussion of the GIS client services and customer support offered by that agency (3.x.6).

Distinct agency programs that are within the same department are presented separately, but are grouped into the same tier-2 section of the Chapter 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 its parent department (DNRP, Section 3.5).

3.1 KCGIS 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 GIS Business Strategy

The business strategy of the KCGIS Center is aligned to support 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 a centralized resource the KCGIS Center facilitates the coordination and delivery of high-quality GIS technology solutions across county agencies. Centralization of administrative and management functions reduces the total effort required to deliver high-quality GIS services, and by concentrating a full range of technical services within a single organization, the KCGIS Center fosters the development of advanced and specialized GIS skills and expertise. These skills can be leveraged to effectively apply GIS technology to a broad array of 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 throughout the county. By fostering communication with the KCGIS community, the KCGIS Center is able to adapt its strategies, priorities, and technology to meet the collective goals and objectives of the KCGIS program. Finally, the KCGIS Center endeavors to be a leader in adherence to GIS professional standards and best practices, as adopted by the KCGIS Technical Committee.

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, reduce, and standardize costs. By pooling specialized skills and technical 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 routine and specialized 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 cadastral base framework layer RECDNET. To optimize the data in the Spatial Data Warehouse the KCGIS Center provides a data coordination service, which is an ongoing effort to involve stakeholders in continuous data content, quality, and usability improvements. 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 among 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 2004 the KCGIS Center will begin its third full 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 GIS internal service fund was created and the KCGIS Center was transferred from Information and Telecommunications Services (ITS) to the DNRP Director's Office Technology Unit. 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 and organizationally referred to as the DNRP GIS Unit. 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. 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 permanent chair of the KCGIS Oversight Committee. Details of this oversight arrangement are discussed in Chapter 2 of this document. 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. This overall staffing level for 2004 is unchanged from 2003. However, the budgeted FTE allocations to the three units changes slightly for 2004 with the transfer of fractional FTE resources from Enterprise Services to both Client Services and the DNRP GIS Unit. The changes are largely the result of administrative and management efficiency gains and are noted in the paragraphs that follow. A key component of successful management of the KCGIS Center is the ability to assign specific staff to tasks across these organizational units to support operational needs and to make best use of available staffing resources. 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. 10.5 FTEs (down from 11.0 FTEs in 2003) 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. An equivalent of 1.0 FTE from this function is allocated to management and administration of the DNRP GIS Unit and the Client Services Unit. All costs for this 1.0 FTE are included in the budgets for those units. Administrative 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 external 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 County

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 7.5 FTEs and cover a broad spectrum including enterprise data coordination, 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 cadastral base framework maintenance process.

Enterprise data coordination was a new service offering of the technical operations group beginning in 2003 with the hiring of a GIS data coordinator. In 2004 the emphasis of this service will shift from an inventory and assessment of the GIS data holdings of King County to a focused effort to resolve certain long-standing GIS data management issues. Primary among these are city boundaries, hydrography, census, critical areas, and the systematic treatment of data obtained from external sources. This effort will bring together data stakeholders, facilitated by the KCGIS Data Coordinator, to address each data management issue and reach a consensus solution. The data coordination service is an ongoing effort with the goal to improve the content and quality of the data held in the KCGIS Spatial Data Warehouse. Quarterly reports will be generated in 2004 outlining the results of this data improvement process.

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 2004 the client services group has a maximum allocation of 9.5 FTEs (up from 9.25 FTEs in 2003). This total includes 0.5 FTE allocated from the Enterprise Operations Unit for management and administration functions. Currently one position in the client services group is vacant. This vacancy will only be filled in response to increased workload demands.

Two Client Services Unit FTEs perform dedicated enterprise level GIS work for the Roads Services and Transit divisions of the Department of Transportation. These positions are shared equally with 1.0 FTE allocated to each division. Due to the transportation oriented focus of this work, day-to-day assignments for these positions are handled by project managers within Road Services and Transit. The KCGIS Center Manager serves as the functional manager for the individuals assigned to these positions.

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 has an allocation of 11.0 FTEs (up from 10.75 FTEs in 2003). This total includes 0.5 FTE allocated from the Enterprise Operations Unit for management and administration functions. This unit is operated through a matrix management structure, with project 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 project manager for most or all of their projects. However, the matrix structure allows project managers to share the pooled resources to optimize response to project demands.

Due to the complexity of their GIS programs and the unique business needs of their divisions, separate project managers are assigned from 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 project 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 operates as the functional manager for the DNRP GIS Unit. As such the functional manager is responsible for supplying and managing the matrix resource (namely the GIS staff). Specific duties of the functional manager include establishing the technical and quality standards for the GIS services, ensuring GIS staff have the necessary training and resources to perform quality work, and balancing staff allocations across the divisions to meet work plan requirements. The GIS project managers for the DNRP divisions have responsibility to develop the division work plans and work with the KCGIS Center Manager to obtain the appropriate GIS staff resources to meet their program objectives.

3.1.2.1 Staffing Requirements

The KCGIS Center staffing model for 2004 consists of 31.0 FTEs allocated across three work units. The annual staffing model is developed in coordination with the KCGIS Oversight Committee. The KCGIS Center is led by the KCGIS Center Manager.

In 2004 the KCGIS Center will continue to 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 interested in obtaining work experience in GIS. They are hired under DNRP internship guidelines. 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. Due to their transitory status the intern positions are not included in the staffing chart.

For the purposes of display in the staffing chart that follows the KCGIS Center is shown as organized into four functional groups. However, roles and responsibilities vary and staff assignments often crosscut all four groups. The staffing model for the DNRP GIS Unit is included here, but additional staffing information for the DNRP GIS work programs can be found in sections 3.5A.2.1, 3.5B.2.1, 3.5C.2.1, and 3.5D.2.1.

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 / Project management	ISA III	FTE	100%
Office Manager	Administrative support	PA II	FTE	100%
Enterprise Operations – Technical				
Technical Lead	To be determined.	ISA III	FTE (Vacant)	100%
Data Coordinator	Data inventory, assessment, and coordination	ISA III	FTE	100%

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

Working Title	Focus	Class	Status	% GIS
GIS Analyst	Matrix support for Water and Land Resources – data development and analysis, map production	ISP II	FTE	100%
GIS Analyst	Matrix support for Water and Land Resources – data development and analysis, map production	ISA II	FTE	100%
GIS Analyst	Matrix support for Water and Land Resources – database development, analysis, map production	ISA I	FTE	100%
GIS Analyst	Matrix support for Parks and Recreation / Solid Waste – database development, analysis, map production	ISA II	FTE	100%

3.1.2.2 Budget

The adopted 2004 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.2.2, 3.5B.2.2, 3.5C.2.2, and 3.5D.2.2). The table also does not include various overhead and county central rate costs. For the total 2004 KCGIS Center budget refer to Section 2.6.

Item	Budget	Comments
Labor Costs (salary + benefits)	$1,827,151	Includes budget for contingent client services staff.
Hardware (acquisition and maintenance)	$53,800	Includes $25,000 allocated to dedicated, long-term equipment replacement fund.
Software (acquisition and maintenance)	$83,412	
Training costs	$27,100	
Discretionary (consultants, outside services, materials, etc.)	$179,362	$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 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.

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.

- **KCGIS Center Enterprise Operations Unit** – This unit is funded under authorization of Ordinance 14270 by 16 County agencies through a shared-cost funding model (known as the KCGIS O&M Funding Model). The funding model is developed and negotiated by the KCGIS

Oversight Committee. See Section 2.6 for details regarding the funding model, including a breakout of costs to each agency.

- **KCGIS Center Client Services Unit** – This unit is funded by customer fees based on full cost recovery for provision of services. In 2004 the hourly fee for services will be $63.00 for analyst and programmer level services and $58.00 for technician level services.
- **DNRP GIS Unit** – This unit is funded by the four DNRP divisions based on a calculated annual work program level of effort with associated staffing requirements. In 2004 the staffing requirements are: 5.0 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 can be supported by KCGIS Center Client Services on the normal cost reimbursable basis.

3.1.2.3 Training

The KCGIS Center Client Services Unit 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 the training program offered internally to KCGIS Center staff.

KCGIS Center staff development is managed through an individualized training plan agreed with KCGIS Center management. Training plans are completed near the first of each year. 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 an individual training plan may include:

- Certified professional and technical 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.
- 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 KCGIS 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 2004 this was set at an average of $1,250 per staff member. Training dollars are allocated to staff based on the individual annual training plans, and reflects both individual and overall KCGIS Center workforce development goals.

3.1.2.4 Hardware and Software

Servers

The KCGIS Center in cooperation with the DNRP Technology Unit operates several UNIX and 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 1800GB of enterprise data storage space (*WILDFIRE and GISDW*), 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.

In 2004 the KCGIS Center will set aside $25,000 into an equipment replacement fund reserve. The equipment replacement fund was established in 2003 by designating $50,000 of previously undesignated fund reserves, and will be supplemented by $25,000 annually. This fund will be used to replace servers and server infrastructure.

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 components of the KCGIS Spatial Data Warehouse, and include applications for data creation and management, metadata input and output, RECDNET (cadastral base framework) editing and integration, parcel layer extraction, and coverage to shapefile conversion. *WILDFIRE* also runs RDBMS (Oracle) and ArcSDE instances. 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).

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 Oracle ODBC drivers.

GISDW – KCGIS Spatial Data Warehouse Server – Microsoft Windows 2000 Advanced Server. *GISDW* is a virtual server comprised of a two-node cluster system configured with 2 RAID arrays, with future expansion for 2 additional RAID systems. The two cluster nodes are Dell PowerEdge 2650 servers named *DWGIS1* and *DWGIS2*. These servers consist of dual 2.4 GHz/512 Cache Xeon processors, 6 GB RAM, and two 18 GB mirrored drives which contain the server operating system. The database array is a single Dell Powervault 220S SCSI RAID array with 2-18 GB SCSI quorum drives and 9-35 GB drives for data. A second Dell PowerVault 220S array, consisting of 13-73 GB SCSI drives, provides capacity to house the KCGIS Spatial Data Warehouse digital imagery libraries. *GISDW* is 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. This system is now functioning as the primary data source for ArcIMS based applications such as iMAP and the Parcel Viewer. 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.

MAPPER1 and *MAPPER2* – Dell Poweredge 2650 servers, Microsoft Windows 2000. These two machines were purchased in 2003 for the sole purpose of supporting the distributed architecture of the KCGIS Center's ArcIMS deployment. *MAPPER1* serves as a "spatial server" to ArcIMS, which means that it receives requests from the "application server" component, connects to the data source (*GISDW*, SQL

2000/SDE) and produces a response of either a map image or a stream of data in XML format. *MAPPER2* 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.

WEBTEST – Master Computer, Windows 2000 Server. *WEBTEST s*erves as the intranet web server for the KCGIS Center 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.

KCGIS-SS1 and *KCGIS-SS2* – Gateway E-4650 PC's, Microsoft Windows 2000. These two machines currently serve as the development environment supporting the distributed architecture of the KCGIS Center's ArcIMS deployment. *KCGIS-SS1* serves as a "spatial server" to the development instance of ArcIMS running on *WEBTEST*. *KCGIS-SS2* also serves as a "spatial server" to ArcIMS, as well as functioning as the "application server" for the development version of ArcIMS.

KCGIS-SQLDEV – Microsoft Windows 2000. *KCGIS-SQLDEV* is a test server for SQL Server implementation.

DNRP1 – Dell Network Attached Storage (NAS) Powervault 715N, Microsoft Windows 2000 NAS kernel. Owned 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.

GISNAS1 - KCGIS Center NAS – Quantum SNAP 4100 server, with 400 GB disk system. This system houses KCGIS Center staff user home directories, administrative files and software media files from *ORCA*. This system will support file space for new projects.

GISNAS2 - KCGIS Center NAS – Quantum SNAP 12000 server, with 960 GB disk system. This system was acquired in 2003 to provide space to process new digital imagery being developed as a result of the ESA/SAO project.

KCGIS-EOC - EOC NAS – Quantum SNAP 2200 server, with 160 GB disk system. This system is installed at the Emergency Operations Center (EOC) for locally used shapefiles. This small desktop system is 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.

Server Enhancements – The following are new server equipment that will be deployed during the 4th quarter of 2003 and the 1st quarter of 2004.

GISPROD – Dell PowerEdge 6650 Server, (2) Dell PowerVault 220S SCSI Drive Arrays, Windows 2003 Enterprise Server, Microsoft SQL Server 2000, ArcSDE 8.x. This server will contain four Intel Xeon processors and 8 GB of RAM. Each drive array will house fourteen 146 GB SCSI disk drives configured in RAID 5 with one hot spare drive in each array. All components will have dual, redundant power supplies and cooling fans. 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 Server/SQL Server 2000 system design 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.

GISIMAGE – Dell PowerEdge 1650 Server, Dell PowerVault 220S SCSI Drive Array, Windows 2003 Server. This server is being acquired to allow for processing of ESA/SAO digital imagery.

Server Software – Vital server-side software that is utilized by the KCGIS Center includes the following.

Arc Internet Map Server (ArcIMS) – ArcIMS is an ESRI software product used to enable interactive mapping functionality on a web site. The KCGIS Center currently uses version 4.01. 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 8.3). ArcSDE facilitates multi-user access to spatial and tabular data stored in an RDBMS. The KCGIS Center currently administers ArcSDE on Oracle and on Microsoft SQL Server.

Oracle – Oracle is a relational database management system (RDBMS). Oracle (current version 8.1.7) is primarily used to support the data environment on *WILDFIRE*. Two database instances are licensed, a standard edition for the components of the KCGIS Spatial Data Warehouse housed on *WILDFIRE* 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 implemented SQL Server on the cluster servers (*DWGIS1* and *DWGIS2*) that comprise the virtual server *GISDW*. SQL Server will also be configured to run on *GISPROD* as that machine is brought into service.

Client Software Licenses Managed for the KCGIS Enterprise

The KCGIS Center manages licenses for ESRI software on five servers and one laptop. The following tables describe the licenses maintained on each of these machines:

WILDFIRE

Software	Licenses
ArcInfo 7.x	17
COGO 7.x	9
Network 7.x	1
ArcPress 7.x	2
ArcView 3.x	2

ORCA

Software	Licenses
ArcInfo 8.x	9
Spatial Analyst 8.x	2
3D Analyst 8.x	2
COGO 8.x	1
Network 8.x	1
ArcMapServer 8.x	1
ArcSdeServer 8.x	2
ArcSdeConnects 8.x	19
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

GISPROD

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

KCGIS_XP_D800 (Laptop)

Software	Licenses
ArcInfo 8.x	1
Spatial Analyst 8.x	1
3D Analyst 8.x	1

The KCGIS Center also maintains licenses for ArcView 3.x and its extensions for use with Windows 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 Used by the KCGIS Center

Autodesk AutoCAD – Utilized to facilitate import and manipulation of Computer-Aided Design (CAD) files, version R13.

ERDAS IMAGINE – Geographic image processing, version 8.4.

Microsoft FrontPage 2002 – Web page editing and site management. Being phased out in favor of Dreamweaver.

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.

Altova XMLSPY – XML development environment.

LizardTech MrSID Geospatial Encoder – Geographic image compression. Being phased out in favor of GeoJP2.

Mapping Science GeoJP2 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 (usually incorporating hillshading and/or area patterns, for digital photo editing, and with ImageReady for the creation of web graphics, especially web versions of maps created in Illustrator.

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.

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 Studio MX – An integrated suite of graphic and web development tools; includes FreeHand MX for vector-based drawing and illustration (similar to Adobe Illustrator), Fireworks MX for creation of interactive and animated graphics, Flash MX for developing interactive presentations and applications, and Dreamweaver MX for web page creation, site design, and site management.

Server Backup and Tape Archiving

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.

Priority Initiative – ArcGIS Software Migration

The KCGIS Technical Committee identified migration to the ArcGIS 8 platform as a key objective for the KCGIS community. As a result 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 is be a comprehensive description of the software transition issues including needs and expectations of KCGIS users, experiences of peer agencies, staff training, data migration options, changes to business practices, and migration milestones. In 2004 the KCGIS Center will commit staff resources, and a portion of $22,000 allocated from the KCGIS Center O&M budget for ESRI consultant services, toward implementation of the ArcGIS migration plan.

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.

3.1.3 Spatial Data

A core responsibility of the KCGIS Center is to manage the enterprise spatial data warehouse, commonly known as the KCGIS Spatial Data Warehouse (SDW). 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 accessible via the KC WAN. A

searchable catalog of the KCGIS Spatial Data Warehouse is provided on the Internet through the Spatial Data Catalog (SDC) at http://www.metrokc.gov/gis/sdc/index.htm. For various business reasons some spatial data maintained by King County agencies is not available in the KCGIS Spatial Data Warehouse. Listings of these data can be found in the agency discussions of spatial data in other sections of this document (see for example Section 3.2.3).

King County GIS continues to expand its role as a regional GIS data and services provider. Participants in the KCGIS program recognize the value of sharing GIS data with other organizations, and encourage cost-free 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. Data from State and Federal sources provides regional datasets that are useful for analyses within the county as well as supporting inter-county mapping. 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 a semi-formal basis with a variety of state, county, city, and utility organizations. These arrangements typically involve data exchanges at annual, quarterly, or monthly intervals. Some, but not all of the SDW raster data (imagery and elevation data), is also available for sharing. With rare exception the KCGIS Center does not redistribute externally obtained data, though it will assist requestors in contacting the original source for further assistance. A listing of active data sharing arrangements is maintained by the KCGIS Enterprise Services Manager.

3.1.3.1 Data Maintenance

The KCGIS Center has a unique set of responsibilities in regards to management of GIS data:

- Acquisition of data from external sources, loading appropriate layers, and organizing documentation;
- Stewardship of data that have no current data owner or active maintenance program (orphan data);
- Ongoing maintenance of a limited set of vector-based enterprise data;
- Storage and updates for corporate raster-based datasets, including orthoimagery, grid-based elevation data, and landcover data; and
- Coordinating data maintenance and metadata documentation for new King County agency data delivered to the SDW.

External Data Sources

The KCGIS Center maintains an ongoing program of acquiring data from a variety of external sources, primarily state, local and city governments and civil and non-governmental agencies. External data deliveries are tracked in two separate spreadsheets – one listing regular recurring sharing arrangements (\\orca\kcgis\datawarehouse\external_data\scheduled_acquisitons.xls) and another tracking data updated on an infrequent, unscheduled basis (\\orca\kcgis\datawarehouse\external_data\non-scheduled_acquistions.xls.

These data 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 SDW, if a continuing business need is defined and if data currency is not a dominant issue. In general, external data are defined as data received from a non-King County agency and for which no value-added effort is applied. Data housed in the external data directories are checked for appropriate posting requirements, i.e., projection, editmask, etc., but no additional changes are made except for appending the source prefix to the name.

A standardized, documented procedure for updating external data holdings in the SDW was initiated in 2003. This procedure was used to resolve a backlog of uninventoried, unloaded external data dating from

the beginning of 2nd quarter, 2002. This included the inventory and tracking of all data layers obtained from external sources, correlation with provided documentation, and necessary formatting and pre-posting steps necessary to move data into the SDW. The tracking spreadsheet showing all inventoried external data can be viewed at \\orca\kcgis\datawarehouse\external_data\ext_data\datalist\MasterExternalTrackingList.xls.

A realignment of the external data directories in the SDW now organizes external data in theme-based libraries consistent with the way King County-maintained data are stored. Previously, external data had been stored in source-named directories, which advantageous in some respects, provided poor database integrity and failed to group common themes together. Similar themes from multiple sources are stored in the same theme-named directory through use of a naming convention uniquely identifying each external source with a three-letter prefix. The posting of data to the SDW is still controlled through SiteTool to ensure database integrity and to provide a single comprehensive listing of vector-based data in the SDW.

Significant enhancements were made to the SDC by adding a fully separate Externally-Obtained data section where metadata pages are generated from the update procedures described above. These metadata pages mimic the standard SDC style, but do not use Doctool for creation. The pages are designed to help users review key components of the external data sets, including a snapshot view of the data to help illustrate extent and detail. Any available documentation is linked to the metadata page without modification so users can review the documentation as provided by the external source.

Full details of the external data library realignment can be found on the Spatial Data Catalog website, http://www.metrokc.gov/gis/sdc/index.htm#ExternalIndex.

Maintenance items for external source data to be addressed in 2004 include:

- Resolve remaining outstanding (approximately dozen) cross-indexing issues between old external directories and new directories, finalize documentation of procedures for import and metadata creation;
- Coordinate with the KCGIS Center Avenue programmer to make changes to ArcView AvLib application to support new directory structure and metadata access;
- Coordinate with Enterprise Services Manager on updates to acquisition spreadsheets and data-sharing agreements. Add appropriate parts of these to Spatial Data Catalog;
- Work with the Enterprise Services Manager to update any data sharing arrangements or MOUs, including formalizing the agreement with the Puget Sound LiDAR Consortium regarding release of high-resolution elevation data;
- Archive data in existing External Data directories and remove directories after notification through best practice procedures, update library control tables;
- Encourage coordination among KCGIS agencies and the KCGIS Center to improve the notification and flow of externally-obtained data to the SDC, where appropriate. Centralize external data holdings located in agency libraries to SDW.

The acquisition spreadsheets can be viewed for a general description of the magnitude and types of data received from various sources. The SDC – External Data section – can be viewed to see current enterprise holdings. Current data receipts, loaded and not loaded, can be viewed through the Tracking spreadsheet, until the Intranet application is brought on line (see 3.1.3.2).

Vector Data Temporarily Maintained by KCGIS Center (Orphan Data)

The KCGIS Center maintains stewardship, on a temporary basis, of GIS data that may be legacy, obsolete, or are under development in coordination with another agency. During 2004 data categorized as legacy or obsolete (orphan data) will be archived and deleted from the KCGIS SDW 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. Orphan data is defined as data that has not been maintained, and has no defined steward per the details in its metadata. If the metadata defines a useful purpose for the data and the data requires no maintenance it will be moved to 'Vector Data Maintained by KCGIS Center' status.

Data Name	Data Description	Status	Proposed Disposition
AIRINDEX	Center points of WADNR aerial photos	Unneeded	Archive
AIRPHOTO	Flight lines of WADNR aerial photos	Unneeded	Archive
ANTSITE	Antenna sites leased out by KC Property Services	Re-Steward	Maintenance by Property Services
ARTCLUST	Polygon coverage of clusters of public art sites in King County	Requires determination	Archive
ARTSITES	Polygon coverage of public art sites in King County	Requires determination	Archive
BASEADJ	Control points for adjustments of the cadastral base	RECDNET	Determine applicability
BASENET	King County centerline network	RECDNET	Determine applicability
BIGWATER	Largest water bodies in King County	Re-Steward	Maintenance by DRNP/WLRD
BIKEMET	Bicycle/non-motorized vehicle paved and unpaved routes	Re-Steward	Maintenance by Transit
BLK53033	1990 Census blocks for King County	Unneeded	Archive
BLKTILE	No documentation	RECDNET	Determine applicability
BLOCKGRP	1990 Census Tract/Blocks with the same hundred level	Uneeded	Archive
BLOCKNET	1990 Census blocks developed for KC TRC from Tigerline files	RECDNET	Archive
C9053033	1990 Census King County boundary	Unneeded	Archive
CANOPY	Forest canopy	Requires determination	Reclass as External
CD453033	1990 Census, portions of Congressional Districts in King County	Unneeded	Archive
CONT100	100 foot contours lines from 10 Meter DEM	To be replaced	Archive
CONT20	20 foot contours lines from 10 Meter DEM	To be replaced	Archive
CONT50	50 foot contours lines from 10 Meter DEM	To be replaced	Archive
CST53033	1990 Census, coastal waters, Puget Sound, Lake Washington, Duwamish, Ship Canal	Unneeded	Archive
CTP53033	1990 Census, transportation planning area, single polygon for entire county	Unneeded	Archive
CTY53033	1990 Cenus King County Boundary	Unneeded	Archive
E911_ESN	Emergency service areas	Re-Steward	Maintenance by EMS
FAULTS	Faults of the Seattle Fault zone	Requires determination	Reclass as External
FAZ	1990 Census Forecast Analysis Zones	Unneeded	Archive
FPD_USFS	U.S. Forest Service Production Districts	Requires determination q	Reclass as External, or DDES acceptance
GDTZIPCD	1999 5-digit zip code file for entire state, based on tiger line files	Requires determination	Reclass as External
GRP53033	1990 Census block groups	Unneeded	Archive

Data Name	Data Description	Status	Proposed Disposition
IND53033	1990 Census Tribal lands, Muckelshoot and Puyallup Tribal lands	Unneeded	Archive
INDEX	Index of RECDNET tiles	RECDNET	Determine applicability
INDEX_QT	Copy of the tiled index with township, range and ¼ tile lines only	RECDNET	Determine applicability
INDEX_TR	Copy of the tiled index with township and range lines only	RECDNET	Determine applicability
KGL53033	1990 Census ,Key geographic locations: Airports, malls, etc	Unneeded	Archive
LAN53033	1990 Census, Various landmarks:hospitals, camps, jails, colleges, golf courses, Boeing Field, parks	Unneeded	Archive
LD_NAMES	Annotation from RECDNET for lot dimensions in map portal parcels	RECDNET	Determine applicability
LNB53033	1990 Census, Railroads: BN,Soo,UP, Monorail, Northern Pac, Unnamed	Unneeded	Archive
LNC53033	1990 Census, Utility line networks, owners unknown	Unneeded	Archive
LND53033	1990 Census, Airfields: Bandera airstrip, Unnamed	Unneeded	Archive
LNH53033	1990 Census, Streams: Creeks, streams, lakes, canals, rivers, sloughs	Unneeded	Archive
LTP53033	1990 Census, Landmark points: 5 named – 4 camps, 1 hospital	Unneeded	Archive
M9053033	1990 Census, Minor civil divisions, County divided into 10 regions	Unneeded	Archive
MCD53033	1995 Minor civil divisions, County divided into 10 regions	Unneeded	Archive
MAPNUM	Map number index	RECDNET	Determine applicability
MAPNUMOK	Map number index	RECDNET	Determine applicability
MTPEAKS	Mountain peaks with elevation	Requires determination	Reclass as External
MUN_WSHD	Municipal watersheds	Requires determination	Reclass as External
NAVAID	Navigational Aids	Requires determination	Reclass as External
OPPIPES	Olympic Pipe Line Company right-of-way through King County	Requires determination	Reclass as External
ORTHOIDX	Index for NIES photos	Unneeded	Archive
P9053033	1990 Census, Places: Cities and selected unicorporated areas	Unneeded	Archive
PLA53033	1995 Places, City areas defined by Census, not necessarily corporation limits	Unneeded	Archive
PLACE	1990 Census, Places edited by KCTRC	Unneeded	Archive
PLSS	Public land survey system	RECDNET	Determine applicability or Survey's maintenance
POCA	Public ownership and administrative boundaries	Requires determination	Determine applicability
POINOPUB	Points of public interest owned or operated by non-public agencies	Requires determination	Determine applicability

Data Name	Data Description	Status	Proposed Disposition
POIPUB	Points of public interest owned or operated by public agency	Requires determination	Determine applicability
PRECIP	Precipitation	Not Useful	Archive
PS_BATH	Puget Sound bathymetry	Requires determination	Reclass as External
RAINSNOW	Rain on snow zones	Not Useful	Archive
REALPROP	Property Services King County owned parcels	Re-Steward	Maintenance by Property Services
REFGRD16	Reference grid (1/16th sections)	RECDNET	Determine applicability or Survey's maintenance
ROW	Street right-of-way with PIN	RECDNET	Determine applicability
RTABNDRY	Regional Transit Authority boundary (approximate)	Requires determination	Determine applicability
SCSTREET	Snohomish County street network	Unneeded	Replacement in external
SDU53033	1990 Census,School districts	Unneeded	Archive
SHR53033	1990 Census, Coastal shorelines, King County land area	Unneeded	Archive
STR53033	1990 Census, Street network	Unneeded	Archive
SOIL	Obselete soils coverage	Requires determination	Reclass as External
SOILUSGS	Soils coverage from USGS	Requires determination	Reclass as External
SOUNDING	Puget Sound soundings	Requires determination	Reclass as External
ST_NAMES	Street name annotation from RECDNET	RECDNET	Determine applicability
STORM10	10-year storm events	Requires determination	Reclass as External
TAZ	1990 Census, Traffic Analysis Zones	Unneeded	Archive
TAZ53033	1990 Census, Traffic Analysis Zones for the Greater Puget Sound	Unneeded	Archive
TRACT	1990 Census, Tracts developed for KCTRC from Tigerline files	Unneeded	Archive
THOM_BROS	Thomas Guide page index	Requires determination	Reclass as External
UAR53033	1990 Census, Version of Urban Growth Area	Unneeded	Archive
URB53033	1990 Census, Urban/rural areas: entire county	Unneeded	Archive
VTD53033	1990 Census, Voter district, entire county	Unneeded	Archive
WASHCO	County boundaries for all of Washington State	Requires determination	Reclass as External
WAT53033	1990 Census, entire county lakes, Puget Sound, and land	Unneeded	Archive
WBD53033	1990 Census, water bodies, lakes, reservoirs, rivers, Puget Sound, sloughs with names	Unneeded	Archive

Vector Data Maintained by KCGIS Center

The KCGIS Center has ongoing maintenance responsibility for data that are key to the maintenance of the cadastral base framework known as RECDNET, as well as a limited number of datasets that by agreement are maintained as an enterprise service. 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	Data Steward	Update Frequency
BLKGRP00	2000 Census, Block groups conflated to RECDNET	KCGIS Center	As needed
BLOCKS00	2000 Census, Blocks conflated to RECDNET	KCGIS Center	As needed
FIRESTN	King County fire stations	Maintained by KCGIS Center for DDES	Randomly
KCP_LOC	Point layer of King County police locations	Maintained by KCGIS Center for DDES	Randomly
SCHSITE	King County school sites and school-related facilities	Maintained by KCGIS Center for DDES	Randomly
ST_ADDRESS	King County streets derived from RECDNET with address ranges	KCGIS Center	Quarterly
ST_ZONES	Street prefix/suffix polygon boundaries	KCGIS Center	Annually
T53033AIR00	2000 Census, Tribal Lands, Muckelshoot, Puyallup	KCGIS Center	Randomly
T53033BLK00	2000 Census, Blocks for King County	KCGIS Center	Randomly
T53033CTY00	2000 Census, King County boundary	KCGIS Center	Randomly
T53033GRP00	2000 Census, Block groups	KCGIS Center	Randomly
T53033PLC00	2000 Census, City areas, but not necessarily corporation limits	KCGIS Center	Randomly
T53033TRT00	2000 Census, Tracts for King County	KCGIS Center	Randomly
T53033VOT00	2000 Census, Voter districts	KCGIS Center	Randomly
TAZ00	2000 Census, Traffic Analysis Zones conflated to RECDNET	KCGIS Center	As Needed
TRACTS00	2000 Census, Tracts conflated to RECDNET	KCGIS Center	As Needed
ZIPCODE	King County zip code boundaries conflated to RECDNET	KCGIS Center	Annually

Raster-based Data Maintained by KCGIS Center

During 2003 the KCGIS Center took on a lead responsibility for organization of four new raster (grid-based) data sets:

- 2002 USGS High-Resolution Urban Orthophotography (version 1)
- 2002 King County ESA/SAO Project Orthophotography
- 2001-2003 King County ESA/SAO and Puget Sound LiDAR Consortium Elevation data
- 2000 King County ESA/SAO Project Impervious Surface Landcover

Each project required various amounts of post-processing and quality evaluation. Contractual project coordination for the ESA/SAO projects was performed by King County Road Services Division, which shared quality assessment responsibilities on the elevation data project. DNRP/WLRD also supplied considerable technical and processing support on all four projects.

The KCGIS Center assumed the role of inventorying the data, performing post-process retiling and image compression using a newly adopted compression standard, JPG2000. The large amount of new raster-based data required establishment of a new SDW component library (Plibrary3) and server location structured around a common tiling and naming convention for all raster-based data sets. This library serves as an extension to the SDW for these new raster-based sets in addition to existing legacy image and other grid data migrated to the new tiling/naming scheme from the SDW Plibrary2 component.

Maintenance items for raster-based data to be addressed in 2004 include:

- Completion of final acceptance and hosting of 2002 ESA/SAO imagery (version 2);
- Completion of Upland portion of LiDAR Elevation project (Lowland portion will be completed in 2003);
- Archive and remove SDW Plibrary2 imagery data per best-practice procedures, upon final review and stabilization of SDW Plibrary3. Retire existing aerial photo indexes in SDW – AIRINDEX, AIRPHOTO, ORTHOIDX
- Coordinate with SDE database administrator for completion of image mosaics for all imagery in GISSQLDW SDE database;
- Work with the KCGIS Center Avenue programmer to incorporate new tiling structure and file location changes into AvLib application;
- Further support user requirements by constructing necessary ArcView and ArcMap image catalogs as an alternative access to base-tile TIFF images and township-range JP2 tiles.

3.1.3.2 Data Enhancement

During 2004 data enhancement will entail a combination of database integrity and organization efforts, and specific dataset improvement projects.

External Data Sources

As indicated above, external data is not modified beyond required formatting and naming changes. However data enhancement goals in 2004 will take the form of stabilizing database integrity and improving the overall quality of the external data holdings.

- Review current SDW data holdings in non-external data directories (i.e., HYDRO, not HYDRO_EXT) to clearly define existing datasets as either KC-Maintained or as non-value added (i.e., obtained at one time from an external source, but not really maintained or updated by King County). If not maintained by King County, or planned for incorporation into county-maintained data, propose relocation of data layer to appropriate external data directory.
- Provide access to information on all received external data, currently maintained in spreadsheet format, through a database with intranet-accessible application. This will allow users to query contents, determine availability and make requests for supplemental data loads.

Vector Data (other than Cadastral)

- Remove 1990 census layers that provide no decennial comparative function and/or are replaced by updated 2000 census layers;
- Remove older digital elevation grid and contours layers from SDW Plibrary2 and SDW Plibrary as final Zone and KeyRegion tiles derived from LiDAR are placed in SDW Plibrary3;

- Identifying data of unknown or undocumented sources (orphans) and remove such data from the KCGIS SDC. For layers with defined steward, but with questionable purpose, review and remove as necessary, after best-practices consultation;
- Identifying and transferring stewardship of data temporarily maintained by the KCGIS Center to the appropriate agency;
- Resynchronize library control tables with SDW contents, including SDE layer synchronization, once orphan data and other proposed deletions are accomplished;
- Evaluate current library category structure, with minimum realignment of existing data in mind, to:
    - More clearly delineate difference between non-value added (external source) data and King County maintained data;
    - Develop well-defined definitions for existing categories supported by thematic keywords to allow a dichotomous decision-tree approach for placement of data, especially for new data. Supplement with general layer-naming guidelines;
    - Determine the need for supplemental category(s), one example being a growing category of data describing man-made structures (i.e., building footprints, general infrastructure, etc.);
    - Determine disposition of data in the "Other" directory, with goal of eliminating this type of miscellaneous theme category. Associated with possible creation of References directory for vector-based data containing necessary indexes and other coordinate reference information comparable to Raster References directory concept;
    - Use results of this analysis, in conjunction with Software Migration Plan concepts, to determine best way to correlate coverage directory name convention to SDE database table owner names in SQL Server;
- Focus on metadata for those data groups represented by multiple variations, i.e., versions of streets, versions of basin boundaries. If multiple layers have clearly defined and separate purposes, assist users in determining appropriate respective uses by illustrating these key differences, possibly in FAQ-style;
- Develop an ongoing data review and quality assurance process for data posted to the SDW. This should include evaluation of required look-up tables, supporting business tables and the best way to integrate these with the data, especially in light of current thinking on the geodatabase model;
- Determine refresh policies for infrequently updated data. Clearly define in metadata correct Progress and Maintenance Frequency criteria and use an annual checklist;
- Negotiate data maintenance standards to ensure that data stewards develop and maintain data sets that meet the needs of a broad base of key stakeholders;
- Rationalize data development and data maintenance activity across county agencies to eliminate redundant or inefficient efforts;
- Identify departmental and project level data sets appropriate for cross-agency sharing and migrating them into the SDW. If not possible, develop a business statement as to why data cannot be made publicly available. Strive toward goal of single master copy of data in only one location - SDW or in department library, but only in one location;
- Share with agencies results of data review that indicate data mirroring, particularly for non-static data. Evaluate needs and determine if incidence can be reduced;
- Establish a mechanism for ongoing review of data responsibility and data management practices;
- Develop data maintenance plans for data layers which currently lack a standard or predictable maintenance cycle;
- Review practicality and functionality of 'Help Ticket' approach to tracking required data enhancements. This approach was briefly tested in 2003.

Raster-based Data

All imagery being relocated to Plibrary3 of the SDW are being tiled, formatted and named per documented standards. No further new data or enhancements to data in the image library are anticipated in 2004. Some items that will be pursued in 2004 to improve accessibility include:

- During 2003 licensing restrictions on Emerge orthophotography dataset were removed by the vendor, allowing the data to be distributed by the KCGIS Center. Some additional clarification will be obtained during 2004 regarding the status of licensing agreements for the remainder of the imagery. If any changes are affected this information will be posted on the SDC.
- Estimates for space requirements will need to be updated to incorporate better storage estimates and the addition of the USGS dataset. Depending on server capacity some less-used image or LiDAR products may need to move offline. User response to current raster data products and formats will assist in making these determinations.
- Multiple vintage Landsat images and landcover interpretations are not incorporated into the SDW. The KeyRegion level of the Plibrary3 image library will be brought up to date with these image and landcover files, and will be documented through the SDC.

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, began 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. 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 staff resources in 2004 to continue investigation of a new cadastral model for King County. A portion of $22,000 allocated to the KCGIS Center O&M budget for ESRI consultant services may also be used for 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 2004 the KCGIS Center will work with the Roads Services Division Survey Unit to develop a methodology for acquiring and utilizing new survey data for the unincorporated portions of King County.

King County Airport

In 2002, the KCGIS Center developed a documentation management system for historic leaseholds and ownership information for the King County Airport. These spatial data are stored as SDE layers, and a query tool was built for access and analysis. This phase of the project is now in maintenance mode. The

next phase, scheduled for 2004, will be extension of the documentation side of the project, development of a more detailed database design for storing extensive related records, and a web-enabled data entry module. Currently the KCGIS Center is providing storage for 425,000 pages of scanned documentation, and this volume will increase dramatically.

3.1.3.3 Data Development

The KCGIS Center has extensive experience and expertise in data conversion, development, and conflation projects. Projects for 2004 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, in conjunction with Department of Assessments and DDES, initiated an effort to develop the ArcGIS 8 database design for the cadastral framework. Work in 2004 will include meetings with GIS data stewards to develop relationship rules for other layers, and further consultation with the Survey Department regarding cadastral control requirements.

Hydrography Layer – Development of a new hydrography layer will be an outgrowth of completion of the LiDAR elevation database and supplemented by the best-available data from all known sources. This project will be completed with resources from the KCGIS Center and the DNRP/WLRD GIS unit with technical support and evaluation from other departments, including DDES and Roads Services. This layer will be designed to support significant attribute databases developed independently but closely tied to the data framework. Coordination with the Washington State Hydrography Framework Project will also be required. This effort will also include required maintenance rules and updates to the water polygon layers and coastline boundaries, leading to reduction of the number of redundant layers currently available.

