King County
Geographic Information System

2017-2018
Operations and Maintenance
Plan

King County

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1 Introduction

This document describes the current state of the King County Geographic Information System (KCGIS). It represents the culmination of a collaborative effort by personnel throughout the county to describe the 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, human services, election services, wastewater facilities planning, natural resource and parks management, waste management, public health, road maintenance, transit services, airport management, crime analysis, budget development, policymaking, equity and social justice, legislative support, and growth management. This document provides the details of how GIS supports those and many other business functions.

KCGIS was organized into a countywide federated structure in 2002 with an enterprise GIS unit (the King County GIS Center), a single point of executive level accountability for GIS within the county, and governance committees at the technical and oversight level. In 2012 the single point of accountability was transferred from the Director of the Department of Natural Resources and Parks (DNRP) to King County's Chief Information Officer (CIO). In 2016 GIS governance was refreshed with new charters and new membership criteria for its technical advisory and steering committees.

A key mission of KCGIS is to generate a comprehensive work plan (known as the Operations and Maintenance Plan, or O&M Plan). This document is the 2017-2018 edition of that work plan. The first such plan was written in 1997, and subsequent plans have been published nearly every year since. The result is a detailed picture of the King County GIS work program.

The document is organized as follows:

- Introduction
- Organization
- Priority Initiatives
- Agency Work Plans
- Summary Information
- KCGIS Center Services
- GIS Committees

The Organization section details how GIS efforts are organized and governed within the County. The Priority Initiatives section provides information on the activities identified by the GIS governance committees as having significant benefit and high value for collaborative effort. These priorities change yearly, with some new initiatives added and some initiatives carrying over from year to year until their objectives are met. The Agency Work Plans section provides information on the organization, goals and objectives of the agencies as they implement and manage their GIS programs. This section may also include a listing of each agency's major GIS projects. The Summary Information section provides a listing of each agency's GIS staffing, a table of GIS software licenses, and information for linking to detailed information about the county's GIS data. The KCGIS Center Services section summarizes the KCGIS Center's various roles, functions and offering as the enterprise GIS unit. Information on the two committees that make up the governance structure is contained in the KCGIS Committees section.

KCGIS embodies a rich source of data, an exceptional set of innovative applications, and a group of highly skilled and motivated professionals dedicated to serving the public's needs. This resource is essential to the diverse business functions of King County. Support from the County 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 residents of King County. The King County GIS O&M Plan is very much a working document. The information in this document will be used to refine King County GIS through cooperation, coordination, communication and consensus.

2 Organization

The King County Geographic Information System (KCGIS) is a coordinated program of county agencies working in partnership with the KCGIS Center, the county's provider of enterprise GIS services. The program is aligned to meet the County Executive's vision for King County's GIS to be the premier provider of GIS services in the region.

King County's Chief Information Officer (CIO) is the responsible authority designated by the County Executive as accountable for the KCGIS program. Aiding the CIO in governance of the program are GIS steering and technical advisory committees.

The KCGIS Center is structured as an internal service fund administered within the home agency of the CIO, the Department of King County Information Technology (KCIT). The enterprise operations provided by the KCGIS Center are funded by nearly all county agencies based on an inclusive and equitable cost allocation model. Details about the funding model can be found on the KCGIS Center website (www.kingcounty.gov/operations/GIS/About.aspx).

Agencies with GIS units provide business specific GIS services to their home agency, however in the absence of an agency GIS unit, or when agency-based GIS services are not feasible or practical, the KCGIS Center offers GIS staffing and project services on a cost reimbursable basis.

The KCGIS program is based on the principle that extensive coordination and collaboration occurs between GIS units in the county. This interaction encompasses most aspects of GIS including data, applications, analysis, reporting, and display. The program is also based on the premise that data are the core asset of KCGIS 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.

2.1 Chief Information Officer

The Chief Information Officer is the executive sponsor of the KCGIS program and is accountable to the County Executive for the overall performance of the program. The CIO delegates day-to-day operation of the KCGIS program to the KCGIS Center Manager. The KCGIS Center Manager in turn reports to management within the Technology Group of KCIT.

2.2 GIS Steering Committee

The GIS Steering Committee (GSC) is the chartered group responsible for setting goals and objectives for the KCGIS program, ensuring goals and objectives are realized by reviewing and approving a coordinated GIS work program, and establishing related performance measures and reviewing performance. Committee responsibilities include:

- Establish standards and expectations for the King County GIS Center addressing enterprise GIS infrastructure reliability, resilience, and performance.

- Collaborate with the GIS Technical Advisory Committee (GTAC) to develop performance metrics that reflect the standards and expectations established for the enterprise GIS infrastructure.

- Collaborate with the GTAC to identify, rank, and establish a portfolio of GIS priority initiatives and projects.

- Develop agency GIS business cases and work programs, and publish a countywide GIS work plan.

Every customer agency is entitled to representation on the GIS Steering Committee. Members of the GIS Steering Committee need to have working knowledge of GIS with some level of accountability for GIS projects within their agency. Members also learn about and advocate for GIS services, and serve as conduits for information between the GIS Steering Committee and their agency. GSC members need to meet the work and time commitments associated with service on the committee as the agency

representative. The KCGIS Center Manager or his/her designee serves as non-voting committee chair. The GIS Steering Committee is required to meet at least quarterly.

2.3 GIS Technical Advisory Committee

The GIS Technical Advisory Committee is a chartered committee that serves in an advisory role to the GIS Steering Committee and to the KCGIS Center. Responsibilities of the committee include:

- Assist in establishing standards and expectations for the KCGIS Center addressing enterprise GIS infrastructure reliability, resilience, and performance.

- Collaborate with the GSC to develop performance metrics that reflect the standards and expectations established for the enterprise GIS infrastructure.

- Provide the GSC with recommendations for a base Service Level Agreement (SLA) for KCGIS Center services including, but not limited to response timeframes, incident notifications, and planned maintenance.

- Develop a GIS work program that encompasses a detailed approach to meeting the standards and expectations associated with enterprise GIS infrastructure reliability, resilience, and performance in order to maintain existing GIS data and functionality.

- Collaborate with the GSC to identify and establish a portfolio of GIS priority initiatives and projects in order to fulfill GIS betterment objectives or for development of new or improved GIS functionality.

- Provide strategic and technical guidance reports to the GSC.

The GIS Technical Advisory Committee is comprised of 15-18 members with demonstrated expertise in various GIS and IT skill sets, have extensive experience related to the King County enterprise GIS environment, or are responsible for GIS framework data. The committee consists of no less than five (5) members who are appointed by the KCGIS Center Manager. The remaining seats are available to participating agencies and members are nominated and approved by the GSC.

The membership of the GIS Technical Advisory Committee is reviewed and updated annually. The KCGIS Center Manager or his/her designee is the non-voting chair of the committee. The committee is required to meet every other month.

2.4 Agencies

Aspects of the KCGIS program are addressed through the consolidated governance structure of the GIS committees, and are guided by active agency participation. Agency GIS programs work together formally via the governance committees, and informally via user groups, teams, ad hoc committees, and routine business contact. An agency's responsibilities to the KCGIS program include:

- Develop and submit a work plan for review and inclusion in the KCGIS Operations and Maintenance Plan.

- Develop and maintain GIS data necessary to support agency business needs, and when compatible, the needs of other data stakeholders.

- Articulate agency GIS business needs to the KCGIS community.

- Comply with GIS standards and best practices approved by the KCGIS governance committees.

- Ensure all agency data appropriate for sharing is integrated into the KCGIS Spatial Data Warehouse (SDW).

- Actively seek opportunities for cross-agency collaboration on data and application projects.