City Boundary – Requests from several agencies required a redefinition and revamp of the city boundary layers. One of the primary drivers is resolution of those city boundaries where the city has jurisdictional responsibility into an adjacent water body. This will allow coordination with the Hydrography layer project on this demarcation. As with the Hydrography project the goal will be to develop a single multi-purpose layer that will resolve data redundancy issues with this theme.

External Data Requests – Though not strictly a development project, a user survey to solicit input from KCGIS users regarding datasets potentially available from external sources will be completed in 2004. Work on the user survey was begun in 2003, and results early in 2004 will be used to more closely tailor data requests from external sources, reduce data gaps and to more efficiently determine which datasets to make part of the enterprise data suite.

Vintage Orthophoto Rectification – Due to workload in migrating existing legacy imagery and hosting of the new 2002 imagery, work on a Road Services request to test digitize and rectify historical hardcopy imagery was tabled. Other requests to expand on a project-by-project basis the library of digital imagery have been floated. Full development of the capabilities to perform this function in-house will require acquisition of additional software. Technical support and the required skill set are available from staff in DNRP/WLRD and in Road Services.

Orthophotography Refresh – Integration of the current 2002 imagery will be largely completed in 2003. During 2004, the KCGIS Center should begin the process of scoping image and orthophotography requirements for a refresh target date of 2006. This scoping will require technical evaluation of available technologies, potential funding partnerships, data specifications and user requirements relative to imagery for planimetric work and potentially separate imagery for land use and resource applications.

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 Data 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.

Raster-based data sets are not amenable to documentation through Doctool. Other tools provided through the FGDC Clearinghouse have been used to create necessary FGDC-compliant metadata for the SDC.

Difficulties in maintaining metadata for external datasets led to modification of the documentation procedures for these data in 2003. A separate set of routines built around the same database for tracking external data imports is related to the library control structure. The generated metadata documents provide easy access to the original documentation provided by the external source.

Enhancement – In 2004 the KCGIS Center will work with agencies to ensure the completion of all metadata for layers in the KCGIS Spatial Data Warehouse. The focus will be on updating metadata for the primary citation information – Abstract, Description, Supplemental Information and Theme Keywords. Close evaluation of this content will assist in developing the priority list for which data should receive fuller documentation and help indicate areas of data overlap and redundancy. Also, full metadata will be created to document RECDNET, which will assist in the Cadastral work plan. One further enhancement will be completion of the Landcover section of the Image/Raster portion of the SDC, begun in 2003. This final and last of component for the Raster section will document the 2000 impervious surface landcover dataset, and organize and define various vintages of Landsat and Landsat TM landcover interpretations the County maintains.

Development – During 2003 KCGIS enterprise metadata storage and maintenance process was redesigned 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 or SQL Server. The KCGIS Center will also be investigating methodologies for generating metadata for non-spatial relational and object data possibly using the Oracle Metadata API. During 2004, the ArcIMS Metadata module will also be tested and evaluated as a way to host metadata. Other options for allowing users to create XML formatted FGDC-compliant metadata through available windows-based editors should be investigated. This could provide a simpler environment for users to update their metadata still maintaining accurate coding yet in a format that could be stored in the back-end database. Another possible area of investigation is how best to document stand-alone look-up tables or other business tables tied to spatial datasets.

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 Application 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	AvLib (ArcView Library) is an ArcView 3.x extension providing 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 are normally randomly generated by ArcView; link data to metadata via an HTML browser; access image data 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 3.x 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 cadastral base framework LIBRARIAN tiles with tools for loading and managing arc and annotation features; generating quarter section maps of cadastral base framework data with minimal user input; and generating formatted mailing labels for selected parcels.	Avenue
iMap	iMap is a web-based map viewer that provides online access to map layers and other related information. This 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 function is also included. The URL for iMap is http://www.metrokc.gov/gis/mapportal/iMAP_main.htm.	ArcIMS, HTML, JavaScript, XML
Parcel Viewer	The Parcel Viewer is a web-based 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. The URL for Parcel Viewer is http://www.metrokc.gov/gis/mapportal/PViewer_main.htm.	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.	ArcIMS, ASP, HTML

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 framework (RECDNET) and cadastral base framework annotation (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 cadastral base framework 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 users 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://webtest/reports/eventlog). 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 various components of 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	Command Line SDE in UNIX

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 2002
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 cadastral base 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.	AML
LibTool Utilities	Unlike most other applications, LibTool is not a discrete tool, but is rather a set of utility routines that are called from other enterprise AML applications. Currently used routines manage database	AML

Name	Description	Language
	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, build indexes on those tables and create statistics on the indexes to optimize access times for common query tasks against them. Those that support Oracle administration include: Add_user – A PL/SQL stored procedure used to streamline the task of adding database user accounts and to ensure that user contact and organizational information is captured to the staff and organization tables. 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.	UNIX and Oracle SQL Utilities
Update	The Update routines are varied and perform many functions to update the KCGIS Spatial Data Warehouse. 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 as coverages and corresponding shapefiles to the KCGIS Spatial Data Warehouse. Various lookup tables are also updated to reflect the posted changes.	AML, Avenue, UNIX script

3.1.4.2 Application 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 address 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 developed and added to iMap in 2004.

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.

Priority Initiative – Parcel Maintenance Tools Enhancement (MaintRec) – The KCGIS Technical Committee identified enhancements to the parcel maintenance tool MaintRec as a priority initiative for 2004. In general, legacy applications such as MaintRec that are tied to AML and the ArcInfo 7 platform, are in maintenance mode and any enhancement requests are evaluated conservatively. However, the Department of Assessments is heavily reliant on MaintRec to complete the time consuming task of editing the cadastral base framework RECDNET. Several enhancements of MaintRec have been requested by Assessments that would improve performance of the tool and make resolution of parcel edits more efficient. The KCGIS Center will work with Assessments to prioritize the requests and will execute a mutually agreeable work plan to complete the enhancements in 2004.

StreetTool – StreetTool is an ArcGIS 8 template that has been developed to allow users to easily access and edit street centerlines and associated data layers. It is documented in the table in Section 3.7A.4.1. StreetTool was intended as an enterprise application but is currently only in use by Road Services to edit the CRIS line work. StreetTool will need to be reevaluated and if necessary reworked into the KCTools framework (see 3.1.4.3 for a discussion of KCTools) if it is to be utilitized as an enterprise application.

3.1.4.3 Application Development

In 2004, GIS across the King County enterprise will undergo a software migration from ArcInfo 7.x and ArcView 3.x to ArcGIS. Applications, data, and processes 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 ArcView 8.x, but it is expected that this transition will be more leisurely.

As part of the migration, a major development push for the KCGIS Center will be to replace and enhance many of the applications listed above to offer data stewards and users the advantage of Arc8.x's much-improved interface, editing tools, and data structures. AVLib and ParcelTools (both ArcView 3.x front-end applications) will be recreated for ArcGIS to preserve the familiar interface while incorporating new functionality of ArcGIS. Other applications such as Doctool, Sitetool, and MaintRec will be evaluated in terms of application requirements and existing ArcGIS functionality, and will be migrated appropriately.

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.

In 2003 a group of GIS programmers formed the KCGIS Application Developers Group. While the primary and ongoing focus of this group is to share development resources and expertise, it is also the goal of this group to deal proactively with software migration and develop best practices for GIS programming within the county.

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 operation. 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 KCGIS Spatial 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 and 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 (see Back End Utilities below). StewardTool will replace the functionality of SiteTool.
- ***Back End Utilities*** – Development has already begun on a set of modularized back end utilities that can be called by the front end interfaces listed above. These will include routines that handle the following: posting of data to the KCGIS Spatial Data Warehouse in single mode, batch mode, and via scheduling; implementation of changes to the data library structure including addition and deletion of layers; QA/QC processing of posted layers; and other functionality as needed.

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 Application Documentation

KCGIS Center applications are documented to commonly accepted industry standards. KCGIS Center application development staff use directories on the *GISNAS1* 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 2004 this infrastructure will be enhanced with server systems optimized to fully support production data editing in the ArcGIS 8 environment, and to support the increased need for imagery storage in the KCGIS Spatial Data Warehouse (see Section 3.1.2.4).

3.1.5.1 RDBMS Backend Support

Oracle – Oracle version 8.1.7 is used to store, maintain, and serve GIS and business data as well as metadata tables and other data control structures. Oracle also is the RDBMS supporting the enterprise ArcSDE installation on *WILDFIRE*. The KCGIS Center has standard and enterprise licensed instances deployed. Oracle will gradually be phased out in favor of SQL Server as the KCGIS Center migrates fully to the ArcGIS 8 environment.

Microsoft Access – MS Access is used as needed to convert, manipulate, and compile data for client services projects, and occasionally as a back-end database to support applications.

Microsoft SQL Server 2000 – In 2004 SQL Server 2000 will be tested and rolled out as the new back-end database for the KCGIS Spatial Data Warehouse. The KCGIS Center has installed SQL Server on the cluster servers (*DWGIS1* and *DWGIS2*) that comprise the virtual server *GISDW*, which will eventually host all components of the KCGIS Spatial Data Warehouse. SQL Server will also be configured to run on *GISPROD*, the server that eventually will house the enterprise production data editing environment.

3.1.5.2 Other Data Management Activity

No other data management activity to report.

3.1.6 Client Services and End-User Support

The KCGIS Center supports GIS end-users both by the general services it provides though its Enterprise Operations functions, by the customized services it delivers to clients through its cost reimbursable Client Services, and by its business specific services it provides to DNRP division through the DNRP GIS Unit. End-user support for the DNRP divisions is discussed more fully in 3.5A.6, 3.5B.6, 3.5C.6 and 3.5D.6. Enterprise Operations and Client Services end-user support offerings are detailed below.

GIS Center Enterprise Services

KCGIS Center enterprise services 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 3.1.2.4), 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).
- Staff resources to support countywide GIS priority initiatives. For 2004 these initiatives include ArcGIS software implementation, GIS data management issue resolution, cadastral data modeling, and parcel data maintenance tools enhancement.
- 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 and other GIS educational opportunities.
- Help desk support for internal customers.

2004 GIS Priority Initiatives – In 2004 the KCGIS Center will provide extensive support to the GIS priority initiatives. Support for these initiatives is considered an enterprise activity and is funded from the GIS O&M budget. For 2004 the priority initiatives include:

- ArcGIS software migration (see Section 3.1.2.4)
- GIS data management issue resolution (see Section 3.1.3.2)
- Cadastral data modeling (see Section 3.1.3.2)
- Parcel maintenance tools enhancement (see Section 3.1.4.2)

GIS Center Client Services

KCGIS Center client services are focused to meet the customized needs of specific clients. Clients can be GIS end-users or professionals who need training or specialized technical assistance, managers needing skilled staff to help meet peak workload demands, or staff needing maps or spatial analysis. The KCGIS Center Client Services Manager is the point of contact for service requests and customer relationship management. KCGIS Center Client Services are provided on a full cost reimbursable basis. For 2004 the standard KCGIS Center billing rate is $63 per hour. A lower rate of $58 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 2004 the standard CD unit cost is $93.

GIS Training – The KCGIS Center offers training in a variety of GIS courses at the DOT/DNRP computer training facility in the King Street Center. 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 2004 planned courses include the following; Introduction to ArcView 3.x, Introduction to ArcGIS, Migrating from ArcView 3.x to ArcView 8, Using KCIGS AvLib/Cartographic Standards, Using KCGIS iMap, Using KCGIS ParcelTools, Putting GIS to Work in King County, KC EOC GIS Volunteer Training, and Creating and Managing a Geodatabase. Each of these courses is more fully described on the KCGIS website (http://www.metrokc.gov/gis/services/training_course_outline.htm).

Help desk style support is also available from Client Services, through its Training Coordinator and other support personnel. Free help desk support is provided 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 needs assessment, implementation, and management, 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. Further examples of typical KCGIS Client Services projects include geocoding services, custom map production for publication quality brochures and displays, large format plotting, and custom GIS application development.

Client User Base – The KCGIS Center user base is served both directly (a GIS professional taking a GIS class, or making a connection to the KCGIS Spatial Data Warehouse) and 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.

Services 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.

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 agency 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 GIS Business Strategy

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 used in 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.

While GIS has become an integral part of business for many employees within the agency there are still many uses that are largely untapped. The agency has many things going for it as it moves forward to more fully integrate GIS into its business. First, the agency is excited about the possibilities that GIS provides. It is not something that needs to be "sold" to managers and decision makers. Secondly, because most of the work is location driven, GIS is a perfect tool to completely integrate into many of the business functions. Finally, the drafting staff within the department have a keen grasp of the tools and techniques to maintain the cadastral data for King County. Unfortunately, this alone is not enough to upgrade and develop applications and train users to use GIS. Currently, there are not enough resources dedicated to integration of GIS with the rest of the business operations. Existing staff are fully utilized on other priority initiatives within the agency. In order to be truly successful, GIS should be seamless for users. One goal for GIS is to develop applications that have been spatially enhanced so using these becomes as common as using Excel or Word. With the conversion of the Seattle data to the county

format complete, we anticipate an increase use of GIS due to the availability of a current countywide parcel data set. In the past, the Seattle area was unreliable due to its separate format.

With the anticipated move to Arc8/9 and a new data model there will be a substantial effort by Assessments to develop a model that overcomes some of the challenges faced with the current model and takes advantage of the topology and other rule based operations that have been developed in Arc8. At the same time we are planning for the conversion to Arc8 we must continue to maintain the cadastral data for King County so that users both internal and external will have access to current data. The transition to Arc8 will likely cause the biggest challenges for Assessments in the coming years with the limited resources available for GIS activity.

Assessments plays an integral part of the County GIS through the maintenance of the cadastral data. 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 Parcel-Picker into both internal and web-based applications and AVLib for ArcView applications.

With the completion of the conversion of the City of Seattle data to the King County format the relationship with Seattle for providing data exchange has changed. While Seattle still receives the parcel data it is now coming from KCGIS. Assessments, the City of Seattle and KCGIS are working together to explore development of a common database model that will take us into the future as we convert to the next generation of GIS software. We would like to develop a common data model with Seattle and other jurisdictions that will facilitate improved data sharing and eliminate the redundant maintenance effort while still guaranteeing data that meets or exceeds standards required by Assessments.

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 agency. GIS in Assessments consists of a coordinator, cartographers, analysts and users. The coordinator reports to the Accounting Division Manager.

The agency has eight cartographers who are responsible for maintaining the countywide (enterprise) 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 agency 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 agency continues to increase the use of GIS in the appraisal process. Every year more appraisers are using ArcView for valuing properties, verifying data and working appeals.

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.

3.2.2.1 Staffing Requirements

Assessments has one staff position to focus on GIS within the agency. 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 agency 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. In 2003 the conversion of the Seattle data to the county format was completed. This will simplify drafting's current maintenance obligations. Approximately 1 FTE was dedicated to the conversion effort in 2003.

No staffing changes are anticipated for 2004. Staffing allocations are generally carried over from year to year. In order to make headway incorporating GIS into the agency processes, programmers will have to be hired or priorities of existing staff redirected to include GIS applications. The possibilities for using GIS within the agency are endless but realizing these will be slow with the existing staff levels/allocations. The agency lacks any dedicated staff for programming applications and has one coordinator to respond to the data, map, analysis and training requests of the many users. The cartographers are dedicated to the maintenance of the GIS data which to date has required full participation from every member of the group.

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

3.2.2.2 Budget

The proposed 2004 budget for Assessments is as follows:

Item	Budget	Comments
Labor Costs (salary + benefits)	$617,000	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 2004.
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.

3.2.2.3 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 generally required to pay for part of the training costs. Many ArcView users would benefit from a basic ArcView training session geared towards Assessments' business process. Internal training is conducted on an ad hoc basis. 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.

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 GIS staff to ensure the same proficiency exists and there is minimal drop in the level of output with regards to data maintenance and service to users. In addition to training, a reasonable amount of "play time" with the new Arc8 software will be required. GIS staff should take as many of the following courses as possible:

- ArcGIS1
- ArcGIS2
- Creating and Editing Geodatabase Features (for ArcEditor and ArcInfo)
- What's New in ArcGIS 8.3. ArcGIS Annotation: Tips and Tricks
- Basics of the Geodatabase Data Model
- Creating and Editing Geodatabase Features (for ArcEditor and ArcInfo)
- Creating and Editing Geodatabase Topology (for ArcEditor and ArcInfo)
- Editing Spatial Data in ArcMap: Tips and Tricks
- Introduction to Geodatabases for ArcGIS (for ArcGIS 8.3)
- Working with CAD Drawings in ArcGIS
- Using ArcCatalog: Tips and Tricks
- Understanding ArcSDE Table Relationships
- Understanding the ArcSDE Spatial Index
- Working with Geodatabase Subtypes and Domains (for ArcEditor and ArcInfo)

Extensive Arc8 training needs to occur when a timeline for migration from the Arc7.x environment is established. Informal Arc8 training for individuals occurs through usage of the software and free online training opportunities.

3.2.2.4 Hardware and Software

Until late 2003 Assessments had three operational SUN workstations networked together to operate as data servers. The two Sparc 20's and Sparc2+ contained all data pertinent to Assessments and acted as a backup system for the cartographers when *WILDFIRE* was down. One of the Sparc 20's died and the decision was made to not replace any Sun equipment. This has forced Assessments to move applications and data to *WILDFIRE* which has been the plan for the last few years. With the completion of the Seattle data conversion the need to maintain the Sun equipment has largely vanished. One piece of equipment that may still be of use is the large digitizing tablet. It had been anticipated that this would be used to convert some wetland data from existing mylar overlays. It has not been determined if this can still occur with the existing configuration. The machine that died was used primarily for data storage so operation of ArcInfo licenses may not be affected. A decision on moving ArcInfo licenses is in the works and should be finalized in 2004.

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. With the shift to *WILDFIRE* a minimum of eight Assessor FTE's are dependent on its operation for keeping the County cadastral data updated.

In addition to servers, GIS users at Assessments utilize an HP 1055cm plotter and color printers. Replacement or alternatives for the digitizer will be addressed in 2004.

Maintenance of the enterprise 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 agency. Assessments uses both ArcInfo and ArcView software.

Software	Licenses
ArcInfo 7.2	9
Cogo	3
ArcView	22
ArcView 8.2	1
Map Objects	1

3.2.3 Spatial Data

The Department of Assessments maintains a variety of GIS data sets both for enterprise users and for specific agency uses. The most widely used data set is the cadastral data for the County. This enterprise 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. There will unlikely be any changes to the current data program in 2004. Aside from the cadastral data, other data sets maintained by Assessments are positional tied to RECDNET therefore the bulk of any effort on data enhancements will be geared toward the development of the new cadastral data model and the maintenance process for this and layers directly associated with the cadastral data.

3.2.3.1 Data 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 generally takes 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 generally 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.

Improving the timeliness of cadastral maintenance is an ongoing effort. 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. Another area for increased efficiency is the use of previously generated spatial data (.dxf files) from cities and developers. Assessments incorporates .dxf data and 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. Due to consent issues Assessments has not been able to receive CAD data from DDES. As a general rule, efficiencies gained via the use of digital data only occur when plats are larger than forty lots. Testing of software products that streamline raster to vector conversion will occur in 2004 with the hope that when the move to Arc8 is complete users will be proficient in various conversion techniques.

Enhancements to the current data and maintenance process were included as KCGIS priority initiatives for 2004. These should help streamline processes. Primary among these are modifications to the RECDNET data for complete removal of type 12 arcs. 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. Additionally, it is unknown if these will impact the data when it is converted to the Geodatabase.

Assessments is responsible for maintenance of the following enterprise 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, lot dimensions and other features necessary for describing property boundaries.	Updated daily as segregation/merger activities take place.

Assessments maintains the following agency data sets.

Data Name	Data Description	Update Frequency
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 agency overlays and updated wetland information.	Updated as drafting has time to convert data from agency overlays.
KCACODE	Levy Code Boundaries.	Updated as needed to meet statutory requirements for development of the data.

Data Name	Data Description	Update Frequency
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 Data 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. Making enhancements to the reference grid layer (ref_grid) used for conversion and subsequently to RECDNET is cumbersome. 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) and about 300 quarter-sections that were captured from Assessor 1"=200' mylars. As time allows, Assessments will continue to correct positional problems when they are encountered.

Within the county GIS community there is an increasing desire to make the data maintenance process more efficient and timely. Aside from ongoing maintenance, most of the effort for data enhancement for 2004 will be geared toward developing a new model for the cadastral data and maintenance process. The enhancement effort will also focus on developing data that is lacking in the current data.

3.2.3.3 Data Development

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 may be completed in late 2004.

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 useful for performing accurate appraisal of properties with wetlands. Unless a comparable source for the information can be obtained digitally, this data should be converted to satisfy the needs of appraisers and potentially other users within the county. With the loss of some SUN equipment the timeline for conversion of this data is unknown.

3.2.3.4 Data 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 agency data sets. During 2004, Assessments will continue to improve the documentation of agency data sets.

3.2.4 Spatial Applications

Assessments relies on two types of spatial applications: internal agency 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 is 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. This has proven to be a successful tool for the appraisers and will continue to gain popularity in 2004. 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, generates parcel shapefiles based on geographic or tabular data boundaries. The generated datasets are available for use with internal VB applications. During 2003 KCGIS, using client services funds, developed an application to automate the creation of the custom shapefile required by Assessments applications. This along with the completion of the Seattle data conversion will enable users to access the weekly updated countywide shapefile and have confidence in the currency of the data.

3.2.4.1 Application 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	Standard plotting applications based on server data for Commercial and Residential appraisers	AML

Name	Description	Language
Nonseaqsmap	and Residential appraisers.	
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 are 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.

3.2.4.2 Application Enhancement

The KCGIS Center has been responsive to requests by Assessments for changes to the maintenance-related applications. KCGIS priority initiatives for 2004 include improvements to the Maint_Rec application. Improvements to Maint_rec and related applications would help reduce the time and effort required updating the enterprise 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 by both Assessments and KCGIS the agency responsible for integration of the changes. 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, spatial enhancements to existing applications written by Assessments Information Services group will occur. Three enhancements are planned although more may occur. The first is updating the RealProperty application to display the GIS data and based on various parcel characteristics pull in the proper layer elements. Second will be integration of GIS with the Assessments Comp Sales application to include a map interface for searching comparable sales. Finally, the Query Master queries that return lists of parcels will be updated to also generate the shapefile attaching the tabular data to the GIS parcel data.

3.2.4.3 Application Development

No new development is anticipated for 2004.

3.2.4.4 Application 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 agency. 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. With the completion of the Seattle conversion effort and the move to incorporate Seattle data into the weekly refresh of the parcel shapefile, users will have a greater confidence in the GIS data and its use as a day to day tool.

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 and Parcel Picker* applications provide external access to a snapshot of data until there can be 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 agency'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 End-User Support

GIS application and data priorities are set by the division managers and processed within the appropriate division. Most agency 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 are the primary activities for the revalue process. The appraisers generally do their own GIS analysis for appraisal related issues although the coordinator helps train appraisers to use the available GIS tools. 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.

An ongoing relationship with the City of Seattle continues despite the completion of the Seattle data conversion. There are still some issues to iron out with the transfer of data between Seattle and KCGIS which we will continue to work on.

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 occur 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 GIS Business Strategy

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 enterprise and agency geographic data sets, and ensure consistency of data between GIS and the Permits Plus system.

The IS section of DDES participates in the successful exchange of data among many King County Departments. Planning and permitting data are provided to other departments through participation in the KCGIS public library. Property data from the Department of Assessments and Environmental Data from the Department of Natural Resources and Parks, of particular importance to accurate Permit Review, are acquired through the KCGIS public library as well as direct data exchanges. IS section GIS Analysts take an active role in facilitating data sharing between DDES and other King County departments.

The work program of the IS section uses GIS to support several of the core business functions of DDES. During 2003 the IS section prepared the DDES Strategic Technology Plan, which was subsequently adopted. GIS is an intrinsic part of this plan, and interoperation with GIS systems is one of the criteria specified for the Permitting System replacement discussed in the plan. Core business functions of DDES supported by GIS include the following:

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 lead position with the implementation of a pending Classification/Compensation Study. 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. When needed, the IS Section provides subject area expertise or project materials to the other King County Agencies.

3.3.2.1 Staffing Requirements

The GIS component of the IS Section staffing model for 2004 consists of 4.0 FTE GIS Analysts/Programmers (ISA-II) and 0.33 FTE Program Manager. GIS staff are a portion of the Information Services Section and management of GIS staff is provided part time by the Information Services Manager. It is the expected that one of the ISA-II positions will be replaced with a Lead Analyst/Programmer position in 2004. One of the ISA-II positions has been vacant since August 2003. It is expected that the position will be filled in the first quarter of 2004.

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 2004 the total staffing budget (salaries plus benefits) for the positions that provide GIS services to DDES is approximately $368,900.

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%

Working Title	Focus	Class	Status	% GIS*
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%

* Percent of FTE allocated to GIS related activity

3.3.2.2 Budget

DDES operates on a cost recovery model, where the actual cost of issuing a permit is charged in fees to the permit applicant. A portion of each hour charged to a permit accounts for administrative support services provided by the Administrative Services Division, which includes the Information Services Section, which in turn includes the GIS function. The amounts shown below are estimates from larger section and/or department budgets.

The proposed 2003 GIS budget is as follows:

Item	Budget*	Comments
Labor Costs *(salary + benefits)*	$368,900	Estimated for 4.33 FTE
Hardware *(acquisition and maintenance)*	$5,000	Disk space on department SAN and maintenance contracts.
Software *(acquisition and maintenance)*	$20,000	Licenses and maintenance agreements.
Training costs	$8,000	Not a specific line item in the DDES budget. The number quoted here is a reasonable expectation of cost based on one week of ESRI training for each dedicated GIS employee.
Discretionary *(consultants, outside services, materials, etc.)*	$5,000	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.

3.3.2.3 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. DDES is expected to complete the transition from the shape file and ArcView 3 based counter application Base2 to a new modular ArcSDE and ArcIMS based suite of applications during 2004. The release of the new applications will require a training plan for IS Section staff.

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 completes migration to the ArcGIS 8 software platform, the staff may supplement their skills through formal course work, depending on what complications arise. 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.

3.3.2.4 Hardware and Software

The department is served by a fiber optic external network connection under the INET program. The PC network for the department is an Ethernet LAN with multiple servers and a data transfer rate of 100 megabits per second. Data are retrieved for the servers via a fiber optic connection to a Storage Area Network (SAN) device.

The PC desktop environment used by GIS staff consists of 1.7 GHz Celeron based machines running Windows 2000. ESRI ArcGIS 8.3, ArcInfo Workstation, and ArcView 3.1 are installed on the Windows 2000 and Windows XP PCs. The GIS end-users in the department are expected to be upgraded from Windows 98 to Windows XP before the end of 2003.

Specialized output devices used by the IS Section include an HP DesignJet 1055CM color plotter and a Canon CLC 1100 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.

The move to ArcGIS 8.3 by the IS Section has necessitated the adoption of the Spatial Data Engine (SDE) and a database management system (DBMS). DDES has a local SDE installation using MS SQL Server 2000 for the DBMS. The implementation plan for SDE at DDES is underway, and implementation is expected to be completed before the end 2003.

Servers devoted in whole or in part to DDES GIS services are as follows.

DDES710 – An HP NetServer E800 running Windows 2000. A production data server, it serves file-based GIS data for mapping and analysis projects.

DDES707 – An HP Server tc3100 running Windows 2000. A production Intranet server, it runs the MS IIS and ESRI ArcIMS. It will provide web based ArcIMS based applications after they are released in 2004.

DDES737 – An HP Server tc3100 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. It will provide ArcSDE geo-database GIS data for ArcIMS applications running on *DDES707. DDES737* also serves as the development and test platforms for MS SQL Server2000 and ArcSDE through the use of multiple instances on the same hardware.

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.

Three ArcInfo 8.3 floating licenses are run from a license manager on *DDES737.* Twenty ArcView GIS 3.x licenses are run from a LAN installation on *DDES737* and are accessible by nearly all PCs in the department. ArcInfo software licensing and maintenance are handled in cooperation with the KCGIS Center.

Software	Licenses
ArcInfo Desktop 8.3	
Core	3
3D Analyst	1
Spatial Analyst	1
ArcPress	1
ArcView 3.1	18
ArcView 3.3	2

Software	Licenses
Adobe Acrobat Distiller 5.0	3
Adobe Photoshop 7.0	1
Macromedia Dreamweaver MX	1
XML Spy 3.0	1
MSDN	1

3.3.3 Spatial Data

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

GIS data are held in three main data repositories at DDES. The first data repository is a series of directories on *DDES737*, which contain ArcView shape files and is set up to mirror the structure of the KCGIS Spatial Data Warehouse. The second data repository is a set of ARCINFO 7.x coverages held on *DDES710* that are maintained using workstation ArcInfo 8.3. These coverages closely mirror the contents of the KCGIS Spatial Data Warehouse, although some names for directories and files are different. The third data repository is an ArcSDE geodatabase held on *DDES737.* The ARCINFO 7.x coverages will be migrated into SDE during 2004, and then abandoned. A description of the GIS data program at DDES is included in the following sections.

An interesting challenge in 2004 will be the ability to coordinate the transition from ARCINFO 7.x coverages to ArcSDE geodatabase, while coordinating with other King County agencies while they negotiate the same transition. The goal of the DDES IS Section is to improve the data synchronization of property and planning layers, while reducing the amount of GIS staff time that is required to do so.

3.3.3.1 Data Maintenance

Two tables are presented in this section. The first table lists enterprise 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.

Enterprise Data

Data Name	Data Description	Update Frequency
AGRPDDST	Polygons representing the Agricultural Production District (APD) as defined by Chapter 3 of the King County Comprehensive Plan.	As needed
ASGWC95	Polygons representing areas susceptible to ground water contamination as defined by Chapter 4 of the King County Comprehensive Plan.	None planned
CITY	Polygons representing current city boundaries. Layer City is a simplified derivative of Citymast.	As needed
CITY_KC	Polygons representing current city boundaries, as well as polygons for the unincorporated areas of King County. Layer CITY_KC is a simplified derivative of CITYMAST.	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
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
COALMINE	Polygons representing Sensitive Area Ordinance coal mine hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Irregular

Data Name	Data Description	Update Frequency
COMPLU	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
CPAREA	Polygons representing Community Planning Areas as defined by various planning documents.	None planned
DPA	Polygons representing demonstration project areas as defined by Title 21A Zoning – 21A.55 of King County Code.	As needed
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
ERODE	Polygons representing Sensitive Area Ordinance erosion hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Irregular
FARMLAND	Polygons representing properties participating in the Farmland Preservation Program.	Irregular
FIRESTN	Points representing fire station sites.	Irregular
FORPDDST	Polygons representing the Forest Production District (FPD) as defined by Chapter 3 of the King County Comprehensive Plan.	As needed
FPD_LINE	Lines representing the Forest Production District (FPD) boundary as defined by Chapter 3 of the King County Comprehensive Plan.	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
HORSE_COMM	Polygons representing Equestrian Communities as defined by Chapter 3 of the King County Comprehensive Plan.	As needed
KCADDRGRID	Lines representing King County addressing grid as adopted by Resolution 16622.	None planned
MPS	Polygons representing road mitigation payment system zones, which are derived from Small Area Zones (SAZ).	As needed
MUCKL_IR	Polygons representing Muckleshoot Indian Reservation boundary.	None planned
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
SCHSITE	Points representing school sites.	Irregular
SDO	Polygons representing areas with special district overlay designations as defined by Title 21A Zoning – 21A.38 of King County Code.	As needed

Data Name	Data Description	Update Frequency
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
SEISM	Polygons representing Sensitive Area Ordinance seismic hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Irregular
SHORELINEMMP	Polygons representing Shoreline Management Master Program designations as defined by Title 25 Shoreline Management 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
UAC	Polygons representing Unincorporated Area Councils (UAC).	As needed
UGLINE	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
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
WILDNET1996	Wildlife Habitat Network as modified in 1996	None planned
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)

Agency Data

Data Name	Data Description	Update Frequency
AREASPFC	Polygons representing area specific drainage conditions as defined by the Surface Water Design Manual.	Irregular
ARSONSXX	Points representing the locations of fire investigations for the given year. Layer name provides the year (e.g. ARSONS98).	Irregular
BLDG_IA	Polygons representing building inspection areas.	Irregular
BOG_DA	Polygons representing bogs as regulated by the Surface Water Design Manual	Irregular
BSNWIDE	Polygons representing basin wide drainage conditions as defined by Surface Water Design Manual.	Irregular
CDIST96	Polygons representing King County Council Districts. A derivative of Election's kccdst with additional attributes.	Irregular

Data Name	Data Description	Update Frequency
CHINOOK	Polygons representing 500-foot buffer from streams identified by Chinook distribution analysis.	As Needed
CITYIMP	Polygons representing impact areas (areas of interest) as defined by various cities.	Irregular
CLEAR_IA	Polygons representing clearing inspection areas.	Irregular
CODE_IA	Polygons representing code enforcement areas.	Irregular
ERS_DA	Polygons representing erosion drainage as regulated by the Surface Water Design Manual.	Irregular
ESA_IA	Polygons representing Environmental Species Act (ESA) inspection areas.	Irregular
ESC_IA	Polygons representing erosion and sediment control inspection areas.	Irregular
FCCTELCO	Points representing locations of existing and planned telecommunication facilities as registered with the Federal Communication Commission (FCC).	Quarterly
GRAD_IA	Polygons representing grading inspection areas.	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
INTRMPAA	Polygons representing interim Potential Annexation Areas (PAA) for cities in King County.	As needed
JPA	Polygons representing joint planning areas as defined by the King County Comprehensive Plan.	Irregular
KINGADDR.MDB	Parcel specific database of situs addresses as recognized by DDES for properties in unincorporated King County.	Continually
LH_DA	Polygons representing landslide hazard drainage areas as regulated by the Surface Water Design Manual.	Irregular
LU_IA	Polygons representing land use inspection areas.	Irregular
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
MDPA	Master Drainage Plans Areas as defined and regulated by the Surface Water Design Manual.	Irregular
MINE97	Polygons representing mineral resource sites as defined by Chapter 3 of the King County Comprehensive Plan.	As needed
MRWATERS	Polygons representing major receiving water bodies as regulated by the Surface Water Design Manual.	Irregular
PARCELS.MDB	Parcel specific database for development conditions information.	As needed

Data Name	Data Description	Update Frequency
PERMPAR	Polygons representing parcels associated with DDES permits. Includes historical parcels that no longer exist.	Monthly
RFFA	Polygons representing the Rural Forest Focus Area (RFFA) as defined by Chapter 3 of the King County Comprehensive Plan.	As needed
SANT.MDB	Parcel specific database for Sensitive Area Notice on Title (SANT) information.	Monthly
SCHDIST	Polygons representing school districts. A derivative of Election's schdist with additional attributes.	Irregular
SNOWLOAD	Polygons representing ground snow load zones.	Irregular
SUBDIV	Polygons representing each recorded plat. Generated by dissolving tax lots on major number.	Irregular
STREAM	Lines representing the Sensitive Area Ordinance streams as defined in Title 21A Zoning – 21A.24 of King County Code.	Irregular
TDR	Polygons representing parcels receiving or sending Transfer of Development Rights (TDR).	As needed
UGAREA01	Polygons representing the Urban Growth Area (UGA).	As needed
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

3.3.3.2 Data 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. DDES has reduced the number of GIS analysts to keep up with the tightening budget requirements. Correspondingly the scope of data enhancement projects has diminished. Only the projects with the largest benefits to staff productivity are undertaken. The projects are listed with their Service Request Numbers used by the IS Section for project control.

Critical Areas Ordinance Interactive Edits – (SR# 713) The critical areas GIS layers maintained by DDES are derived from the same small scale sources as the December 1990 Sensitive Areas Map Folio, with some corrections and additions made as the result of field visits. The alignment of the critical areas with the GIS parcel layer is in need of improvement. If resources are available the data will be enhanced in 2004. Refer to Section 3.3.4.3 for further information.

3.3.3.3 Data 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 the 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 Data Metadata

In 2004, 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. Some layers are no longer a good match with DDES' role in the overall KCGIS program. Where there is another King County Agency with a clear reliance on these data layers, DDES hopes to work with those departments, and KCGIS Center Data Coordinator, to better align data stewardship, with data use patterns.

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, Java, and ASP.NET; and web interfaces using Cold Fusion and Microsoft Access.

During 2004 DDES will complete the transition from an ArcView 3.1 based application to an ArcIMS based series of applications for production staff. The ArcIMS based applications will be used through a web browser interface to all DDES employees. A small number of advanced production staff will transition to ArcView 3.3 for mapping tasks that require more powerful features than ArcIMS offers. All applications will access data from ArcSDE, rather than shape files.

3.3.4.1 Application 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.	Avenue

Name	**Description**	**Language**
	"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. This application is planned to be retired before the end of 2004.	
Autoplot	"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. While based on the same code as "Base2", "Autoplot" produces complex maps that would be difficult to implement in ArcIMS. As a result "Autoplot" will be retained for the foreseeable future.	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

3.3.4.2 Application 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.

Autoplot – (SR# 707) "Autoplot" will be significantly updated to provide two major benefits. First, the data source will be pointed to an ArcSDE data source rather than the current shape file data source. Second, the mechanism for customizing what layers are printed will be simplified for easier maintennance.

DDES Defined Map Sets – (SR# 1979) Additional map sets for *iMAP* will be identified and developed in 2004 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 Application Development

The transition of DDES' GIS data into ArcSDE geodatabse format creates the need for a large amount of application development, and an opportunity for reconsidering the approach for DDES' in house applications. A significant amount of GIS resources will be devoted to that task in 2004. In general a more modular approach to application development will be pursued. A user survey was administered in 2003. The results of the survey will be used to determine the number and exact nature of the applications that will be produced. The transition to many small ArcIMS based applications represents a significant change for DDES.

Unamed Base2 Replacements – (SR# 707) These applications will access data from ArcSDE, rather than shape files. The applications will typically be developed to serve a small focused purpose. Many of these applications may be developed to replace the current monolithic ArcView 3.1 application. DDES production staff will be able to pick and choose only those applications that are needed to do their specific business tasks.

Critical Areas Ordinance Interactive Edits – (SR# 713) In 2003 a project was approved to create an application that enables critical areas inspectors to update the critical areas layers directly from their field notes in a web browser and using ArcIMS. Due to loss of staff in 2003 this project was delayed. If staff are replaced in a timely fashion and other higher priority projects are completed, the Critical Areas Interactive Edits application will be undertaken in 2004.

3.3.4.4 Application 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*.

The forthcoming ArcIMS applications will result in the opportunity to fully document their interface and use. It is also expected that training materials will be developed to aid the production staff in their transition to these tools.

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 permit routing management, 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.

During 2003 the IS section prepared the DDES Strategic Technology Plan, which was subsequently adopted. GIS is an intrinsic part of this plan, and interoperation with GIS is one of the criteria specified for the permitting system replacement discussed in the plan. GIS staff has participated in the review of various permitting systems, in order to provide accurate input regarding the integration of GIS in each system. The ultimate selection of a new permitting system will take into account the need for GIS integration.

3.3.5.1 RDBMS Backend Support

The IS Section currently uses Microsoft SQL Server 2000 for back-end support of GIS. This is the same Microsoft SQL Server Instance that is used as the backend for ArcSDE. This function is limited to a handful of specific use databases such as Sensitive Areas Notice on Title and parcel data imported from the Assessor extracts. 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.

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. GIS staff work closely with the other IS section staff to provide integration of GIS and more conventional information services.

3.3.6 Client Services and End-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 DDES or KCGIS Center data libraries. 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.

Development Conditions Search Engine – The IS Section maintains a database driven, web based 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 script to serve database requests from a Microsoft Access database.

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. In addition during 2004 DDES will develop ArcIMS applications that will be available only to DDES staff within our LAN. 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 mission of the Department of Executive Services (DES) to provide King County agencies, municipalities and the public with high quality, general government services. To achieve this mission DES provides specialized administrative and general government services to a diverse community of internal and external customers.

DES provides various highly specialized internal administrative support services to allow other King County agencies to focus on their unique business specific objectives:

- Financial management services
- Human resource management services
- Code of Ethics education and violation prevention
- Facility and property asset management services
- Risk management services
- Information technology infrastructure services,
- Records management services

DES also provides a variety of highly valued general government services directly to the public:

- Management of all county elections
- Document recording and licensing services
- Emergency management coordination
- Civil rights administration
- Animal Control services
- Collection and disbursing of real estate excise taxes

DES is organized into 9 separate divisions and offices to provide this broad array of services. Active utilization of GIS to support Department of Executive Services business functions is concentrated in three divisions: Facilities Management, Emergency Management, and Records, Elections, and Licensing Services (REALS). More detail about the GIS programs of these three individual divisions will be found later in this section. Typical DES uses of GIS include mapping County owned property, providing GIS data for E911 Public Safety Answering Point (PSAP) call center maps, and maintaining and mapping major political and minor taxing district boundaries for King County. For each of these agencies, GIS is perceived as a technology that provides value for improving services and meeting customer expectations.

Within the three divisions, GIS service delivery is managed differently. Records, Elections and Licensing Division includes a dedicated GIS unit, with GIS professional staff focused on supporting County elections. Emergency Management Division has one GIS professional, primarily focused on E911 GIS support, with EOC GIS support shared by the KCGIS Center. Facility Management Division relies almost wholly on KCGIS Center client services support to achieve its goal of developing an internal GIS user base.

Unlike other County departments with GIS use in multiple divisions (DOT and DNRP), DES has no strong common business focus among the three current GIS user divisions, because of the specialized nature of the support services each provides. The potential to develop future GIS use in other DES divisions (Civil Rights, ITS, Finance, Ethics, Human Resources, Risk Management) is limited because their businesses lack a strong geographic component. The limited GIS needs of these divisions (GASB 34 asset mapping for Finance and I-Net fiber cable route mapping for ITS) have generally been provided adequately by KCGIS Center client services.

The three DES divisions using GIS coordinate their GIS activities on an ad-hoc basis. The potential for future coordination may include shared GIS resources and expertise (for example, plotters and technical

advice could be shared between REALS and Facility Management staff who are co-located in the County Administration Building). Internal coordination with Emergency Management GIS is hampered by remote location in two sites: the County EOC in Renton and E911 office at King County International Airport. The three DES representatives on the KCGIS Technical Committee use a variety of countywide GIS activities (including twice monthly KCGIS Technical Committee meetings and participation in development of the annual KCGIS O&M Workplan) as opportunities to meet and discuss DES specific GIS coordination related issues.

3.4A Emergency Management Division

Emergency Management Division: E-911 Program Office - The mission of the Emergency Management Division, E-911 Program Office (E-911) is to provide leadership and high quality service to improve the safety of the public in King County. The E-911 Program Office is committed to providing public safety solutions and support to 14 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 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.

The core E-911 GIS activities are to ensure that the GIS based AliTrakker maps are working to display each and every 911 call that comes into the PSAP. That cell tower information coming in from seven different wireless carriers is kept up to date and integrated onto the mapping for display at the PSAPs. To make sure that up-to-date GIS data is uploaded on to AliTrakker map applications. Finally, to ensure that call taker staff at PSAPs are trained on how to use the GIS based location identification software primarily the AliTrakker map application.

Emergency Management Division: Office of Emergency Management – The Office of Emergency Management operates the King County Emergency Operation Center (EOC). Until 2003, E-911 and EOC offices were collocated at King County International Airport. However, the EOC moved to a new facility in Renton in June, 2003. GIS is an integral part of the EOC operations, when activated. Prior to the move to Renton, E-911 GIS staff were in a position to provide routine and emergency support to the EOC. Currently the EOC relies primarily on KCGIS Center Client Services for on-going support.

3.4A.1 GIS Business Strategy

E-911's core customer base is comprised of the 14 Public Safety Answering Points (PSAPs) that handle 911 emergency calls and route requests to appropriate public safety agency staff for response. PSAPs are located throughout King County serving regional populations and or local area confined by city boundaries. Seattle, Bellevue, Valley Communications (a regional 911 service provider), the Port of Seattle, University of Washington Public Safety, Washington State Patrol, and the King County Sheriff's Office are only a few of the small to large PSAPs answering 911 calls in King County. Each PSAP is staffed 24 X 7 by call takers who receive 911 distress calls from within a designated region. The primary business function of each PSAP is to verify the name and location of a person in distress, as well as the nature of their problem, and route that information to the appropriate public safety organization. The goal of the PSAP is to provide first responders with key information about a person in distress to help ensure that the appropriate public safety assets arrive at the correct location as quickly as possible.

The work of PSAP call takers is characterized by periods of high stress related to both call volume and to the life or death nature of many requests for help. A few key goals of the E-911 Program Office are to assure that PSAPs have the latest E-911 phone technologies, that the 911 system is up and running 24x7, provide the best available 911 related training to PSAP staff, and when ever possible to know about the latest information about E-911. With support from the E-911 Program PSAPs can continue to retain quality, trained employees for a longer period of time and continue to provide excellent 911 emergency services. . Each 911 call requires accurately determining the location of the caller. As the volume of wireless and wireline 911 distress calls increase, an easy to use, easy to understand, PSAP front-end mapping application is critical to ensure that all 911 calls are given a geographic location when possible. Therefore geography is a profoundly important aspect of E-911 Program business.

The E-911 Program work plan is mandated by Federal and State law and is technology driven. The FCC requires wireless carriers to provide wireless call location information to PSAPs. State law requires that King County 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 increased to approximately 70% of the total 911 calls made in King County. In order to display the location information associated with each 911 call, 911 call location technology must be installed at the PSAPs.

The GIS business strategy of the E-911 Program Office primarily supports the use of GIS applications and data to locate wireless and wireline 911 distress calls. These wireless and wireline distress calls are

displayed on the AliTrakker map viewer software installed at each King County supported PSAP. AliTrakker is a specialized GIS based application from MicroData GIS, designed for PSAP use to automatically display caller location and provide discrepancy reports. Each PSAP call taker and or dispatcher phone is attached to an AliTrakker map application that uses KCGIS data necessary to support accurate call location determination.

E-911 Program Office GIS support services include training end users on the use of AliTrakker software and KCGIS data. Training is provided on site in each PSAP and includes follow-up support, trouble-shooting GIS related problems, and fulfilling GIS data layer requests as required. A user meeting is held quarterly at each PSAP to maintain effective communications between individual call-taker staff and the E-911 GIS program.

The E-911 Program Office also distributes required GIS data to the PSAPs. The primary current location data source is the KCGIS ST_ADDRESS layer. In the future, ST_ADDRESS will be replaced by T-Net data from KC Transit GIS. The E-911 GIS Program processes KCGIS data using a MicroData GIS ArcView based extension called E9GIS. E9GIS converts KCGIS data from the state plane coordinate system into geographic coordinates (latitude and longitude) and performs other data formatting required by AliTrakker to locate wireless 911 calls. E-911 GIS also provides other data layers, such as coverage areas, cell tower locations, and dispatch zone boundaries. Individual PSAPs may also request custom data, such as specific site or building locations, or integration of local computer aided dispatch (CAD) data. These data are also processed by E-911 GIS using E9GIS software. Once processed, E-911 GIS distributes GIS data via 911-Net, a closed network providing secure access to each PSAP.

To support the E-911 GIS strategy, data quality issues received from PSAPs are addressed and resolved. Once TNET is implemented by E-911 GIS, data discrepancies will be provided back to KC Transit GIS staff, and the E-911 GIS staff will use the TNET data editor as part of the TNET consortium. E-911 GIS is developing GIS data guidelines to be used by local agencies for CAD data and city GIS data to be included in the E-911 GIS database.

Key strengths of the E-911 GIS program include a fully operational environment that has proven its ability to deliver highly accurate KCGIS data supported by an effective front end application to facilitate the work of PSAP call takers. AliTrakker software provides an effective data management/exception-reporting tool for administration of E-911 GIS data. Staffing limitations in responding to all PSAP GIS data and support requests are mitigated somewhat by the use of County Work-study Program staff. Some specialized data desired by PSAPs is lacking, for example GPS-based location of highway mile markers with digitized site photos.

Opportunities include future coordination with the KCGIS Center to exchange GIS data with city GIS departments. E-911 GIS is also in a good position to communicate key changes to County geography (new streets and facility locations) on a near-live basis to the rest of KCGIS.

A key challenge is training PSAP call taker staff and encouraging some call takers who are ‘new-technology adverse’ to fully utilize the map based information available. Many call takers have worked whole careers without the ready availability of GIS-based map data and resist its use, especially after any data accuracy or software functionality problem occurs. The growing use of wireless communications drives the need to integrate GIS mapping at PSAPs, so success in this area is a key goal. PSAP staff are aware that geography is ever changing and that updates to the map will be frequent in order to keep up with geographic changes. As geography within the region changes, data will also change to reflect new geographic updates.

Cross agency coordination within Emergency Management is primarily with the EOC and involves providing critical facility locations. Other support/coordination activity has declined since the EOC moved to Renton. External coordination is a key aspect of the E-911 GIS program, focused on acquiring and processing GIS data from KCGIS, city GIS departments, response agency CAD, and (in the near future) TNET, and providing it to PSAPs.

The key long-term goal of the E-911 Program Office is to keep up to date with changes within the E-911 industry. A major component of the long-term goal is to keep mapping up-to-date at the PSAPs with the latest geographic changes which includes an x,y location of all structures within King County. Wireless 911 distress calls to PSAPs have increased steadily over the last few years. GIS is 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 so that PSAP equipment would then be able to interpret and display a point to the caller's physical geographic location. All 14 PSAPs will be equipped with mapping by the end of 2003.

E-911 GIS Program's role within KCGIS is primarily as a data coordinator out to PSAP end userss. E-911 GIS is also in a key position to notify KCGIS data maintainers of data update or accuracy enhancement needs.

3.4A.2 GIS Program Overview

The E-911 GIS Program is provided by a single GIS staff position. The E-911 GIS Program Administrator reports directly to the E-911 Program Office manager. A Work-study program intern's provides occasional part-time assistance.

The E-911 GIS program customer base is comprised of 14 PSAPs located throughout King County including Bellevue PD, Bothell PD, Enumclaw PD, Issaquah PD, King County Sheriff's Office, Kirkland PD, Mercer Island DPS, Port of Seattle PD, Redmond PD, Seattle PD, University of Washington, Valley Com, Washington State Patrol, and Seattle Fire.

Typical GIS services provided by E-911 GIS to the E-911 Program include mapping, data coordination, data development and maintenance for PSAP-specific data needs, and training of PSAP staff in use of AliTrakker software. E-911 GIS program does not perform application development, but does support AliTrakker deployment to PSAPs. A key function in 2004 will be assessing, preparing for, and supporting deployment of the future Arc8 based version of AliTrakker from MicroData.

Specialized E-911-specific GIS services are described in detail below:

Training - Training services are provided to dispatchers, call takers, and other end user clients at the PSAPs on the AliTrakker GIS map view application. Current and future training will focus on new employees at the PSAP who need AliTrakker map view application training.

Data Verification - The E-911 GIS Administrator is required 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 which E-911 acquires GIS data. The GIS administrator also reports any data discrepancies back to the providing agency when discovered by the E-911 program or PSAP staff. On occasion the GIS administrator will field locate residential, business, public, and other geographic entities using GPS to meet 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 to KCGIS or any other E-911 GIS data source.

AliTrakker Administration Procedures - The installed AliTrakker application includes a built in function to record 911 and GIS discrepancies. Because of increased 911 call volume and constantly changing geography, calls do not always match to an address. A call discrepancy manager built into the AliTrakker application captures and records GIS or 911 call discrepancies. Discrepancies are transmitted from the PSAP to the E-911 GIS program via the 911-Net for further review and corrections. A typical GIS discrepancy is a map display location that does not match the caller's actual location. The dispatcher digitally records the GIS discrepancy on the map and sends it to the E-911 GIS office. The E-911 GIS Administrator then identifies the discrepancy location, corrects it, and notifies the KCGIS Center or other GIS data source of the discrepancy and corrections made. E9GIS is an ArcView based extension used by E-911 GIS to perform core GIS and 911 related back-end functions, including data creation and GIS data maintenance. E9GIS combines all GIS and Automatic Location Identifying (ALI) data developed and maintained for use on the AliTrakker application at the PSAPs. E9GIS includes an export utility to forward data corrections as shapefiles back to the original GIS data source for resolution. Once GIS data has been updated by E-911 GIS, it is then redistributed to PSAPs via the 911 data network.

Support – Other E-911 GIS support functions not described elsewhere include:

- Coordinate with wireless carriers for new cell tower information and updates to existing cell towers.

- GIS business expertise and technical support to PSAPs related to mapping and GIS
- Coordinate with PSAP Computer Aided Dispatch (CAD) vendors and assist in the integration process of map display features between CAD and GIS mapping
- Maintain current knowledge of 911, telecommunications, and GIS industry technology changes and help determine future impacts on PSAP map data delivery system

3.4A.2.1 Staffing Requirements

One GIS Mapping Administrator staffs the E-911 GIS Program. A Work-study program intern provides approximately half time support during the school year and full time during the summer to assist the GIS Mapping Administrator. No change to staffing level is foreseen. The staff position is funded through the E-911 tax included in county phone bills. For staff assignment details, refer to the following table:

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

*Senior Information System Specialist

The current 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. The intern will also assist with GPS and data maintenance projects related to mapping in the E-911 Program Office.

3.4A.2.2 Budget

The proposed 2004 E-911 GIS Program budget is as follows:

Item	Budget	Comments
Labor Costs (salary + benefits)	$64,426.08	One FTE GIS Administrator Position
Hardware (acquisition and maintenance)	$0	*No hardware purchases related to mapping are planned for the 2004 year.*
Software (acquisition and maintenance)	$242,000.00	*From June of 2003 and on into 2004. This includes all consulting and software maintenance with MicroData GIS.*
Training costs	$0	No separate funds for GIS training. Training is provided on a discretionary basis
Discretionary (consultants, outside services, materials, etc.)	$10,500	. Discretionary budget for KCGIS Center client services.

The E-911 Program, including GIS, is funded from the E-911 wireless and wireline tax.

3.4A.2.3 Training

The E-911 GIS Mapping Administrator relies on KCGIS Client Service for GIS training. As the County migrates to Arc8 and as PSAPs are provided with the future Arc8 based version of AliTrakker, Arc8 training will be required. It is assumed that the E-911 GIS Mapping Administrator can master upgrades to AliTrakker, E9GIS, and other MicroData back-end applications via self-training, tutorials, on-line help, and access to the MicroData support desk. The GIS Administrator also participates in various GIS conferences and application workshops. Training is funded through the E-911 Program Office training budget.

3.4A.2.4 Hardware and Software

Network connection to KCGIS is via KCWAN. Connection to PSAPs is via the 911-Net, a secure, closed system operated by King County E-911, with vendor support from PRC a local CAD services provider.

The E-911 desktop environment consists of a Pentium 3, 750Mb of RAM, running Windows XP. The inter workstation is a Pentium 4, 650Mb of RAM, running Windows 2000. The field workstation is a dell laptop, Pentium 3, 1G processor, running Windows 2000. 911-NET/ GIS Desktop Dell Pentium 4, 1G processor, running Windows XP. Used primarily by GIS Administrator for GIS data processing and E9GIS operations but not connected to King County WAN. . .

The E-911 GIS Program has two plotters available: an HP 1055 and an HP 2500CM.

With the departure of the EOC (with a Snap file server which had been shared with E-911) to Renton, local file storage of E-911 GIS Program Data has become a challenge. Before the end of 2003, E-911 GIS hopes to have a new E-911 Snap file server available for local data storage. The Snap Server 4500 480GB windows 2000/NT.40 software is what will be installed at E-911 to mirror the GIS library data from KCGIS.

Specialized spatial applications from MicroData GIS are used 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.

E-911 GIS currently has the following license structure:

Software	Licenses
E-911 GIS:	
MicroData SW:	
E9GIS	1
Admin	1
Other?	0
ESRI SW:	
ArcGIS 8.2	
Core	3
Spatial Analyst	1
ArcView 3.2	
Local Installs	2
Spatial Analyst	2
AliTrakker Map Viewer	
Washington State Patrol	10
Valley Communications	38
Seattle PD	12
Bellevue PD	6
King County Sheriff	30
Kirkland PD	6
Bothell PD	5
Redmond PD	6
University of Washington	2
Enumclaw PD	2
Issaquah PD	2
Port of Seattle	2
Mercer Island PD	2
Seattle Fire	7

Software	Licenses
AliTrakker-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
Enumclaw PD	1
Issaquah PD	1
Port of Seattle	1
Mercer Island PD	1

3.4A.3 Spatial Data

The only enterprise GIS data maintained by the E-911 GIS program is Emergency Service Zone Numbers (ESN) boundaries. ESN boundary changes are forwarded to the E-911 GIS Program for processing. The GIS administrator is responsible for updates and improvements to the ESN boundaries. These changes are then forwarded to the KCGIS Center. Cell towers, cell sectors, and PSAP-specific data such as patrol zones, tow zones, special patrol districts are created, updated and maintained by E-911 GIS. A recurring need is for limited amounts of street data from Pierce and Snohomish Counties, for cities which cross county lines (Bothell, Milton, Pacific). This may be addressed by T-Net in the future.

3.4A.3.1 Data Maintenance

Enterprise Data

Data Name	Data Description	Update Frequency
E-911_ESN	Emergency Service Zone Numbers (ESN) boundaries	As Needed

Agency Data

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 Data 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. In the future similar updates and enhancements will be reported to KC Transit GIS when T-Net data is in use.

3.4A.3.3 Data Development

Data development normally only occurs when specifically requested by PSAPs.

3.4A.3.4 Data Metadata

The only metadata E-911 GIS maintains is for the layer E-911_ESN.

3.4A.4 Spatial Applications

The E-911 GIS Program does not provide spatial application services.

3.4A.4.1 Application Maintenance

E-911 GIS has no activity in this area.

3.4A.4.2 Application Enhancement

E-911 GIS has no activity in this area.

3.4A.4.3 Application Development

E-911 GIS has no activity in this area.

3.4A.4.4 Application Documentation

E-911 GIS has no activity in this area.

3.4A.5 System Integration

E-911 GIS has no internal activity in this area. E-911 GIS does provide GIS data to the Qwest 911 database run by PRC as part of 911-Net.

3.4A.5.1 RDBMS Backend Support

Currently GIS address range data are managed through Microsoft Access.

3.4A.5.2 Other Data Management Activity

E-911 GIS has no activity in this area.

3.4A.6 Client Services and End users Support

The E-911 Program Office manager defines the E-911 GIS work program. Initial GIS services are provided to individual PSAPs prioritized by the order in which mapping is installed and activated at the PSAPs. Activation priority is based on the number of wireless 911 calls answered by each PSAP. Ad-hoc requests for GIS assistance are received via phone, e-mail or at the quarterly PSAP meeting. Daily communications between the PSAPs and the E-911 GIS Program is ongoing via e-mail, phone, fax, or through the 911 data network.

3.4B Records, Elections, and Licensing Services 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 GIS Business Strategy

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 (KCGIS) Program. The District data layer is utilized by many agencies within King County and it supports numerous County department business applications. KCEGIS staff support division and department business functions by providing digital map and CD production services, data creation, integration, maintenance and analysis, and internet based services of available map products and the polling place lookup application.

Listed below are division business functions 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)* and annual voting district maintenance *(RCW 29.04.040 and RCW 29.04.050).* 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 support 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.
- ***Public Information –*** GIS maps, data and applications are used to aid in the delivery of public information. District information is depicted using GIS for all the division map series products available hard copy or via the Internet. Polling place data is disseminated to the public via an internet application or over the telephone via an interactive voice response system. This year the division would like to add district themed map sets to the iMAP 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 2004, three FTE GIS analyst positions, and two TLT GIS staff report to the Program Manager. These analysts perform duty assignments supporting five basic business areas: political redistricting, minor taxing district boundary maintenance, voter registration, 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 KCEGIS 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 2003, KCEGIS staff provided approximately 75 CDs and 600 paper maps containing spatial data. Seventy one different maps are also available as pdfs on the Elections website which averaged 650 downloads a month during the election season. Also, the division launched the online polling place lookup application.

3.4B.2.1 Staffing Requirements

For 2004 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 (1 vacant).

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%

Working Title	Focus	Class	Status	% GIS
GIS Analyst	Elections and voter registration support, street file maintenance	ISA I	FTE (vacant)	90%
GIS Analyst	Jurisdiction QC, metadata	ISA I	TLT	100%
GIS Analyst	REET project, data/ documentation	ISA I	TLT (vacant)	100%

3.4B.2.2 Budget

Item	Budget	Comments
Labor Costs (salary + benefits)	$298,240	
Hardware (acquisition and maintenance)	$16,800	
Software (acquisition and maintenance)	$0	
Training costs	$2,000	
Discretionary (consultants, outside services, materials)	$43,335	

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 29.07.030.

The KCEGIS staffing allocation for 2004 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 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 2004 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 2004 most of the training effort will focus on utilizing online virtual campus courses from Environmental Systems Research Institute (ESRI) and other vendors. In 2004, 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 2004.

3.4B.2.4 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 Precision 350 workstations running Windows 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 Dell Inspiron 8200 Laptop is used for remote poll scan and Election Day troubleshooting 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 2004, in conjunction with the implementation plan developed by the GIS technical committee, the section will migrate to the ArcGIS 8 environment.

Maintenance of KCEGIS' enterprise 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 2004, local and wide area network support will be provided by ITS. A new voter registration system will be implemented by the third quarter of 2004.

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 enterprise and department GIS data. Once enterprise 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 Data 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 enterprise data sets consist of the following:

Enterprise 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

Data Name	Data Description	Update Frequency
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
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 enterprise spatial data for Cemetery, Airport, and other associated miscellaneous 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 Data Enhancement

In 2004 the REALS division GIS staff will continue to focus on improving spatial accuracy of minor taxing district coverages via the Jurisdiction QC Project, with expected completion in the fourth quarter of 2004. KCEGIS TLT staff will becompleting this effort and the GIS Program Manager will be coordinating with various Departments, the KCGIS 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 the first quarter of 2004. REALS GIS staff will also be working the King County Assessor GIS staff to continue enhancing 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 Data Development

New data development will occur as the result of planned work programs and ongoing election management support. In 2004, the KCEGIS unit will be developing coverages and data related to school director districts, PUD commissioner districts, zip code, and additional poll data. The KCEGIS staff will further develop Chinese language ballot areas and other data associated with Section 203 of the US Department of Justice Voting Rights Act. New data will be developed to aid in the election process re-engineering. New data may be developed concerning the proposed redistricting of the Metropolitan King County Council. This is contingent on the outcome of the 2004 election.

3.4B.3.4 Data 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 2004, 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 2004.

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 supports 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 Application 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 Application Enhancement

The Election section of the REALS Division has implemented an automated Election Management System (EMS). One component of the EMS 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. Completion of this component is scheduled for the third quarter of 2004.

3.4B.4.3 Application 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. In 2003, KCEGIS staff partnered with ITS and the King County web team to develop a web based, voter and polling place look up application. Further enhancements to the REALS division web site, will continue to improve customer service for 2004.

3.4B.4.4 Application 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 2004. As Election business processes are reviewed and or re-engineered, each process or procedure will be fully documented by KCEGIS staff.

3.4B.5 System Integration

The REALS Division is involved in a project to replace the Election Management Voter Registration (EMVR) system. The current system is a series of mainframe applications developed 20 years ago. Over time this system has had added functionality and requirements to meet the demands of a growing county population, and changes in both Federal & state election law. This has led to a collection of fragile and piecemeal subsystems and interfaces.

The recommended approach is to replace existing elections management and voter registration systems with a proven, stable and reliable vendor package solution. This solution must integrate effectively with the county's current ballot and vote tabulation system (referred to as GEMS – Global Elections Management System - a product now supported by Diebold Election Systems Inc.), provide the necessary interfaces and capability to update and transfer data to King County GIS, and to provide integration with other systems dependent on elections data. This project will be completed by June 30, 2004. Implementation of the new system prior to the 2004 Primary Election will focus on the priority components and required functionality in order to achieve on-time project delivery and enable successful election processing.

3.4B.5.1 RDBMS Backend Support

KCEGIS has no activity in this area.

3.4B.5.2 Other Data Management Activity

KCEGIS has no activity in this area.

3.4B.6 Client Services and End-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. The division now produces 71 different map products and in 2004 plans to add a new map series product, a set of individual school district maps. The maps are now available on the elections website in pdf format. A new internet based polling place application is in beta testing. In 2004 KCEGIS would like to add district themed map sets to the iMAP application. 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 mission of the Department of Executive Services, Facilities Management Division (FMD) is to "manage and operate the County's capital assets by developing and maintaining cost conscious, sustainable, quality facilities and environments." FMD builds, manages, and maintains the land, buildings, and other structures owned, leased, and operated by King County.

FMD has made limited attempts to adopt GIS in the past. Currently, GIS services are obtained periodically from the KCGIS Center Client Services group. In the future, FMD hopes to develop and deploy GIS internally to help provide effective, economical, and environmentally sound services.

3.4C.1 GIS Business Strategy

Facility Management Division business functions, for which future GIS support is planned or envisioned, include:

Managing County Property – This function involves maximizing efficient use of the property and facilities used by various County agencies. The goals are to develop a comprehensive database of property that is easy to maintain and that supports efficient GIS-based retrieval and analysis of data and records, based on a variety of location-based queries.

Long-term Space Planning and Lease Management – This function involves forecasting future space needs for County agencies, and developing scenarios to meet general office and certain other facility space requirements. It also involves minimizing the need for and the cost of leased space. Because County facility needs have a strong locational component, GIS is seen as an important tool to support this function.

Parks and General Government CIP – FMD manages capital design and development projects for the Parks Capital Improvement Program and for the General Government Capital Improvement Program. GIS promises to be useful in site selection, preliminary design, and related project management functions.

Permit Management – FMD manages the permit process which allows access to County property and rights-of-way by cable, wireless, and other utility companies. GIS will allow the integration of FMD data sources and records with KCGIS core data to improve the effectiveness of the permitting process and the County's oversight of existing permit holders.

GASB Management/Valuation – FMD hopes to apply GIS data, mapping, and analysis to make the periodic GASB asset valuation process more effective, while minimizing division staff time for this effort.

FMD business functions also include building maintenance and moving services.

As FMD looks to future GIS utilization, key strengths include a designated budget for a variety of GIS services from KCGIS Center Client Services. In addition, following a report in 2001 by the Properties Expert Review Taskforce (PERT), FMD has recently initiated a planning process that will culminate in the acquisition or development of a Real Estate Portfolio Management System (REPMS). REPMS will be an integrated database to maintain data related to County real property assets. It may be web based and integrated with KCGIS to support asset management, analysis, and decision-making; asset retention versus disposition calculations; and analysis of asset valuation, marketability, and life cycle costs. It is hoped that REPMS will provide the impetus for accelerated GIS deployment by FMD. Another key strength is a knowledgeable Division director, with past experience in GIS business implementation. Weaknesses include insufficient budget for current GIS business needs, as well as a lack of staff with GIS training.

Current interest by the FMD Permits and Franchise Unit's staff in GIS training and services provides an opportunity to focus current GIS activity. Challenges include a need within FMD to prioritize GIS uses and allocate the GIS Client Services funding currently available. A major data related challenge is the lack of PIN information in the Lease Section property database, which will make integration of lease information with GIS property data difficult. Another challenge is the permit database: a very old legacy DB2-based system developed in-house, which lacks staff resources for support or future migration.

To summarize, FMD's business strategy for GIS includes both improving its internal operations and improving its support of other County agencies through enhanced GIS uses.

3.4C.2 GIS Program Overview

There is no organizational unit responsible for GIS functions within FMD. The division director has designated an FMD representative on the KCGIS Technical Committee, and he provides some internal coordination. FMD staff members have taken GIS training in the past, but their skills are out of date. The division WAN administrator is a potential resource, because of his past GIS experience, but his current work responsibilities do not include GIS.

At present, limited GIS services are obtained from the KCGIS Center Client Services group. Types of services obtained include mapping and training. In the future, GIS application development, analysis, and data development may be obtained from Client Services. The long-term goal for FMD is to become trained and proficient in using GIS data and software on their own.

A variety of real property/asset related spatial data is maintained in tabular form. This data is proposed to be consolidated in the REPMS, which will enable future GIS development and operations.

3.4C.2.1 Staffing Requirements

For 2004 it is planned for KCGIS Client Services to continue to provide direct support to FMD as budget and priorities dictate. FMD hopes to have some staff sufficiently trained by 2004 to provide internal GIS user capability. Depending on the nature of REPMS implementation, a GIS analyst support position within FMD may be needed in the future.

3.4C.2.2 Budget

Details for funding a Real Estate Portfolio Management System are still being discussed and negotiated, but it is likely that some interdepartmental contributions to pay for a consultant, system acquisition and development are possible in 2004. Other than that, the proposed 2004 FMD GIS Budget is outlined below:

	Budget	Comments
Labor Costs (salary + benefits)	0	
Hardware (acquisition and maintenance)	0	
Software (acquisition and maintenance)	0	
Training costs	0	
Discretionary (consultants, outside services, materials, etc.)	$15,750	This represents funding for KCGIS Center Client Services

3.4C.2.3 Training

FMD staff members took KCGIS Center training several years ago, but because GIS has not been utilized actively in the agency, and because FMD GIS software has not been upgraded to current versions, much of this training will need to be repeated. It is anticipated that the KCGIS Center will be the primary source of future GIS training. Training is funded via the GIS services account in the annual division budget. As GIS capability is developed, a division-wide training plan, including custom training, may be developed.

3.4C.2.4 Hardware and Software

Although access to the KCGIS Data Warehouse via the County WAN is adequate, FMD's LAN staff support is minimal (about 0.5 FTE for 25+ staff). In addition, FMD computer hardware may need upgrading to adequately run future GIS software. FMD hopes to have at least one dedicated GIS capable

PC by the end of 2003, and is looking to the KCGIS Center to provide recommended system specifications.

FMD GIS related software and/or applications currently available include:

Software	Licenses
ArcView 2.x	1
Win2Data (subscription real estate data access application)	
Other	

By the end of 2003, FMD hopes to have a high quality color office printer available. A color 11x17 printer would be beneficial for FMD business needs. There is no GIS data server in FMD.

3.4C.3 Spatial Data

FMD is not responsible for any enterprise GIS data. The division anticipates integrating a variety of internal tabular spatial data sources via the proposed REPMS project. REPMS will integrate and rationalize various internal databases (based on a variety of legacy software packages) to centralize access and enable future application development.

Development of the Real Estate Portfolio Management System will enable FMD to perform its business functions more effectively. It will also elevate cross agency data integration problems as well. For instance, FMD lease information is indexed by site address, but not PIN. KCGIS street address data is perceived as inadequate to allow FMD to fully utilize other KCGIS data layers.

3.4C.3.1 Data Maintenance

The FMD GIS program does not include activity in this area.

3.4C.3.2 Data Enhancement

If implemented in 2004, the REPMS project will result in enhanced integration and access for property/asset data. Adding a spatial identifier (for example, section, township, and range) to the utility franchise permits would provide an important locational component for retrieval of permitting data. Procedures to acquire this information will be implemented in 2004.

3.4C.3.3 Data Development

The FMD GIS program does not anticipate activity in this area in 2004.

3.4C.3.4 Data Metadata

The FMD GIS program does not include activity in this area.

3.4C.4 Spatial Applications

There are no current spatial applications. To address the 2001 PERT report to Council, acquisition or development of REPMS in 2004 is envisioned to include (possibly) web based functionality, integrated with KCGIS data, to support asset management, analysis, and decision-making; asset retention versus disposition calculations; and analysis of asset valuation, marketability, and life cycle costs.

3.4C.4.1 Application Maintenance

The FMD GIS program does not include activity in this area.

3.4C.4.2 Application Enhancement

The FMD GIS program does not include activity in this area.

3.4C.4.3 Application Development

It is hoped that development of REPMS will begin in 2004.

3.4C.4.4 Application Documentation

The FMD GIS program does not include activity in this area.

3.4C.5 System Integration

There is no current division wide system integration, either with GIS or across division business functions. The proposed Real Estate Portfolio Management System (REPMS) is envisioned as the pivotal data management, data access, and management information system for the division. If implemented in 2004, REPMS will provide the impetus for GIS system integration within FMD.

A current hindrance to effective system integration is the division's lack of an alternative to reliance on the legacy mainframe fixed asset management system. The reporting capabilities from this system are limited, and must be obtained from programmer resources beyond the control of FMD. This mainframe system provides no interactive functionality or integration capability (other than simple data entry) and none is planned.

3.4C.5.1 RDBMS Backend Support

Several isolated, personal level business databases are maintained throughout FMD to support division needs. These generally include spatial data fields, which would enable use by GIS. However, there is no standard RDMS, with MS Access, DB2, and Excel in use. A key goal of the proposed REPMS will be to consolidate appropriate property asset data into a central repository for efficient data maintenance and effective access for division business applications.

3.4C.5.2 Other Data Management Activity

The FMD GIS program does not include activity in this area.

3.4C.6 Client Services and End-User Support

FMD will use KCGIS Center Client Services into the future to support end users for their project needs, as available. The long-term goal is for FMD to develop in house staff with adequate GIS training and access to appropriate GIS hardware/software to support many of their own end-user needs.

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 the Wastewater Treatment 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 GIS Business Strategy

The Wastewater Treatment Division (WTD) GIS staff provide services to augment planning of wastewater services, monitor changed conditions and develop programs to meet customer needs. WTD GIS analysts also maintain and support enterprise data that are related to wastewater business. All data sets that are created and maintained by the following divisional programs are available on KCGIS Center's enterprise servers *WILDFIRE* and *DNRP1*. Currently, WTD GIS analysts are planning to consolidate all WTD databases allowing timely updates of GIS data sets and easier access to these data sets for all WTD staff. This project is described in a draft Long Range Plan. 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 CSI project focuses on County-owned regional conveyance facilities such as pipes, pump stations, force mains, regulators and tunnels. 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 – WTD 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 the new plant.

Regional Infiltration/Inflow Control Program – WTD GIS supports the Regional Infiltration/Inflow (I/I) Control Program's goal to reduce the amount of excess clean storm water and/or groundwater that enter the local sewer system. New and updated layers depicting local sewers, King County sewers, meter locations, modeling basin locations and sewerable areas have been created. Maps and analysis to support wastewater modelers are created as needed. 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 facility and sewer data and for developing the Onelines (King County Sewers) 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 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.2.2 Budget

The proposed 2004 KCGIS Center, DNRP GIS Unit, WTD budget for the five standard O&M Plan reporting categories is presented below. Note that KCGIS Center overhead costs allocated to the DNRP GIS Unit are not included below. For additional 2004 WTD budget information, see sections 2.6 and 3.1.2.2.

Item	Budget	Comments
Labor Costs (salary + benefits)	$332,087	Includes cost for 4.0 FTE plus allocated portion of KCGIS Center management and administration labor costs
Hardware (acquisition and maintenance)	$ 2,895	
Software (acquisition and maintenance)	$ 2,733	
Training costs	$ 5,448	
Discretionary (consultants, outside services, materials, etc.)	$ 34,338	Includes $31,500 for KCGIS Center client services support and $2,838 for misc. supplies and services

3.5A.2.3 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 courses, which are taught in the computer training room on King Street Center's 7th Floor. During 2004, 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. ESRI also provides comprehensive online classes. Selective use of such training will take place as needed.

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 2004 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 offered by King County HR.

3.5A.2.4 Hardware and Software

DNRP GIS Unit users have a new Server, *DNRP1*, that was put on line in late 2002 and is maintained by the KCGIS Center. This server combines GIS datasets from the old WLRD, Parks and WTD servers in

one place. 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. DNRP Unit GIS users map one drive to *DNRP1*, and continue to map one drive to King County enterprise data on the KCGIS Spatial Data Warehouse on *WILDFIRE*.

WTD GIS analysts reside on the 5th floor of the King Street Center and hooks to the Wide Area Network through the Wastewater Treatment Division's domain. This has caused slow network access in the past since the WTD GIS analysts are accessing large data sets. The WTD GIS analysts are working with the WTD WAN people to improve access.

WTD GIS analysts have five computers, four at the King Street Center and one at the I/I Project Office. Three of the King Street Center computers are running Windows 2000 and have 25 gigabits of space. The fourth King Street Center computer is running Windows NT and has 10 gigabits of space. The I/I Project Office computer is running Windows 2000 and has 25 gigabits of space. All computers have ArcView 3.x software and license loaded locally. ArcGIS 8.x software is also loaded locally on all computers, but the license for the four King Street Center computers resides on *ORCA* and is accessed across the network. The ArcGIS 8.x license for the I/I Project Office computer resides on a dedicated PC and is accessed across the network. Regular WTD staff have ArcView 3.x loaded on their PCs and access the licenses on *ORCA* across the network.

GIS Software Inventory and Licensing:

Software	**Licenses**
ArcGIS 8.3 (1 WTD GIS Analyst)	1 (*ORCA*)
ArcGIS 8.2 (3 WTD GIS Analysts)	3 (*ORCA*)
ArcGIS 8.1 (I/I Office)	1 (*ORCA*)
ArcInfo 7.x	4 (*ORCA*)
ArcView 3.1	4 (PC Hard Drive)
ArcView 3.2	1 (PC Hard Drive)
Adobe Acrobat Distiller 5.0	4 (PC Hard Drive)
AutoCAD 2000	1 (PC Hard Drive)
AcrView 3.1 (WTD Staff)	~25 (*ORCA*)

Output Devices:

Device	**Purpose**
8-TAHOMA-LEX4079-Q	Slow Lexmark Color Printer
ALMA	Fast HP Color Printer
WTD20-3200	Super fast, good quality, many featured, color, laser printer
WTD37-HP2600	Very fast HP color printer
8-pavlof-hp2500cp-q	Slow, good quality, HP plotter
9-w-hp750c-q	Fast, draft quality, HP plotter (obsolete and must be replaced)
Ksc5-mt-baker-q	Fast, black and white laser printer

In 2004, WTD GIS will fully migrate to GIS software ArcGIS 8.x from ArcView 3.X under the guidance from the KCGIS Center. Also, 4 of the 5 WTD GIS analysts' computers will be upgraded to current personal computer standards.

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. WTD also maintains many non-agency themes and acquires several data sets from external sources.