- Ensure data development and data maintenance tasks are quality controlled and completed on schedule.

- Ensure agency 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 operation and maintenance (O&M) services for the KCGIS program, requested services to internal and external clients, and programmed support to county agencies by means of matrix staffing allocations. The KCGIS Center work program is developed under the guidance of the KCGIS governance committees. One mechanism to help accomplish this is the Operations and Maintenance (O&M) Plan developed by the GIS governance committees.

Responsibilities of the KCGIS Center include:

- Manage the KCGIS Spatial Data Warehouse (SDW).
- Provide data coordination services to ensure KCGIS data development and data maintenance activities are performed in an efficient manner and occur as planned.
- Facilitate integration of quality controlled agency data into the KCGIS Spatial Data Warehouse.
- Report data maintenance issues and concerns to the GIS governance committees.
- Set up and manage data acquisition and data sharing arrangements with external agencies and coordinate response to external data requests.
- Provide tools for developing, maintaining, and accessing KCGIS metadata.
- Provide public access to GIS data.
- Maintain a record of and comply with the GIS standards and best practices approved by the GIS governance committees.
- Actively participate on KCGIS committees.
- Market GIS services in coordination with KCIT Regional Services.
- Provide GIS training services to professionals and end-users.
- Provide GIS expertise to agencies as requested.
- Coordinate the evaluation of technical options with agency GIS programs and the GIS governance committees.
- Implement and maintain the architectural and system standards for the enterprise GIS platform.
- Maintain a common GIS application development framework.

2.6 KCGIS Budget and Funding

This section provides an overview of budgets, funding mechanisms, and financial resources for the KCGIS program, as well as a brief synopsis of the fund history.

On December 13, 2001 the King County Council approved ordinance 2001-0555 (enactment 14270) creating the King County Geographic Information Systems Fund. The ordinance stated, in part, the purpose of the fund is for "operating, maintaining, and enhancing automated geographic information systems that serve both county agencies and external customers." The ordinance took effect January 1, 2002. The fund operates under the name King County GIS Center (KCGIS Center). King County Code gives internal service funds full financial and operational responsibility to provide designated services and agencies receiving services or benefiting from internal service fund activities are required to budget for internal service fund costs.

Effective January 1, 2012, the KCGIS Center became part of the King County Department of Information Technology (KCIT) and King County Code was modified to reflect that change. In 2013 the KCGIS Center transitioned from an annual budgeting cycle to a biennial cycle to align with the rest of KCIT.

For budgeting purposes the KCGIS Center divides its activities into three 'business lines' (Enterprise GIS Operations, GIS Client Services, and Matrix GIS Staffing Services). Each business line supports a logical cost allocation methodology to help GIS users understand the basis for individual GIS service cost components. A clear understanding of cost components for GIS services allows user agency managers to make informed business decisions on how to use GIS as a tool for their agency's operations. To ensure customers fully fund appropriate costs, and to ensure the fair allocation of costs for shared services, a detailed budget/rate development spreadsheet is used to account for all planned costs and to determine a rate that will recover sufficient revenue within each business area.

Enterprise GIS Operations (aka O&M) – The KCGIS Center's core business line provides enterprise GIS infrastructure and operational services. Specific enterprise GIS services are defined in consultation with the GIS steering and GIS technical advisory committees. These services include:

- KCGIS Center management
- KCGIS governance support (steering and technical advisory committees, standards and best practices, and biannual KCGIS O&M Plan)
- KCGIS program coordination (agency support)
- Regional GIS contact and coordination
- Spatial Data Warehouse operation and management (SDW administration, content management and metadata management)
- KCGIS website management
- GIS enterprise application development and maintenance (back-end, web, and desktop)
- Data maintenance coordination (coordinate agency data maintenance and quality control, external data acquisition and designated enterprise data maintenance)
- Regional imagery acquisition program
- GIS related contract management, including Esri enterprise agreement and enterprise license management
- Education and outreach (brownbag sessions, custom GIS training class development, regional KCGIS User Group, marketing)
- Coordination of designated GIS priority work initiatives

The rate model for GIS O&M is based on a blending of customer usage measures and agency staffing counts, known as Full Time Equivalents (FTE). This breaks down as follows:

- 50% of rate - Users of ArcGIS Desktop software, as measured by minutes of usage tracked with a license monitoring system
- 10% of rate - Users of KCGIS Center web-based mapping applications, as measured by number of sessions tracked to internal county IP address ranges
- 40% or rate - Number of FTEs, as measured per county budget cost center

A primary objective of the O&M rate methodology is to promote use of GIS technology while minimizing cost related disincentives. By using a pay as you go model (no up-front costs to access GIS software and applications), and including FTEs (costs are spread across all cost centers), the O&M rate methodology helps achieve this objective.

GIS Client Services (aka Requested Services, a Sub-Component of GIS Spatial Services) – The KCGIS Center Spatial Services group provides on-demand GIS client services to meet the needs of county business units and external customers. GIS client services charges are based on an hourly labor

rate plus materials, billed in 30 day cycles. Many county agencies opt to have predetermined GIS client services expenditure amounts included in their biennial budgets. These agencies are billed for one-twenty-fourth (1/24th) of those amounts on a monthly basis throughout the biennium. As work is completed the resulting prepaid balance is drawn down. A true-up is performed at the end of the biennium to correct for any under or over payments.

Matrix GIS Staffing Services (aka Programmed Services, a Sub-Component of GIS Spatial Services) – The KCGIS Center Spatial Services group directly provides GIS operations at a programmed level of support for county agencies choosing to use this service. For the 2017-2018 biennium the KCGIS Center Spatial Services is supporting eight county work units via this matrix staffing concept. These include all four divisions of the Department of Natural Resources and Parks (DNRP), two divisions of the Department of Transportation (DOT), the Office of Performance, Strategy and Budget (PSB), and the Department of Permitting and Environmental Review (DPER). The KCGIS Center Spatial Services works cooperatively with each matrix customer to evaluate the level of need for GIS services within their work unit, and coordinates the assignment of staff to work on specific tasks or projects.

The following table provides a high level view of the KCGIS Center financial plan. The plan shows the beginning fund balance, revenues, expenditures, reserve balances, and ending fund balance. It covers an eight year timeframe, starting with the 2015-2016 budget actuals, the 2017-2018 adopted budget; as well as projections for the following two biennium.

2017-2018 Financial Plan
Geographic Information System (GIS)/000005481

Category	2015-2016 Actuals	2017-2018 Adopted Budget	2019-2020 Projected	2021-2022 Projected
BEGINNING FUND BALANCE	**1,518,000**	**689,380**	**221,414**	**214,988**
REVENUES				
Agency O&M Rates	5,238,920	6,627,023	7,177,066	7,851,710
Agency Matrix Rates	4,571,856	4,203,428	4,552,313	4,980,230
Agency Client Services Rates	1,406,237	2,066,874	2,238,425	2,448,836
E911 Transfer	-	1,739,591	1,837,008	1,939,881
Contingency Imagery Revenue	-	1,719,500	1,817,512	1,942,920
External Imagery Revenue	744,746	1,142,000	1,207,094	1,290,383
Credit to KCIT for M&BF Costs Collected	-	(659,647)	(714,398)	(781,551)
Total Revenues:	**11,961,759**	**16,838,769**	**18,115,020**	**19,672,409**
EXPENDITURES				
Wages, Benefits and Retirement	(7,971,667)	(10,217,297)	(10,789,466)	(11,447,623)
GIS Plan Development	-	(220,750)	-	-
Contribution to Capital	(1,161,602)	-	-	-
Direct Services	(1,489,373)	(4,427,326)	(4,679,684)	(5,002,582)
Intergovernmental Services	(2,167,737)	(2,541,362)	(2,752,295)	(3,011,011)
Total Expenditures:	**(12,790,379)**	**(17,406,735)**	**(18,221,445)**	**(19,461,216)**
ESTIMATED UNDEREXPENITURES	**-**	**100,000**	**100,000**	**100,000**
ENDING FUND BALANCE	**689,380**	**221,414**	**214,988**	**526,181**
RESERVES				
Prepaid Client Services Reserve	(100,765)	(100,765)	(100,765)	(100,765)

Revenue Variance Reserve	(308,190)	-	-	-
Strategic Sustainable Capacity Reserve	(280,425)	-	-	-
Total Reserves:	**(689,380)**	**(100,765)**	**(100,765)**	**(100,765)**
RESERVE SHORTFALL	**-**	**-**	**-**	**-**
ENDING UNDESIGNATED FUND BALANCE	**-**	**120,649**	**114,223**	**425,416**

3 KCGIS Priority Work Initiatives

In coordination with development of the GIS O&M plan, the GIS Steering Committee identifies priority work initiatives. The priority initiatives described here represent a continuation of efforts begun in earlier years and new work that has recently become a focus.