3.5A.3.1 Data Maintenance

Enterprise Data

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 Facility Information Retrieval System (FIRS). It represents all facilities in the King County Wastewater Treatment System.	Weekly
IWPERMIT	Industrial Waste Permits	As needed
PLANT_ANNO	Contains wastewater treatment plant names.	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
PUMP_ANNO	Contains WTD pump station names.	As needed
REG_ANNO	Contains WTD regular names.	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	Depicts King County WTD's conveyance system. It is generated from the Facility Information Retrieval System (FIRS), a database populated by the WTD Facility Inspection Section. Arc segments represent sections of conveyance pipe between manholes or other facilities (see FACILITY point coverage).	Weekly
SEWER_ANNO	Contains WTD sewer line annotation.	As needed
SITEPLAN	Facility footprints. Building footprints of treatment plants or other facilities	As needed
SRVBASN_ANNO	Contains name of sewer basins.	As needed
SWRBASIN	WTD defined boundaries for sewer basins including planning basins, and it 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	As needed

Data Name	Data Description	Update Frequency
	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.	Weekly

Agency Data

Data Name	Data Description	Update Frequency
CSO	Combined Sewer Overflow discharge locations.	As needed
CSOBSN	Basins that contribute wastewater to Combined Sewer Overflow discharge locations.	As needed
FLOWMNTR	Contains depictions current and historic monitors used in a variety of projects from day to day system flow monitoring to I/I project monitoring.	As needed
LOCALLN	Contains depiction of local sewer pipes with available attribute information	As needed
LOCALMH	Contains depiction of local sewer facilities with available attribute information	As needed
MDLBSN	Basins developed for WTD modelers through the Inflow and Infiltration project based on 2001 data.	As needed
MDLBSN00	Basins developed for WTD modelers through the Inflow and Infiltration project based on 2000 data.	Never
MNIBSN01	Basins developed for flow monitoring efforts through the Infiltration and Inflow project based on 2001 data.	As needed
MNIBSN00	Basins developed for flow monitoring efforts through the Inflow and Infiltration project based on 2000 data.	Never
RWSPBSN	Basins used by WTD to plan and manage wastewater flow as used in the Regional Wastewater Service Plan and until 2003.	As needed
SERVAREA_DISS	WTD service area boundary.	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
SWRLND	Areas of sewered land delineated using local line sewer information, Emerge imagery, and parcel lines based on 2001 data	As needed
SWRLND00	Areas of sewered land delineated using local line sewer information, Emerge imagery, and parcel lines based on 2000 data	Never
WTDBSN	WTD sewer basins-this basin matches the boundary of modeling basin	As needed

Data Name	Data Description	Update Frequency
	basin	
RAINGAGE	Contains depictions of WTD and Water and Land Resources rain gages.	As needed
UGACOMBO	Polygon showing Urban Growth Area (UGA) for King County and Snohomish County. Combined 2002 King County UGA data and 2000 Snohomish UGA data.	As needed
WTD_HCP	WTD Habitat Conservation Plan Boundary.	As needed
KCTILE	Parcel tile index extracted from data on *WILDFIRE*.	Never
CED_CON	Contours in 20-foot increments for southwest Snohomish County.	Never
CEDSLOPE	Steep Slopes by southwest Snohomish County contour area.	Never
CESLOPE	Steep Slopes by King County Cedar River contour area.	Never
CWSLOPE	Steep Slopes by King County Lake Washington contour area.	Never
GESLOPE	Steep Slopes by King County Soos Creek contour area.	Never
GWSLOPE	Steep Slopes by King County Duwamish/Green River contour area.	Never
LSKA_CON	Contours in 20-foot increments for northwest Snohomish County.	Never
LSKASLOPE	Steep Slopes by northwest Snohomish County contour area.	Never
NPSLOPE	Steep Slopes by northwest King County contour area.	Never
S1SLOPE	Steep Slopes by King County Duvall contour area.	Never
S2SLOPE	Steep Slopes by King County North Fork Tolt River contour area.	Never
S3SLOPE	Steep Slopes by King County Snoqualmie contour area.	Never
S4SLOPE	Steep Slopes by King County Middle Fork Snoqualmie River contour area.	Never
SASLOPE	Steep Slopes by King County Sammamish contour area.	Never
SC_TOPOINDX	Snohomish County contour layer index.	Never
SLOPE_INDX	Steep slope layer index.	Never
SNBA_CON	Contours in 20-foot increments for central and southeast Snohomish County.	Never
SNBASLOPE	Steep Slopes by central and southeast Snohomish County contour area.	Never
SPSLOPE	Steep Slopes by King County Duwamish River West Bank contour area.	Never
STILL_CON	Contours in 20-foot increments for Snohomish County Stilliguamish River area.	Never
STILLSLOPE	Steep Slopes by Snohomish County Stilliguamish River contour area.	Never
USKA_CON	Contours in 20-foot increments for Snohomish County Glacier Peak area.	Never

Data Name	Data Description	Update Frequency
USKASLOPE	Steep Slopes by Snohomish County Glacier Peak contour area.	Never
VASLOPE	Steep Slopes by King County Vashon Island contour area.	Never
WRSLOPE	Steep Slopes by King County White River contour area.	Never

3.5A.3.2 Data Enhancement

WTD GIS analysts will continue to migrate WTD facility data and local sewer lines to Arc 8.x geodatabase during 2004. Data for unpopulated fields in these layers will be entered, as time allows.

3.5A.3.3 Data Development

No new layers are planned on being developed in 2004. However, current layers will be migrated to ArcGIS 8.x.

3.5A.3.4 Data Metadata

Metadata for spatial data is being populated as the layers are being uploaded to the new DNRP server, *DRNP1*. This is an ongoing process.

3.5A.4 Spatial Applications

The Wastewater Treatment Division maintains a number of legacy applications 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 Application 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 MS Access 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. It is currently offline awaiting evaluation of its use and need of maintenance.	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). This is currently offline awaiting maintenance.	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 Application Enhancement

The FIRS database structure will be updated in 2004 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 Application 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.

Currently, WTD is developing a metadata tool for the DNRP GIS Unit. This application is being written as an Arc Object in VBA that people can add to their ArcGIS session. It is based on the standard metadata tool available in ArcGIS Catalogue but will only include information important to the DNRP GIS Unit.

Planning will also begin on an application to make rain gauge and flow monitor data available through the GIS depiction of these collection devices.

3.5A.4.4 Application 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. A long-range plan has been developed to address data that are appropriate for integration and visualization through GIS. This plan will start being implemented in 2004.

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.
- Working with the Flow Monitor Inspection Team to develop GIS applications that allow them to update data in much the same way FIRS does for the Facilities Inspection Team.

3.5A.6 Client Services and End-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. 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.

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.

3.5B Water and Land Resources Division

GIS program supports the major WLRD's work programs to accomplish the missions of the 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 GIS Business Strategy

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. 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 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

Five 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, often working jointly to deliver requested products. These five staff receive project assignments from WLRD staff based on areas of expertise and project workloads as detailed below:

- Image processing & analysis, general WLRD GIS analysis projects - 1 FTE
- ArcIMS (iMap) and GIS-related web applications, DNRP GIS intranet site creation/maintenance, general WLRD GIS analysis projects - 1FTE
- Forestry, agriculture, land ownership, noxious weeds, current use assessment, and open space related GIS projects - 1FTE
- Parks related GIS projects, DNRP public land inventory - 1FTE

- General WLRD GIS analysis projects - 1FTE

3.5B.2.1 Staffing Requirements

There are five GIS analysts within the DNRP GIS Unit who primarily support the needs of the Water and Land Resources Division.

They are classified as follows:

Working Title	Work Focus	Classification	Status
GIS Analyst	Water and Land Resources Division	ISP III	FTE
GIS Analyst	Water and Land Resources Division	ISP III	FTE
GIS Analyst	Water and Land Resources Division	ISP II	FTE
GIS Analyst	Water and Land Resources Division	ISA II	FTE
GIS Analyst	Water and Land Resources Division	ISA II	FTE

3.5B.2.2 Budget

The proposed 2004 KCGIS Center, DNRP GIS Unit, WLRD budget for the five standard O&M Plan reporting categories is presented below. Note that KCGIS Center overhead costs allocated to the DNRP GIS Unit are not included below. For additional 2004 WLRD budget information, see sections 2.6 and 3.1.2.2.

Item	Budget	Comments
Labor Costs (salary + benefits)	$423,425	Includes cost for 5.0 FTE plus allocated portion of KCGIS Center management and administration labor costs
Hardware (acquisition and maintenance)	$ 3,619	
Software (acquisition and maintenance)	$ 6,935	
Training costs	$ 6,809	
Discretionary (consultants, outside services, materials, etc.)	$ 3,546	

3.5B.2.3 Training

The Water & Land Resources GIS Analyst positions require a considerable breadth of GIS-related skills and abilities for both essential and specialized tasks. A primary focus of training in 2004 will be to get all five analysts basic training in the new GIS data model, geodatabases. As funds are available above this crucial training focus, analysts will also continue to upgrade and improve their skills in each of their primary specialized areas. As in 2003, 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.2.4 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 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 3.2a 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 5500, 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 3.1 shared network licenses but no ArcInfo licenses. The WLRD GIS and Visual Communications server, *WLRNT11*, hosts 45 ArcView 3.2a shared network licenses. In addition, five standalone ArcView 3.2a licenses are installed on analyst's desktops.

Ancillary software available to GIS analysts within WLRD includes ERDAS Imagine, ESRI ArcIMS, Web content development such as Macromedia Dreamweaver, and Visual Studio programming environment.

3.5B.3 Spatial Data

WLRD maintains and updates enterprise data sets in the KCGIS Center data warehouse and 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 Data Maintenance

Enterprise data sets maintained by WLRD

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 version 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 WLRD uses in all planning efforts.	As needed
DRNSTUDY	SWES Engineering Studies	Random
FISH9	Distribution of 7 salmon species 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	Random

Data Name	Data Description	Update Frequency
	(Oncorhynchus mykiss), & cutthroat trout *(Oncorhynchus clarki)*.	
FISH9_PT	Point observations of 7 salmon species in WRIA9, 7 observation 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)*.	Random
FISHV	Distribution of 5 salmon species 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)*.	Random
FISHV_PT	Point observations of 5 salmon species 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)*.	Random
FLDPLAIN	A digital representation of the paper FEMA flood maps. This coverage details the locations of 100 year floodplains as defined by the Federal Emergency Management Agency.	As new data is received from FEMA
FLOODWAY	A digital representation of the paper FEMA flood maps. This coverage details the locations of 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
HYDROGAUGE	King County Hydrological Gauges	Weekly
KC_WHPA	Well Head Protection Areas are designed to show zones 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
STORMFAC	Commercial and residential stormwater facilities.	As needed
NDA	Neighborhood drainage projects of Stormwater Services Section.	Random
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_ALL and WELL_B.	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
	connections, as recorded by the WA Department of Health. See also 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	Random
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

Agency data sets

Data Name	Data Description	Update Frequency
CITY_3CO	Incorporated Cities - Pierce, Snohomish, and King Counties	Yearly for other counties, as new annexations occur for KC
JURIS00	Incorporated Cities Year 2000	None planned
JURIS90	Incorporated Cities Year 1990	None planned
APD_RIPAR100	APD Riparian Condition Units - 100 ft stream buffers	None planned
APD_RIPAR25	APD Riparian Condition Units - 25 ft stream buffers	None planned
APDLU	APD General Landuse	None planned
BUGS_MAA	Benthic Macroinvertebrate Sampling Sites	None planned
GRN_DU_HIST	Historical Green-Duwamish River	None planned
HYDROBASIN	Drainage Basin Boundaries	As needed
MAJ_STRM	Major Streams and Rivers, a sub-set of WTRCRS	As needed
RIVER_MI	River Miles derived from WTRCRS	As needed
RIVERFAC	King County River Facilities	As needed
CUT_AG	Current Use Taxation Program: Agricultural Properties	As needed
CUT_FOREST	Current Use Taxation Program: Forestry Parcels	As needed
CUT_PBRS_TIM	Public Benefit Rating System and Timber Land Program Parcels	As needed

DAIRIES	Dairies and Commercial Agricultural Operations	As needed
FARMPLAN	Parcels with Farm Plans	As needed
FISH7	Fish distribution in WRIA 7	None planned
FISH7_PT	Fish distribution in WRIA 7, shapefile points	None planned
FISH7_SOURCE	Fish Distribution (WRIA 7) Source Table	None planned
FISH8	Salmon Distribution (WRIA 8)	None planned
FISH8_PT	Salmon Observation Locations (WRIA 8)	None planned
FISH8_PT_DAT	Salmon Observations Data Table (WRIA 8)	None planned
FPP	Farmland Preservation Properties	As needed
FTA	Forestry Technical Assistance	As needed
LIVESTOCK_VFD	Verified Livestock Parcels	As needed
RFFA	Rural Forest Focus Areas (as adopted in 2001 Comp. Plan)	As needed
WEED_PT	Noxious Weeds Locations	As needed
GWMA	Ground Water Management Areas	None planned
RDP_BND	Rural Drainage Program Service Areas	As needed
SWES_PROJ	WLRD SWES Section CIPs and SHRPs	Random
DRAINAGE_PROP	King-County Owned Drainage Properties	Random
FLOOD_PROP	Flood Hazard Reduction Section Flood Buyout Parcels	As needed
PARCEL_DATA	WILDFIRE PARCEL data layer with additional attributes	Quarterly
PUBLIC	Publicly owned parcels derived from Assessor's data and PARCEL	Quarterly
BATH_TOPO	Puget Sound Bathymetry	None planned
CONTOUR40	King County Contours - 40'	As needed
LKSAMBATH	Lake Sammamish Bathymetry	None planned
PS_BATH10	Puget Sound Bathymetry - 10 Foot Contours	None planned
PS_BATH20	Puget Sound Bathymetry - 20 Foot Contours	None planned
PS_BATH5	Puget Sound Bathymetry - 5 Foot Contour	None planned
STORMREG	Regional Stormwater Facilities	As needed

WLRD also maintains non-enterprise themes and data from external sources.

3.5B.3.2 Data Enhancement

WLRD GIS analysts will begin migrating existing data sets to the geodatabase data model in 2004. A schedule for migration will be established and rules and relationship will be determined.

3.5B.3.3 Data 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 2004. 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 completing the impervious surface data layer.
- Hydrography Theme - Groundwork and work plan development has been largely completed for development of a new hydrographic model for King County. 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. Converting the hydrography theme to the geodatabase data model will also be considered.
- DRNP Public Lands Inventory & Target Acquisition Project - This project has several interlinked components. In 2003, land target acquisitions were identified across DNRP in order to inform the DNRP Acquisition Strategy. This annual process is formulated by WLR and Park Division Managers to determine levels/types of acquisition projects that the Department can pursue, as embodied within each Division's 6 year CIP. In addition, information was collected on currently owned public lands in order to create a base, draft lands inventory. In 2004, these two components will be improved and linked as a cross-programmatic, property database that can serve a variety of future WLR/Parks CIP and O&M purposes.
- 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 by WLRD 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.
- 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. 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.

3.5B.3.4 Data 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 2004. 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

Spatial applications have been a minor part of the work done by the Division. To date, no Division-wide user applications have been developed, nor are any currently planned.

However, the Division is planning to expand and increase its focus on developing and improving ArcIMS applications. The Division sees this as an important area because of its potential cost savings by providing access to GIS data and maps using only a web browser. In addition, the Division is exploring methods whereby data stored in non-GIS data files, but with spatial location information, such as that collected by GPS units, can be routinely uploaded and made available to GIS.

3.5B.4.1 Application Maintenance

The Division does not directly support any ArcView-based or other custom applications through the GIS staff. However, WLRD does maintain 3 ArcIMS (iMap) mapsets, each of which serve the specific needs of particular WLRD sections: Hydrographic Information, Groundwater, and Stormwater.

3.5B.4.2 Application Enhancement

WLRD will continue to enhance ArcIMS features and tools needed for the existing WLRD mapsets as well as new ones developed in 2004. In addition, WLRD will work closely with the KCGIS Center to improve overall iMap site functionality, reliability, and useability.

Specific enhancements to existing mapsets include:

- *ARCIMS: Stormwater* – additional datasets requested, development of custom table display and query tools.
- *ARCIMS: Groundwater* - development of an ASP.NET web interface to access various portions of the already developed Groundwater SQL database. This web interface will be accessible via the already developed Groundwater iMap mapset. This will allow users to combine a number of types of queries into both locations and types of groundwater data.

3.5B.4.3 Application Development

- *ARCIMS: WRIA 9 projects* - KC GIS portal application to support WRIA 9 project locator needs. Mapset will display project locations of projects entered into the WRIA 9 project database, offering links to detailed information on each project stored in a related SQL database. The GIS layer used in the mapset is updated nightly via a utility routine from the subset of projects in the database with a primary Parcel Identification Number available for that project. Eventually, the database will include all projects in WRIA 9, even those not managed by King County. The development of the data in the database will be by the WRIA 9 clients through an ASP user interface. Although a base draft of this service is scheduled to launch in 2003, extensive enhancements and upgrades are planned and may require much of 2004 to complete.
- *ARCIMS: Noxious Weeds* – The Noxious Weed group in WLRD has developed several datasets depicting the locations of noxious weeds in King County. These datasets are currently only available on a local Noxious Weeds group server. In 2004, WLRD will be working with this group to organize and develop these datasets further in preparation of posting onto DNRPLIB or WILDFIRE. Once these datasets are available publicly, a draft iMap mapset customized for the Noxious Weed group will be developed. This draft is scheduled for launch by the end of 2004.

- *ARCIMS/Web Application: DNRP Public Lands Inventory* – In 2004, this project from 2003 will enter a new phase. Whereas in 2003, the focus was the development of a GIS dataset, in 2004 the focus will shift to conversion of this GIS dataset to a permanent database accessible through iMap or other ASP.NET web application interface by non-GIS users for both query and maintenance.
- *Stormwater Services Automated GIS Data Creation Routine*: Working closely with both WLRD LAN and the KCGIS Center Operations workgroups, WLRD will be modifying an existing ArcObjects utility routine (used for the creation of the Hydrogauge dataset on Wildfire) to fill a similar function for the Stormwater Facilities database. Essentially the routine will pull locational and attribute data for each stormwater facility in the database and create a GIS layer posted to wildfire on a regular schedule TBD. This data layer is crucial to the Stormwater mapset, and so additional work will be needed to ensure it also gets regularly posted on the iMap SQL Server.

3.5B.4.4 Application Documentation

No applications are maintained by WLRD.

3.5B.5 System Integration

There is no activity in this area.

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.

3.5B.6 Client Services and End-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 50 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.

In addition to direct client requests for products, analysts also serve as on-call end-user support specialists for GIS software and data. Besides desktop assistance, WLRD designs, creates, and maintains a DNRP GIS intranet site as a client support resource.

WLRD analysts also function as technical experts for projects involving GIS, ArcIMS, or remote sensing. Lastly, each analyst also has a number of datasets they are responsible for as a data steward to maintain and keep current.

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. Major funding reductions in recent years have limited the Division's focus to key regional properties and facilities and to parks and recreation within the unincorporated areas of the County. GIS capabilities in the Division are used for inventory and monitoring of Division properties and facilities, operation and maintenance of recreational facilities and open space, and to support planning and land management needs. Reduced funding for GIS support for 2003 necessitated a reduction in staff from two full-time GIS Analysts to a single FTE. This caused the Division's GIS resources to be strained significantly throughout the entire year, since there was no corresponding decrease in demand for GIS products and services within the Division. This situation is expected to persist in 2004, as staffing levels remain constant while demand for GIS support continues at or near the level experienced in 2003.

3.5C.1 GIS Business Strategy

GIS capabilities in the Division are used for inventory and monitoring of Division properties and facilities, operation and maintenance of recreational facilities and open space, and to support planning and land management needs. 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 2003, two analysts within the DNRP GIS Unit shared responsibilities for providing GIS services and support to Parks and Recreation Division projects and programs at the level of 1.0 FTE. Each of these GIS Analysts was assigned specific core areas of responsibility, in addition to providing ad hoc services and support upon request. One analyst was responsible for design, management, and maintenance of the parks facilities database, while the other focussed primarily on managing parks and trails map layers, GPS data collection, and property data.

In 2004, the Parks and Recreation Division will continue to fund GIS support at the level of 1.0 FTE. One of the two analysts assigned to the Division in 2003 will continue to divide their time equally between the needs of Parks and those of the Solid Waste Division. The second analyst will transition to full-time GIS support for the Water and Land Resources Division. This individual will be replaced by a staff analyst from the KCGIS Center's Client Services Unit, who will perform the balance of GIS support work for Parks after being trained by the current analyst on the projects and processes for which they will be taking

responsibility in 2004. A transition plan has been developed to direct this process and to ensure that all affected work activities are appropriately reassigned and managed so as to maintain normal service levels and minimize delays and disruptions for Parks managers and staff. This plan focusses specifically on activities involving data and application development and maintenance, client services, and support for end users throughout the 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 2004.

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 2004.

3.5C.2.1 Staffing Requirements

Through 2003, two analysts within the DNRP GIS Unit shared responsibilities for providing GIS services and support to Parks and Recreation Division projects and programs at the level of 1.0 FTE. In 2004, as described above, one of these analysts will transition to full-time GIS support for the Water and Land Resources Division, and their GIS support responsibilities for Parks will be assumed by a staff analyst from the KCGIS Center's Client Services Unit. The GIS Program Manager for the Parks & Recreation Division will continue to 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 – database development and analysis, map design and production, web and application development	ISA I	FTE	100% (50% Parks, 50% SWD)
GIS Analyst (shared with KCGIS Center Client Services Unit)	Parks and Recreation – database development and analysis, map design and production	ISA I	FTE	100% (50% Parks, 50% KCGIS Center)

3.5C.2.2 Budget

The proposed 2004 KCGIS Center, DNRP GIS Unit, Parks and Recreation Division budget for the five standard O&M Plan reporting categories is presented below. Note that KCGIS Center overhead costs allocated to the DNRP GIS Unit are not included below. For additional 2004 Parks Division budget information, see sections 2.6 and 3.1.2.2.

Item	Budget	Comments
Labor Costs (salary + benefits)	$ 84,891	Includes cost for 1.0 FTE plus allocated portion of KCGIS Center management and administration labor costs
Hardware (acquisition and maintenance)	$ 724	

Item	Budget	Comments
Software (acquisition and maintenance)	$ 1,152	
Training costs	$ 1,362	
Discretionary (consultants, outside services, materials, etc.)	$ 708	

3.5C.2.3 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 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 approximately once each month in the computer training room on the seventh floor of King Street Center. Additional training in software and data management is available from ESRI and other commercial providers, and may be used selectively during 2004 to address specific needs.

Ongoing professional development for the Parks GIS Analysts in 2004 will continue to focus on meeting specific division and project requirements. As in 2003, a training plan will be developed jointly by the analysts and the GIS Program Manager to guide this development and ensure that courses taken meet the specific requirements of the Division's GIS work program.

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 2004 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.2.4 Hardware and Software

Through 2003, the Parks and Recreation Division maintained a Compaq Proliant 1600 server (*RASTA*) as a combined development and production server. This system runs Windows NT 4.0 and hosts the ArcView licenses which are shared over the Division's network. In 2004, *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.

Software	Licenses
ArcView 3.2	6

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 2004.

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.

A dedicated data server is operated and maintained by DNRP to manage GIS data which have been developed by Department staff primarily for internal use. These data are typically designed to meet specific project needs and are not intended to be maintained in the KCGIS Spatial Data Warehouse for general use. The analysts in the DNRP GIS Unit share responsibility for maintaining these data and for periodic review and evaluation to identify data which should be removed from this server and either archived offline or permanently deleted.

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 2003, these data have been in the process of being migrated from the server *RASTA* to the new DNRP data server. This migration is expected to be completed during 2004.

As the Division makes the transition to operating under an entirely new business model in 2004, 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 Data Maintenance

The Division maintains two GIS data layers in the KCGIS Spatial Data Warehouse. These data are maintained as ArcInfo 7.x coverages and are also available to users 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. Additional coverages and shapefiles intended primarily for internal use are maintained on *DNRP1,* the DNRP data server.

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

Parks and Recreation - Agency Data

Data Name	Data Description	Update Frequency
PARK	All King County Parks	As Needed
TRAIL	All King County Trails	As Needed
ARMS_SERVICE	Parks Financial Zoning Areas	As Needed
ATLASANNO	Parks Atlas Annotation	As Needed
MAINTDIST	King County Maintenance Boundaries	As Needed

Data Name	Data Description	Update Frequency
PARKS_P	All King County Park Properties	As Needed
PSAFI_POINT	King County Park Facilities	As Needed
RESOCOORD	King County Park Resource Area Boundaries	As Needed
SP_SITES	County-wide Active Sport Sites	As Needed
WTANNOAT	County-wide Water Annotation Coverage	As Needed
PARKPLAN	King County Parks Planning Info	As Needed
PROPTRAIL	King County Trails Plan	As Needed

The PARK and TRAIL data layers reside on both *WILDFIRE* and *DNRP1*, as it is the policy of the DNRP GIS Unit staff to maintain a copy of any data layer for which they are stewards on both data servers. All of the other data layers in the above table reside only on *DNRP1*.

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 Data 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 2004, 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 Data Development

The Parks GIS Analysts continually maintain and improve data layers related to Parks and Recreation facility use and maintenance. This activity does not currently include the development of any new data layers, but does involve the ongoing maintenance of the enterprise GIS layers Park and Trail, as well as the related PSAFI and Parkprop databases. During 2004, it is anticipated that work will begin on the design and development of an improved, expanded Parkinfo database. This will include significant new data elements which the current version of Parkinfo lacks, but which have become important to have integrated with other GIS data for use in meeting the Division's changing business needs and program requirements. Development of this new database will be coordinated closely by Parks management, the Parks GIS Program Manager, and the Parks GIS Analysts.

3.5C.3.4 Data 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 KCGIS

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.

Basic metadata are also being developed for Parks-related layers which reside on the DNRP data server. Information is entered using automated forms to record essential metadata elements. A new utility for recording FGDC-compliant metadata is being developed and is expected to be implemented during 2004.

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 Application Maintenance

Through 2003, the Parks GIS Analysts 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 2004, but it is anticipated that this activity will require relatively little time and effort.

3.5C.4.2 Application 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 2004 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 Application Development

Application development during 2004 will focus on a limited number of key applications, due to reduced funding and numerous other staff commitments. Work is anticipated to begin on a replacement for the existing ParkView application. This will most likely take the form of a universal interface for accessing Parks-related GIS data, which will provide users with a quick, efficient means to get the maps and data they need on their own in many cases. This interface will be written in Visual Basic and will be developed in coordination with the improved, expanded Parkinfo database discussed above. 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. Under the transition plan discussed above, the design and development of these routines will be a key responsibility of the incoming GIS Analyst. As with other application activities, any new development will be done in coordination with the KCGIS Center application development team.

3.5C.4.4 Application 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 2004, 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 are maintained on the DNRP data server. 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 2004, 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 maintain several non-GIS databases for the Division. These include 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 reduced level of Division GIS funding support, 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 End-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 client 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.

The services and support provided to Division clients, and the tools and procedures for providing them, are not expected to change significantly during 2004. However, continuing to provide GIS support with the equivalent of a single FTE, split between two GIS Analysts who are shared with other clients and their needs, will continue to limit the ability of those analysts to handle all of the work that will be requested of them. In addition, the transfer of service and support responsibilities from a long-established Parks GIS Analyst to one who is new to the Division will involve changes in procedures, priorities, work assignments, and client relationships. The plan which has been developed to guide this transition is intended to ensure that normal service levels for all affected activities are maintained with minimal disruption for Division clients and end users. As the transition proceeds, the Parks GIS Program Manager will work closely with Parks management and staff to coordinate priorities, assess user satisfaction, and promptly resolve any issues which arise as a result of these changes.

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. In the past, the Division has made limited, sporadic use of GIS, primarily as a result of having no dedicated staff to provide GIS products and services. For 2003, however, Solid Waste for the first time had direct GIS support available through its funding of a 0.5 FTE within the DNRP GIS Unit. Progress was made during the year on several key projects, and the work performed by the Solid Waste GIS Analyst was well received by Division managers and staff. As a result, the proposed 2004 budget includes continued funding for direct GIS support in the Division.

3.5D.1 GIS Business Strategy

Through 2003 the Solid Waste Division's dedicated GIS resources were used to address the needs of several key Division business units. An initial work program was established to identify and prioritize projects on which GIS support would initially focus. Products and services were developed for managers and staff within Engineering Services, Operations, Planning and Communications, and Marketing. In 2004 it is anticipated that GIS activity will expand further in support of these and other Division business units. It is also anticipated that needed data layers will begin to be created and maintained for planning and managing Solid Waste programs and outreach to the public. During the year, GIS will continue developing support for 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

During 2003, the Solid Waste Division for the first time had direct GIS support available through its funding of a 0.5 FTE within the DNRP GIS Unit. An initial work program was developed which identified and prioritized the projects on which the Solid Waste GIS Analyst focussed their efforts during the year. The Analyst assigned to support the Division provided services and products for key projects for several

Division business units. The Solid Waste GIS Program Manager coordinated between the management team and the GIS Analyst to plan and schedule work, monitor progress, and help ensure satisfactory results. The work performed by the Solid Waste GIS Analyst provided timely, effective support and was well received by Division managers and staff. As a result, the proposed 2004 Solid Waste budget includes continued funding of a 0.5 FTE for direct GIS support. The current work program is being revised for 2004 to reflect the completion of some projects and to confirm the status and establish priorities for work on others.

Projects which have been completed or for which substantial work has been done during 2003 include:

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

  Potential candidate sites were identified for a new transfer station east of Lake Washington, using queries of spatial and tabular data. This analysis was based upon multiple search criteria which were developed by project staff and management. Numerous maps and data reports were prepared detailing candidate parcels to support a series of site selection evaluations.

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

  Property ownership changes in the vicinity of the Cedar Hills landfill are required by the settlement terms of past litigation to be reported to the Division on an ongoing basis. This is to ensure that current information is used when notifications are required for developments or situations which could affect property owners near the landfill. In many cases, however, this reporting is not happening, so the Division must track these sales for itself. In an initial phase of work, records of property sales within the specified notification area were identified from Assessor's records. Sales were grouped by quarter, beginning with those from July, 2000, which is when the litigation was settled and the reporting requirement took effect. Maps and data reports were prepared for the sales during each quarter up to the present time. Preparing new maps and data reports at the end of each quarter will be a continuing activity.

- **Truckside advertising pilot study**

  The Division is considering selling advertising space on its trucks as a new revenue source. The marketing manager and staff are assessing the potential viewership for advertising signs placed on the trucks which haul material from outlying transfer stations to the Cedar Hills landfill. To support this effort, traffic count data were obtained from the King County and Washington State transportation departments for points along the eight current haul routes. These data were then mapped, and these maps are being used to determine which routes will be included in the pilot study. Additional detailed mapping along individual routes and route segments is planned as part of this evaluation.

- **Cedar Hills Landfill complaint tracking and mapping**

  A new application is being developed for recording, tracking, and processing odor, noise, vibration, and bird complaints in areas adjacent to the Cedar Hills Landfill. A GIS-compatible database is being designed and tested, along with a set of new data entry screens to ensure consistent recording of complaints. A set of standard maps will also be developed to display information by area and type of complaint. Additional planned project activities include creating automated processes for custom map generation and for analysis of complaint data.

- **General mapping and analysis support**

  Designing and producing maps and performing geographic analysis as requested to support division-wide or project-specific needs.

Projects which are expected to start during 2004 include:

- **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.

- **HAZUS data coordination**

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

- **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.

- **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.

- **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.

- **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.

- **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.

- **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.

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.

Through 2003, GIS support for Solid Waste was provided by a GIS Analyst within the DNRP GIS Unit. This analyst divided their time between the needs of the Parks and Recreation Division and the Solid Waste Division and worked on projects for both. This arrangement will continue for 2004, with the GIS Analyst working on the projects described above and the Solid Waste GIS Program Manager supervising their work and coordinating with Division managers and staff to develop new projects, set priorities, and monitor overall progress. 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 Analyst 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 Staffing Requirements

In 2003, the Solid Waste Division allocated funding in its budget for a 0.5 FTE to provide dedicated GIS support for Division projects. Responsibility for funding the remaining 0.5 FTE was assumed by other

DNRP divisions. This funding arrangement will continue in 2004, with the Solid Waste GIS Analyst once again dividing their time between the needs of Parks and Solid Waste Division and working on projects for both. The Solid Waste GIS Program Manager will supervise the analyst's work, set priorities, and guide overall work direction, in coordination with Division managers and staff. The title, work focus, classification, status, and time allocation for the Solid Waste GIS Analyst are as follows:

Working Title	Work Focus	Classification	Status	% GIS
GIS Analyst	Solid Waste / Parks and Recreation – database development and analysis, map design and production, web and application development	ISA I	FTE	100% (50% SWD, 50% Parks)

3.5D.2.2 Budget

The proposed 2004 KCGIS Center, DNRP GIS Unit, SWD Budget for the five standard O&M Plan reporting categories is presented below. Note that KCGIS Center overhead costs allocated to the DNRP GIS Unit are not included below. For additional 2004 SWD budget information, see sections 2.6 and 3.1.2.2.

Item	Budget	Comments
Labor Costs (salary + benefits)	$ 43,025	Includes cost for 0.5 FTE plus allocated portion of KCGIS Center management and administration labor costs
Hardware (acquisition and maintenance)	$ 362	
Software (acquisition and maintenance)	$ 58	
Training costs	$ 681	
Discretionary (consultants, outside services, materials, etc.)	$ 26,606	Includes $26,250 for KCGIS Center client services support and $356 for misc. supplies and services

3.5D.2.3 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 Analyst 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 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 approximately once each month in the computer training room on the seventh floor of King Street Center. Additional training in software and data management is available from ESRI and other commercial providers, and may be used selectively during 2004 to address specific needs.

Ongoing professional development for the Solid Waste GIS Analyst in 2004 will continue to focus on meeting specific division and project requirements. As in 2003, a training plan will be developed jointly by the analyst and the GIS Program Manager to guide this development and ensure that courses taken meet the specific requirements of the Division's GIS work program.

Beyond the needs of the Solid Waste GIS Analyst, 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 Solid Waste GIS Analyst. To avoid having this become burdensome, an inventory of ArcView users within the Division should be conducted during 2004 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 Analyst, allowing them to focus on providing products, services, and support which require advanced skills and abilities.

3.5D.2.4 Hardware and Software

During 2003 the Solid Waste Division began to expand access to GIS software within the Division, through the purchase of its first concurrent-use licenses for ArcView 8.x and several key extensions to that software. These were installed on a designated GIS license server and are being used primarily by Engineering staff. In addition, managers and staff continue to share the use of the Division's two ArcView 3.2 licenses. Through 2004, usage patterns for these licenses will be reviewed and 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.

Software	Licenses
ArcView 8.3	1
Spatial Analyst 8.3	1
3D Analyst 8.3	1
Geostatistical Analyst 8.3	1
Survey Analyst 8.3	1
Tracking Analyst 8.3	1
ArcView 3.2	2

The desktop environment used by the Solid Waste GIS Analyst 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 2004.

Currently, spatial or related tabular data which are used for particular projects are typically stored on the individual user's PC. As new GIS-related database development occurs during 2004, however, the Division will be evaluating the need to purchase and install a SQL Server platform to host these databases.

A dedicated DNRP data server is used to maintain and manage GIS data which have been developed by DNRP staff primarily for internal use. These data are typically designed to meet specific departmental or divisional needs and are not intended to be maintained in the KCGIS Spatial Data Warehouse for general use. As GIS use in the Division grows during 2004, the Solid Waste GIS Analyst and other managers and staff are expected to begin using this data server to store and maintain data of this type.

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 2004, 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 Analyst.

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 2004, the Solid Waste GIS Program Manager and the Solid Waste GIS Analyst 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 Analyst. 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 Data Maintenance

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

3.5D.3.2 Data Enhancement

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

3.5D.3.3 Data Development

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

3.5D.3.4 Data 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 2004, the Solid Waste GIS Analyst 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 Analyst 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 Analyst 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 Application Maintenance

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

3.5D.4.2 Application Enhancement

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

3.5D.4.3 Application Development

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

3.5D.4.4 Application 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 2004, 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 Catalog 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 Analyst becomes familiar with the tabular attribute data maintained by individual users within the Division during 2004, 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 Analyst works on more Division projects and develops additional

client relationships in 2004, 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 End-User Support

The principal client base for GIS products and services within the Solid Waste Division is its managers and staff. Most of the requests which the Solid Waste GIS Analyst receives for maps, data, analysis, technical support, and other services originate with them. On some occasions, the GIS Analyst provides support for contractors who are working on Division projects, but this has been strictly limited to date.

As discussed above in the GIS Program Overview section, a work program is developed each year to identify and prioritize the projects on which the Solid Waste GIS Analyst will focus their efforts during that year. For each of these projects, the Solid Waste GIS Program Manager and GIS Analyst 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 Analyst meet as needed with the client to review progress and discuss any issues or problems which have surfaced. Specific details of tasks and schedules are also discussed and revised when necessary at these coordination meetings.

In addition to the projects identified on the Solid Waste GIS work program, the GIS Analyst 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 the GIS Analyst. 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 did not occur often, since the Division managers and staff had to first familiarize themselves with the GIS capabilities and resources available to them. In 2004, it is anticipated that ad hoc requests will become more numerous and frequent. The GIS Program Manager will coordinate with requestors and with the GIS Analyst to ensure that appropriate priorities and resources are assigned to these requests, taking into account the needs of previously-assigned projects.

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 that 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 GIS Business Strategy

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 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.

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.

EPE section also would like to coordinate products related to the 2000 Census with King County and Seattle demographers. Each of wants to prepare one or more maps, bulletins with tables, text, and graphs reporting results of the Census. There is also a current discussion of a web page that has been prepared for the White Center community by Chris Jansen and Michael Jenkins of the GIS Center, with an interactive map and 82 items of Census information. The EPE and King County demographer would like to extend that site to other communities in King County, including breaking up Seattle into neighborhoods - and the Seattle demographer is interested in that too.

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 ArcView 3.1 for specific projects.

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

3.6.2.1 Staffing Requirements

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

3.6.2.2 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.

3.6.2.3 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

3.6.2.4 Hardware and Software

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

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 Data 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 Data Enhancement

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

3.6.3.3 Data Development

EH Envision data available for mapping purposes.

3.6.3.4 Data 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 Application Maintenance

N/A.

3.6.4.2 Application Enhancement

EH Envision Data.

3.6.4.3 Application Development

N/A.

3.6.4.4 Application 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 End-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 Community and Administration Services, which includes the DOT Director’s Office. Transit, Road Services, and the Airport 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 any 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

The Road Services Division (RSD) designs, builds, operates and maintains roads, bridges and pathways in unincorporated areas of King County. The Division strives to make the county's transportation system safe and efficient for all uses and modes of travel. Road Services' GIS activities support this mission in the areas of planning, engineering, construction, maintenance, emergency response, and Traffic Services for unincorporated King County. GIS staff distributed across several Road Services offices provide user support, technical application support, spatial analysis data collection and organization, and map making services.

3.7A.1 GIS Business Strategy

The RSD 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 King County. Each unit has unique and specific business needs, while working toward the common Division goal of safe and efficient transportation and mobility. Consequently, staffs utilizing GIS are also spread throughout the Division to better meet these specific business needs.

The decentralized structure of Road Services' GIS work requires division-wide coordination. The continuing development and implementation of GIS related activities is a crucial part in improving the Division's efficiency. RSD staff is responsible for data maintenance and development, data analysis, applications support, and internal work requests that can originate outside of their work unit.

Expertise in transportation and specific RSD programs and business systems enable the RSD transportation professionals in Administration, Traffic Engineering, Maintenance, Engineering Services (including Survey Services) and Transportation Planning Sections to support and efficiently deliver quality GIS products and applications specific to RSD business. Listed below are some of the business functions within the Division that rely on Geographic Information.

Capital Improvement Program (CIP)– Identifies, programs, designs and constructs roadway, bridge projects, intersections and traffic flow improvements, including intelligent transportation systems. Projects are mapped, reported, and analyzed using GIS.

Concurrency Management Program – The King County Council adopted a Transportation Concurrency Management requirement in Ordinance 11617, effective January 9, 1995 and revised under Ordinance 14375, effective June 28, 2002. The ordinance establishes a concurrency management system that assures adequate transportation facilities are available to meet the requirements of new development in King County. GIS is used to depict the areas of the county that have adequate transportation facilities.

Cultural Resources Protection – Laws at the Federal, State and local level require agencies such as the RSD to consider impacts of their projects on significant cultural resources. Furthermore, discovery of cultural resources during construction can lead to schedule and budget overruns. For these reasons, the RSD and the Historic Preservation Program (HPP) are developing a GIS planning tool that will increase King County's ability to efficiently manage and protect archaeological and other cultural resources. The planning tool includes the collection and maintenance of data housed in a digital library and an archaeological sensitivity model created and expressed in GIS.

Emergency Preparedness and Response - Prepare for and respond to natural and man-made disaster events affecting the safety and closure of bridges and roadways. Includes snow and ice removal, removal of downed trees, landslide cleanup, flood response activities, and emergency road repair.

Engineering Technical Support Services – In-house services that support the RSD's CIP include, but are not limited to, field surveying using GPS, materials lab analysis, computer aided drafting design and mapping, and record management and archival support.

Environmental Compliance – The GIS data, tools, and applications necessary for the RSD to achieve environmental compliance require constant update and evaluation by staff with technical expertise in roadway construction, maintenance, and engineering. 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 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 RSD to use and update accurate GIS information and applications.

Inter-jurisdictional Service Contracts – The Roads Services Division provides a significant level of contract service to eleven cities that have incorporated since 1990 or expanded significantly through annexation. The division also has valued contractual relationships with many additional cities. Services provided by contract include maintenance, engineering, environmental, and transportation planning services.

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

Traffic Operations - Includes the collection and analysis of traffic count and accident data; operation of traffic control systems; design, installation and maintenance of safety improvements including signals and other traffic control equipment, guardrails, signs, and pavement markings; traffic impact (of development) review; and identification and implementation of neighborhood safety improvements.

Transportation Planning – The Transportation Needs Report (TNR), which represents the transportation improvement projects necessary for the next 20 years, is being revised along with the method used to prioritize projects for funding in the CIP. The GIS is being used as a primary tool to aggregate different types of transportation projects to common corridors. A corridor approach to programming diverse CIP projects will lead to efficiencies to program planning, design, mitigation and construction.

3.7A.2 GIS Program Overview

RSD 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. 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. Staff also provides 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.

The Maintenance Section Technology Unit Manager will chair the Division's GIS Technical Committee in 2004. This is a shared bi-annually coordinated effort between the Division IT Technology Manager and the Maintenance Section Technology Unit Manager.

GIS coordination in the RSD is accomplished through committee structures led by the Division IT Technology Manager, who is one of two central division-wide GIS positions. The Division IT Technology Manager is a member of the RSD IT Coordination Team and reports to the Division's Budget and Systems Manager. The Budget and Systems Manager reports to the Division Director. 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 Division IT Technology Manager is to administer coordination of the Division's decentralized GIS network.

The RSD GIS 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 Roads GIS committee also coordinates hardware purchases, data development, application development resources, software support, software licensing compliance, and hardware support. The RSD GIS committee meets quarterly 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 Professional assigned to the Division IT Technology Manager to serve in a Division-wide GIS support and coordination role.

Section GIS staff support end-users with GIS software applications, development and maintenance of GIS, respond to GIS-related work and map requests. Currently there are approximately 30 GIS end-users in the RSD.

Customers and potential customers can obtain GIS services from RSD staff by contacting any RSD GIS member. King County customers can request services either by phone, e-mail, in-person or through our GIS request tracking system. Once a request is received, the appropriate staff member reviews the request and either forwards it to the appropriate Section GIS member or fulfills the request based on their knowledge to complete the task, workload and priority.

- *New-users* in the Division that are identified as potential GIS users are added to the Roads ArcView group. Network versions of ArcView are then installed on their desktop. Appropriate section staff provides an overview of available King County data and then ArcView training is set up with the KCGIS center.
- *Existing users* usually require ArcView application assistance, troubleshooting server connections, clarification on data usage and plotting assistance. Most of these users occasionally use ArcView to accomplish their own unique project related tasks.
- *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.
- *RSD managers* are frequently supported by RSD GIS staff. They are usually in need of data analysis and/or project specific location maps. This work is done on a project-by-project basis

3.7A.2.1 Staffing Requirements

Eight technical staff, providing the equivalent of 3.0 Full time employees, are assigned GIS roles and responsibilities throughout the RSD. 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 KCGIS Center Client Services Group. This position assists with development and ongoing maintenance of the Roads Endangered Species Act (ESA) project and other RSD Maintenance Section work of an enterprise nature. This workload represents those work tasks that are specifically Road Services oriented. It was recognized, however, that the nature of the work required unusually close coordination with the RSD Maintenance Section. The position, therefore, was matrixed back into the RSD. Working titles, employee classifications and GIS FTE or TLT activity levels are described in the table below.

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 is listed in the table below.

Working Title	Focus	Class	Status	%GIS
Budget and Systems Manager (Administration)	Finance & Administration Manager	MGR	FTE	5%
Division IT Technology Manager	Managing Information Systems in the Road Services Division	ISP5	FTE	33%
GIS Technical Support TLT(Administration)	Map production and data analysis	ISP3	TLT	33%

Working Title	Focus	Class	Status	%GIS
TLT(Administration)				
Maintenance Section Technology Unit Manager	Coordinate Division GIS efforts and Maintenance Section lead	ISP5	FTE	40%
Maintenance Section Data Handling	Maintenance Section production	Eng1	FTE	60%
**Maintenance Section Data Analyst	Map production and data analysis (matrixed from KCGIS Center)	ISP3		
Engineering Section Data Manager (Engineering)	Engineering section lead	Eng3	FTE	60%
Engineering Section Data Analyst (Engineering)	Map production and data analysis	Eng2	FTE	40%
Traffic Section Data Manager (Traffic)	Traffic section lead	ISP4	FTE	30%

*Percent of FTE allocated to GIS related activity

**Matrixed Maintenance Section Data Analyst Status and %GIS is contained in the KCGIS Centers' staffing table for budgetary purposes.

3.7A.2.2 Budget

Funding support for these positions comes from the RSD operating budget, an appropriation unit supported by the Road Fund. The RSD's financial management involves the planning, budgeting, and accounting of dollars needed for the Division's operating programs and capital improvement programs, or CIP. Funds are managed by the Division for budgeting and accounting of the operating and the CIP budgets in two principal funds: the Road Fund (operating and CIP revenue transfer) and the Road Construction Fund (CIP).

The staffing configuration and assignments are appropriate given the organizational structure and different physical locations in the Division. GIS staffs within each section have a comprehensive understanding of the business activities within their work units, clear reporting relationships, and efficient communication with end-users.

The proposed 2004 RSDGIS budget is as follows:

Item	Budget	Comments
Labor Costs (salary + benefits)	$260,547	Budget and Systems manager salary not included
Hardware (acquisition and maintenance)	$2,500	Hardware maintenance
Software (acquisition and maintenance)	$10,000	Software maintenance on GIS licenses
Training costs	$7,500	Includes local GIS conferences and SDE training.
Discretionary (consultants, outside services, materials, etc.)	$3,500	Plotter supplies, training manuals, subscriptions, etc.

3.7A.2.3 Training

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

In 2004, Division staff will continue to take advantage of KCGIS Center's plan to offer low-cost alternatives for ArcView and ArcGIS training. RSD staff will also be utilizing ESRI web-based online classes in 2004.

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

3.7A.2.4 Hardware and Software

The RSD operates mostly in a PC environment. The environment ranges from Dual Processor Pentium 4 machines to Pentium II machines running Windows 98, Windows NT 4.0, Windows 2000 and Windows XP. We will continue running in these environments through 2004.

- *JABBA*: ALR 9200, Win2000 Server (5.00) SP2, data development and storage server. This server houses the Division's GIS datasets and is a storage area for the Division's GIS-related working data. When data is complete it is moved up to the KCGIS Center enterprise data server. This server also allows a single place for users to store project files.
- *BABYLON:* Gateway 7250R, Win2000 (5.00) SP2, data development and storage server. This server houses all data developed, enhanced and maintained as part of the King County Cultural Resources Protection Project. Due to the sensitive nature of the data, this server is only accessible by 5 employees in King County.

Plotting devices used in the RSD include:

- (2) HP Design jet 800
- (1) HP Design jet 1055CM
- (2) HP Design jet 2500CM color plotter
- (1) HP Design jet 650C

Two ArcGIS 8.3 licenses are run from a license manager on a server called *JABBA*. This server is located in Kingstreet. The Division is also running two more ArcGIS 8.3 licenses on a license manager in Renton at our RSD 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 35 PCs in the Division. All ESRI software licensing and maintenance is handled in cooperation with the KCGIS Center.

The RSD GIS currently has the following license structure:

Software	Licenses
ArcGIS	
8.3 (NT)	
Core	4
3D Analyst	1
Spatial Analyst	1
ArcPress	1

Software	Licenses
ArcView	
Version 3.2	
Core	35
3D Analyst	2
Spatial Analyst	3
ArcPress	4

Ancillary software used by the Division include AutoCad Map, AutoCAD 14.0, ArcCad, Adobe Illustrator 10.0, Adobe Map Publisher, Adobe Acrobat 5.0, Adobe PageMaker 6.5, Adobe Photoshop 7.0, Microsoft Access 97, Microsoft Access 2000, Microsoft SQL 2000 and Cold Fusion.

3.7A.3 Spatial Data

The Division is responsible for a variety of transportation-related data layers. An example of these datasets are CIP, Bridges, County Road Inventory System (CRIS), average daily traffic counts, accidents, striping 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 Data Maintenance

GIS staff within the RSD is 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 the RSD 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 RSD staff:

Enterprise Data

Data Name	Data Description	Update Frequency
MONUMENT	Point shapes representing RSD/Survey Section surveyed monuments.	Annually
REFGRID	Quarter section, section and township reference grid for King County.	None Planned
VERTICAL	Vertical control for ortho photography.	Randomly

Agency Data

Data Name	Data Description	Update Frequency
ST_CRIS	Lines shapes representing King County's County Road Inventory System (CRIS). Last year the Engineering Services Section completed a major data conversion project in collaboration with KCGIS Center associated with the CRIS. This conversion is done and updates are being made for the 2004 submittal.	Daily
KGCO_DS	Soils data for King County. Seamless soils shapefile for entire county.	None planned
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

Data Name	Data Description	Update Frequency
SIG_EXPECTED	Point shapes representing King County countywide Traffic Section 2001 Signal projects expected to be completed	Monthly
STRIPING	Line shapes representing installation and maintenance of Traffic Section maintained roadway marking features	None Planned
HARS	Line shapes representing King County countywide High Accident Roadways	Annually
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 National Pollution Discharge Elimination System (NPDES)	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 RSD Environmental Unit’s impact statements	Monthly
RD_BA	Point shapes representing RSD Environmental Unit’s biological assessments	Monthly
RD_PROP	Point shapes representing RSD-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 countywide guardrail	Monthly

Data Name	Data Description	Update Frequency
COUNT_LOCATIONS	Point shapes representing RSD Traffic Section Historical Count Locations w/o data attached	Annually

Due to the sensitivity of the data, the following layers are only accessible by selected individuals as part of the King County Cultural Resources Protection Project.

Sensitive Agency Data

Data Name	Data Description	Update Frequency
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
CLP	Recorded Cultural Resources managed by Seattle Public Utility (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 Government land Office (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

3.7A.3.2 Data Enhancement

Data enhancement efforts for 2004 will primarily be in response to three projects:

1. 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 Microsoft SQL server application with data input, inquiry, and reporting available over the King County intranet. In 2004, RSD 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 a Microsoft SQL server platform in order to support GIS mapping of the data by accident locations. The system will be developed in 2004 and will accommodate State-provided data when the State comes back online in late 2003.

2. The Pavement Marking Tracking System is currently being developed by the Traffic Engineering Section. It will be used to manage the installation and maintenance of roadway marking features. Currently, roadway striping routes are being developed in GIS; when the dataset is completed, it will allow for more efficient project management of linear routes, easier distribution of information, and map production capabilities for planning purposes. In 2004, additions to the GIS inventory will include roadway buttons and thermo-plastic locations.

3.7A.3.3 Data Development

Data development efforts for 2004 will primarily be in response to the Cultural Resources Protection Project (described below) as well as the ESA/SAO Data Acquisition project, Road Vacations, Road Improvement Districts, Transportation Network (TNET) street centerline project already described in this document (*refer to Transit Division section 3.7B.3.2*), County Road Inventory System (CRIS) management and data development in our Traffic Engineering Section.

Citizen Request Tracking System - 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 expandable to other Division workflow tracking requirements and opportunities. The new CARTS system will also utilize GIS to support spatial query and reporting capabilities.

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 RSD and the Historic Preservation Program (HPP) 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 or policies to guide cultural resource work across the panoply of regulatory regimes under which RSD works.

Much of the data developed within this project will not be shared, as it is sensitive and exempt from the public disclosure act (i.e.: archaeological sites and Native American place names). However some data sets, like the Government Land Office (GLO) images (representing early King County's natural and man-made environments) will be made available to the GIS community**.**

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 was three years in duration, and is expected to be substantively complete by December 31, 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. This component is complete.
    - 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. This component is underway and will likely be complete by December, 2003
    - 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 - shapefiles with detailed metadata
- Ethnographic place names for King County - 471 sites, shapefiles with metadata
- Recorded archaeological sites for King County – 320+ sites, shapefiles with metadata
- Heretofore unrecorded archaeological sites for King County - 210+sites, shapefiles with metadata
- Paleo-landscape features (late Pleistocene and Holocene) - shapefiles with metadata
- Areas of traditional cultural significance for Native American groups in King County - shapefiles with metadata
- Government Land Office (GLO) Plat Maps 1855-1900 as image files
- Cultural features digitized from GLO maps for use as shapefiles (feature data sources) - with metadata
- Areas of previous cultural resource surveys – shapefiles with metadata

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 2004. The datasets will show Road Vacations and RID's in polygon shapefile format.

Endangered 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: The high-resolution Digital Elevation Model for some areas is available through the KCGIS data warehouse. Initially products will consist of townships based ArcInfo Grids on 6-foot postings, Hill shade images, and contours (generally 5 foot interval). Data for areas west of Range 7 have been received and are being posted as they are processed and checked. All data for the county has been collected and the processed data is scheduled to be delivered to the County by January 31, 2004.
- New Contours: Contours based on the DEM are being posted along with the grid as a final product.
- New Digital Aerial Photography: The 2002 digital imagery is being rectified and will be posted to the warehouse as each image is completed. Imagery for the area west of Range 7 will be available by the end of the year. Other images will follow as DEM becomes available. Photos will be available as one foot pixel compressed images.

3.7A.3.4 Data Metadata

Spatial data documentation in the KCGIS Center Spatial Data Warehouse is regularly maintained using Doctool for all posted layers. Documentation is not maintained for agency layers not posted to the Spatial Data Warehouse. One exception is agency metadata produced as part of the Cultural Resources Protection Project. Certain datasets developed and or enhanced within this project will not be shared, therefore metadata for these sensitive datasets will not be available outside of identified core project members.

3.7A.4 Spatial Applications

The Road Services Division maintains the following transportation-related GIS applications. Streettool was a cooperative project between King County Department of Transportation – RSD and KCGIS Center. This application provides an environment for editing, maintaining, quality controlling, and plotting spatial data for the County Road Inventory System (CRIS).

3.7A.4.1 Application Maintenance

The following is a list of applications that are maintained and that will continue to be maintained by Division 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 Microsoft SQL database for the Maintenance and Defect Bond Program for King County DOT – Road Services Unit. GIS link will be integrated in 3rd quarter of 2004.	

3.7A.4.2 Application Enhancement

Application enhancement efforts for 2004 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 3rd quarter of 2004. A GIS link will be integrated into this application.

3.7A.4.3 Application Development

At this time there are no Division application development efforts scheduled for 2004.

3.7A.4.4 Application 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 2004.

3.7A.5 System Integration

System integration of geographic data within the Division 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.

In 2004, Road Services Division will be finishing a division-wide GIS Strategic Plan. This plan will help guide and focus the Divisions' long-range GIS objectives and goals. This plan will also provide a framework for integration of Division features with the new Transportation Network.

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 Microsoft 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 Microsoft 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 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 desktops.

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 all at once.

In 2004, 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 2004.

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
- Microsoft SQL databases
- Microsoft Excel spreadsheets – Desktops
- Rbase databases – Desktops
- Advanced Revelations databases – CRIS, Pavement Management System

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 End-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 geographic information to support Road Services Division staff.
- Provide FTP site that houses GPS base station files for internal and external use.
- Provide technical application support to users, software installation, maintenance, updates and training.
- Prepare maps and make sure data is available to Road Services Division staff.
- Serve as Road 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 tracked in a Coldfusion\SQL web application.
- Processing of requests is based on knowledge to complete the requested task, current workload and priority of request.

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.
- A knowledgebase of GIS related questions and answers are maintained on the Road Services Division intranet.
- 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, internal King County Departments / Divisions, and members of the new Transportation Network Consortium (includes King County cities) 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 GIS Business Strategy

GIS within Transit is centralized with all support services provided through a single workgroup to users throughout the Division. The role of the workgroup is to, wherever possible, *enable* Transit staff to incorporate GIS tools and data into their workflows. This workgroup has a clear understanding of all Transit business functions, the geographic elements of these functions, and the best delivery mechanisms necessary to support them. These mechanisms include publication of spatial information in Transit corporate databases with other business data; development of specialized extensions to GIS vendor off-the-shelf products; development of whole new applications to support spatial data maintenance, access, and reporting; and advice to project managers on the acquisition of vendor products with geographic components. The Transit Division GIS workgroup also has the responsibility for coordinating data maintenance of a variety of business specific spatial data layers and coordinating data maintenance of the King County Transportation Network. Both the support services and data maintenance coordination responsibilities are essential to many business functions within the agency. Below are listed some of the business functions within the Transit Division that rely upon geographic information and geographic information services from the Division's GIS workgroup.

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 1,300 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 300+ 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. This system 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. This system 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 – Reporting is a function performed throughout the agency for a variety of purposes. In particular, two reports are mandated by the Federal Government for all transit properties that apply for federal funding and grants. These are the National Transit Database/Section 15 and Equity in Transit reports. The National Transit Database Section 15 Report 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. The Equity in Transit report ensures equitable service to minority and non-minority areas. 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.

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 2003, there were approximately 135 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.

In 2004, new relationships will be forged as the new Transportation Network is deployed (see *Spatial Data* section below). This network will be maintained by a consortium of data maintainers within King County and at Cities and other public agencies. Transit GIS will coordinate the maintenance of the network with these agencies, support their access to the database, and assist in their use of the data maintenance application. The new transportation network will not only increase the number of users supported by Transit GIS, but it will add users from non-King County agencies who will be accessing an important and highly-visible system. It will be a challenge for Transit GIS to prioritize support required by Transportation Network Consortium members and Transit business personnel.

3.7B.2.1 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. These GIS professionals also identify potential future users that would benefit from access. As such, the GIS professionals must have some knowledge of every part of the business so that they can appropriately recommend the level of GIS integration.

Transit GIS professionals are responsible for directly maintaining or coordinating the maintenance of agency data layers, 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 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	1 FTE	95
GIS Database Administrator	INFO, geodatabase, shape, ArcSDE administration, and GIS-to-Oracle interfacing	ISP IV	1 FTE	95
GIS Senior Application Developer	Application development and coordination	ISP IV	1 FTE	95
GIS Application Developer	Application development	ISP IV	1 FTE	95
GIS Analyst	Map production, data analysis, software installation	ISP III	1 FTE	95
GIS Analyst	Map production, data analysis, software installation	ISP III	1 FTE	95
MITT, Infrastructure and Integration Supervisor	GIS Team Supervisor, GIS Oversight Representative	ISP V	1 FTE	15
MITT Systems Analyst	Hardware and operating system support (NT, Web)	ISP V & IV	1 FTE	10
ITS Systems Analyst	Hardware and operating system support (UNIX)	?	1 FTE	5
MITT Oracle DBA	Oracle Database Administration	ISP V	1 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 Wintel Migration is complete (See *Spatial Application Section* below). An unsigned service level agreement is in place. Transit's Management Information and Transit Technology Section Server Group maintains Wintel servers. A signed service level agreement is in place. Transit GIS staff have much greater direct support control on the Wintel 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.2.2 Budget

The proposed 2004 Transit GIS budget is as follows:

Item	Budget	Comments
Labor Costs (salary + benefits)	$488,012	Operating (3.9 FTE) and Grant (.75 FTE) only; $76,000 estimated grant reimbursement from FTA
Hardware (acquisition and maintenance)	$36,000	Hardware maintenance (½ for shared servers) including ITS charges
Software (acquisition and maintenance)	$16,500	Software maintenance on GIS licensing and license monitoring software
Training costs	$15,000	Includes GIS International and local conferences, and other technical training
Discretionary (consultants, outside services, materials, etc.)	$94,600	Plotter supplies, training manuals, subscriptions, etc. $91,600 for matrixed position from KCGIS Center

Staff funding is supplied from a variety of sources: 3.9 FTE from Operating, 0.75 from federal grants, 0.35 from capital projects.

3.7B.2.3 Training

In 2002, Transit negotiated an arrangement with the KCGIS Center to offer a low-cost alternative for the "Introduction to ArcView" class. Transit GIS would coordinate the training room calendar, software installation, enrollment, training materials, and all other preparation activity. The KCGIS Center would teach the class for two days plus an additional 4 hours preparation time at the hourly services rate. Transit GIS did not take advantage of this opportunity during 2003 due to other priorities, but intends to work with the KCGIS Center to offer several of these classes in 2004.

Transit GIS offers a formal training class "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 2004, Transit and DNRP arranged to have ESRI use the King Street Center training facility for formal training. ESRI is charged a fee that is collected and managed by DNRP for eventual asset replacement of the training room computers and to subsidize training for King County staff. Transit GIS intends to take advantage of this fund to supplement KCGIS Center classes and ESRI training for GIS Professionals.

In 2003 and 2004, it is expected that the Transit GIS Database Administrator will become fully certified as an Oracle DBA in response to an increasing reliance on Oracle by Transit GIS. Funding for this training will partially be available from a Federal Government H-1B Grant awarded to the MITT section in 2003. These funds are provided by the federal government to employers to train employees in areas where existing skills do not meet current or anticipated critical technology needs. It is also expected that GIS programmers will have additional training in .NET in anticipation of using that platform for new application development.

3.7B.2.4 Hardware and Software

The Division maintains several production and development servers that house 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. Below is a list of these servers. All servers were purchased with capital dollars as part of Transit's capital improvement program, and are shared with other information systems to maximize server capacity.

- *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 and bus route tracing. It is also used for nightly batch processing of data prior to publication in the production spatial library and the Oracle corporate database.
- *ORASERV1*: Compaq ES 40, UNIX (5.1A), production, Oracle databases. This server houses Transit's corporate data warehouse and the GIS Oracle database 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 these databases, including GIS desktop data access applications querying spatial and non-spatial attribute data.
- *ORATWO*: Compaq ES 40, UNIX (5.1A), test, Oracle databases. This server is the test platform for Transit's corporate data warehouse and the GIS Oracle database. It is used to test applications against new or changed data structures/content prior to deployment to *ORASERV1*.
- *PHOENIX*: Compaq ES 40, UNIX (5.1A), development, Oracle databases. This server is the development platform for Transit's corporate data warehouse and the GIS Oracle database. It is used to develop new or changed data structures/content prior to testing on *ORATWO*.
- *KCMOLYMPUS*: Compaq Proliant 8000, Win2000 Server, production, spatial database, application, ArcGIS license server, and ArcSDE 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. *KCMOLYMPUS* is also the home of the *T*NET ArcSDE database. After the Wintel 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.
- *KCMMATHIAS*: 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 on *KCMOLYMPUS*. In addition, the GIS team uses this server as a file server for source code, shared files, and individual backups.
- *KCMMAGI*: Pentium IV, Win2000 Server, production Magi server. This server resides on the King County Public Access Segment and brokers/authenticates communications between *T*NET consortium members and the *T*NET database during synchronization.
- *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 the Security Data Management System.
- *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 prior to deployment on *KCMRAINIER*.

As this document went into production, the requirement for an additional server for *T*NET was identified to provide ArcGIS processing of transportation network delta files sent from *T*NET clients to the master database. This server was spec'd out to be a high-end PC, but the server name and final specifications will be identified in early 2004.

In 2003, the UNIX development/test server *MAZAMA* was decommissioned due to excessive costs to maintain the server and the expectation that no new UNIX application test/development activities would occur in the future. Access to other UNIX servers is generally limited to GIS professionals and users of legacy ArcInfo applications through Exceed emulation software. During 2001-2004, Transit GIS is migrating all data, applications, and users from UNIX to the Wintel platform. Once completed, GIS will no longer need access to *COUGAR*. More information about this migration is discussed below under the *Spatial Applications* section. Most GIS users access data and applications on the Win2000 production server *KCMOLYMPUS* through standard TCP/IP protocol. Supported desktop configurations include Windows 95, 98, NT 4.0, 2000,and XP. A diagram of the Transit GIS environment illustrating servers, databases, applications, and nightly batch processing applications is shown below. (Note that this diagram is best shown in color to illustrate the interrelationships between applications, nightly processing, and datasets.)

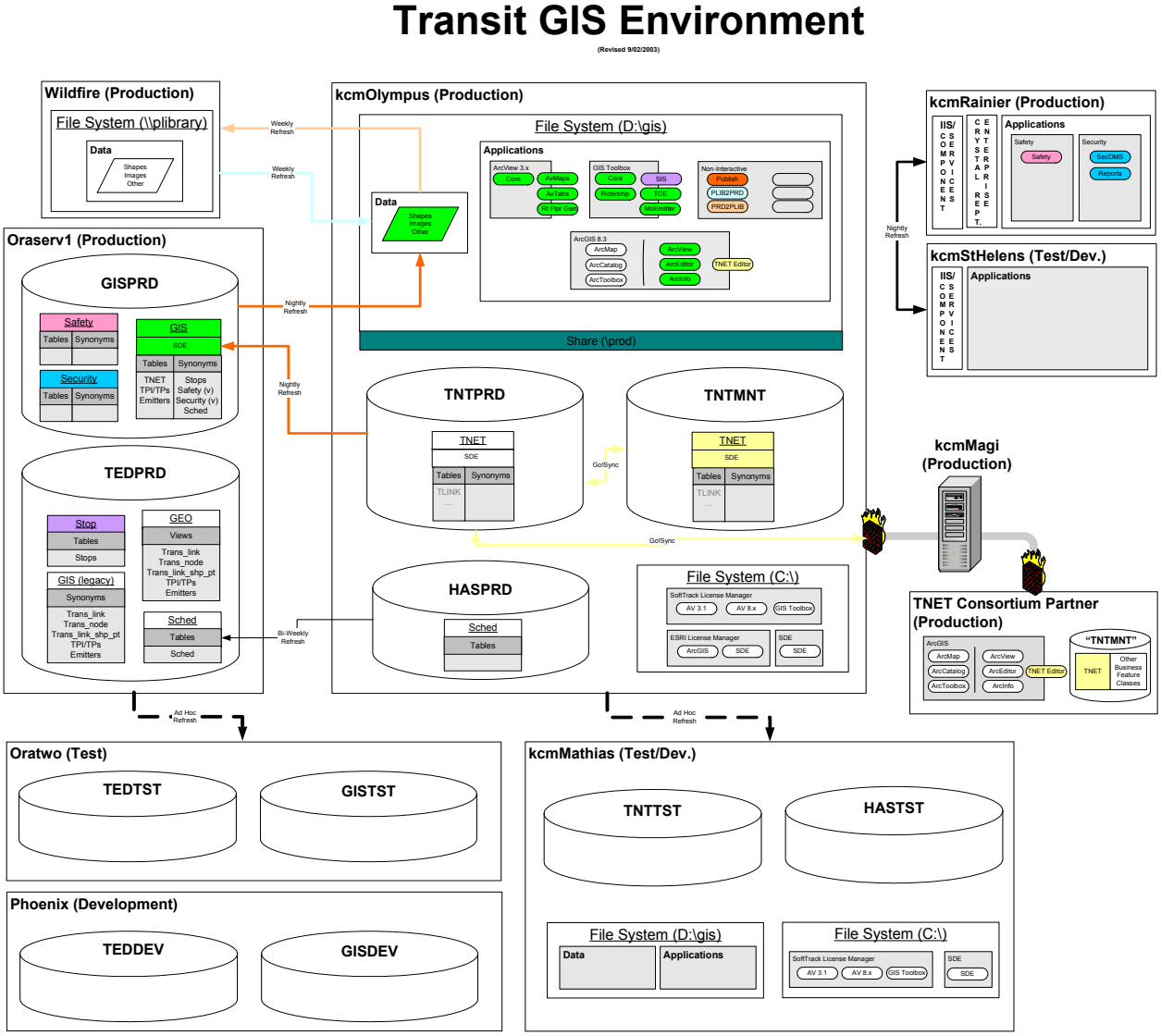


Diagram showing Transit GIS environment.
Note this diagram shows both components in production and components targeted for production during 2004. Components to be decommissioned in 2004 are not shown.

Transit GIS supports two specialized output devices:

- HP Designjet 5500PS Plotter (large format)
- Tektronix Phaser 7300 Color Printer (small format)

Users have access to the plotter and color printer for map production. Plotter usage is tracked and individual sections are charged for paper.

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 8.3	
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
ArcSDE	
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 140 desktops.

Budget was requested for 2004 to upgrade legacy ArcView 3.1 users to ArcView 3.3 since ArcView 3.1 is not supported by ESRI on a Windows XP platform. Users will be upgraded throughout the year if the funding is retained in the 2004 budget.

3.7B.3 Spatial Data

The Transit Division is responsible for maintenance of a variety of transportation-related data layers that generally fall into two categories: Transit layers (e.g., routes, stops, and timepoints) and the transportation network. Both categories are used within map based applications and as coordinate input to applications that do not use a map. Transit layer maintenance is critical to ensure accurate data is available to the public regarding transit routes and stops through a variety of public information systems.

The transportation network is the second category of data layer that the Transit Division is responsible for. This data layer is currently being completely enhanced and improved through a multi-agency cooperative effort coordinated through the Transit Division GIS workgroup, and is discussed below under *Data Enhancement*. The transportation network is critical to the Transit Division, the Department, other King County departments, as well as external users and data maintainers. Many transit layers are

fundamentally tied to the transportation network through some locational referencing system (e.g., as line event, id/offset, address), and thus accurate and timely maintenance of the transportation network is critical to the accurate and timely maintenance of other transit layers.

In 2004, data enhancements are being driven by the implementation of the new Transportation Network and adjustment of all transit layers that are locationally referenced to that network.

3.7B.3.1 Data Maintenance

Transit layers are maintained both directly by GIS staff and by specific end-users within other workgroups using tools developed and supported by GIS staff. The transportation network is maintained directly by GIS staff. End-user maintained layers are submitted to the GIS staff 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 generally 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

Data Name	Data Description	Update Frequency
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
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

Data Name	Data Description	Update Frequency
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
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
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
APCEMIT	Point shapes representing Transit radio frequency emitters derived from EMITTER. These points may have a different location from the physical emitter location to facilitate Automatic Passenger Counter system processing.	Daily
AVLEMIT	Point shapes representing Transit radio frequency emitters derived from EMITTER. These points may have a different location from the physical emitter location to facilitate Automatic Vehicle Location system processing.	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

Data Name	Data Description	Update Frequency
DEADNEXT	Line shapes representing Transit non-revenue service route footprint for the following (next) transit service change. These shapes are derived from STREET as an ordered set of links.	Daily
FAREZONE	Polygon shapes representing Transit fare zones for King County Metro, Community Transit, Pierce County Transit, and Sound Transit.	Annually
INCIDENT	Point shapes representing transit security incidents. INCIDENT attributes include date, route characteristics, on street, cross street, and items describing the incident type.	Daily
REVNEXT	Line shapes representing Transit revenue service route footprint for the following (next) transit service change. These shapes are derived from STREET as an ordered set of links.	Daily
SERVGRID	Polygon shapes representing a simple Transit service grid used on the Web for users to pick an area of interest. Information about the Transit service in that grid is provided.	
ZONES	Point shapes representing all active and inactive Transit bus stops derived from street as a distance from an intersection along a link.	Daily

3.7B.3.2 Data Enhancement

Data enhancement efforts for 2004 will primarily be in response to two major projects:

1. The first 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 2004—code named TNET). This fundamental data layer supports critical Transportation business needs for almost all core business functions. Although minimally suitable in the early 1990s 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.

   This project will deliver a new transportation network data layer, a data maintenance application, and the foundation of a consortium of data maintainers including King County Departments, Cities, and other agencies. 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. By the end of 2003, the project will have completed development and review of data and application requirements from potential consortium members; conflation of GDT data and the current street network (KCSN) to high-accuracy linework developed by KC Road Services; development of the data maintenance application; and license purchase, training, and installation of ArcSDE. The maintenance application will use ArcGIS 8.3, ArcSDE, and Oracle. In 2004, the system will be adapted to the Transit GIS infrastructure and fully tested in a multi-user environment; new linework will be added for other modes (e.g., rail, pedestrian); data corrections identified during the conflation will be implemented; improvements/additions from 2002 digital orthophotography and user identified changes collected while the legacy data was frozen will be made; private roads that exist in the legacy street network and not in the new network will be identified, confirmed, and transferred; left and right zip codes will be corrected based on the recently released Zip Code layer; transit objects (e.g., routes and stops) will be linearly referenced to the

new transportation network and any identified connectivity issues will be corrected; and consortium members will be brought on line throughout the year.

This data and application development effort is being funded by Transit and Road Services capital dollars.

2. The second project is a major shift in Transit GIS infrastructure to the Wintel platform, ArcGIS, ArcSDE, and the geodatabase (see also *Spatial Applications* below). Besides being the current industry direction, ArcSDE and the geodatabase provide several significant benefits to the Transit GIS workgroup: They allow for the storage and maintenance of GIS data layers directly in Oracle rather than storing the data in proprietary databases and maintaining complex loading applications; it simplifies the situation by facilitating maintenance of the transportation network and transit layers in a single environment; transit layers referenced to the transportation network by address can now be directly tied to the transportation network facilitating their maintenance as the network changes.

   In 2003, as part of the development of *7*NET, the Transit GIS team will have purchased and installed ArcSDE as well as attended formal training. In 2004, the GIS team will begin movement of data maintenance activities, traditionally performed in Arc/Info with coverages or ArcView with shapes, to ArcGIS and ArcSDE. This transition is fundamental to the organization of data flows within the agency as shapefiles/coverages will no longer be the source for geographic information. These data will be stored and maintained directly in Oracle with one of the outputs being traditional shapefiles. This will also impact future applications developed within the GIS workgroup, as they will now be directed to access the ArcSDE layers rather than shapefiles. (See the system diagram in the *Hardware and Software* section above.)

   This data and application development effort is being funded by Transit capital dollars and operating funds.

3.7B.3.3 Data Development

There are no Transit data development efforts scheduled for 2004. Note that some of the data enhancement work discussed above might be considered development. These projects were discussed in their entirety in the Data Enhancement section, however, to simplify presentation.

3.7B.3.4 Data Metadata

Spatial data documentation in the KCGIS Spatial Data Warehouse is regularly maintained using Doctool for all posted layers. Documentation is not maintained for agency layers not posted to the Spatial Data Warehouse.

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 as well as integrity and comparability between the spatial data warehouse and the corporate Oracle database.

Application maintenance, enhancements, and development are performed on a test/development server before being deployed into production. Maintenance of AMLs, UNIX scripts, 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.

In 2004, application enhancements are being driven by the implementation of the new Transportation Network and the Wintel Migration, although there are additional enhancement efforts planned as well.

3.7B.4.1 Application 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
Route Footprint Generator (formerly AS)	This application is an ArcView 3.x extension. It provides Accessible Services staff with a 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. This application will be replaced in 2003/04 as part of the Wintel Migration.	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 Information System – Bus stop maintenance tool. • TOE -- Maintaining route paths and time point locations (to be implemented in 2004). • Emitter – Maintaining emitter locations (to be implemented in 2004).	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. This application will be replaced in 2003/04 as part of the Wintel Migration.	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. This application will be integrated into the GIS Toolbox in 2004.	VB
Safety DMS	This application provides safety and operations staff with a tool for entering accident information, tracking accidents through the legal	HTML, ASP, VB

Name	Description	Language
	process and reporting on accidents.	Script, Java Script
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.	HTML, ASP, VB Script, Java Script
TOE	Transit Object Editor. This application is the primary tool used by customer information analysts for maintaining route paths and time point locations. This application will be integrated into the GIS Toolbox in 2004.	AML

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 2004 as part of the transportation network project and as part of the Wintel Migration.	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. This application will be replaced in 2003/04 as part of the Wintel Migration.	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
CopyOtherShapes	This application copies shape files for themes other than Transit and Street from *COUGAR* to *KCMOLYMPUS*. This application will be decommissioned once the Wintel Migration is complete in 2004.	DOS Batch Script
CopyStreetTransitShapes	This application copies shape files for the Transit and Street themes from *COUGAR* to *KCMOLYMPUS*. This application will be decommissioned once the Wintel Migration is complete in 2004.	DOS Batch Script
CopyTabs Extract	This application copies data from the TABS server to *KCMOLYMPUS* necessary for the AvTabs application.	DOS Batch Script
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. This	AML

Name	Description	Language
	database and reports on any inconsistencies to Transit GIS staff. This application will be decommissioned once the Wintel Migration is complete in 2004.	
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. This application will be replaced in 2003/04 as part of the Wintel Migration.	AML
Kctran2nat	This application transfers Transit and street network related coverages to the KCGIS Spatial Data Warehouse. This application will be replaced in 2003/04 as part of the Wintel Migration and modified to transfer shape files.	AML
Labelscreate	This application automatically generates street labels for use in the GIS Toolbox. This application will be replaced in 2003/04 as part of the Wintel Migration.	AML
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). This application will be replaced in 2004 once *T*NET and other core data maintenance applications have been replaced as part of the Wintel Migration.	AML
Nbatch	This application combines Toetow and Toeddb into a single application with some quality control checks prior to their execution. This application will be replaced in 2003/04 as part of the Wintel Migration.	AML
Plib2prd	This application transfers data from the KCGIS Spatial Data Warehouse to the Transit GIS library. This application will be replaced in 2003/04 as part of the Wintel Migration and modified to transfer shape files.	AML
ProcessMonitor	This application reports on the status of nightly batch processes that have been executed within the last 24 hours.	VB
StopProcessort	This application processes stop locations and flags stops that are on changed streets.	VB
Stp2atis	This application adds/updates various attributes (e.g., city, zip code) to the bus stop data layer through a variety of overlay operations. These attributes are necessary for the trip planning application. This application will be replaced in 2003/04 as part of the Wintel Migration.	AML
Stpupdate	This application creates a list of changed streets from the previous day's editing to identify stops that may have been affected by those changes. This application will be replaced in 2003/04 as part of the Wintel Migration.	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. This application will be replaced in 2004 once *T*NET and other core data maintenance applications have been replaced as part of the Wintel Migration.	AML

Name	Description	Language
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. This application will be replaced in 2004 once *T*NET and other core data maintenance applications have been replaced as part of the Wintel Migration.	AML
Update_Tnet2prd_script2	This script takes existing KCSN data and converts it into the data structure of TNET. The GIS Toolbox V204 requires this new data structure. This script also populates data into the new MAPPED_TIMEPOINT table from the TIMEPOINT table.	SQL
UpdatePathLinks	This application is used to update the TPI paths (new and modified) and the description field on the TPIPATH database table.	VB

3.7B.4.2 Application Enhancement

Application enhancement efforts for 2004 will primarily be in response to four major projects.