KCGIS generally pursues work initiatives that can be accomplished using existing staff and budget resources. A large share of the work is carried out by KCGIS Center staff. An important factor in successful completion of the priority work initiatives are resource contributions from staff in other King County agencies. Therefore, the GIS Steering Committee acknowledges there is a commitment to provide access to key staff within agencies to help ensure the objectives of the priority initiatives are met.

The work initiatives are administered by the KCGIS Center. Regular and periodic project reporting to the GIS governance committees is required. As an aid to the reporting process each initiative is assigned a tracking code. Codes beginning with "O" indicate initiatives primarily associated with organizational issues. Codes beginning with "D" indicate initiatives primarily associated with a data issue, and codes beginning with "A" indicate initiatives primarily associated with software application development.

In order to provide guidance to the KCGIS Center for allocating resources the priority work initiatives are scored against a set of criteria during the proposal phase. Each initiative is first self-scored by the sponsor, and that score is then subject to final adjustment by the GIS Steering Committee. Criteria for scoring include whether or not the product or service is required; fit or alignment to the strategic goals of King County; the risk associated with not performing the work; potential cost and level of effort to complete the work, the value to the public; the benefit to internal users; and the potential to leverage the outputs of the initiative for other purposes. At its discretion the GIS Steering Committee can reject a proposed initiative, or cancel an existing one.

The initiatives are described below, presented in descending order based on the adjusted scores of the GIS Steering Committee. The scores are shown in parenthesis to the right of the initiative title.

D-5   Cadastral Accuracy Improvements – (213)

> **Background:** The positional accuracy of King County's parcel data varies. Some areas are of poor quality and need improvement to align with more accurate data collected by GPS or survey methods. Several cities have sought positional improvements on their own and maintain their own version of parcel data. Opportunities to collaborate with cities to improve the county's parcel data are being pursued. The first of these efforts began in 2006 with an agreement between the city of SeaTac and Assessments. Since then several other cities have provided data or participated with the county in cadastral data improvement efforts. Substantial progress has been made, but much work remains. One outcome of the accuracy improvements is that boundaries tied to parcel features that are maintained as separate layers may no longer align properly with the parcel data. These boundaries then need adjustment. A systematic method to track changes to the cadastral data and notify data stewards of those changes needs to be developed.

> **Objective:** The KCGIS Center and the Department of Assessments will continue to work together to find opportunities to improve the positional accuracy of the parcel data. Efforts underway with a handful of cities will continue. Other cities will be contacted to determine their interest in similar work. The KCGIS Center will continue to provide staff resources on a limited but steady basis to work on targeted areas of the county. Efforts will be focused where accurate data are available and/or positional errors are significant. A change tracking mechanism will be developed as an aid to data stewards in other agencies.

> **Who would perform most of the effort:** Assessments and KCGIS Center

> **Requires ongoing KCGIS Center O&M:** No

> **Level of effort:** High

> **Sponsor:** Christie Most, Assessments

D-8   TNET Data Enhancements – (198)

Background: TNET is the authoritative transportation network to be used by all county agencies. Although the data quality for unincorporated King County has greatly improved, incorporated areas are in need of review and enhancement.

Objective: The KCGIS Center and the Roads Services Division will continue to work together to find opportunities to improve the positional accuracy of the TNET data. Efforts underway with cities that are active TNET Consortium members will continue. Other cities will be contacted to determine their interest in joining the editing consortium. The KCGIS Center will continue to provide staff resources on a limited but steady basis to work on targeted areas of the county. Efforts will be focused where accurate data are available and/or positional errors are significant within incorporated areas. A change tracking mechanism will be developed as an aid to data stewards in other agencies.

Who would perform most of the effort: Road Services and KCGIS Center

Requires ongoing KCGIS Center O&M: No

Level of effort: Medium

Sponsor: James Bach, KCGIS Center

D-20   Stream and Wetland Layer Improvements – (198)

Background: Multiple business units have found a serious need to improve the spatial accuracy and database schema for streams and wetland layers currently in GIS. The lack of this information in a central layer has caused several side layers to be created which are not accessible to all staff and the current layer does not meet mandated needs for determining waters of the state properly. Also the layers in their current state cannot be used to push data improvements forward to the state and then federal levels because the schema is not compatible with the National Hydrography Dataset Plus (NHD+). The NHD is a good starting point for a base schema and provides benefits of matching the terms used by regulatory agencies and other jurisdictions.

Objective: Create workgroup to evaluate business needs that need to be considered in data design and evaluate the NHD schema to come up with an improved schema. The existing data can then be migrated into the new datasets and improvements can be made to attributes and spatial accuracy. This also would include creation of data maintenance procedures for expanded attribution that the layer will contain.

Who would perform most of the effort: Water and Land Resources and KCGIS Center

Requires ongoing KCGIS Center O&M: No

Level of Effort: Medium

Sponsor: Nick Hetrick, Water and Land Resources

D-21   Address Point Data Enhancements – (198)

Background: In support of emergency services and the authoritative address point file, a proposed coordinated effort among interested King County agencies to allow for more resources for address point data enhancements and maintenance. The priority would coordinate an effort between the KCGIS Center, The E-911 Program Office, Elections and any other interested agencies. For example, Elections has been geocoding voters against address point sending address verifications to E-911. The mutual benefit has successfully rectified over 2,500 address points and cured over 5,000 active voter addresses across King County. Elections currently has about 1,000 unique addresses complied for verification and about 4,000 addresses we have yet to research. Given the growth of the county, rate of address changes and new plats, this priority could open an opportunity for shared resources in helping keep up with the new and changed

address information submitted on a daily basis by addressing authorities and other county agencies. We anticipate this coordinated effort of resources to be medium at first and transition into ongoing maintenance once caught up.

Objective: E-911 would continue to be the owner and primary data steward while other KC agencies would provide resources for address corrections, research or updates. An internal process for submitting/exchanging updates would be established. A possible formation of a new addressing work group to introduce partnerships and workflow. A possible enhancement or new field "Edit date" could be added to address point. The edit date could track updates and help streamline workflow between agencies to avoid duplicating efforts, agencies can sort by date, view the updated points quickly and update their independent databases or address files.

Who would perform most of the effort: Elections, E-911 Office, KCGIS Center

Requires ongoing KCGIS Center O&M: No

Level of effort: Medium

Sponsor: Katrina Sroufe, Elections

O-10   The Next KCGIS Vector Data Warehouse Platform – (186)

Background: The current KCGIS Vector Data Warehouse PLIBRARY is hosted in SQL Server 2008 R2 on SVE. SQL Server 2008 R2 support ends July 1 2017. We may move to the cloud in SQL Server or in PostgreSQL. We have deferred the move to native spatial data types for geometry storage. Testing needs to happen. We should define or update and document standards for data warehouse data storage: data types, conversions and transformations (file GDB, personal GDB, MSSQL, Oracle, PostgreSQL). Also, update QA/QC tests if needed.