1. The first project is a major development effort to create a new high-resolution transportation network and a maintenance plan (*T*NET) to ensure the continued accuracy and completeness of the data layer. This includes the deployment of a new transportation network maintenance application that will replace the current KCSN Editor. Please see the discussion in the Transit *Spatial Data Enhancement* section of this document.
2. The second project is the development of a new Transit Object Editor (TOE) application. TOE is used to trace transit bus route paths and place timepoints and is currently implemented as an AML application in the UNIX environment accessing Arc/Info route systems. Both of these environments are antiquated and require rewrite as part of the Transit GIS migration from UNIX to the Wintel platform. TOE will be redeveloped as a module of the GIS Toolbox in a modern Visual Basic environment. This application development effort is being funded by federal grant funds.
3. The third project is the migration of all users, data, and applications from UNIX to the Wintel platform. This move will benefit the Division by significantly reducing hardware replacement costs and both internal (ITS) and external (Compaq) support costs. Moving to the Wintel 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 the Wintel platform will occur in stages throughout this time frame and therefore requires access to a production and development/test platform in both environments (see the list of servers and the Transit GIS environment diagram in the *Hardware and Software* section above). All user accounts, data for user access, and end-user interface applications have been migrated prior to 2003. In 2003 and 2004, the project will focus on the migration of all core data maintenance programs for transit objects and the transportation network as well as all legacy ArcInfo AML and UNIX scripts. See the tables above for descriptions of these applications. Many of these will be written as COM objects and scheduled in the Wintel server environment using Microsoft scheduling tools. Transit GIS has secured assistance from the KCGIS Center to assist in completing this task.

   The Wintel Migration project is also dependent upon *T*NET and the new TOE to replace the UNIX AML applications KCSN Editor and the old TOE. In addition, to developed applications, this effort includes migration away from Arc/Info and the coverage data model to ArcGIS, ArcSDE, and the geodatabase. In 2003, staff were trained in ArcGIS and ArcSDE. In 2004, ArcGIS will be used for

data maintenance activities. See the *Spatial Data Enhancement* section above for more information on these activities.

This data and application development effort is being funded by Transit capital dollars and operating funds.

4. The fourth project is the development of a replacement for the MoEmitter application. This application allows Transit staff to manage the location and attributes of vehicle location emitters. This application was developed using MapObjects 1.0 and an early release of Visual Basic. To improve support, it needs to be updated to the latest technology and incorporated as a module of the GIS Toolbox along side other similar Transit Object maintenance modules.

   This application development effort is being funded by federal grant funds.

3.7B.4.3 Application Development

There are no Transit application development efforts scheduled for 2004. Note that some of the application enhancement work discussed above might be considered development. These projects were discussed in their entirety in the Application Enhancement section, however, to simplify presentation.

3.7B.4.4 Application 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 as well as the Security and Safety Intranet applications. This documentation will continue to be maintained. User help for applications with user interfaces that are being rewritten as part of the Wintel Migration 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 2004.

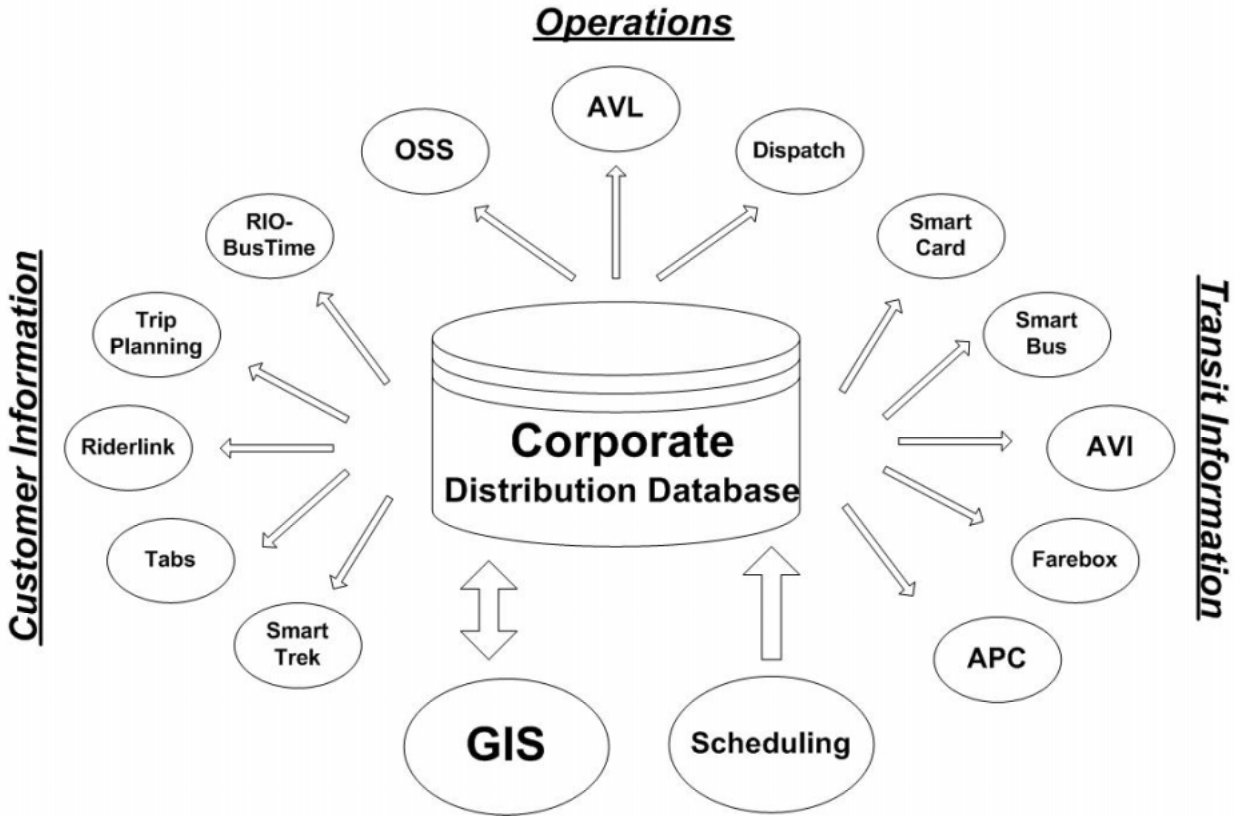
3.7B.5 System Integration

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).

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 and data maintenance coordination 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 is the framework on which these data are integrated and will consume a large percentage of the Transit GIS staff time in 2004.



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.

In 2004, Transit GIS will also be working on a GIS Strategic Plan for the Division. This plan will identify and detail long-range objectives and goals as well as recommend approaches, strategies, and costs to reach them. The development of this strategic plan will address issues such as legacy ArcView 3.1 users, wider implementation of ArcGIS, possible implementation of IMS, integration of Transit features with the new Transportation Network, long-term application development approaches using ArcObjects, staffing solutions, and other strategic planning initiatives. This document will be made public as soon as it has been presented and reviewed by Transit Management.

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 cycle. 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, and bus stops completed) 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 will also be moved to an application that manages data directly in Oracle in 2004.

As 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. In 2003, the Transit GIS team has purchased, installed, trained in, and tested ArcSDE 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 End-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 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 2004*:*

The implementation of *T*NET will introduce additional customers, clients, and service delivery mechanisms including the implementation of an informational website targeted at *T*NET Consortium Members (http://www.metrokc.gov/gis/Projects/TNET/tnet_main.htm).

3.7C King County International Airport

King County International Airport (KCIA) is a division of King County's Transportation Department. Its 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 mission of KCIA is to support the economic vitality of the county, to support the national air transportation system, to encourage advanced technology, to provide safe and continuous general aviation airport services to King County businesses and residents and to serve as a gateway to the county. In fulfilling this mission, the Airport will be a good neighbor and an environmental steward and will provide quality facilities to Airport tenants and operators in an efficient, environmentally safe and fiscally prudent manner.

The airport supports commercial, corporate, cargo and military aviation, as well as general aviation and aviation manufacturing. The airport currently uses the KCGIS Center as its primary provider of GIS services for planning and property management applications, and anticipates future use for engineering, maintenance and administrative functions. The future development of internal GIS capability is a key business goal.

3.7C.1 GIS Business Strategy

The airport's business functions, which currently use GIS or plan to do so in the near future, are reflected in the Airport's organizational structure.

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, and their consultants use GIS for analysis in plan development, environmental evaluations and program tracking. In addition, GIS will support use of graphic planning materials. Planning uses a GIS-based application for KCIA's Airport Layout Plan and other required Federal Aviation Administration (FAA) documents.

Engineering and Environmental Management--This program provides and/or oversees engineering-related planning and construction management and assures that the airport operates in an environmentally safe manner. Elements of the program include ground and surface water management, soils protection and remediation. In 2002, the Airport used GIS to map and coordinate 75 years of environmental data. 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, condition and/or maintenance of pavement, facilities and utilities will be included in the GIS database and may be integrated with a maintenance management system. A new engineer was hired in 2003 with a background in GIS – it is hoped that Engineering will be able to provide additional internal GIS capability in 2004. The Airport anticipates developing a technical document center within Engineering to serve the entire Airport.

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.

Maintenance--Airport Maintenance maintains and repairs all airport facilities, including the airfield, utilities, and structures with a wide range of trade and utility employees. The Airport has purchased MAXIMO, a leading maintenance and facility management system that will be implemented in 2004. This system can integrate with the Airport's GIS system to provide spatial data for maintenance and inventory functions. The Airport anticipates that this function will be activated in2004-2005.

Operations and Compliance--This 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 Sheriff's Office. The airport currently uses CADD to identify or track safety or security related items, including hazardous materials and emergency response information. This CADD data will be converted to the GIS database in 2004. Operation'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.

Management and Administration-- Management and Administration personnel will use GIS and the Airport's Oracle database primarily for planning, analysis and reporting. Integration of MAXIMO and GIS will provide more easily accessible data for comprehensive activity and facility-based costing and related management decisions.

Summary--The key current strength of the KCIA GIS program is the completion of a substantial body of historical lease data in a GIS compatible format. However, the lack of an efficient front-end interface restricted use of this data by Airport staff. KCGIS is currently developing this interface, which will be completed in the first quarter of 2004. Other projects to be completed by KCGIS in 2004 include conversion of CADD utility, safety, security and facility and pavement condition documents, and updated survey and orthographic information. The Airport also plans to convert CADD-based planning documents required by the FAA into GIS layers.

A strategic goal of the Airport is to implement a new Maximo-based work order management system. Maximo will provide KCIA maintenance, operations, and engineering staff with work order data on hand held field devices to enhance the efficiency of maintenance and repair operations. The GIS data already completed for the Airport will be a key component of the Maximo database. Success of this initiative will also depend on the entry of additional airport infrastructure data, plus the ability to provide planning, survey, and other data to the FAA.

KCIA looks to LAX as a model for technology implementation. The long term goal of KCIA is to implement state of the art airport management practices and technology in the areas of property management, maintenance, facility management, utilities, land use, tenant management, and pavement management. KCIA utilizes Carter-Burgess, an airport consulting firm, to help plan development.

Within the overall context of KCGIS, the Airport depends on Countywide standards to facilitate efficient interoperability and utilization of KCGIS data and resources.

3.7C.2 GIS Program Overview

There is no dedicated Airport GIS unit. Responsibility for GIS system planning and development falls within the Airport director's office (Administrator IV). GIS technical document management and production is assigned to the Airport Engineering section. Current KCIA internal GIS system support is limited to the WAN Administrator. A GIS intern has been used in the past and one may be used again in 2004. Also, in 2004 the Engineering section will devote as much as 20% of a FTE to GIS activity. Although seven airport employees have received ArcView training, they have relied primarily on the KCGIS Center for support.

In summary, 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.

Types of GIS services used by the Airport include mapping, GIS data development, analysis and maintenance. KCGIS Center staff provides GIS application development.

3.7C.2.1Staffing 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, a GIS intern will provide general and project on-site support. In 2004 the Airport plans to make use of the GIS skills in the Engineering section. All staff are funded from normal airport revenue.

Working Title	Focus	Class	Status	% GIS*
WAN Administrator	WAN and application support		Permanent FTE	10%
Engineer	Engineering, construction management, and technical document management.		Permanent FTE	15%
Administrator	Application development project management and IT planning.		FTE	20%
Records Manager	Tenant information data entry and reporting		TLT	10%
Intern (Potential placement)	Application development and production support		TLT / Intern	50% (20 hrs.)

* Percent of FTE allocated to GIS related activity

3.7C.2.2Budget

The 2004 Proposed budget includes $56,243 for ITS-GIS Development. Funding for the Airport's internal GIS costs is included in the airport's Management, Engineering and Finance and Administration operating budgets or specific project budgets.

3.7C.2.3Training

The Airport relies on the KCGIS Center for the majority of GIS related development work, which has reduced internal training requirements. KCIA has no formal GIS training plan, but anticipates utilizing KCGIS Center for any GIS training needs in 2004.

3.7C.2.4Hardware and Software

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. The KCWAN connection at the airport is very slow. It is hoped that a new airport router will improve system performance in 2004. 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.

At this time all airport GIS data resides on Orca. This data supports one of the airport's critical projects. During 2004 the airport will acquire a new server to support the Maximo work order system. By 2005 a separate server or network attached storage device for GIS data may be required at the airport.

The following table outlines KCIA GIS related software.

Software	Licenses
Arc 8	2
Arcview 3.2	2

The Airport has one HP Designjet CM 1055 plotter available for GIS.

No or limited changes to current Airport GIS hardware or software are anticipated in 2004.

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.

Layer Name	Layer Description	Maintenance and Update Frequency
BUILDINGS	building footprints digitized from imagery	irregularly as needed
LEASEHOLDS	leaseholds digitized from imagery	irregularly as needed
LEASEHOLDS_COGO	leaseholds COGO'ed from legal descriptions in other documentation	irregularly as needed
LEASE_TIELINES	adjunct layer for leaseholds_cogo to define true points of beginning	irregularly as needed
MAP_SOURCE	spatial extent of rectified map imagery	none planned
OWNERSHIP_HISTORY	extents of airport property acquisition in historical context	irregularly as needed
swdbslip4.shp	Surface water drainage basin for Slip 4: digitized from multiple sources, including existing imagery and CAD drawings. Located on Orca.	none planned

3.7C.3.1Data Maintenance

Maintenance of the data layers is provided by the KCGIS Center.

3.7C.3.2Data 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 2004 may include:

- Engineering technical document analysis data to the Oracle database.
- Business and technical document images to the database.
- Hazardous materials and other safety and security data.
- Review, identification and addition of new lease data.
- Utilities.
- Runway, ramp, and access road pavement data.
- Transportation planning data.
- Updated survey and orthographic images and data
- Data/spatial modeling

3.7C.3.3Data Development

Other than development/conversion of new survey, safety/security, operating and infrastructure data, 2004 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.3.4Data 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.

The KCIA spatial applications maintained by the KCGIS Center are described below: Development of the updates to the GIS/Oracle system will entail development of one or more additional spatial applications.

Name	Description	Language
LeaseEdit	Database-driven document management tool for lease information that is directly related to the spatial layers listed above	VB
LeaseQuery	displays spatial information, relates the spatial layers to the document management information and displays maps and reports	VB based ArcGIS

3.7C.4.1Application Enhancement

The airport will continue development of its Information Management system in 2004. 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 2004.

3.7C.4.2Application 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 database 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. Completion of a KCIA front-end interface will be a key goal to leverage airport data development efforts.

3.7C.4.3Application 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 2004, the airport will continue work with the KCGIS Center to ensure that required interfaces are developed to support integration with other airport systems as necessary. Integration with the Airport's new Maximo-based work management system is a key goal.

3.7C.5.1RDBMS 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.5.2Other 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 has purchased the MAXIMO maintenance and facilities management system to replace the current MP2 system.

3.7C.6 Client Services and End-User Support

The airport will use KCGIS Center as required for projects. Airport end users will continue to be a variety of internal staff throughout the division, as well as limited external agencies (FAA, etc.).

3.8 King County Sheriff's Office

Within the King County Sheriff's Office (KCSO), the Research, Planning & Information Services Unit (RP&IS) of the Technical Services Division has primary responsibility for providing GIS services. RP&IS is a multidisciplinary unit with crime analysis being a key responsibility. RP&IS' GIS program vision, mission, and objectives are outlined below.

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 GIS Business Strategy

Three broad categories of KCSO business functions are current or potential users of RP&IS GIS support:

Administrative – These functions are generally related to supporting the department's management decision process and include database management for a variety of public safety related data sources. Some of these have a GIS-specific component, such as various patrol and precinct boundary layers. Other sources are KCSO-specific crime or public safety resource tabular data in a variety of formats, maintained and/or administered for both GIS and non-GIS business functions.

Strategic – These functions relate to GIS and are used to track, analyze, and map crime related incidents, patterns, trends jurisdiction-wide as well as for specific geographies – over time. GIS also plays a role in the analysis and deployment of department resources (personnel, vehicles, patrol routes, etc.) by specific geographic region. A variety of GIS-based maps, analysis, and data help KCSO leadership deploy department assets geographically to maximize public safety impact. This category also includes post-incident use of GIS data and aerial photography for police action analysis and as exhibits for court cases.

Tactical – These functions relate to GIS and other information resources support for real time incident command. They also include immediate preparation and execution of planned surveillance or law enforcement actions. RP&IS has not had the staff or data resources to make an impact in this area in the past. KCSO's planned new Computer Aided Dispatch (CAD) implementation next year will rely on improved GIS data and may increase RP&IS support of tactical functions.

Another key part of the GIS business strategy is support of the Sheriff's Office work for contract cities within King County. Contract city GIS support extends to each of the three business functions outlined above.

Key strengths of the RP&IS GIS program include a core staff of very strong ArcView and CrimeView GIS users, skilled at meeting the mapping and analysis needs of internal customers. RP&IS staff members are not GIS professionals, rather – they are niche users of GIS, with a very strong focus on internal business specific information requirements.

One area in which RP&IS staff lack expertise includes utilizing and customizing "pure GIS" application functionality. While they have some VB and significant SQL skill, RP&IS has not developed "pure GIS" programming ability. For example, data is not moved directly to and from ArcView but rather via SQL 'extracts' into Excel and then into ArcView.

Implementation of a new CAD system during 2004 will provide an excellent opportunity for RP&IS to provide its GIS skills and support for tactical business functions. Optimal CAD implementation will rely on regular updates to the ST_ADDRESS data layer. An adequately maintained ST_ADDRESS should allow RP&IS to abandon use of an old Cobol-based legacy address database. KCGIS' growing portfolio of

imagery resources also provides opportunities for supporting a variety of strategic and tactical business functions.

A key RP&IS GIS-related challenge for 2004 will be to web enable CrimeView and other crime or public safety related data. This objective in itself supports a high level strategic goal of KCSO.

A continuing challenge for RP&IS is to show the value of GIS for Sheriff's Office business needs. While GIS is seen as a tool (and many times a valuable tool), it still isn't viewed as an absolutely essential core technology.

Despite the application niche nature of KCSO GIS activity, cross-agency dependencies are important for current operations and successful future development. Digital orthophotography from KCGIS has become an important data source within RP&IS. The new CAD implementation in 2004 will require accurate and timely updates to ST_ADDRESS. RP&IS is currently helping to enhance KCGIS data reliability by contributing detailed input on ST_ADDRESS data problems into the Q/C loop back to the data maintainer. Looking outward, the RP&IS business strategy is dependent on extensive GIS-related work in support of crime analysis, strategic, and administrative functions for KCSO contract cities.

A major long-term goal of KCSO is to enhance the distribution of agency information via the web, both internally for enhanced business performance and externally to citizens. RP&IS hopes to enhance GIS use by integrating web-mapping functionality into the department's Internet strategy. KCGIS Center's iMap, ParcelViewer, and custom applications are seen as possible tools to support this objective, but there is concern about application functionality and system reliability.

3.8.2 GIS Program Overview

The Research, Planning & Information Services Unit of the KCSO Technical Services Division has primary responsibility for providing GIS services for the King County Sheriff's Office. RP&IS is a multidisciplinary unit with crime analysis being a key responsibility. While KCSO has no personnel with full-time GIS responsibilities, 4.0 RP&IS FTE's are proficient with ArcView 3.2 and use it on a regular basis to support all agency GIS end users. RP&IS analysts also use Crime View, a crime reporting, mapping, and analysis extension to ArcView GIS, developed by The Omega Group.

The RP&IS supervisor coordinates all GIS activity, as well as performing a variety of non-GIS related information technology business functions. For example, RP&IS is also supporting the non-GIS data requirements for the new CAD replacement system. A unique aspect of the RP&IS program is the assignment of GIS support responsibility for a designated geographic region of the county (a precinct) to each of the four ArcView proficient staff. This simplifies communications between field staff (patrol), investigative staff (detectives) and the RP&IS crime analysts. The RP&IS supervisor has specific crime analysis support functions (primarily administrative and major crimes/intelligence-related), performs periodic workload balancing and handles a number of specialized projects.

Types of GIS services provided to end users include mapping, GIS analysis, data development, and limited data maintenance.

3.8.2.1 Staffing Requirements

The RP&IS Supervisor coordinates use of GIS and related technology within KCSO. Currently there are 3 RP&IS crime analysts who are power GIS users. For staffing details refer to the following table:

Working Title	Focus	Class	Status	% GIS*
RP&IS Supervisor	Research/planning, information systems planning & management, supervision	Information Systems Professional V	FTE	10-15%
Crime Analyst	Crime analysis & mapping	Project/Program Manager II	FTE	10-15%

Working Title	Focus	Class	Status	% GIS*
Crime Analyst	Crime analysis & mapping	Project/Program Manager II	FTE	10-15%
Crime Analyst	Crime analysis & mapping	Project/Program Manager II	FTE	10-15%

* Percent of FTE allocated to GIS related activity

3.8.2.2 Budget

RP&IS staffing and operations are funded from the KCSO CX budget, with a portion of funding attributed to revenue derived from contract police services provided to regional jurisdictions. GIS is included as a designated overhead function in typical KCSO police service contracts with local cities.

The connection between GIS service and improved or increased police service is not as clear and compelling as the benefits derived from hiring additional officers or purchasing more field equipment. KCSO funding for KCGIS Center enterprise operations and client services have been subject to particular scrutiny in recent years.

Item	Budget	Comments
Labor Costs (salary + benefits)		
Hardware (acquisition and maintenance)	$6,000	*Requested in 2004 budget process for new plotter and RAM upgrades*
Software (acquisition and maintenance)		
Training costs		
Discretionary (consultants, outside services, materials, etc.)	$1,995	*For Omega Group customer support package*

3.8.2.3 Training

4 RP&IS power users have received adequate ArcView and CrimeView training. KCGIS Center Client Services training has been used as a training source in the past. RP&IS staff will likely receive some CAD training once the new computer aided dispatch system is selected and installed.

3.8.2.4 Hardware and Software

RP&IS connection to the KCWAN provides good service, although recurring web born virus threats are a concern for future network reliability. As use of KCGIS imagery grows, the KCSO LAN limits may impact performance. Because RP&IS GIS based products are often provided to end users in remote Sheriff's Office 'storefront' stations or to contract cities located throughout King County, local network connectivity may hamper service and/or product (JPEG and PDF) delivery. At present though, most map products are provided in hard copy format.

The typical RP&IS desktop computer is a Dell Pentium 4 with 256 MB RAM running Windows 2000.

KCSORPIS is the unit business data server, a Compaq 8000 with dual Pentium 550 MHz processors and a RAID 5 array. *KCSORPIS* serves a variety of RP&IS and KCSO needs, with GIS production and data warehousing being segregated in separate volumes. A shared directory provides RP&IS staff with production access and a separate directory provides read-only access to GIS data, including shapefiles.

KCSO GIS-related software currently in use includes:

Software	Licenses
ArcView 3.2	10*
Spatial Analyst 2.0	4
CrimeView 2.10	4

*Only 4 ArcView licenses are currently in use.

CrimeView is an ArcView/ArcGIS extension that includes a number of query, reporting, analysis, and mapping features to support public safety agency crime analysis procedures, including:

- Queries - by any attribute, geographic boundary, or proximity to a landmark
- Density Maps - standardized density, hot spot maps, repeat calls
- Cyclical Reports - combine and save queries, reports, and graphs to run anytime
- Exception Reporting – create COMPSTAT style comparison reports
- Threshold Alert – be alerted by email when activity thresholds have been reached
- Analyses - crime rate generator, spatial trends

The Omega Group provides contract CrimeView training and implementation support to RP&IS.

RP&IS output device is an HP model 450, 4-pen, 36” format color plotter. Proposed enhancements for 2004 (subject to budget approval) include a new HP plotter and RAM upgrade for each RP&IS desktop computer to enhance staff productivity via faster ArcView/CrimeView processing speed.

3.8.3 Spatial Data

RP&IS does not currently maintain enterprise GIS data. KCSO-maintained district, precinct, and patrol boundary shapefiles may be provided to the KCGIS spatial data warehouse in the future if an enterprise need for the data is established, and if RP&IS receives training/support on appropriate data posting procedures and processes.

In addition to shapefile polygon data referred to above, RP&IS also maintains shapefile point data for a number of specific categories/themes for internal business functions. Other business-specific tabular data sources include computer aided dispatch information, follow-up/investigative data, and registered sex offender information. KCSO and RP&IS are very much involved in regional information sharing with other law enforcement agencies. Appropriate data from these agencies is utilized as it becomes available.

As referred to earlier in this document, future KCSO implementation of a new computer aided dispatch system is currently planned to rely on ST_ADDRESS. RP&IS plans to work with the KCGIS Center to define appropriate ST_ADDRESS update cycles. RP&IS is currently providing data accuracy and update feedback to the designated ST_ADDRESS data maintenance agency to support a viable Q/C process.

3.8.3.1 Data Maintenance

Data warehoused on *KCSORPIS* is backed up on a regular schedule.

3.8.3.2 Data Enhancement

KCSO would benefit greatly from improved accuracy and completeness in the KCGIS street network data to support planned CAD system replacement in 2004. KCSO and the KCGIS Center are collaborating to update and keep the ST_ADDRESS layer current. An upgraded ST_ADDRESS will allow RP&IS to discontinue use of a legacy address database.

3.8.3.3 Data Development

No new internal KCSO GIS data development is currently planned.

3.8.3.4 Data Metadata

KCSO does not currently maintain metadata documentation for agency GIS data.

3.8.4 Spatial Applications

No GIS applications are currently maintained by KCSO.

To support the Sheriff's Office strategic goal of utilizing the Internet for improved agency data dissemination, future web-based GIS applications may be possible. A likely application would be a web site to provide the public with basic crime location information. This could potentially be based on a web-enabled version of CrimeView.

A custom ArcIMS-based sex offender application was developed in 2002 for RP&IS by the KCGIS Center. This application is ready to be deployed, but has been delayed due to RP&IS concerns about ease of application use by typical external web site users.

3.8.4.1 Application Maintenance

The RP&IS GIS program has no activity in this area.

3.8.4.2 Application Enhancement

The RP&IS GIS program has no current activity in this area.

3.8.4.3 Application Development

The RP&IS GIS program has no activity in this area.

3.8.4.4 Application Documentation

The RP&IS GIS program has no activity in this area.

3.8.5 System Integration

GIS is a niche application within RP&IS' wider realm of responsibilities to support public safety-related data maintenance and crime analysis for KCSO. RP&IS utilizes a variety of internal data sources to support the use of GIS based maps for administrative and crime analysis functions. Significant integration of GIS into other KCSO data management technologies is not planned. The lone exception being the new CAD system that will make more direct use of GIS-based data sources (ST_ADDRESS).

3.8.5.1 RDBMS Backend Support

Primary agency specific business data sources are managed in SQL Server or Oracle, supported by RP&IS or other KCSO staff. RP&IS runs Oracle version 6, which is out of maintenance and unsupported by Oracle. Oracle data are typically converted to SQL Server for use. RP&IS reliance on Oracle will be phased out with full implementation of the new CAD system. There are also isolated instances of stand-alone data sources. RP&IS tries to consolidate such sources as opportunities arise.

3.8.5.2 Other Data Management Activity

The RP&IS GIS program has no activity in this area.

3.8.6 Client Services and End-User Support

RP&IS provides the following types of client services to a variety of business end users:

- Custom map product development
- Custom data development (non-GIS)
- Crime statistics and analysis
- End-user training

The client list includes KCSO Field Operations Division (patrol) and Criminal Investigations Division (major crimes), 13 contract cities and numerous other law enforcement agencies.

GIS-related work for contract cities is a very high priority because over 40% of KCSO work is in support of this important customer base. On occasion assignments are reprioritized to respond to very high priority politically driven GIS work. Normally though, clients are encouraged to work with individual RP&IS crime analysts directly, based on the geographic location of the requestor and the individual analyst's assigned area of responsibility.

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 GIS Business Strategy

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 Staffing Requirements

The Council has one GIS Coordinator, 15 percent of whose time is devoted to this function. 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.

Title	Focus	Class	Status	% GIS*
Legislative Analyst II	Assist staff with GIS, act as liaison with GIS community	7035	FTE	15%

3.9.2.2 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.

3.9.2.3 Training

Council staff utilizing GIS participate in training offered through the KCGIS program. Anticipated training needs for 2004 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 2004. The Council pays for GIS training with resources from its general training fund. There is currently no in-house training of GIS end-users.

3.9.2.4 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 2004. The Council utilizes the KCGIS Spatial Data Warehouse for its data needs, and does not store GIS data locally.

Software	Licenses
ArcView 3.2	2

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 Data Maintenance

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.3.2 Data Enhancement

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.3.3 Data Development

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.3.4 Data 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 Application Maintenance

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.4.2 Application Enhancement

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.4.3 Application Development

The GIS program for the Metropolitan King County Council does not include activity in this area.

3.9.4.4 Application 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 End-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 mission is to develop, administer and monitor the annual operating budget and capital improvement program, and perform related tasks. The Budget Office, with approximately 40 FTEs, provides broad budget-related policy and fiscal direction analysis for King County government. OMB also monitors compliance with the adopted Budget and performs related information functions.

OMB operations require organizational flexibility to support major countywide priorities during preparation of the County Executive's proposed budget. For example, a key focus of the proposed 2004 budget will be the governance transition initiative to accelerate municipal annexation and incorporation of all defined Potential Annexation Areas (PAA's) within the urban growth area. This initiative will have a potentially profound impact on the future geographic organization of municipal services within King County. OMB has formed a special Governance Transition Team, which will rely on GIS to support this initiative.

Budget Office GIS activity supports a subset of specialized business functions for which GIS based maps and analysis can improve agency effectiveness. Staff to handle ad-hoc requests for GIS services are concentrated in the Budget Office Growth Information Team, reporting directly to the OMB Director. The Budget Office economist is also a trained GIS user.

3.10.1 GIS Business Strategy

The Growth Information Team provides internal GIS support for OMB business functions (see below). The core business functions of the Budget Office, for which current and potential future GIS support is provided, include:

Operating Budget – The primary business 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. GIS support is peripheral to this function and occurs most frequently when questions arise regarding the spatial distribution of budgeted county resources or the location of various government service recipient communities. Mapping and analysis of the operating budget impact of governance transition within PAA's should be a frequent GIS activity into 2004.

Capital Improvement Program – OMB also 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. An annual CIP map is prepared to document proposed project locations as part of the budget. Mapping and analysis of the CIP budget impact of governance transition within PAA's should also be a common GIS activity into 2004.

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. GIS use for this function is rare.

Governance Transition Team – This group analyzes annexation and incorporation of all PAA land within the Urban Growth Area and assists cities in providing urban services. GIS is a key tool to help decision makers analyze the budget impact of options with a spatial component and to negotiate efficient service delivery relationships between cities and other jurisdictions.

Growth Information Team (GIT) – The GIT is comprised of three staff. One serves half-time as the OMB GIS analyst. GIT prepares supporting data and documents about growth issues in King County including construction, land development, demographics, and economics. Standard 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 a core tool, used by GIT for research, analysis, spatial display of County growth trend information, and to provide public information on growth management issues. GIS is also used to respond to up to 2,000 ad hoc data requests from the

Executive and other Executive offices including Business Relations and Economic Development, the Council, County departments, local cities, businesses, media and the public. Among these requests are many for spatial and tabular County census data.

Economic Forecasting – This function produces revenue and economic forecasts for King County and unincorporated King County. The lead economist is a GIS user.

Key strengths of the OMB GIS program include two proficient GIS users within GIT (including one specifically allocated half time to GIS work), plus a supervisor who is an active user of GIS products and a strong supporter of GIS technology. The GIT supervisor reports directly to the Budget Director, who views GIS as an effective tool to improve the budget development process. Another strength is location of the OMB GIS customer base in close proximity to GIT staff. The GIS capability of the OMB economist helps demonstrate the value of the technology and minimizes some of the GIS workload within GIT.

Weaknesses include limited staff resources. The second trained GIT staff has no designated time available for providing GIS support. The GIT supervisor has only limited understanding of GIS. Despite the small office size, GIS software use is split between ArcGIS8.3 and ArcView 3.3.

Future opportunities include greater use of GIS by budget analysts to improve the operating and CIP budget development processes. Also, ArcGIS training for the GIT supervisor could aid more effective integration of the technology into OMB business functions. A challenge for the OMB GIS program is its location within the County Executive's office. This proximity often results in high priority but ad-hoc GIS service requests that divert GIS capable staff from core OMB business functions.

Cross agency activity is an important component of the OMB GIS program. GIT receives periodic requests for analysis from every County department. Requests for GIS data from external agencies (for example, current interest by local jurisdictions in County GIS maps and data related to PAA's) are sometimes a significant distraction from GIT's core business. GIT will investigate transferring some of this interagency contact to the KCGIS Center as part of their responsibility to provide 'single point of contact' for external GIS service requests. OMB's GIS program is also highly dependent on data from many external sources for its GIS program. Typical external sources include the US Census Bureau, local cities, the Suburban Cities Organization, PSRC, State and Federal agencies, and the UW Urban Sim project.

The OMB GIS program derives continuing value from active participation in KCGIS, including participation in the KCGIS Technical Committee. OMB hopes to increase future data sharing via the KCGIS Spatial Data Warehouse, both as a data provider and user.

3.10.2 GIS Program Overview

OMB's GIS work program is integrated into the Growth Information Team's work plan as support to all on-going OMB activity. GIS is centered in the GIT because of the variety of products (Annual Growth Report, Benchmark Report, Affordable Housing Bulletin) and research/analysis responsibilities (demographics, growth management, buildable lands) of GIT that have a strong geographic analysis/mapping component. None of GIT's 3 FTE's has full time GIS responsibility, although two are trained GIS end users.

The GIT supervisor is responsible for section activity, but most GIS work goes directly to the GIS Analyst, who prepares ad-hoc maps, analysis, or GIS projects upon request by internal OMB staff. Request for more complex services are referred to the KCGIS Center. OMB also develops PAA profile data and maintains buildable lands data, AGR maps, and residential plat record geocoding.

OMB's GIS customer base is remarkably broad for an operation of its size. Customers include staff from every agency within King County, as well as from local jurisdictions, business, and the media. Requests are not uncommon from remote jurisdictions, research agencies, and media nationally, and occasionally from overseas. Requests fall into two broad categories: agency decision makers typically request answers to specific questions which can be met with a map or a numerical response; while planners, researchers, and analysts usually want data and map coverages with which to do their own unique analysis.

3.10.2.1 Staffing Requirements

The OMB Growth Information Team staffing model is unchanged from 2003. The GIT supervisor has 0.5 FTE dedicated for GIS plus another staff person who knows ArcView and acts as a back- up for the GIS Analyst. For staff assignment details refer to the following table:

Working Title	Focus	Class	Status	% GIS*
Analyst/GIS Coordinator	Data Analysis	Program-Project Manager II	FTE	50%
Benchmark Program Coordinator	Report Project Management	Program-Project Manager II	FTE	10%

* Percent of FTE allocated to GIS related activity.

The current OMB GIS staffing allocation should remain unchanged for the foreseeable future.

3.10.2.2 Budget

GIS is not a separate line item within the Growth Information Team budget. GIT operations are funded from the OMB CX-based budget. Funding for GIS related hardware, software, and training is difficult. The budget for discretionary GIS services was reduced from $32,500 in 2003 to $21,000 for 2004.

OMB's 2004 budget share for KCGIS Center enterprise operations (O&M) is $21,890. OMB GIS budget detail is outlined below:

Item	Budget	Comments
Labor Costs (salary + benefits)	$36,000	Approximate labor cost for dedicated 0.5 FTE GIS analyst
Hardware (acquisition and maintenance)	$360	Assume half of GIT section office supplies budget for GIS maintenance supplies
Software (acquisition and maintenance)	$0	No known software budget
Training costs	$900	Approximately 50% of GIT's $1,800 training budget is allocated for GIS - allowing about one course per year for the GIS analyst
Discretionary (consultants, outside services, materials, etc.)	$21,000	Discretionary budget for KCGIS Center client services.

3.10.2.3 Training

OMB's GIS 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 increased training in 2004.

The GIT GIS analyst has benefited from attendance at the annual ESRI user conference to stay current with latest technology and GIS capabilities. The GIT supervisor would benefit from GIS training tailored for decision makers, as well as introduction to ArcGIS training.

3.10.2.4 Hardware and Software

OMB has experienced periodic problems emailing large files of GIS data or products, because of OMB's own software and hardware limitations. ArcMap is perceived as slow and there have been hardware and network performance problems with processes run on the KCGIS server *WILDFIRE*. In 2004, OMB staff will work with GIS Center staff to address these issues.

The typical GIT desktop computer is a Master Computer Pentium 3 with 512 mb RAM, running in Windows XP at 805 mHz.

OMB utilizes a shared directory on the ITS enterprise server *ITS-FARM* for common data and project storage.

OMB GIS software currently in use includes:

Software	Licenses
ArcView 3.3	2
ArcGIS 8.2 (used by OMB GIS Analyst)	1
ArcGIS 8.2 (used by OMB lead economist)	1
Spatial Analyst for ArcView 3.3	1

OMB hopes to upgrade one ArcView license to ArcGIS in 2004, for the backup GIS analyst.

The primary output device is an HP Designjet 2800CP. A small EPSON color printer has been used occasionally when small working drafts are needed.

3.10.3 Spatial Data

OMB has not developed and maintained any primary KCGIS coverages in the past. OMB is responsible for the creation of some GIS data which reside and are maintained on *ITS-FARM.* A key goal for 2004 will be to begin to provide appropriate OMB GIS data files to the Spatial Data Warehouse as KCGIS enterprise data.

The Budget Office makes use of coverages available in the KCGIS Spatial Data Warehouse to prepare maps and analyze growth management and budget issues. They create, plot and maintain shapefiles and maps derived from other departments' coverages. OMB relies heavily on the KCGIS Center and other King County departments for development, maintenance and enhancements of the spatial data used.

3.10.3.1 Data Maintenance

In 2003 no OMB GIS data were posted to the KCGIS Spatial Data Warehouse. The following tables reflect OMB's 2004 goal to provide appropriate data to KCGIS for enterprise use. We intend to post REC-LOTS and NEWUNITS annually thereafter. OMB will continue to maintain other data for internal agency use only.

Enterprise Data (To be posted to KCGIS Spatial Data Warehouse beginning in 2004)

Data Name	Data Description	Update Frequency
URB-V&R	King County Vacant and Redevelopable Urban Land - Analysis as defined by the Buildable Lands Amendment to Growth Management Act per state mandate. Derived from: • Parcel • Assessor's Database • Parks And Open Space • Sensitive Areas	Update due in 2007 per state mandate. The update work is planned for 2006.
KC-MIC	King County Manufacturing and Industrial Center Boundaries – Maintained on behalf of BRED. Responsibility for this dataset may move to DDES. Derived from: • City of Seattle • City of Kent • City of Tukwila	As needed.

Data Name	Data Description	Update Frequency
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
PAA	Potential Annexation Areas. Derived from various urban growth boundaries.	As needed
MAJOR-PAA	Major Potential Annexation Areas. Derived from various urban growth boundaries.	As needed
SUBAREAS	Four broad sub-areas of Urban-designated King County	As needed

3.10.3.2 Data Enhancement

A major goal for OMB in 2004 will be the migration of designated agency GIS data to the KCGIS Spatial Data Warehouse. This effort will include creating appropriate metadata for the KCGIS Spatial Data Catalog.

3.10.3.3 Data Development

OMB plans no development of new GIS data for 2004. 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 KCGIS on this subject.

3.10.3.4 Data Metadata

OMB does not currently maintain metadata. In 2004, metadata will be developed for the key data layers to be posted to the KCGIS Data Warehouse.

3.10.4 Spatial Applications

The OMB GIS program has no current activity in this area.

3.10.4.1 Application Maintenance

The OMB GIS program has no current activity in this area.

3.10.4.2 Application Enhancement

The OMB GIS program has no current activity in this area.

3.10.4.3 Application Development

The OMB GIS program has no current activity in this area.

3.10.4.4 Application Documentation

The OMB GIS program has no current activity in this area.

3.10.5 System Integration

The key OMB budget preparation system, Essbase, is now used exclusively in the Budget Office. After a bumpy start, Essbase is working well, but it does not have any spatial component. There exists a potential for future integration of GIS into Essbase to enhance the geographic aspects of the budget preparation process. In 2004, OMB will explore closer links between the budgeting system and GIS capability.

3.10.5.1 RDBMS Backend Support

MS Access is used for download of MLS data. Demographic data are often compiled in MS Excel.

3.10.5.2 Other Data Management Activity

OMB is often involved in acquiring and processing data from other outside agencies. For example, U.S. Census Bureau data are an important source for the Growth Information Team and Washington Department of Revenue tax data supports the lead economist's GIS-based analysis of the revenue impact of future annexation for each potential annexation area. Typically outside data resources require processing before they are fully usable by OMB staff.

3.10.6 Client Services and End-User Support

GIS is a key tool used by GIT staff to help respond to as many as 2,000 ad-hoc information and data requests each year. Approximately 50% of GIT's customer base is from internal King County agencies. An additional 25% is from other local government agencies, and 25% from the private sector.

Maps and GIS based analysis are the most common services provided. Maps to accompany the County's Annual Growth Report (AGR) and periodic Benchmark Report (BR) are recurring projects. The AGR and BR maps are also posted to the web in PDF format each year.

Requests can go to any of the GIT staff, with the supervisor informally establishing priorities and balancing workload. GIS projects are generally done on a first in, first out basis, but this pattern can be interrupted by high priority work for County leadership.

4 Appendices

The appendices in Section 4 provide additional information for the KCGIS governance committees (4.1 and 4.2), as well as a glossary of definitions for potentially unfamiliar terms and acronyms that appear in this document (4.3). Also provided are summary combined tables for enterprise spatial data (4.4.1) and for GIS applications (4.4.2), information that is presented in separate agency-based formats in Section 3. The annual GIS task list that has been included with this document in the past is now separately maintained. A copy of the 2004 task list can be found in the KCWAN Public Folders at Public Folders / All Public Folders / Inter-Agency / GIS / GIS Technical Committee / O&M Workgroup / 2004 / Tasks.

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 recent membership history for the committee and the committee's current charter.

4.1.1 Membership History

2004 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	Terry Denend	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

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 Terry Denend	Jan-Jun Jul-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

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 recent membership history for the committee, the committee's current charter, and objectives statements and activity reports for the committee's work groups.

The KCGIS Technical Committee publishes its agendas, minutes, quarterly reports, and other documents to the Public Folders on the KC WAN, which are 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

2004 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	Dave Wilson	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 Transportation	Road Services	Michael Kulish	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
Sheriff's Office	--	Jim Hilmar	Jan-Dec

***** Chair
****** Vice-Chair

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

Agency	Sub-Agency	Representative	Term
Environmental Services			
Dept. of Executive Services	Office of Emergency Management	Khalid Khan	Jan-Dec
Dept. of Executive Services	Records, Elections and Licensing	Harry Sanders Dave Wilson	Jan-Sep Oct-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 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
Sheriff's Office	--	Jim Hilmar	Jan-Dec

***** Chair
****** Vice-Chair

4.2.2 Charter

King County
GIS TECHNICAL COMMITTEE
January 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 work groups to address technical and programmatic issues. The KCGIS Technical Committee currently has three such work groups (Best Practices, Cartographic Standards, and Operations and Maintenance). Work groups are given clear objectives by the KCGIS Technical Committee, in order to focus and guide the group's 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.

Best Practices Work Group members are authors and maintainers of the "Best Practices for GIS Within King County" document. Changes to the Best Practices are subject to approval by the Technical and Oversight committees. See http://www.metrokc.gov/gis/kb/Content/BestPractices.htm for the complete text of the current version of this document.

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.

Cartographic Standards Work Group members are authors and maintainers of the "GIS Cartographic Standards" document. Changes to the Cartographic Standards are subject to approval of the Technical and Oversight committees. See http://www.metrokc.gov/gis/kb/Content/CartoStandards.htm for the complete text of the current version of this document.

4.2.3.3 Operations and Maintenance

Objectives Statement:
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.

With the publishing of this document the work group has completed the "2004 King County GIS Production Operations and Maintenance Plan". In the later half of 2004 the work group will begin efforts to draft the 2005 GIS operations and maintenance plan. See http://www.metrokc.gov/gis/kb/Content/OandM.htm for the complete text of the most recently published version of the KCGIS operations and maintenance plan.

4.3 Glossary

▪

.NET

Microsoft published set of software technologies used to develop small building-block applications that can connect to each other as well as to other, larger applications over the Internet. Used with various programming languages such as Visual Basic and Active Server Pages. See also listings for VB and ASP.

A

Accuracy

The degree to which data represent the real world whether it regards geographic location or attribute.

Agency Data

Data primarily for internal use by the King County agency being discussed, typically not shared with other agencies and not posted in the KCGIS Spatial Data Warehouse.

AIRS Form

A form required for the processing of monetary inter-fund transfers between King County budget units.

ALI

Automatic Location Identifying

A feature by which information is provided to a public safety answering point identifying the location, the latitude and longitude of a call to a public safety answering point.

AML

Arc Macro Language

AML is an interpreted macro (script) language which translates and executes ESRI Arc/INFO commands.

APC

Automatic Passenger Counting

An information system used by Transit to collect, process, summarize, publish, and manage daily ridership counts.

Arc/INFO or ArcInfo

ESRI published GIS software. Used extensively by GIS programs within King County. Significant changes where introduced between ArcInfo 7.x and ArcInfo 8.x. Versions before 8.0 are sometimes referred to as "workstation". Versions after 7.0 use an entirely new data structure.

Arc8.x or Arc9.x

ESRI published GIS software. See listing for Arc/INFO.

ArcGIS

ESRI published GIS software. See listing for Arc/INFO.

ArcIMS

Internet Map Service

ESRI published software solution for distributing mapping and GIS data and services on the Web.

ArcObjects

ESRI published collection of software components with GIS functionality and programmable interfaces, based on the COM protocol. Often used with Visual Basic.

See also listing for VB.

ArcSDE

Arc Spatial Data Engine

ESRI published software solution for storing Geographic data in a RDBMS.

ArcView

ESRI published GIS software. Used extensively by GIS programs within King County. Significant changes where introduced between ArcView 7.x and ArcView 8.x.

Versions before 8.0 are a based on a unique code base. Versions after 3.0 are a limited functionality version of ArcInfo 8.x. See listing for ArcInfo.

ASP

Active Server Pages

Microsoft published scripting language used to create web pages. The scripting is stored and executed on the server hardware. See also .NET listing.

Author

Person or organization responsible for collecting and/or encoding data into a GIS readable format.

Avenue

An object oriented scripting language for ArcView 3.x or earlier.

AVL

Automatic Vehicle Location

An information system with an interactive graphic map display used by Transit coordinators to track revenue coaches and manage service in near real time.

B

Back End

The portion of a computing environment dealing with Servers and information system that the End User does not deal with directly.

Benthic

The collection of organisms living on or in the sea or lake bottoms.

Best Practices

See section 4.2.3.1 for a detailed discussion of the term's meaning in the King County GIS context.

Buffer

A type of GIS analysis that calculates the area within a given distance from a set of geographic features.

C

CAD (1)

Computer Aided Drafting

A computer system used to create detailed measured drawings. Used for Architectural, Engineering, and other plans.

CAD (2)

Computer Aided Dispatch

A computer system used to aid in the dispatch of emergency vehicles to respond to incoming calls.

Cadastral

A public record, survey, or map of the value, extent, and ownership of land as a basis of taxation.

Cadastral Base

Layer depicting the extent and ownership of land parcels.

CARS

Citizen Action Requests

Reports from Citizens in King County regarding drainage problems.

CARTS

Citizen Action Request Tracking System

A computer system used to track CARS.

CASE

Computer Aided System Engineering

See listing for ESRI CASE extension.

CIP

Capital Improvement Program

A portion of the King County budget containing capital construction projects, often including a list of projects to be financed and constructed over a 6-year period. Each project includes one or more of the following elements: acquisition of a site and/or existing structure, program or site master planning, design and environmental analysis, design, construction, major equipment acquisition, reconstruction, demolition or major alteration of a capital asset.

Client

Any person or organization that is receiving GIS services.

Clustering

Linking together two or more computers to work together on performing functions.

COGO

Coordinate Geometry

COGO is a command structured problem oriented language and computer program for the solution of geometric problems.

COMPSTAT

A crime analysis and police management process developed by the New York City Police Department.

Conflation

The process of transferring attributes from one source spatial dataset to another target spatial dataset. Typically the geometry of the target is more complete or more accurate than the source, but it is often missing required attributes that exist in the source.

Coverage

A specific data format used for GIS layers native to Arc/INFO version 7.x and earlier.

CRIS

County Road Inventory System

CRPP

Cultural Resources Protection Project

A countywide integrated system for documenting, assessing and treating cultural resources. Designed to provide a more efficient compliance with federal, state and local cultural resource law, and expedite transportation projects.

Currency

The degree to which data represent the real world as it exists at the most recent moment in time.

Currentness

See listing for Currency.

Customer

Any person or organization that is receiving GIS services.

CX

Current Expense

The county's Current Expense fund; provides budget for various programs and departments that do not have their own revenue streams.

D

Data Development

Creating a data set from scratch.

Data Maintenance

The process of tending to a data layer as it ages: updating attributes that change; correcting errors that are identified; assuring data integrity; migrating to new data formats as necessary; etc.

Data Modeling

A conceptual representation of the data structures that are required by a database implementation. Data structures include the data objects, the associations between.

data objects, and the rules which govern operations on the objects.

Data Owner

See listing for Data Steward.

Data QC

Data Quality Control

A process for maintenance of standards of quality for data layers.

Data Set

One or more tables or spatial layers together with their metadata.

Data Stakeholder

A client or other party who relies on GIS data for the business functions of their organization.

Data Steward

The person responsible for the maintenance of a data set who controls content, currency, and access to that data set.

Data Stewardship

Maintenance of a data set's content, currency and access permissions.

Data Warehouse

A computer storage system used to make data available to a wide range of users. Often used to refer to the KCGIS Spatial Data Warehouse. See listing for KCGIS Spatial Data Warehouse.

Database Administrator

The person who provides access to data, and moderates content, structure and location of data.

DBA

Database Administrator

See listing for Database Administrator.

DCHS

Department of Community and Human Services

King County Department.

DDES

Department of Development and Environmental Services

King County Department.

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.

Derivative

A data set created as a subset or modification of an existing data set.

DES

Department of Executive Services

King County Department.

Digitize

The process of capturing data, as recorded from direct observation or from non-computerized data products, for use with a computer system.

DMS

Data Management System

See listings for SafetyDMS and SecurityDMS.

DMZ

De-Militarized Zone

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

King County Department.

DNRP GIS Unit

A functional unit of DNRP that provides GIS services to internal clients.

DOCTOOL

A KCGIS enterprise application used by data stewards for creating and maintaining metadata for enterprise data layers.

DOT

Department of Transportation

King County Department.

DPH

Department of Public Health

Merged Seattle & King County Department.

Dynamic Segmentation

The ability to compute the locations of events at run time of linear features. The segmentation points are not stored in the geometry of the coverage – they are derived when needed.

E

EH

Environmental Health

A division of the Seattle & King County Public Heath Department.

EMS

Emergency Medical Services

A division of the Seattle & King County Public Heath Department.

End User

See listing for GIS User.

Eng

Engineer

King county employee Classification.

Enterprise Data

Data shared with other agencies, and posted in the KCGIS Spatial Data Warehouse.

EOC

Emergency Operations Center

A facility used to coordinate public services and information during an emergency situation.

EPE

Epidemiology, Planning and Evaluation

A division of the Seattle & King County Public Heath Department.

ESA

Endangered Species Act

A federal statute originally passed in 1973 to provide for the designation and protection of invertebrates, wildlife, fish, and plant species that are in danger of becoming extinct, and conserve the ecosystems on which such species depend.

ESRI

Environmental Systems Research Institute

A vendor of GIS tools and applications used widely by King County GIS staff.

ESRI CASE extension

Computer Aided System Engineering

Computer Aided System Engineering tools, used to assist in application development with ESRI products.

F

FEMA

Federal Emergency Management Agency

US government agency devoted to response to catastrophic emergencies.

FGDC

The Federal Geographic Data Committee

An interagency committee, organized in 1990 that promotes the coordinated use, sharing, and dissemination of geospatial data on a national basis.

FIRS

Facility Information Retrieval System

A computer system used by King County DNRP Wastewater Treatment Division.

Front End

The portion of a computing environment that the End User interacts with directly.

FTE

Full-Time Equivalent

Representing a single full-time employee.

G

GASB

Governmental Accounting Standards Board

Organization whose mission is to establish and improve standards of state and local governmental accounting and financial reporting.

Geocoding

The process of processing addresses in a GIS to provide a corresponding geographic data point.

Geodatabase

A specific data format used for GIS layers native to ArcINFO version8.x and later.

GIS

Geographic Information System

A collection of computer hardware & software tools used to enter, edit, store, manipulate, and display geographically referenced data.

GIS Center

See listing for KCGIS Center.

GIS Oversight Committee

The KCGIS Oversight Committee is responsible for guiding the direction of the KCGIS program. See section 2.2 for a detailed discussion.

GIS Power User

An individual who uses GIS at an intensive level but whose main function in the County is not the creation, maintenance, and analysis of GIS data.

GIS Professional

An individual whose main function in the County is the creation, maintenance, and analysis of GIS Data.

GIS Technical Committee

The KCGIS Technical Committee is responsible for developing standards, coordinating work programs, and addressing programmatic issues for the KCGIS program. See section 2.3 for a detailed discussion.

GIS User

An individual who uses GIS to any degree but whose main function in the County is not the creation, maintenance, and analysis of GIS data.

GLO

Government Land Office

GPS

Global Positioning System

A system of satellites, computers, and receivers that is able to determine the latitude and longitude of a receiver on Earth by calculating the time difference for signals from different satellites to reach the receiver.

GUI

Graphical User Interface

An interface for issuing commands to a computer utilizing a pointing device, such as a mouse, that manipulates and activates graphical images on a monitor.

GWMA

Groundwater Management Areas

Administrative Areas of King County designated by WLRD for the purpose of managing ground water.

H

HPP

Historic Preservation Program

HRI

History Resource Inventory

An ongoing survey of historic resources resulting in an inventory of over 1300 properties.

I

Integrity

The measure of data that indicates its usable condition.

Internal Service Fund

A King County agency that provides services to other King County agencies. The funding for an internal service agency is provided by those other King County agencies.

Intranet

A linked network among King County agencies, that is not available to the larger Internet.

ISA

Information Systems Analyst

A King County Job Classification.

ISP

Information Systems Professional

King county employee Classification.

IT

Information Technology

The development, installation, and implementation of computer systems and applications.

K

KCEGIS

King County Elections GIS

A functional unit of Records & Elections Division of DES that provides GIS services to accommodate the election process.

KCGIS

King County GIS

See section 2 for a detailed explanation of the King County GIS program.

KCGIS Center

King County Department of Natural Resources and Parks group that works with the KC 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.

KCGIS Oversight Committee

See listing for GIS Oversight Committee.

KCGIS Spatial Data Warehouse

A central repository of GIS data that is maintained by various agencies within King County, as well as other entities, for the purpose of common access.

KCGIS Technical Committee

See listing for GIS Technical Committee.

KCIA

King County International Airport

A functional unit of KC DOT. Also known as Boeing Field.

KCSO

King County Sheriff's Office

King County Department.

KCSORPIS

King County Sheriff Office's Research, Planning and Information Services Unit.

L

LAN

Local Area Network

A system that links together electronic office equipment, such as computers and word processors, and forms a network within an office or building.

Layer

A collection of geographic data objects that represent one particular characteristic for a specific spatial extent.

LIMS

Laboratory Information Management System

A large database and access tools for the King County Department of Natural Resources and Parks.

M

Matrix Management structure

A management structure in which two or more supervisors share the responsibilities of management of the same people or groups.

Matrixed

See listing for Matrix Management.

Metadata

Definitional data that provide information about or documentation of other data managed within an application or environment.

MLS

Multiple Listing Service

A means by which real estate agents are informed of the properties offered for sale by other agents.

MMS

Maintenance Management Systems

A computer systems used to assist in the planning, scheduling, and tracking of maintenance work.

Mount Point

An established starting point (path) for directory browsing.

MS SQL Server

Microsoft Relational Database Management System.

Multispectral Imagery

Images obtained simultaneously in a number of discrete bands (specific section) of the electromagnetic spectrum.

Mylars

Thin strong polyester film used primarily for ink-drawn maps and graphics.

N

NAS

Network Attached Storage

Hard disk storage that is set up with its own network address rather than being attached to the file server.

NIES

A former Western Washington mapping group, now the US office of Triathlon that provides photogrammetry services and digital orthophotography products to many Puget Sound organizations.

NPDES

National Pollutant Discharge Elimination System

Program under the U.S. Environmental Protection Agency that controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

O

O&M Plan

Operations and Maintenance Plan

Describes how the KCGIS program will be administered and operated.

OCR

Office of Cultural Resources

Functional unit of King County government.

ODBC

Open Database Connectivity

A standard method of sharing data between databases and other programs. ODBC drivers use the standard Structured Query Language (SQL) to gain access to data stored in a RDBMS.

OEM

Office of Emergency Management

Functional Unit of DES.

OMB

Office of Management and Budget

King County's budget office.

Oracle

A RDBMS software application.

Originator

See listing for Author.

ORPP

Office of Regional Policy and Planning

King County organization disbanded at the end of 2002, with many functions including GIS distributed into the Budget office.

Orthoimagery

A remotely-sensed digital picture, stored in a raster data format.

Oversight Committee

See listing for GIS Oversight Committee.

P

ParaTransit

See section 3.7B.1 for a detailed explanation of ParaTransit

PDF

Portable Document Format

Computer document format that is well suited for distributing documents with complex formatting, used extensively by KCGIS for map distribution.

PIN

Parcel Identification Number

Unique ten digit numeric identifier for real property within King County.

PLSS

Public Land Survey System

A system established in 1785 by the Federal Government, providing for surveying and describing land by reference to principal meridians and base lines. Also called the rectangular or government survey.

POCA

Public Land Survey, Ownership, County, and Administration boundaries

An office of the Washington State Department of Natural Resources.

Poster

The person responsible for the publication of a data set to the data warehouse.

Production data

Data which are as current and accurate as possible and suitable for, use on an enterprise-wide level.

Production Environment

A computing environment available to multiple users, tested and stable for daily use.

Project Data

Data sets created or developed for specific projects which may not be suitable for broader purposes.

PSAFI

Park Site and Facilities Information

PSAP

Public Safety Answering Point

Location where E911 calls are received.

PSRC

Puget Sound Regional Council

An association of cities, towns, counties, ports, and state agencies that serves as a forum for developing policies and making decisions about regional growth and transportation issues in the four-county central Puget Sound region.

P-Suffix

A property-specific zoning or land-use condition that is applied to a parcel or a group of parcels.

Public

Accesses data in the warehouse without authentication and typically has extremely limited privileges.

Public Library

Data housed on a central server that is accessible to all of King County government, the contents of which are accessible according to privileges assigned by data.

stewards.

Public Server

A computer system that is accessible to all of King County government, the access to which is assigned by the DBA.

Publisher

See listing for Poster.

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.

Q

Qualified Technician

An individual who has been adequately trained in the installation/maintenance of the hardware, software, database, or applications.

R

RAID

Redundant Array of Independent Disks

A strategy for organizing physical disks for a server.

Raster

A type of computer graphics that is specified by a grid of columns and rows of values that are arrayed to form an image.

RCW

Revised Code of Washington

The compilation of all permanent laws now in force in the State of Washington.

RDBMS

Relational Database Management System

A program that allows users to create, update and administer a relational database.

REALS

Records, Elections and Licensing Services

A division of DES.

RECDNET

Record Network

Abbreviation for the King County cadastral base GIS layer.

RID

Road Improvement District

A method allowed under Washington State Law to pay for the cost of road improvements that provide a special benefit to adjacent property. All the property owners pay for the project, usually over 10 to 20 years.

RP&IS

Research, Planning & Information Services

A functional unit of KCSO.

RSD

Road Services Division

A division of KC DOT.

S

SafetyDMS

Safety Data Management System

An application for recording and tracking bus accidents and transit operator safety records.

SAN

Storage Area Network

A high-speed communications network optimized for storage.

SAO

Sensitive Areas Ordinance

King County ordinance governing the allowed development activities within a significant impact threshold of environmentally sensitive area.

SCSI

Small Computer System Interface

A standard for computer system communication. Generally used by the KCGIS program for server computers to communicate with high performance, high reliability, hard disk drives.

SDE

Spatial Database Engine

See listing for ArcSDE.

SecurityDMS

Security Data Management System

An application for recording and tracking incidents that occur on or around transit coaches.

SF1 (SF2, SF3...)

Summary File

Summary files available from the US Census Bureau.

Shapefile

A specific data format used for GIS layers native to ArcView version 4.x and earlier.

SIS

Stop Information System

An application that will allow the placing, sequencing, and attribution of bus stops.

SMDM

Science, Monitoring and Data Management

A section of WLRD.

Spatial Data Warehouse

See listing for KCGIS Spatial Data Warehouse.

SQL

Structured Query Language

An industry-standard computer language used for creating, updating and, querying RDBMS.

SQL Server

See listing for MS SQL Server.

Steward

See listing for Data Steward.

Stewardship

See listing for Data Stewardship.

SWD

Solid Waste Division

A division of DNRP.

T

Technical Committee

See listing for GIS Technical Committee.

Technology Management Board

Part of the King County Technology Governance Structure that oversees technology projects.

Test Environment

A computing environment available for developing and testing of new/revised applications and software.

Testing data

Data being developed that are not ready for enterprise-wide use but will be in the future.

TLT

Term-limited Temporary

A temporary King County employment position with a specified end date.

TNET

Transportation Network

See section 3.7B.3.2 for discussion of this Transit supported system.

TOE

Transit Object Editor

An application for placing and editing Timepoints and TPIs in the Transit GIS network.

Topology

The spatial relationship between geographic features. The term is often used to refer to explicit rules of relationships that are allowed, and the resulting record of those relationships.

Triathlon

Formerly NIES, a Western Washington mapping group, provides photogrammetry services and digital orthophotography products to many Puget Sound organizations.

Two-cluster system

See listing for Clustering.

U

UNIX

A multiuser general-purpose operating system. Generally used by the KCGIS program for GIS software and RDBMS servers.

URL

Uniform Resource Locator

An address that identifies a document or resource on the World Wide Web.

V

VB

Visual Basic

Microsoft programming language, and Integrated Development Environment, supporting graphic user interfaces and used extensively with ESRI GIS software. There are many versions of Visual Basic including VBA (Visual Basic for Applications) and VB.NET. See also listing for .NET.

Vector

A type of computer graphics that is specified by mathematical formula, and consisting of lines and shapes.

W

WAN

Wide Area Network

A communications network that uses such devices as telephone lines, satellite dishes, or radio waves to span a larger geographic area than can be covered by a LAN.

Warehouse

See listing for Spatial Data Warehouse.

Wintel

Windows/Intel

A technology platform incorporating Microsoft Windows as an operating system and Intel-type chip sets.

WLRD

Water and Land Resources Division

A division of KC DNRP.

WRIA

Water Resource Inventory Areas

Administrative Areas of Washington State designated by Washington State Department of Ecology.

WSDNR

Washington State Department of Natural Resources

Washington State government agency.

WTD

Wastewater Treatment Division

Division of DNRP.

X

XML

Extensible Markup Language

A text markup language for interchange of structured data between various software applications.

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.

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 Enterprise, Agency (Department or Division), or Not Specified:

Name	Description	Data Type	Organization
AIRINDEX	Center points of WADNR aerial photos	Enterprise	KCGIS Center
AIRPHOTO	Flight lines of WADNR aerial photos	Enterprise	KCGIS Center
ANTSITE	Antenna sites leased out by KC Property Services	Enterprise	KCGIS Center
ARTCLUST	Polygon coverage of clusters of public art sites in King County	Enterprise	KCGIS Center
ARTSITES	Polygon coverage of public art sites in King County	Enterprise	KCGIS Center
BASEADJ	Control points for adjustments of the cadastral base	Enterprise	KCGIS Center
BASENET	King County centerline network	Enterprise	KCGIS Center
BIGWATER	Largest water bodies in King County	Enterprise	KCGIS Center
BIKEMET	Bicycle/non-motorized vehicle paved and unpaved routes	Enterprise	KCGIS Center
BLK53033	1990 Census blocks for King County	Enterprise	KCGIS Center
BLKTILE	No documentation	Enterprise	KCGIS Center
BLOCKGRP	1990 Census Tract/Blocks with the same hundred level	Enterprise	KCGIS Center
BLOCKNET	1990 Census blocks developed for KC TRC from Tigerline files	Enterprise	KCGIS Center
C9053033	1990 Census King County boundary	Enterprise	KCGIS Center
CANOPY	Forest canopy	Enterprise	KCGIS Center
CD453033	1990 Census, portions of Congressional Districts in King County	Enterprise	KCGIS Center
CONT100	100 foot contours lines from 10 Meter DEM	Enterprise	KCGIS Center
CONT20	20 foot contours lines from 10 Meter DEM	Enterprise	KCGIS Center
CONT50	50 foot contours lines from 10 Meter DEM	Enterprise	KCGIS Center

Name	Description	Data Type	Organization
CST53033	1990 Census, coastal waters, Puget Sound, Lake Washington, Duwamish, Ship Canal	Enterprise	KCGIS Center
CTP53033	1990 Census, transportation planning area, single polygon for entire county	Enterprise	KCGIS Center
CTY53033	1990 Cenus King County Boundary	Enterprise	KCGIS Center
E911_ESN	Emergency service areas	Enterprise	KCGIS Center
FAULTS	Faults of the Seattle Fault zone	Enterprise	KCGIS Center
FAZ	1990 Census Forecast Analysis Zones	Enterprise	KCGIS Center
FPD_USFS	U.S. Forest Service Production Districts	Enterprise	KCGIS Center
GDTZIPCD	1999 5-digit zip code file for entire state, based on tiger line files	Enterprise	KCGIS Center
GRP53033	1990 Census block groups	Enterprise	KCGIS Center
IND53033	1990 Census Tribal lands, Muckelshoot and Puyallup Tribal lands	Enterprise	KCGIS Center
INDEX	Index of RECDNET tiles	Enterprise	KCGIS Center
INDEX_QT	Copy of the tiled index with township, range and ¼ tile lines only	Enterprise	KCGIS Center
INDEX_TR	Copy of the tiled index with township and range lines only	Enterprise	KCGIS Center
KGL53033	1990 Census ,Key geographic locations: Airports, malls, etc	Enterprise	KCGIS Center
LAN53033	1990 Census, Various landmarks:hospitals, camps, jails, colleges, golf courses, Boeing Field, parks	Enterprise	KCGIS Center
LD_NAMES	Annotation from RECDNET for lot dimensions in map portal parcels	Enterprise	KCGIS Center
LNB53033	1990 Census, Railroads: BN,Soo,UP, Monorail, Northern Pac, Unnamed	Enterprise	KCGIS Center
LNC53033	1990 Census, Utility line networks, owners unknown	Enterprise	KCGIS Center
LND53033	1990 Census, Airfields: Bandera airstrip, Unnamed	Enterprise	KCGIS Center
LNH53033	1990 Census, Streams: Creeks, streams, lakes, canals, rivers, sloughs	Enterprise	KCGIS Center
LTP53033	1990 Census, Landmark points: 5 named – 4 camps, 1 hospital	Enterprise	KCGIS Center
M9053033	1990 Census, Minor civil divisions, County divided into 10 regions	Enterprise	KCGIS Center
MCD53033	1995 Minor civil divisions, County divided into 10 regions	Enterprise	KCGIS Center
MAPNUM	Map number index	Enterprise	KCGIS Center

Name	Description	Data Type	Organization
MAPNUMOK	Map number index	Enterprise	KCGIS Center
MTPEAKS	Mountain peaks with elevation	Enterprise	KCGIS Center
MUN_WSHD	Municipal watersheds	Enterprise	KCGIS Center
NAVAID	Navigational Aids	Enterprise	KCGIS Center
OPPIPES	Olympic Pipe Line Company right-of-way through King County	Enterprise	KCGIS Center
ORTHOIDX	Index for NIES photos	Enterprise	KCGIS Center
P9053033	1990 Census, Places: Cities and selected unicorporated areas	Enterprise	KCGIS Center
PLA53033	1995 Places, City areas defined by Census, not necessarily corporation limits	Enterprise	KCGIS Center
PLACE	1990 Census, Places edited by KCTRC	Enterprise	KCGIS Center
PLSS	Public land survey system	Enterprise	KCGIS Center
POCA	Public ownership and administrative boundaries	Enterprise	KCGIS Center
POINOPUB	Points of public interest owned or operated by non-public agencies	Enterprise	KCGIS Center
POIPUB	Points of public interest owned or operated by public agency	Enterprise	KCGIS Center
PRECIP	Precipitation	Enterprise	KCGIS Center
PS_BATH	Puget Sound bathymetry	Enterprise	KCGIS Center
RAINSNOW	Rain on snow zones	Enterprise	KCGIS Center
REALPROP	Property Services King County owned parcels	Enterprise	KCGIS Center
REFGRD16	Reference grid (1/16th sections)	Enterprise	KCGIS Center
ROW	Street right-of-way with PIN	Enterprise	KCGIS Center
RTABNDRY	Regional Transit Authority boundary (approximate)	Enterprise	KCGIS Center
SCSTREET	Snohomish County street network	Enterprise	KCGIS Center
SDU53033	1990 Census,School districts	Enterprise	KCGIS Center
SHR53033	1990 Census, Coastal shorelines, King County land area	Enterprise	KCGIS Center
STR53033	1990 Census, Street network	Enterprise	KCGIS Center

Name	Description	Data Type	Organization
SOIL	Obselete soils coverage	Enterprise	KCGIS Center
SOILUSGS	Soils coverage from USGS	Enterprise	KCGIS Center
SOUNDING	Puget Sound soundings	Enterprise	KCGIS Center
ST_NAMES	Street name annotation from RECDNET	Enterprise	KCGIS Center
STORM10	10-year storm events	Enterprise	KCGIS Center
TAZ	1990 Census, Traffic Analysis Zones	Enterprise	KCGIS Center
TAZ53033	1990 Census, Traffic Analysis Zones for the Greater Puget Sound	Enterprise	KCGIS Center
TRACT	1990 Census, Tracts developed for KCTRC from Tigerline files	Enterprise	KCGIS Center
THOM_BROS	Thomas Guide page index	Enterprise	KCGIS Center
UAR53033	1990 Census, Version of Urban Growth Area	Enterprise	KCGIS Center
URB53033	1990 Census, Urban/rural areas: entire county	Enterprise	KCGIS Center
VTD53033	1990 Census, Voter district, entire county	Enterprise	KCGIS Center
WASHCO	County boundaries for all of Washington State	Enterprise	KCGIS Center
WAT53033	1990 Census, entire county lakes, Puget Sound, and land	Enterprise	KCGIS Center
WBD53033	1990 Census, water bodies, lakes, reservoirs, rivers, Puget Sound, sloughs with names	Enterprise	KCGIS Center
BLKGRP00	2000 Census, Block groups conflated to RECDNET	Enterprise	KCGIS Center
BLOCKS00	2000 Census, Blocks conflated to RECDNET	Enterprise	KCGIS Center
FIRESTN	King County fire stations	Enterprise	KCGIS Center
KCP_LOC	Point layer of King County police locations	Enterprise	KCGIS Center
SCHSITE	King County school sites and school-related facilities	Enterprise	KCGIS Center
ST_ADDRESS	King County streets derived from RECDNET with address ranges	Enterprise	KCGIS Center
ST_ZONES	Street prefix/suffix polygon boundaries	Enterprise	KCGIS Center
T53033AIR00	2000 Census, Tribal Lands, Muckelshoot, Puyallup	Enterprise	KCGIS Center
T53033BLK00	2000 Census, Blocks for King County	Enterprise	KCGIS Center

Name	Description	Data Type	Organization
T53033CTY00	2000 Census, King County boundary	Enterprise	KCGIS Center
T53033GRP00	2000 Census, Block groups	Enterprise	KCGIS Center
T53033PLC00	2000 Census, City areas, but not necessarily corporation limits	Enterprise	KCGIS Center
T53033TRT00	2000 Census, Tracts for King County	Enterprise	KCGIS Center
T53033VOT00	2000 Census, Voter districts	Enterprise	KCGIS Center
TAZ00	2000 Census, Traffic Analysis Zones conflated to RECDNET	Enterprise	KCGIS Center
TRACTS00	2000 Census, Tracts conflated to RECDNET	Enterprise	KCGIS Center
ZIPCODE	King County zip code boundaries conflated to RECDNET	Enterprise	KCGIS Center
RECDNET	Countywide Cadastral Data. Includes streets and other features necessary for describing property boundaries. Based on the legal description of the property.	Enterprise	Assessments
PARCEL	Countywide parcel boundaries derived from RECDNET.	Enterprise	Assessments
RECDANNO	Countywide Cadastral Annotation. Includes street names, lot dimensions and other features necessary for describing property boundaries.	Enterprise	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.	Agency	Assessments
COMAREAS	Commercial Area boundaries.	Agency	Assessments
RESAREAS	Residential Areas boundaries – under construction.	Agency	Assessments
KCASURV	Survey data necessary for building new plats or redrawing cadastral data.	Agency	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.	Agency	Assessments
KCAWET	Wetland boundaries taken from agency overlays and updated wetland information.	Agency	Assessments
KCACODE	Levy Code Boundaries.	Agency	Assessments
KCACITY	City boundaries for Assessments purpose	Agency	Assessments
AGRPDDST	Polygons representing the Agricultural Production District (APD) as defined by Chapter 3 of the King County Comprehensive Plan.	Enterprise	DDES

Name	Description	Data Type	Organization
ASGWC95	Polygons representing areas susceptible to ground water contamination as defined by Chapter 4 of the King County Comprehensive Plan.	Enterprise	DDES
CITY	Polygons representing current city boundaries. Layer City is a simplified derivative of Citymast.	Enterprise	DDES
CITY_KC	Polygons representing current city boundaries, as well as polygons for the unincorporated areas of King County. Layer CITY_KC is a simplified derivative of CITYMAST.	Enterprise	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.	Enterprise	DDES
CLRESTR	Polygons representing clearing and grading restrictions as defined by Title 16 Building and Construction Standards – 16.82.150 of King County Code.	Enterprise	DDES
COALMINE	Polygons representing Sensitive Area Ordinance coal mine hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Enterprise	DDES
COMPLU	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.)	Enterprise	DDES
CPAREA	Polygons representing Community Planning Areas as defined by various planning documents.	Enterprise	DDES
DPA	Polygons representing demonstration project areas as defined by Title 21A Zoning – 21A.55 of King County Code.	Enterprise	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.	Enterprise	DDES
ERODE	Polygons representing Sensitive Area Ordinance erosion hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Enterprise	DDES
FARMLAND	Polygons representing properties participating in the Farmland Preservation Program.	Enterprise	DDES
FIRESTN	Points representing fire station sites.	Enterprise	DDES

Name	Description	Data Type	Organization
FORPDDST	Polygons representing the Forest Production District (FPD) as defined by Chapter 3 of the King County Comprehensive Plan.	Enterprise	DDES
FPD_LINE	Lines representing the Forest Production District (FPD) boundary as defined by Chapter 3 of the King County Comprehensive Plan.	Enterprise	DDES
GRWTHPAT	Polygons representing King County generalized land use pattern, which is a simplification and grouping of the Comprehensive Plan land use designations.	Enterprise	DDES
HORSE_COMM	Polygons representing Equestrian Communities as defined by Chapter 3 of the King County Comprehensive Plan.	Enterprise	DDES
KCADDRGRID	Lines representing King County addressing grid as adopted by Resolution 16622.	Enterprise	DDES
MPS	Polygons representing road mitigation payment system zones, which are derived from Small Area Zones (SAZ).	Enterprise	DDES
MUCKL_IR	Polygons representing Muckleshoot Indian Reservation boundary.	Enterprise	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.	Enterprise	DDES
SCHSITE	Points representing school sites.	Enterprise	DDES
SDO	Polygons representing areas with special district overlay designations as defined by Title 21A Zoning – 21A.38 of King County Code.	Enterprise	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.	Enterprise	DDES
SEISM	Polygons representing Sensitive Area Ordinance seismic hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Enterprise	DDES
SHORELINEMMP	Polygons representing Shoreline Management Master Program designations as defined by Title 25 Shoreline Management of King County Code.	Enterprise	DDES
SLIDE	Polygons representing Sensitive Area Ordinance landslide hazards as defined in Title 21A Zoning – 21A.24 of King County Code.	Enterprise	DDES
UAC	Polygons representing Unincorporated Area Councils (UAC).	Enterprise	DDES
UGLINE	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.)	Enterprise	DDES