Objective: Determine update schedule and target versions for migration. Plan, test, and implement the migrations according to findings. Select an update timeframe, and target ArcGIS/Geodatabase version. Compile a list of functional requirements and tests for them. Implement test instances of RDBMS candidates: SQL Server, PostgreSQL, developing procedures for their deployment, host system (including on premise or cloud), configuration, maintenance, optimizations. Set a date for upgrade and communicate via GSC, GTAC, and Change Management.

Who would perform most of the effort: KCGIS Center

Requires ongoing KCGIS Center O&M: Yes

Level of effort: High

Sponsor: Debbie Bull, KCGIS Center

D-22   External Data Cleanup – (183)

Background: Many agencies depend on the external data acquired by the KCGIS Center to conduct routine and mission critical work. Over the years, the amount of data has grown beyond what the original approach to data management can currently handle. Data often evolves at the contributing agencies leaving duplicates or out of date data on the KCGIS enterprise database when "new" data is acquired. The timely acquisition of data is hampered by the complexities of dealing with multiple contributing agencies. In addition, how King County users define "timeliness" is relative to their individual needs; current data for one division might be too out of date for the needs of another. An evaluation of the current state of the data, the needs of the users, and procedures related to how external data is managed is needed. Subsequently, a systematic, transparent, and documented approach to collection and maintenance needs to be developed.

Objective: This initiative will start with a survey of external data needs within King County to ensure needed data is collected, but time is not wasted collecting unneeded data. Also, an inventory will be conducted to evaluate the current state of the external data warehouse looking

to eliminate redundancy, to normalize naming, and to certify the data is the most up-to-date. Finally, a documented maintenance plan will be developed with contact information for the contributing agencies and procedures for how data is acquired and managed. Schedules and responsibilities should be highlighted. Maintenance of the warehouse in accordance with the documented procedures will be ongoing.

Who would perform most of the effort: KCGIS Center

Requires ongoing KCGIS Center O&M: Yes

Level of effort: Medium

Sponsor: Shaun O'Neil, KCGIS Center

O-11   KC Symbology Guidelines – (162)

Background: Creating symbology guidelines would save time on cartographic products, increase county map standardization, support new users, and provide a more consistent experience for both internal and external users.

Objective: Establish King County symbology guidelines for all data in PLibrary. Not all data published to PLIBRARY loads with preset symbology so the goal would be to fill in the gaps to cover all datasets. In addition to creating symbology for all datasets in PLibrary to come pre-set when loaded from LibTool, a stylesheet will be made available to support cartographic needs.

Who would perform most of the effort: KCGIS Center

Requires ongoing KCGIS Center O&M: No

Level of effort: Medium

Sponsor: James Bach, Road Services

O-12   GIS SDW Maintenance Prioritization and Tracking System – (153)

Background: There are many layers in the KCGIS Spatial Data Warehouse (SDW) that are update less frequently than stated in their metadata and less frequently than is optimal. There are fewer resources available for data maintenance that would be required to complete all data maintenance tasks on schedule. Additionally the exact SDW layers that correspond to the URISA Framework layers are not currently identified. The workload for maintenance of each framework layer is not known.

Objective: Develop a system that: Identifies framework layer status for SDW layers. Monitors the update frequency of SDW layers compared to their stated update frequency. Estimates workload requirements for maintenance of each layer. Prioritizes layers. Designates staffing of layers according to priorities informed through the KCGIS governance committees.

Who would perform most of the effort: KCGIS Center

Requires ongoing KCGIS Center O&M: Yes

Level of effort: Medium

Sponsor: Paul McCombs, KCGIS Center

O-13   Refactor MAINT Database – (144)

Background: The KCGIS Center's MAINT Enterprise Geodatabase on SQL Server 2008 R2 on server GISSQLKC serves a diverse set of use cases. MAINT was devised to host a multi-user, versioned geodatabase editing environment wherein KCGIS members could maintain data and then post it to the enterprise vector Spatial Data Warehouse (PLibrary). Where multi-user editing and versioning is not required for the maintenance environment, MAINT serves simply as a staging database for the purpose of posting data to PLibrary. Over time, the MAINT database has

become unwieldy with the number of datasets, versions, and users it supports, to the point where data stewards avoid using it for its original purpose.

Objective: MAINT should be refactored into: (1) multiple databases with smaller user audiences for each one, either by agency or by project, and (2) a new dedicated staging geodatabase for PLibrary updates. Devise new best practices for editing and posting data to the SDW and for performing data development work in file geodatabases and enterprise geodatabases, and for posting from those sources to the staging geodatabase for PLibrary with predictable and consistent results.

Who would perform most of the effort: KCGIS Center

Requires ongoing KCGIS Center O&M: Yes

Level of effort: Medium

Sponsor: Debbie Bull, KCGIS Center

A-14 **Develop User Interface Standards for Web Mapping – (135)**

Background: By adopting a user interface standard and controls, developers across the county could implement well-designed web mapping applications and reuse custom controls which should create efficiencies. The benefit would be to have a common experience across public facing web mapping applications, allowing the public to go from application to application without having to learn how to interact with each application. This approach would also provide a particular "King County web map app" branding and high standard.

Objective: To adopt existing, or develop new, user interface standards using common controls and common interface look and feel. This includes control utility and page placement recommendations.

Who would perform most of the effort: KCGIS Center

Requires ongoing KCGIS Center O&M: No

Level of effort: Medium

Sponsor: Tamara Davis, KCIT Operations

D-23 **Enhanced Rights of Way Layer – (117)**

Background: The ROW feature class is currently derived from the KCAM database owned and managed by the King County Assessor's Office. There is a countywide need for other information, such as Special Use Permits, to be added to enhance or enrich this layer for use to King County business systems.

Objective: To add value to a ROW feature class to include how, where and when the ROW was acquired, status of record (record life cycle), active Special Use Permits, and metadata about the record. Determine rules and methodology to ensure conflation and maintenance of correct topological relationship to the boundary layer. To establish a data owner and steward. Also, to create a common, automated workflow to process the data nightly via KCAM to the PLibrary.

Who would perform most of the effort: Facilities Management, Assessments, KCGIS Center

Requires ongoing KCGIS Center O&M: No

Level of effort: High

Sponsor: Michael Kulish, Facilities Management

O-14 **Create am Esri License Management Plan – (87)**

Background: One of the core enterprise services performed by the KCGIS Center is the hosting of an Esri license manager and assuring users have access to a license when they need it. Since

the KCGIS Center no longer has a dedicated IT support person, the responsibility and procedure for adding or removing licenses, changing license levels, and authorizing licenses for extensions is not formalized.

Objective: The objective is to define the roles, responsibilities, expectations and communication channels of the license manager service. Some of the things that can be addressed include the following: If a user is unable to get a license from the Esri license manager software, who should they contact. If the KCGIS Center becomes aware that all Esri licenses of a certain type are in use, what chain of events and communications should be triggered. How will the KCGIS Center handle providing Esri licenses to the training room and assure that they do not negatively impact the ability of GIS users to obtain a license. Define the steps and people needed to perform a modification to the number or type of licenses on the Esri license server. Define who will be trained and authorized to make changes to the number or type of licenses on the Esri license server.

Who would perform most of the effort: KCGIS Center, GIS Steering Committee

Requires ongoing KCGIS Center O&M: No

Level of effort: Low

Sponsor: Michael Jenkins, KCGIS Center

4 Agency Work Plans

Chapter 4 of the KCGIS O&M Plan provides details of the GIS work plans for the KCGIS Center and participant agencies. Each agency work plan is described separately using a similar outline progression to standardize 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 section typically includes description of the agency's mission and primary business responsibilities. The discussion provides detail about the strategies employed by the agency to deliver GIS services, 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. The remainder of each agency section is organized in tabular format and describes significant ongoing and new projects.

Each agency program is presented as a separate subsection of this chapter, and programs within the same department occur sequentially. Due to its unique status as the enterprise GIS unit, the KCGIS Center is presented first.

Note: Beginning in June 2017 and extending to April 2018, KCGIS Center management and staff were engaged in a major effort to align the KCGIS Center to the KCIT organizational structure. This lengthy process consumed much of the time and resources of the KCGIS Center, and placed many strategic initiatives on hold, including completing the 2017-2018 GIS O&M Plan. As a result, this plan is published many months later than originally intended. Another outcome was fewer submissions of agency work plans because of the limited time available to assist agencies in completing their plans. Agencies that had submitted plans for previous versions of the O&M Plan, but did not submit for this version include: E-911 Program Office; Department of Public Health; Road Services Division; King County International Airport; King County Sheriff's Office; and Department of Community and Human Services.

4.1   King County GIS Center

4.1.1 Agency GIS Overview, Priorities, and Goals

The King County GIS Center's mission is to deliver efficient, high-quality GIS technology solutions to King County agencies, the public, and our regional partners, in order to meet the needs of King County government and the communities we serve. To carry out this mission the KCGIS Center works with the KCGIS governance committees, and King County departments and their GIS programs to provide enterprise GIS services, on-demand GIS client services, and matrix GIS staff services. The core value of the KCGIS Center is to provide services that are accurate, consistent, accessible, affordable, and comprehensive.

The KCGIS Center is an internal service fund administratively assigned to the Department of King County Information Technology (KCIT). The KCGIS Center Manager handles daily operation and strategic direction for the KCGIS Center and is non-voting chair for both the GIS Steering Committee and the GIS Technical Advisory Committee. The KCGIS Center Manager reports to the manager of KCIT Software Engineering, who in turn reports to the county's Chief Technology Officer.

The KCGIS Center has 28 staff positions organized into three business units; Enterprise Operations, Client Services, and Matrix Staff Services. Further details regarding staffing can be found in Section 5.1.1.

Enterprise Operations – The Enterprise Operations unit provides management and technical services to support the KCGIS program. Services provided by this group include staff management, program development, strategic planning, marketing, enterprise coordination, and data acquisition. The marketing efforts promote use of KCGIS products and services and further the vision of the KCGIS Center as a regional service provider to public agencies, private firms, and citizens. The technical functions of the Enterprise Operations Unit are provided by GIS analysts and program managers and include GIS data coordination and validation, spatial data warehousing, database administration, website management, application development, and infrastructure management. Other technical services of this group include administration and publishing of GIS metadata, maintenance of the KCGIS open data and data download websites, imagery acquisition and processing, and data integration and quality control for the cadastral maintenance lifecycle. Members of this group also provide on-call support services during off-hours.

Enterprise Operations also works in close collaboration with the Business and Financial Services group of KCIT. That group oversees budgeting, administrative and clerical support, and vendor contract management. They also coordinate with the KCGIS Center for management of the KCGIS internal service fund, budget development, billing for cost shares and GIS services, financial expenditure controls, and financial reporting.

Client Services – The Client Services unit offers GIS consulting and project services on an hourly cost-reimbursable basis to King County agencies and external customers. The hourly labor rates are based on a tiered pricing structure, which is described in Section 6. The Client Services Manager supervises the unit and initiates and coordinates service delivery, which is fulfilled by drawing on the specialized skills of staff throughout the KCGIS Center. For additional details on the services provided by Client Services see Section 6: KCGIS Center Services.

Matrix Staff Services – The Matrix Staff Services unit provides GIS staff support to King County work programs based on mutually agreed service levels. For the 2017-2018 biennium the KCGIS Center is allocating staff to eight work programs in three departments (DNRP, DOT, DPER) and one office (PSB). Program managers, either from the agency receiving support or from the KCGIS Center, are assigned to oversee each work program. These managers coordinate to draw from a pool of KCGIS Center staff resources. Matrix Staff Services personnel are generally assigned to a single work group, however the matrix staffing strategy allows program managers to share the pooled resource to optimize response to project demands.

4.1.2 Ongoing and New Projects

Name	**Data Coordination Priorities**
Description	The focus will be on data quality and improvements in data and metadata posting workflows. Agency data will be reviewed for possible inclusion in the Spatial Data Warehouse. Build on the progress of the Data Handling Team to continue with layer-by-layer evaluation to develop a list of data-related action items from each review, assigning each item a priority rating. Evaluations will focus on the accuracy of the geometry and attributes of each layer and what quality assessment workflows are in place to ensure the necessary accuracies. Coordinate on development of workflow and scripts to inventory ArcGIS Server applications for data dependencies. Support the KCGIS Technical Committee's current and new data related priority initiatives.
Interdependencies	Coordination and scheduling with KCGIS agency data stewards and other key stakeholders (users, developers, and DBAs), as necessary.
Status	In progress.
Target	Ongoing.
Activity	▪

Name	**Imagery Project Management**
Description	Acquire aerial ortho and oblique imagery in the spring of 2019 for King County and portions of southwest Snohomish County. Across the collection area resolution will vary from 3" to 9", with the highest resolution collected in urban areas. Project planning is ongoing in 2017-2018. An RFP will be released in the summer of 2018, with bid award expected in December.
Interdependencies	Favorable pricing obtained through the RFP process. Reliance on vendor to perform up to expectations. Suitable weather during collection windows.
Status	In progress.
Target	Q2 2019 – Complete acquisition of orthoimagery Q4 2019 – Accept delivery of final orthoimagery
Activity	▪ Project management for 2019 acquisition in coordination with KCIT PMO. ▪ Data review and acceptance of 2019 imagery products. ▪ Project planning for acquisitions beyond 2019.

Name	**ArcGIS Online for Organizations Implementation**
Description	The ArcGIS Online for Organizations service features easy to use tools for creating and publishing maps, data, and applications to the Web. It enables the county to provide our authoritative maps and data to virtually anyone, anywhere. It

	will also enable non-GIS users to create their own maps and share them, including through social media channels. ArcGIS Online is an opportunity to provide GIS functionality to a wide number of county staff. For an organization to effectively manage ArcGIS Online it is necessary to develop standards and best practices for content, look and feel, symbology, publishing, access, permissions, groups, training, metadata, and other factors that influence implementation. This project will focus of developing those standards and best practices, and on administration and management of King County's implementation of ArcGIS Online.
Interdependencies	None.
Status	In progress.
Target	Ongoing
Activity	▪ Continue to host regular forum for knowledge sharing. ▪ Provide quarterly half-day training sessions. One for ArcGIS Online users only, one for users with access to ArcGIS desktop software. ▪ Continue to develop standards and best practices as required for effective organization and management.