Name	Description	Data Type	Organization
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.	Enterprise	DDES
WILDNET1996	Wildlife Habitat Network as modified in 1996	Enterprise	DDES
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.	Enterprise	DDES
AREASPFC	Polygons representing area specific drainage conditions as defined by the Surface Water Design Manual.	Agency	DDES
ARSONSXX	Points representing the locations of fire investigations for the given year. Layer name provides the year (e.g. ARSONS98).	Agency	DDES
BLDG_IA	Polygons representing building inspection areas.	Agency	DDES
BOG_DA	Polygons representing bogs as regulated by the Surface Water Design Manual	Agency	DDES
BSNWIDE	Polygons representing basin wide drainage conditions as defined by Surface Water Design Manual.	Agency	DDES
CDIST96	Polygons representing King County Council Districts. A derivative of Election's kccdst with additional attributes.	Agency	DDES
CHINOOK	Polygons representing 500-foot buffer from streams identified by Chinook distribution analysis.	Agency	DDES
CITYIMP	Polygons representing impact areas (areas of interest) as defined by various cities.	Agency	DDES
CLEAR_IA	Polygons representing clearing inspection areas.	Agency	DDES
CODE_IA	Polygons representing code enforcement areas.	Agency	DDES
ERS_DA	Polygons representing erosion drainage as regulated by the Surface Water Design Manual.	Agency	DDES
ESA_IA	Polygons representing Environmental Species Act (ESA) inspection areas.	Agency	DDES
ESC_IA	Polygons representing erosion and sediment control inspection areas.	Agency	DDES
FCCTELCO	Points representing locations of existing and planned telecommunication facilities as registered with the Federal Communication Commission (FCC).	Agency	DDES

Name	Description	Data Type	Organization
GRAD_IA	Polygons representing grading inspection areas.	Agency	DDES
HISTSITE	Parcel specific database of historic sites as defined by the King County Historic Resource Inventory.	Agency	DDES
INTERLOC	Polygons representing DDES interlocal agreements with various cities and agencies.	Agency	DDES
INTRMPAA	Polygons representing interim Potential Annexation Areas (PAA) for cities in King County.	Agency	DDES
JPA	Polygons representing joint planning areas as defined by the King County Comprehensive Plan.	Agency	DDES
KINGADDR.MDB	Parcel specific database of situs addresses as recognized by DDES for properties in unincorporated King County.	Agency	DDES
LH_DA	Polygons representing landslide hazard drainage areas as regulated by the Surface Water Design Manual.	Agency	DDES
LU_IA	Polygons representing land use inspection areas.	Agency	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).	Agency	DDES
MDPA	Master Drainage Plans Areas as defined and regulated by the Surface Water Design Manual.	Agency	DDES
MINE97	Polygons representing mineral resource sites as defined by Chapter 3 of the King County Comprehensive Plan.	Agency	DDES
MRWATERS	Polygons representing major receiving water bodies as regulated by the Surface Water Design Manual.	Agency	DDES
PARCELS.MDB	Parcel specific database for development conditions information.	Agency	DDES
PERMPAR	Polygons representing parcels associated with DDES permits. Includes historical parcels that no longer exist.	Agency	DDES
RFFA	Polygons representing the Rural Forest Focus Area (RFFA) as defined by Chapter 3 of the King County Comprehensive Plan.	Agency	DDES
SANT.MDB	Parcel specific database for Sensitive Area Notice on Title (SANT) information.	Agency	DDES

Name	Description	Data Type	Organization
SCHDIST	Polygons representing school districts. A derivative of Election's schdist with additional attributes.	Agency	DDES
SNOWLOAD	Polygons representing ground snow load zones.	Agency	DDES
SUBDIV	Polygons representing each recorded plat. Generated by dissolving tax lots on major number.	Agency	DDES
STREAM	Lines representing the Sensitive Area Ordinance streams as defined in Title 21A Zoning – 21A.24 of King County Code.	Agency	DDES
TDR	Polygons representing parcels receiving or sending Transfer of Development Rights (TDR).	Agency	DDES
UGAREA01	Polygons representing the Urban Growth Area (UGA).	Agency	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).	Agency	DDES
E-911_ESN	Emergency Service Zone Numbers (ESN) boundaries	Enterprise	DES-EMD
POLICE, FIRE AND EMS ZONES	PSAP specific data layers boundaries that PSAPs refer to when dispatching specific emergency services to locations.	Agency	DES-EMD
CARRIER CELL TOWER LOCATIONS	Points of cell towers in King County that is regularly updated and added.	Agency	DES-EMD
SECTOR COVERAGE AREAS	Polygons of cell towers that cover specific areas in King County, attached to cell towers.	Agency	DES-EMD
CITYDST	Boundaries of incorporated cities and towns	Enterprise	DES-REALSD
CONGDST	Congressional District boundaries in King County	Enterprise	DES-REALSD
DIRDST	Director districts within the Seattle School District	Enterprise	DES-REALSD
DSTCODE	Unique Voting Levy Description Polygons (unique ballot styles)	Enterprise	DES-REALSD
FIRDST	King County Fire Protection Districts	Enterprise	DES-REALSD
HSPDST	King County Hospital Districts	Enterprise	DES-REALSD

Name	Description	Data Type	Organization
JUDDST	King County Court Electoral Districts	Enterprise	DES-REALSD
KCCDST	Current King County Council Districts	Enterprise	DES-REALSD
LEGDST	Legislative Districts in King County	Enterprise	DES-REALSD
LIBDST	King County Library District	Enterprise	DES-REALSD
MS1DST	Proposed Electoral Districts group 1 (temporary ballot measures such as the merger of 2 water districts)	Enterprise	DES-REALSD
MS2DST	Proposed Electoral Districts group 2 (temporary ballot measures)	Enterprise	DES-REALSD
MUNDST	County recognized Municipal Incorporation Districts (explain)	Enterprise	DES-REALSD
PRKDST	King County Park Districts / Special Park authorities	Enterprise	DES-REALSD
SCHDST	Public School Districts in King County	Enterprise	DES-REALSD
SWRDST	King County Sewer Districts	Enterprise	DES-REALSD
VOTDST	Voting Districts (commonly referred to as Precincts)	Enterprise	DES-REALSD
WSDST	Combined Water and Sewer Utility Districts	Enterprise	DES-REALSD
WTRDST	King County Water Districts	Enterprise	DES-REALSD
STREETSEG	Street centerline master address file (MAF)	Agency	DES-REALSD
PRECINCT	Voting precinct assignment	Agency	DES-REALSD
LEVY	Minor taxing district assignment	Agency	DES-REALSD
COMBO	Unique Ballot style	Agency	DES-REALSD
POLLPLACE	Election polling place assignment	Agency	DES-REALSD
ROUTE	Election supply delivery routes	Agency	DES-REALSD
ZONE	Election day trouble shooter assignments	Agency	DES-REALSD
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.	Enterprise	DNRP-WTD
IWPERMIT	Industrial Waste Permits	Enterprise	DNRP-WTD

Name	Description	Data Type	Organization
PLANT_ANNO	Contains wastewater treatment plant names.	Enterprise	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.	Enterprise	DNRP-WTD
PUMP_ANNO	Contains WTD pump station names.	Enterprise	DNRP-WTD
REG_ANNO	Contains WTD regular names.	Enterprise	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.	Enterprise	DNRP-WTD
SEWER	Depicts King County WTD's conveyance system. It is generated from the Facility Information Retrieval System (FIRS), a database populated by the WTD Facility Inspection Section. Arc segments represent sections of conveyance pipe between manholes or other facilities (see FACILITY point coverage).	Enterprise	DNRP-WTD
SEWER_ANNO	Contains WTD sewer line annotation.	Enterprise	DNRP-WTD
SITEPLAN	Facility footprints. Building footprints of treatment plants or other facilities	Enterprise	DNRP-WTD
SRVBASN_ANNO	Contains name of sewer basins.	Enterprise	DNRP-WTD
SWRBASIN	WTD defined boundaries for sewer basins including planning basins, and it 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).	Enterprise	DNRP-WTD
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.	Enterprise	DNRP-WTD
CSO	Combined Sewer Overflow discharge locations.	Agency	DNRP-WTD

Name	Description	Data Type	Organization
CSOBSN	Basins that contribute wastewater to Combined Sewer Overflow discharge locations.	Agency	DNRP-WTD
FLOWMNTR	Contains depictions current and historic monitors used in a variety of projects from day to day system flow monitoring to I/I project monitoring.	Agency	DNRP-WTD
LOCALLN	Contains depiction of local sewer pipes with available attribute information	Agency	DNRP-WTD
LOCALMH	Contains depiction of local sewer facilities with available attribute information	Agency	DNRP-WTD
MDLBSN	Basins developed for WTD modelers through the Inflow and Infiltration project based on 2001 data.	Agency	DNRP-WTD
MDLBSN00	Basins developed for WTD modelers through the Inflow and Infiltration project based on 2000 data.	Agency	DNRP-WTD
MNIBSN01	Basins developed for flow monitoring efforts through the Infiltration and Inflow project based on 2001 data.	Agency	DNRP-WTD
MNIBSN00	Basins developed for flow monitoring efforts through the Inflow and Infiltration project based on 2000 data.	Agency	DNRP-WTD
RWSPBSN	Basins used by WTD to plan and manage wastewater flow as used in the Regional Wastewater Service Plan and until 2003.	Agency	DNRP-WTD
SERVAREA_DISS	WTD service area boundary.	Agency	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.	Agency	DNRP-WTD
SWRLND	Areas of sewered land delineated using local line sewer information, Emerge imagery, and parcel lines based on 2001 data	Agency	DNRP-WTD
SWRLND00	Areas of sewered land delineated using local line sewer information, Emerge imagery, and parcel lines based on 2000 data	Agency	DNRP-WTD
WTDBSN	WTD sewer basins-this basin matches the boundary of modeling basin	Agency	DNRP-WTD
RAINGAGE	Contains depictions of WTD and Water and Land Resources rain gages.	Agency	DNRP-WTD
UGACOMBO	Polygon showing Urban Growth Area (UGA) for King County and Snohomish County. Combined 2002 King County UGA data and 2000 Snohomish UGA data.	Agency	DNRP-WTD

Name	Description	Data Type	Organization
WTD_HCP	WTD Habitat Conservation Plan Boundary.	Agency	DNRP-WTD
KCTILE	Parcel tile index extracted from data on *WILDFIRE*.	Agency	DNRP-WTD
CED_CON	Contours in 20-foot increments for southwest Snohomish County.	Agency	DNRP-WTD
CEDSLOPE	Steep Slopes by southwest Snohomish County contour area.	Agency	DNRP-WTD
CESLOPE	Steep Slopes by King County Cedar River contour area.	Agency	DNRP-WTD
CWSLOPE	Steep Slopes by King County Lake Washington contour area.	Agency	DNRP-WTD
GESLOPE	Steep Slopes by King County Soos Creek contour area.	Agency	DNRP-WTD
GWSLOPE	Steep Slopes by King County Duwamish/Green River contour area.	Agency	DNRP-WTD
LSKA_CON	Contours in 20-foot increments for northwest Snohomish County.	Agency	DNRP-WTD
LSKASLOPE	Steep Slopes by northwest Snohomish County contour area.	Agency	DNRP-WTD
NPSLOPE	Steep Slopes by northwest King County contour area.	Agency	DNRP-WTD
S1SLOPE	Steep Slopes by King County Duvall contour area.	Agency	DNRP-WTD
S2SLOPE	Steep Slopes by King County North Fork Tolt River contour area.	Agency	DNRP-WTD
S3SLOPE	Steep Slopes by King County Snoqualmie contour area.	Agency	DNRP-WTD
S4SLOPE	Steep Slopes by King County Middle Fork Snoqualmie River contour area.	Agency	DNRP-WTD
SASLOPE	Steep Slopes by King County Sammamish contour area.	Agency	DNRP-WTD
SC_TOPOINDX	Snohomish County contour layer index.	Agency	DNRP-WTD
SLOPE_INDX	Steep slope layer index.	Agency	DNRP-WTD
SNBA_CON	Contours in 20-foot increments for central and southeast Snohomish County.	Agency	DNRP-WTD
SNBASLOPE	Steep Slopes by central and southeast Snohomish County contour area.	Agency	DNRP-WTD
SPSLOPE	Steep Slopes by King County Duwamish River West Bank contour area.	Agency	DNRP-WTD
STILL_CON	Contours in 20-foot increments for Snohomish County Stilliguamish River area.	Agency	DNRP-WTD
STILLSLOPE	Steep Slopes by Snohomish County Stilliguamish River contour area.	Agency	DNRP-WTD

Name	Description	Data Type	Organization
USKA_CON	Contours in 20-foot increments for Snohomish County Glacier Peak area.	Agency	DNRP-WTD
USKASLOPE	Steep Slopes by Snohomish County Glacier Peak contour area.	Agency	DNRP-WTD
VASLOPE	Steep Slopes by King County Vashon Island contour area.	Agency	DNRP-WTD
WRSLOPE	Steep Slopes by King County White River contour area.	Agency	DNRP-WTD
CHNLMIGR	River channel migration hazards	Enterprise	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. Please note that KC's version differs from the version 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 WLRD uses in all planning efforts.	Enterprise	DNRP-WLRD
DRNSTUDY	SWES Engineering Studies	Enterprise	DNRP-WLRD
FISH9	Distribution of 7 salmon species 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)*.	Enterprise	DNRP-WLRD
FISH9_PT	Point observations of 7 salmon species in WRIA9, 7 observation 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)*.	Enterprise	DNRP-WLRD
FISHV	Distribution of 5 salmon species 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)*.	Enterprise	DNRP-WLRD
FISHV_PT	Point observations of 5 salmon species 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)*.	Enterprise	DNRP-WLRD

Name	Description	Data Type	Organization
FLDPLAIN	A digital representation of the paper FEMA flood maps. This coverage details the locations of 100 year floodplains as defined by the Federal Emergency Management Agency.	Enterprise	DNRP-WLRD
FLOODWAY	A digital representation of the paper FEMA flood maps. This coverage details the locations of floodways as defined by the Federal Emergency Management Agency	Enterprise	DNRP-WLRD
GWMA	Groundwater Management Areas. GWMA depicts the boundaries of areas that have undergone groundwater management planning according to a Washington state program	Enterprise	DNRP-WLRD
HYDROGAUGE	King County Hydrological Gauges	Enterprise	DNRP-WLRD
KC_WHPA	Well Head Protection Areas are designed to show zones 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.	Enterprise	DNRP-WLRD
SURFGEOL	KC Surface Geology	Enterprise	DNRP-WLRD
STORMFAC	Commercial and residential stormwater facilities.	Enterprise	DNRP-WLRD
NDA	Neighborhood drainage projects of Stormwater Services Section.	Enterprise	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_ALL and WELL_B.	Enterprise	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.	Enterprise	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	Enterprise	DNRP-WLRD
WTRBODY	Open Water	Enterprise	DNRP-WLRD

Name	Description	Data Type	Organization
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.	Enterprise	DNRP-WLRD
WTR_SERV	Water Service Areas	Enterprise	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.	Enterprise	DNRP-WLRD
CITY_3CO	Incorporated Cities - Pierce, Snohomish, and King Counties	Agency	DNRP-WLRD
JURIS00	Incorporated Cities Year 2000	Agency	DNRP-WLRD
JURIS90	Incorporated Cities Year 1990	Agency	DNRP-WLRD
APD_RIPAR100	APD Riparian Condition Units - 100 ft stream buffers	Agency	DNRP-WLRD
APD_RIPAR25	APD Riparian Condition Units - 25 ft stream buffers	Agency	DNRP-WLRD
APDLU	APD General Landuse	Agency	DNRP-WLRD
BUGS_MAA	Benthic Macroinvertebrate Sampling Sites	Agency	DNRP-WLRD
GRN_DU_HIST	Historical Green-Duwamish River	Agency	DNRP-WLRD
HYDROBASIN	Drainage Basin Boundaries	Agency	DNRP-WLRD
MAJ_STRM	Major Streams and Rivers, a sub-set of WTRCRS	Agency	DNRP-WLRD
RIVER_MI	River Miles derived from WTRCRS	Agency	DNRP-WLRD
RIVERFAC	King County River Facilities	Agency	DNRP-WLRD
CUT_AG	Current Use Taxation Program: Agricultural Properties	Agency	DNRP-WLRD
CUT_FOREST	Current Use Taxation Program: Forestry Parcels	Agency	DNRP-WLRD

Name	Description	Data Type	Organization
CUT_PBRS_TIM	Public Benefit Rating System and Timber Land Program Parcels	Agency	DNRP-WLRD
DAIRIES	Dairies and Commercial Agricultural Operations	Agency	DNRP-WLRD
FARMPLAN	Parcels with Farm Plans	Agency	DNRP-WLRD
FISH7	Fish distribution in WRIA 7	Agency	DNRP-WLRD
FISH7_PT	Fish distribution in WRIA 7, shapefile points	Agency	DNRP-WLRD
FISH7_SOURCE	Fish Distribution (WRIA 7) Source Table	Agency	DNRP-WLRD
FISH8	Salmon Distribution (WRIA 8)	Agency	DNRP-WLRD
FISH8_PT	Salmon Observation Locations (WRIA 8)	Agency	DNRP-WLRD
FISH8_PT_DAT	Salmon Observations Data Table (WRIA 8)	Agency	DNRP-WLRD
FPP	Farmland Preservation Properties	Agency	DNRP-WLRD
FTA	Forestry Technical Assistance	Agency	DNRP-WLRD
LIVESTOCK_VFD	Verified Livestock Parcels	Agency	DNRP-WLRD
RFFA	Rural Forest Focus Areas (as adopted in 2001 Comp. Plan)	Agency	DNRP-WLRD
WEED_PT	Noxious Weeds Locations	Agency	DNRP-WLRD
GWMA	Ground Water Management Areas	Agency	DNRP-WLRD
RDP_BND	Rural Drainage Program Service Areas	Agency	DNRP-WLRD
SWES_PROJ	WLRD SWES Section CIPs and SHRPs	Agency	DNRP-WLRD
DRAINAGE_PROP	King-County Owned Drainage Properties	Agency	DNRP-WLRD
FLOOD_PROP	Flood Hazard Reduction Section Flood Buyout Parcels	Agency	DNRP-WLRD
PARCEL_DATA	WILDFIRE PARCEL data layer with additional attributes	Agency	DNRP-WLRD

Name	Description	Data Type	Organization
PUBLIC	Publicly owned parcels derived from Assessor's data and PARCEL	Agency	DNRP-WLRD
BATH_TOPO	Puget Sound Bathymetry	Agency	DNRP-WLRD
CONTOUR40	King County Contours - 40'	Agency	DNRP-WLRD
LKSAMBATH	Lake Sammamish Bathymetry	Agency	DNRP-WLRD
PS_BATH10	Puget Sound Bathymetry - 10 Foot Contours	Agency	DNRP-WLRD
PS_BATH20	Puget Sound Bathymetry - 20 Foot Contours	Agency	DNRP-WLRD
PS_BATH5	Puget Sound Bathymetry - 5 Foot Contour	Agency	DNRP-WLRD
STORMREG	Regional Stormwater Facilities	Agency	DNRP-WLRD
PARK	All parks in King County, including those which are owned and/or maintained by other agencies and jurisdictions	Enterprise	DNRP-Parks
TRAIL	Trails in King County	Enterprise	DNRP-Parks
PARK	All King County Parks	Agency	DNRP-Parks
TRAIL	All King County Trails	Agency	DNRP-Parks
ARMS_SERVICE	Parks Financial Zoning Areas	Agency	DNRP-Parks
ATLASANNO	Parks Atlas Annotation	Agency	DNRP-Parks
MAINTDIST	King County Maintenance Boundaries	Agency	DNRP-Parks
PARKS_P	All King County Park Properties	Agency	DNRP-Parks
PSAFI_POINT	King County Park Facilities	Agency	DNRP-Parks
RESOCOORD	King County Park Resource Area Boundaries	Agency	DNRP-Parks
SP_SITES	County-wide Active Sport Sites	Agency	DNRP-Parks
WTANNOAT	County-wide Water Annotation Coverage	Agency	DNRP-Parks
PARKPLAN	King County Parks Planning Info	Agency	DNRP-Parks
PROPTRAIL	King County Trails Plan	Agency	DNRP-Parks
MONUMENT	Point shapes representing RSD/Survey Section surveyed monuments.	Enterprise	DOT-RSD

Name	Description	Data Type	Organization
REFGRID	Quarter section, section and township reference grid for King County.	Enterprise	DOT-RSD
VERTICAL	Vertical control for ortho photography.	Enterprise	DOT-RSD
ST_CRIS	Lines shapes representing King County's County Road Inventory System (CRIS). Last year the Engineering Services Section completed a major data conversion project in collaboration with KCGIS Center associated with the CRIS. This conversion is done and updates are being made for the 2004 submittal.	Agency	DOT-RSD
KGCO_DS	Soils data for King County. Seamless soils shapefile for entire county.	Agency	DOT-RSD
2002 GUARDRAIL	Line Shapes representing King County countywide Traffic Section 2002 proposed guardrail replacement projects	Agency	DOT-RSD
SIG_COMPLETE	Point shapes representing King County countywide Traffic Section 2001 Signal projects completed	Agency	DOT-RSD
SIG_EXPECTED	Point shapes representing King County countywide Traffic Section 2001 Signal projects expected to be completed	Agency	DOT-RSD
STRIPING	Line shapes representing installation and maintenance of Traffic Section maintained roadway marking features	Agency	DOT-RSD
HARS	Line shapes representing King County countywide High Accident Roadways	Agency	DOT-RSD
HALS	Point shapes representing King County countywide High Accident Locations	Agency	DOT-RSD
CIPPLINE	Line shapes representing King County Capital Improvement Projects	Agency	DOT-RSD
CIPPATH	Line shapes representing King County Capital Improvement Sub-Projects	Agency	DOT-RSD
CIPPOINT	Point shapes representing King County Capital Improvement Projects	Agency	DOT-RSD
ADOPT	Line shapes representing the adopted sections of King County roadways countywide	Agency	DOT-RSD
PWAY_DATA	Line shapes representing countywide School Pathway Projects	Agency	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.	Agency	DOT-RSD
BRIDGE	Point shapes representing King County-maintained Bridges.	Agency	DOT-RSD

Name	Description	Data Type	Organization
"BY BASIN" MANY THEMES	Point and line shapes that represent King County's drainage inventory National Pollution Discharge Elimination System (NPDES)	Agency	DOT-RSD
3P	Line shapes showing King County Countywide proposed pedestrian improvement projects	Agency	DOT-RSD
NEP LINES	Line shapes representing King County Countywide Neighborhood Enhancement Projects	Agency	DOT-RSD
COUNT_DATA	Point shapes representing Countywide year 2000 Historical Count Location w/ data attached	Agency	DOT-RSD
RD_EIS	Point shapes representing RSD Environmental Unit's impact statements	Agency	DOT-RSD
RD_BA	Point shapes representing RSD Environmental Unit's biological assessments	Agency	DOT-RSD
RD_PROP	Point shapes representing RSD-owned properties	Agency	DOT-RSD
FREIGHT_GOODS	Line shapes representing routes designated by the state as roadways that carry freight and goods	Agency	DOT-RSD
GUARDRAIL	Line shapes representing the King County Inventory of countywide guardrail	Agency	DOT-RSD
COUNT_LOCATIONS	Point shapes representing RSD Traffic Section Historical Count Locations w/o data attached	Agency	DOT-RSD
LAASETHNSP	Ethnographic place names for King County	Agency	DOT-RSD
PREHIST_ARCH	Recorded prehistoric archaeological sites for King County	Agency	DOT-RSD
HIST_ARCH	Recorded historic archaeological sites for King County	Agency	DOT-RSD
CLP	Recorded Cultural Resources managed by Seattle Public Utility (SPU)	Agency	DOT-RSD
BURKEBLUEPOLY	Heretofore unrecorded archaeological sites for King County	Agency	DOT-RSD
BURKEGRAYPOLY	Heretofore unrecorded archaeological sites for King County	Agency	DOT-RSD
LANDFORM	Paleo-landscape features (late Pleistocene and Holocene)	Agency	DOT-RSD
LAASTCPSP	Areas of traditional cultural and religious significance for Native American groups in King County	Agency	DOT-RSD

Name	Description	Data Type	Organization
GLOETHNOTRAIL	Cultural features digitized from Government land Office (GLO) maps for use as shape files (feature data sources)	Agency	DOT-RSD
GLOHISTRD	Cultural features digitized from GLO maps for use as shape files (feature data sources)	Agency	DOT-RSD
GLOHISTPT	Cultural features digitized from GLO maps for use as shape files (feature data sources)	Agency	DOT-RSD
GLOETHPOLY	Cultural features digitized from GLO maps for use as shape files (feature data sources)	Agency	DOT-RSD
GLOHISTPOLY	Cultural features digitized from GLO maps for use as shape files (feature data sources)	Agency	DOT-RSD
CRREPORTS	Areas of previous cultural resource surveys	Agency	DOT-RSD
BENLINE	Line shapes representing The George Benson Waterfront Streetcar Line derived from REVSERV as an ordered set of timepoint intervals.	Enterprise	DOT-Transit
BUSBASE	Point shapes representing bus base locations (also called depots or garages). BUSBASE attributes include name, on street, cross street, and address.	Enterprise	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, side of the street, length of stop, fare zone, and zip code.	Enterprise	DOT-Transit
COLLECTOR	Line shapes representing collector arterials derived from STREET and King County road classification.	Enterprise	DOT-Transit
DEADHEAD	Line shapes representing Transit non-revenue service route footprint derived from STREET as an ordered set of links.	Enterprise	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.	Enterprise	DOT-Transit
FREESTRT	A polygon shape representing the Transit ride-free-area derived from STREET.	Enterprise	DOT-Transit
FREEWAY	Line shapes representing freeways derived from STREET and King County road classification.	Enterprise	DOT-Transit

Name	Description	Data Type	Organization
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.	Enterprise	DOT-Transit
LOCAL	Line shapes representing local roads derived from STREET and King County road classification.	Enterprise	DOT-Transit
MINOR	Line shapes representing minor arterials derived from STREET and King County road classification.	Enterprise	DOT-Transit
NHOOD	Polygon shapes representing neighborhoods. This layer directly supports Transit's trip planning system. NHOOD attributes include the name of the neighborhood.	Enterprise	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.	Enterprise	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.	Enterprise	DOT-Transit
PLANDIST	Polygon shapes representing Transit Planning District as defined by Facility Planners.	Enterprise	DOT-Transit
PRIMARY	Line shapes representing primary arterials derived from STREET and King County road classification.	Enterprise	DOT-Transit
REVSERV	Line shapes representing Transit revenue service route footprint derived from STREET as an ordered set of links.	Enterprise	DOT-Transit
SIGNAL	Point shapes representing traffic signal locations derived from STREET (nodes) and traffic signal key.	Enterprise	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.	Enterprise	DOT-Transit
STREET (junctions)	Node shapes representing intersections of line shapes. STREET (junction) attributes include transit timepoint key and traffic signal.	Enterprise	DOT-Transit

Name	Description	Data Type	Organization
SUBSTATN	Point shapes representing electrical distribution nodes for overhead wire trolley system. SUBSTATN attributes include name, address, type, supplier, label, and kilowatt-hours.	Enterprise	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.	Enterprise	DOT-Transit
TRNSAREA	Polygon shapes representing Transit planning districts as defined by Service Planners.	Enterprise	DOT-Transit
TRNSCNTR	Point shapes representing transit center locations. TRNSCNTR attributes include name, on street, cross street, and address.	Enterprise	DOT-Transit
TRNSFACL	Point shapes representing transit facilities other than P&R, bus bases, and transit centers. TRNSFACL attributes include name.	Enterprise	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.	Enterprise	DOT-Transit
TUNLSTN	Polygon shapes representing transit tunnel stations. TUNLSTN attributes include the name of the tunnel station.	Enterprise	DOT-Transit
TUNNEL	A polygon shape representing the Transit tunnel.	Enterprise	DOT-Transit
WTRTAXI	Line shapes representing the Water Taxi route derived from REVSERV as an ordered set of timepoint intervals.	Enterprise	DOT-Transit
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.	Agency	DOT-Transit
APCEMIT	Point shapes representing Transit radio frequency emitters derived from EMITTER. These points may have a different location from the physical emitter location to facilitate Automatic Passenger Counter system processing.	Agency	DOT-Transit
AVLEMIT	Point shapes representing Transit radio frequency emitters derived from EMITTER. These points may have a different location from the physical emitter location to facilitate Automatic Vehicle Location system processing.	Agency	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.	Agency	DOT-Transit
DART	Polygon shapes representing Dial-a-Ride service area for Transit.	Agency	DOT-Transit

Name	Description	Data Type	Organization
DEADNEXT	Line shapes representing Transit non-revenue service route footprint for the following (next) transit service change. These shapes are derived from STREET as an ordered set of links.	Agency	DOT-Transit
FAREZONE	Polygon shapes representing Transit fare zones for King County Metro, Community Transit, Pierce County Transit, and Sound Transit.	Agency	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.	Agency	DOT-Transit
REVNEXT	Line shapes representing Transit revenue service route footprint for the following (next) transit service change. These shapes are derived from STREET as an ordered set of links.	Agency	DOT-Transit
SERVGRID	Polygon shapes representing a simple Transit service grid used on the Web for users to pick an area of interest. Information about the Transit service in that grid is provided.	Agency	DOT-Transit
ZONES	Point shapes representing all active and inactive Transit bus stops derived from street as a distance from an intersection along a link.	Agency	DOT-Transit
BUILDINGS	building footprints digitized from imagery	Not Specified	DOT-KCIA
LEASEHOLDS	leaseholds digitized from imagery	Not Specified	DOT-KCIA
LEASEHOLDS_COGO	leaseholds COGO'ed from legal descriptions in other documentation	Not Specified	DOT-KCIA
LEASE_TIELINES	adjunct layer for leaseholds_cogo to define true points of beginning	Not Specified	DOT-KCIA
MAP_SOURCE	spatial extent of rectified map imagery	Not Specified	DOT-KCIA
OWNERSHIP_HISTORY	extents of airport property acquisition in historical context	Not Specified	DOT-KCIA
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-KCIA

Name	Description	Data Type	Organization
URB-V&R	King County Vacant and Redevelopable Urban Land - Analysis as defined by the Buildable Lands Amendment to Growth Management Act per state mandate. Derived from: • Parcel • Assessor's Database • Parks And Open Space • Sensitive Areas	Enterprise	OMB
KC-MIC	King County Manufacturing and Industrial Center Boundaries – Maintained on behalf of BRED. Responsibility for this dataset may move to DDES. Derived from: • City of Seattle • City of Kent • City of Tukwila	Enterprise	OMB
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	Enterprise	OMB
NEWUNITS	New Housing Units Permitted in King County. Data taken as permitted from KC DDES.	Enterprise	OMB
PAA	Potential Annexation Areas. Derived from various urban growth boundaries.	Enterprise	OMB
MAJOR-PAA	Major Potential Annexation Areas. Derived from various urban growth boundaries.	Enterprise	OMB
SUBAREAS	Four broad sub-areas of Urban-designated King County	Enterprise	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	AvLib (ArcView Library) is an ArcView 3.x extension providing 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 are normally randomly generated by ArcView; link data to metadata via an HTML browser; access image data 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	KCGIS Center
KC Parcel Tools	This ArcView 3.x 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 cadastral base framework LIBRARIAN tiles with tools for loading and managing arc and annotation features; generating quarter section maps of cadastral base framework data with minimal user input; and generating formatted mailing labels for selected parcels.	Front End	KCGIS Center
iMap	iMap is a web-based map viewer that provides online access to map layers and other related information. This 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 function is also included. The URL for iMap is http://www.metrokc.gov/gis/mapportal/iMAP_main.htm.	Front End	KCGIS Center

Name	Description	App Type	Organization
Parcel Viewer	The Parcel Viewer is a web-based 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. The URL for Parcel Viewer is http://www.metrokc.gov/gis/mapportal/PViewer_main.htm.	Front End	KCGIS Center
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	KCGIS 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	KCGIS 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	KCGIS Center
Inview	Inview (INtegration VIEWer) is designed to allow users to view edits applied to the cadastral base framework (RECDNET) and cadastral base framework annotation (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	KCGIS Center

Name	Description	App Type	Organization
Keytool	Keytool allows users to create and maintain polygon keyfiles that describe GIS datasets conflated to the cadastral base framework 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.	Back End	KCGIS Center
Sitetool	Sitetool allows KCGIS users 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	KCGIS Center
Eventlog Reader	Eventlog Reader is a web-based application located on the intranet web server so only King County employees have access (http://webtest/reports/eventlog). 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	KCGIS 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	KCGIS 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	KCGIS Center

Name	Description	App Type	Organization
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.	Utility	KCGIS Center
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 cadastral base 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	KCGIS Center

Name	Description	App Type	Organization
LibTool Utilities	Unlike most other applications, LibTool is not a discrete tool, but is 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	KCGIS 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 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, build indexes on those tables and create statistics on the indexes to optimize access times for common query tasks against them. Those that support Oracle administration include: Add_user – A PL/SQL stored procedure used to streamline the task of adding database user accounts and to ensure that user contact and organizational information is captured to the staff and organization tables. 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.	Utility	KCGIS Center
Update	The Update routines are varied and perform many functions to update the KCGIS Spatial Data Warehouse. 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 as coverages and corresponding shapefiles to the KCGIS Spatial Data Warehouse. Various lookup tables are also updated to reflect the posted changes.	Utility	KCGIS 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

Name	Description	App Type	Organization
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
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

Name	Description	App Type	Organization
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. This application is planned to be retired before the end of 2004.	Front End	DDES
Autoplot	"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. While based on the same code as "Base2", "Autoplot" produces complex maps that would be difficult to implement in ArcIMS. As a result "Autoplot" will be retained for the foreseeable future.	Front End	DDES
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
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 MS Access as the backend. This data support all WTD infrastructure based analysis and products including the Onelines atlas.	Front End	DNRP-WTD
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. It is currently offline awaiting evaluation of its use and need of maintenance.	Front End	DNRP-WTD
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). This is currently offline awaiting maintenance.	Back End	DNRP-WTD

Name	Description	App Type	Organization
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	Back End	DNRP-WTD
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 Microsoft SQL database for the Maintenance and Defect Bond Program for King County DOT – Road Services Unit. GIS link will be integrated in 3rd quarter of 2004.	Not Specified	DOT-RSD
Route Footprint Generator (formerly AS)	This application is an ArcView 3.x extension. It provides Accessible Services staff with a simple easy-to-use menu interface for creating transit fixed route service footprints based on time of day.	Front End	DOT-Transit
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. This application will be replaced in 2003/04 as part of the Wintel Migration.	Front End	DOT-Transit

Name	Description	App Type	Organization
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 Information System – Bus stop maintenance tool. • TOE -- Maintaining route paths and time point locations (to be implemented in 2004). • Emitter – Maintaining emitter locations (to be implemented in 2004).	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. This application will be replaced in 2003/04 as part of the Wintel Migration.	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. This application will be integrated into the GIS Toolbox in 2004.	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.	Front End	DOT-Transit
TOE	Transit Object Editor. This application is the primary tool used by customer information analysts for maintaining route paths and time point locations. This application will be integrated into the GIS Toolbox in 2004.	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 2004 as part of the transportation network project and as part of the Wintel Migration.	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

Name	Description	App Type	Organization
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. This application will be replaced in 2003/04 as part of the Wintel Migration.	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
CopyOtherShapes	This application copies shape files for themes other than Transit and Street from *COUGAR* to *KCMOLYMPUS*. This application will be decommissioned once the Wintel Migration is complete in 2004.	Utility	DOT-Transit
CopyStreetTransitShapes	This application copies shape files for the Transit and Street themes from *COUGAR* to *KCMOLYMPUS*. This application will be decommissioned once the Wintel Migration is complete in 2004.	Utility	DOT-Transit
CopyTabs Extract	This application copies data from the TABS server to *KCMOLYMPUS* necessary for the AvTabs application.	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. This application will be decommissioned once the Wintel Migration is complete in 2004.	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. This application will be replaced in 2003/04 as part of the Wintel Migration.	Utility	DOT-Transit
Kctran2nat	This application transfers Transit and street network related coverages to the KCGIS Spatial Data Warehouse. This application will be replaced in 2003/04 as part of the Wintel Migration and modified to transfer shape files.	Utility	DOT-Transit
Labelscreate	This application automatically generates street labels for use in the GIS Toolbox. This application will be replaced in 2003/04 as part of the Wintel Migration.	Utility	DOT-Transit

Name	Description	App Type	Organization
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). This application will be replaced in 2004 once *T*NET and other core data maintenance applications have been replaced as part of the Wintel Migration.	Utility	DOT-Transit
Nbatch	This application combines Toetow and Toeddb into a single application with some quality control checks prior to their execution. This application will be replaced in 2003/04 as part of the Wintel Migration.	Utility	DOT-Transit
Plib2prd	This application transfers data from the KCGIS Spatial Data Warehouse to the Transit GIS library. This application will be replaced in 2003/04 as part of the Wintel Migration and modified to transfer shape files.	Utility	DOT-Transit
ProcessMonitor	This application reports on the status of nightly batch processes that have been executed within the last 24 hours.	Utility	DOT-Transit
StopProcessort	This application processes stop locations and flags stops that are on changed streets.	Utility	DOT-Transit
Stp2atis	This application adds/updates various attributes (e.g., city, zip code) to the bus stop data layer through a variety of overlay operations. These attributes are necessary for the trip planning application. This application will be replaced in 2003/04 as part of the Wintel Migration.	Utility	DOT-Transit
Stpupdate	This application creates a list of changed streets from the previous day's editing to identify stops that may have been affected by those changes. This application will be replaced in 2003/04 as part of the Wintel Migration.	Utility	DOT-Transit
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. This application will be replaced in 2004 once *T*NET and other core data maintenance applications have been replaced as part of the Wintel Migration.	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. This application will be replaced in 2004 once *T*NET and other core data maintenance applications have been replaced as part of the Wintel Migration.	Utility	DOT-Transit

Name	Description	App Type	Organization
Update_Tnet2prd_script2	This script takes existing KCSN data and converts it into the data structure of TNET. The GIS Toolbox V204 requires this new data structure. This script also populates data into the new MAPPED_TIMEPOINT table from the TIMEPOINT table.	Utility	DOT-Transit
UpdatePathLinks	This application is used to update the TPI paths (new and modified) and the description field on the TPIPATH database table.	Utility	DOT-Transit
LeaseEdit	Database-driven document management tool for lease information that is directly related to the spatial layers listed above	Not Specified	DOT-KCIA
LeaseQuery	displays spatial information, relates the spatial layers to the document management information and displays maps and reports	Not Specified	DOT-KCIA
ParkView	Look-up tool to access general information for parks, trails, facilities, and programs.	Not Specified	DNRP-Parks
PSAFI	Park site and facility information application, which tracks detailed data for all park sites and the facilities within them.	Not Specified	DNRP-Parks
IMAP Parks System	KCGIS Map Portal map set that provides an overview of the County's park system.	Not Specified	DNRP-Parks