Name	**Spatial Data Warehouse Validation Tools**
Description	The Spatial Data Warehouse (SDC) has multiple representations across data and metadata objects, as well as data access objects (i.e., layer files), and other related objects. *PostRep* performs nightly validation on the primary data objects as GDB layers and shapefiles. Additional tools are required to accomplish three main database-wide review objectives: (1) search for commission errors (objects within network not supported by control tables), (2) search for omission errors (data or related objects required by control tables but not found within the network), and (3) identify validation errors (checks on specific properties for selected objects). These tools are required across all three branches of the enterprise SDW: enterprise vector and tabular data, raster datasets, and non-KCGIS vector data. Some enterprise workflows, such as the GIS Data Portal, are supported by independent validation routines executed during each Portal build cycle. This additional layer of validation tools would not replicate these. Rather its focus would be a weekly evaluation of the enterprise to maintain a high level of synchronization between related objects, identify corrupted or out-of-date objects, and reduce the need for manual cleanup.
Interdependencies	Logical build-out of modules. Logical and efficient reporting for follow-up actions.
Status	Started. Some pilot modules have created and tested.
Target	Q3 2015 for all component deployment, but early phases will be rolled out as completed.

Activity	- Complete requirements analysis. - Document existing validation routines to avoid redundancy. - Determine best way to modularize functionality, and frequency requirements for certain tests. - Create scripts to execute functionality. - Perform weekly maintenance of enterprise by executing specified workflows. - Review reporting results, with manual follow-up of certain tasks.

Name	**Focused Data Enhancements**
Description	Between new data development and regular data maintenance lays a zone of focused data enhancements. These projects require sufficient data modeling and/or workflow development to elevate their time and effort commitments. The composition of this list and prioritizations is adjusted as necessary by the Data Handling Team.
Interdependencies	Coordination with various King County agencies who are the ultimate data stewards for data content, and who provide the required business drivers.
Status	All projects have existing components, but some only with preliminary scoping.
Target	Varies, but completed or tabled (with justification) by 2016
Activity	- Develop work plan for each focused enhancement effort. - Review and acquire required data sources. - Design data models and workflow, including necessary scripting applications. - Pilot designs and evaluate. - Revise and scale workflow up to production. - Create metadata and publish to SDW. - Put layer into maintenance.

Name	**Data Maintenance Plan Assessment and Development**
Description	Detailed assessment of individual data production and maintenance plans for KCGIS Center maintained layers
Interdependencies	Coordination with data stewards responsible for specific data sets. KCGIS Center Data Handling Team will also be involved in preliminary evaluation of data plans during data set review. Details derived from developed plans regarding applications and workflow scripts will need to synchronize with Application Digest.
Status	In progress.
Target	On-going

Activity	- Inventory current state of KCGIS Center maintained data sets with focus on status of a production and maintenance plan. - Develop template for plans in order to ease creation and to standardize input. - Move existing plans into template. - Data Handling Team reviews samples for acceptance. - Coordinate with appropriate steward to develop additional plans; prioritization to be determined by Data Handling Team.

4.2   Department of Assessments

4.2.1 Agency GIS Overview, Priorities, and Goals

- The mission of the Department of Assessments is to be the nation's best county department of assessments. We will accomplish this by being people-focused and striving to be efficient and innovative in setting fair and equitable property values to fund vital community services. GIS is integral in supporting the above stated mission. It's all in dedication to our taxpayers to conduct our work in a fair, equitable and understandable manner.

- GIS is integrated into all facets of the Department of Assessments business operations. It is used in valuing property, defending valuation methods and estimates, maintaining public records including maps, legal descriptions and taxing district boundaries, administering exemptions and providing customer service. 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:

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

  o *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 fill this responsibility. Numerous agencies and individuals both within and outside the County access GIS property boundaries maintained by Assessments. Digital versions of the quarter-section maps are available on the Web as PDF files.

  o *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.

  o *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 as well as lists of parcels to be changed. GIS data are generated for Washington State Department of Revenue for apportionment of utility valuations and the state levy.

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

  o *Miscellaneous Property Related Analysis/Public Information* – 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.

  o *Customer Service* – GIS is used as a tool to respond to various types of public information requests. Assessment staff processes walk-in clients and on-line requests for GIS based information.

  o *Administration* – Assessment management and administrative staff often request data and information for analysis that contains a GIS component.

- DOA will continue to pursue collaboration and partnership efforts with jurisdictions to share survey and other information that may be useful to positional upgrades. While our needs are different, the goal is to develop cadastral data that will be a resource for other jurisdictions. As the

King County data becomes more accurate opportunities for collaboration with cities for data maintenance emerge.

- In 2022 there will be new geometric and geopotential datums. This will impact both DOA and other agencies that maintain GIS data. While the shift is still a few years away, understanding and planning for the shift needs to start now.

- DOA is working to replace the current property tax administration software system. An RFP will be posted in mid-2018. While design of a new system is under discussion it will likely present opportunities to make changes to the way GIS is handled internally.

- We continue to rely on the expertise of KCGIS Center/KCIT staff and on a stable server environment for data maintenance and access to PLIBRARY and map services. Access limitations due to server access issues or database issues create cascading problems for DOA because of the tight integration between our business applications and KCGIS Plibrary data.

- Access to current external jurisdictional data is critical to the appraisers in making sound judgements on property values and appeals. It is hoped that revamped efforts to improve the timeliness of updates to external data in Plibrary will take shape in 2018.

- Oblique imagery is integral to the work at DOA. DOA will continue to be part of the discussion for funding imagery post 2017.

- DOA will continue to evaluate the Esri parcel model/fabric to determine a best path for migration or change to the existing data structure. DOA will work with ERSI on a pilot to analyze the existing cadastral data model and identify changes within the existing database that will enhance opportunities for a successful migration to the parcel fabric.

4.2.2 Ongoing and New Projects

Name	**Positional Accuracy Improvements**
Description	Redraw areas of the County where the positional accuracy is unacceptable. Users of the parcel and related cadastral layers will see an increased level of accuracy and stability of the data once an area has been redrawn. All users of the parcel data will benefit from an accurate cadastral data.
Interdependencies	Staff availability and appraisal physical inspection schedule.
Status	Ongoing
Target	2017 and beyond.
Activity	▪ Research problem areas. ▪ Coordinate redraw priorities with appraisal team leaders. ▪ Assign redraws to mapping staff with scope and work plan expectations. ▪ Work with Jurisdictions as appropriate to obtain data. ▪ Determine correct data to be used for redraw. ▪ Build exterior plat and quad boundaries as necessary. ▪ Build and code interior data. ▪ Move annotation to correspond to new line work. ▪ Integrate into KCAM database.

Name	**Update RealProp ArcEngine to 10.3.1**
Description	The RealProp application is integral to operations at KCA. DOA's extensive network of users present issues when upgrading any software. Upgrades to RealProp impact users beyond DOA. RealProp It is used for parcel lookup, maintenance and QA of various data elements. Mapping is built into the application through ArcEngine components. The mapping provides access to cadastral data, KCGIS Public Library layers as well as various standard and customized renderings and custom tools for the appraisers and other staff.
Interdependencies	DOA staff for coding.
Status	Complete.
Target	2018
Activity	▪ Migrate code to 10.3.1 version of Engine. ▪ Test code revisions. ▪ Uninstall 10.1/Install ArcEngine 10.3.1 on every DOA machine. ▪ Uninstall 10.1/Install ArcGIS 10.3.1 software and extensions as on selected DOA machines.

Name	**Geoserver**
Description	Internally host Geoserver to be used by the Localscape and ePortal web apps.
Interdependencies	Waiting on information from Spatialest
Status	On Hold
Target	
Activity	Work with Spatialest to move Localscape internally and use Geoserver for ePortal.

Name	**Property Tax Administration System (PTAS)**
Description	King County is looking to replace the current property tax administration software system which spans multiple agencies. The current way of doing business is made up of numerous applications and processes some of which involve GIS.
Interdependencies	While the project is not GIS/map centric it is anticipated that changes to the way we currently do business will precipitate changes to the way GIS data is accessed and/or managed for internal use.
Status	Gathering requirements in preparation for RFP
Target	RFP – Mid 2018.

Activity	Provide support as necessary to the project.

Name	**Parcel Fabric Pilot**
Description	The KCAM cadastral data model was developed prior to the release of the ESRI Parcel Fabric model. Earlier conversion tests identified hurdles to migration to the Fabric. A new pilot will be conducted.
Interdependencies	ESRI, KCA staff time.
Status	In progress
Target	2018
Activity	Work with ESRI to pilot small area conversion of KCAM database to the Parcel Fabric data model.

Name	**Update iRealProperty map to 64 bit**
Description	Convert the existing iRealProperty application to 64 bit.
Interdependencies	Staff time
Status	In progress
Target	Year end 2018
Activity	▪ Migrate iPad application to 64bit. ▪ Test ▪ Deploy

Name	**Taxing District Boundary Development and Review Process Update**
Description	Maintenance and development of the Taxing District boundary layers has become complex and cumbersome. DOA will endeavor to streamline the maintenance of the district data layers in conjunction with QA efforts to ensure the accuracy of the layers. Taxpayers, voters and districts will benefit with accuracy in tax distribution.
Interdependencies	DOA Staff availability and coordination with Elections GIS.
Status	In progress.
Target	Ongoing
Activity	▪ Data model redesign to incorporate additional editors.

	• Initial district boundaries have been developed from dissolved levy code polygons.
	• Compare results to district Mylars.
	• Review each district boundary discrepancy for compliance with district legal description.
	• Add historic boundaries as time and business needs allows.
	• Coordinate efforts with Elections GIS to reduce duplication of effort.
	• If there are discrepancies between DOA and Elections data requiring immediate attention these will be reviewed regardless of the project status or timeline.

Name	**Scanned Map Imagery Database**
Description	Build a database for easy retrieval of scanned maps. DOA has thousands of pages of vintage maps. Many are scanned however accessing imagery is nearly impossible without knowledge of the map sets. Anyone needing access to the imagery will be served by development of the database.
Interdependencies	DOA staff time.
Status	Not started
Target	Start 2020
Activity	• Complete inventory of scanned map images.
	• Cross check imagery against source materials.
	• Develop data model.
	• Geo locate imagery.

Name	**ArcGIS Pro Testing**
Description	DOA will install ArcGIS Pro to test the viability of migrating to the new platform and/or using it in addition to ArcGIS desktop.
Interdependencies	DOA Mapping will receive new computers in 2018.
Status	Waiting for new computers.
Target	2018
Activity	Install ArcGIS Pro. Test both mapping and data maintenance.

4.3 Department of Permitting and Environmental Review

4.3.1 Important Background Information

Although this report section is focused on DPER as a department, the use and access to GIS related services and tools is a multi-dimensional issue involving multiple County departments and agencies.

From a system perspective, the GIS services and data are tied together through the Accela Civic Platform. KCGIS is tightly integrated with Accela both as the source data for all things related to property and to provide data for a graphical GIS UI within the Accela program. Geo-located data also plays a role in automating work such as inspection scheduling and routing.

Multiple department/agency users and touchpoints include, but are not limited to,

- DPER
  - Land use, building and fire permits,
  - Some business licenses,
  - Code enforcement.
- DES/RES, on behalf of
  - DOT/Roads; Right-of-Way and Over Legal Vehicle permits.
  - DNRP/Parks; Special Use permits.
- DOA for real property valuation research.
- PAO for legal records research.

DPER also makes use of GIS data/services provided by other departments such as the marijuana business location mapping. In addition to the internal data uses and linkages, there are numerous external customers including other government agencies, businesses and constituents. Examples:

  - Online permitting, permit status and inspection scheduling (search/confirm by address or parcel).
  - Browser based GIS services for property research.
  - US Census and PSRC[1]

In short there is a very significant amount of inter-linked/shared/inter-dependent spatial and tabular data provided through the County's GIS services.

4.3.2 Agency GIS Overview, Priorities, and Goals

The Department of Permitting and Environmental Review (DPER) is responsible for 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 in unincorporated King County. DPER also provides licensing for certain types of businesses. DPER serves a 2017 population of approximately 247,000 residents in the unincorporated areas of the County. DPER's area of responsibility covers over 1,713 square miles.

DPER's volume of work has been greatly impacted by many city incorporations and annexations over the past two decades. In general, DPER's work is focused in the rural areas of the County. At the same time, the remaining pockets of unincorporated urban areas are not likely to incorporate or be annexed in the foreseeable future.

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[1] PSRC – Puget Sound Regional Council

Since the permitting and code enforcement functions are most often based on real property, the services and data provided by KCGIS are mission critical elements. The graphic below provides a general overview of the flow of information and data between DPER, other departments/agencies and KCGIS.

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┌─────────────────┐      ┌─────────────────┐      ┌─────────────────┐
│      DPER       │      │ Recorders Office│      │ Dept. of        │
│ Creation of New │ ───► │ Legal Recording │ ───► │ Assessments     │
│    Parcels      │      │  of Plat/Parcels│      │ Assessed & Parcel│
│                 │      │                 │      │ Record Number   │
│                 │      │                 │      │ Created         │
└─────────────────┘      └─────────────────┘      └─────────────────┘
         ┌──────────────────────────────────────────────┘
         ▼
┌─────────────────┐      ┌─────────────────┐
│      KCGIS       │      │ GIS & Parcel Data│
│ Parcel(s) Mapped│ ───► │ Available for    │
│ with Attribute  │      │ Public and       │
│     Data        │      │ Internal Use     │
└─────────────────┘      └─────────────────┘
```
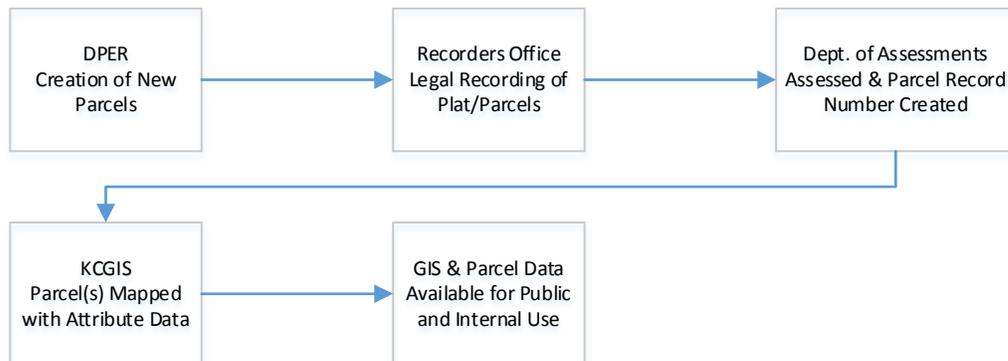
As GIS services and tools have matured, DPER has increased reliance on GIS data systems through system integration as well as use of internal and external end-user GIS tools. Without the centralized GIS function and data, DPER would need to develop and maintain its own parcel and addressing data.

DPER would be hard pressed to replicate the depth and breadth of GIS services and data within the existing budget.

Core business functions of DPER supported by GIS include the following:

- Permit Receipt (Intake) – GIS tools and data sets are essential to successfully conduct intake review and complete the permit application process. Site location, zoning, development conditions, critical areas and other land related factors are identified and confirmed. Permit viability is assessed, permit requirements determined, and permit routing initiated.

- Permit Review – Site engineering and planning requires GIS tools to map a series of attributes for each project under review. Building plan review requires GIS tools to guide decisions on building requirements. GIS data and tools are used to assign correct addresses and facilitate emergency response after building is complete. Current planning requires GIS tools to determine development conditions, historic zoning, and planning requirements.

- Inspection and Enforcement – GIS tools are used to auto-assign inspection areas, project assignments and to balance inspection and case workloads.

- Regulatory Review – GIS tools are used to develop planning proposals for regulatory control. GIS technology, including mapped environmentally critical areas and building hazards, are also used in regulatory programs including the Critical Areas Ordinance, the Endangered Species Act, and the Growth Management Act.

- Public Information – GIS maps, data, and applications are used extensively in the department for public information and education. Environmental, regulatory, and property-based data are disseminated using GIS web applications, display materials for public meetings, and various publications.

DPER relies heavily on GIS to efficiently deliver reliable and efficient constituent services.

KCIT provides matrixed GIS support for DPER through the KCGIS Center. The DPER GIS program manager coordinates primarily with DPER Chief Financial Officer and the Permit Integration (PI) Program Manager to determine what GIS projects are undertaken, and how resources are allocated among the projects. The DPER GIS program manager participates in weekly DPER team meetings. The DPER GIS program manager provides periodic updates to the DPER ITSDM to coordinate with

overall KCIT provided support. The DPER GIS program manager also participates as a member of the permit integration team, which administers and supports the King County permitting system Accela Civic Platform[2].

The DPER GIS program manager works with the DPER management team to set goals and priorities for the provision of the following GIS services to the staff, customers and stakeholders of DPER:

- Geographic analysis presented in the form of maps, graphics, data files, and reports.

- Development, integration, and maintenance of enterprise and agency geographic data sets.

- Development and maintenance of customized end user applications.

- Custom map production services.

- Support of map data web services, and other data sharing processes to provide direct access to geographic data from the permit system.

Other high priorities for the DPER GIS program include:

- Ongoing support of GIS integration with Accela,

- Maintenance of the enterprise GIS layers owned by DPER,

- Maintenance and support of the GISMO report modules,

- Training and support of DPER users of GIS tools. The GIS Tools in use currently include Accela GIS, Desktop ArcGIS, iMap, ArcGIS Online, Parcel Viewer 2, and Pictometry Online.

Requests for routine assistance from DPER staff come through the King County IT Service Center, or directly to the DPER GIS program manager. Requests for new system features, or new data products require a formal request process that is routed through a change management process to coordinate feature requests with the Permit Integration project. The process allows the business units to direct the limited available matrixed service time towards the most needed features.

DPER participates in the successful exchange of geographic data among many King County agencies. Planning and permitting data are provided to other agencies through participation in the KCGIS Spatial Data Warehouse (SDW). Property data from the Department of Assessments and environmental data from the Department of Natural Resources and Parks are acquired through the KCGIS SDW and direct data exchanges.

DPER actively participates in the county-wide GIS program. The DPER GIS program manager is currently vice chair of the KCGIS Steering Committee and a member of the KCGIS Technical Advisory Committee. The Permit Integration Program Manager is also a member of the KCGIS Steering Committee. The matrixed service model facilitates the coordination of GIS data, procedures, and practices between DPER and the other agencies of King County.

Two major projects are starting in 2017 and are likely to continue into 2018. A web-based system to track recently recorded plat lots until they are officially created and published by the Assessor's office will solve a current need for GIS objects to be available immediately after recording to allow for GIS query of property attributes. The Accela GIS module that provides linkage between KCGIS and the vendor hosted permitting system needs to be migrated to a new JavaScript based application before their currently optional user interface becomes mandatory.

Challenges for DPER GIS in 2018-2019:

- With GIS staff physically located remotely from DPER, care has been taken to remain accessible and responsive to staff requests and needs. This will continue to require special attention to maintain current levels of service.

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[2] The County is licensing the vendor hosted version of Accela Civic Platform.

- Until recently DPER supported all regional planning. In 2016 0.5 FTE of GIS matrix support was moved from DPER to the regional planning group in the Office of Performance, Strategy, and Budget (PSB). DPER continues to employ planners who work on sub-area plans and coordinate with regional planning on the update of the King County Comprehensive Plan. The exact balance of work after this transition is not yet resolved. Care must be taken to ensure that all critical GIS data is owned by the correct agency to ensure proper maintenance.

- The variety of GIS projects that could increase the efficiency and improve regulatory results continue to outstrip the GIS resources available to DPER. Careful assessment of various projects and maintenance is required to ensure the most benefit is gained from the GIS resources available.

- The Accela GIS module that provides linkage between KC GIS and the vendor hosted permitting system needs to be migrated to a new JavaScript based application before their currently optional user interface becomes mandatory.

Opportunities for DPER GIS in 2017-2018:

- A web-based system to track recently recorded plat lots until they are officially created and published by the Assessor's office will solve a current need for GIS objects to be available immediately after recording to allow for GIS query of property attributes.

4.3.3 Ongoing and New Projects

Name	**Comprehensive Permitting Agency Finder Web Application**
Description	King County customers will be able to determine from a central location where their various permitting needs can be met based on the location of their property and the various permitting agency jurisdictions that apply. A table will be added to the KCGIS data warehouse to support the necessary contact information. Some new feature classes may be generated.
Interdependencies	KCGIS staff will participate in developing the web application.
Status	In progress
Target	2018
Activity	▪ None.

Name	**Provide a GIS Layer of Automation Permits and Associated Parcel Geometry**
Description	DPER and other county agencies participating in the Accela Automation permitting system will be able to show mapping of active/historic permits outside of Accela environment. This will allow more flexible and complex mapping and analysis than is supported in the Accela GIS Module.
Interdependencies	KCGIS Center staff working with KCDOT hosted database to up create an updated layer on a weekly basis
Status	Delayed
Target	2018

Activity	▪ Hope to have a working process and refine outputs to support DPER business needs in 2018.

Name	**Pre-Production Parcel Database**
Description	Currently the DPER permitting system (Accela Automation) is unable to link permits to newly platted parcels during the lag time between when a plat is recorded and when the resulting child parcels become available in the Parcel layer available from the GIS Center's spatial data warehouse. Contributing to this delay is a dependency of the GIS parcel layer on the Assessor's mainframe database which can only hold data for one tax year at a time, which results in an annual freeze on parcel edits.
	DPER will address this issue with a database that can host provisional parcel data in a pre-production state. This pre-production database (PPDB) would contain at a minimum parcel number, assigned address, and geographic extent. The abstracts techs at the Assessor's Office currently provides major numbers to DPER staff, which is added to lot numbers from the plat maps to determine likely provisional parcel numbers. DPER provides new addresses when they are designated. The geographic extents will be added using the plat map data. This geographic extent in the database would be provisional and temporary until the parcels are official and present in the parcel layer. Plats submitted for review as CAD data would be used when available.
	The PPDB would be used as an additional data source to produce the GIS layers that are currently generated on a weekly basis for the specific purpose of providing external tables of parcels and addresses for use with the Accela Automation online permitting system. The PPDB would be drawn in the Accela GIS module with a unique symbology that highlights the provisional nature of the pre-parcel data.
	Security controlled access to the PPDB for other appropriate county staff could be provided through a web application. The web interface would allow browsing of the available data and search capabilities. It would provide agency authentication to allow data to be added or updated through the web interface.
Interdependencies	Assessor's Office abstract techs, to provide major numbers. KCGIS Center staff (or other KCIT staff) to develop web application. KCGIS staff time will be needed to enhance the processes used to create PARCEL_ADDRESS_AREA layer used as external parcel control file by Automation.
Status	Proposal, Not Started
Target	2017

Activity	- Establish procedure to create a preproduction database that can store parcel numbers, addresses, and geometry in advance of the official parcel layer being updated. - Update PARCEL_ADDRESS_AREA creation process to accommodate new data and remove resulting temporary data when it is no longer needed. - Develop report of Addresses attached to permits that are not linked to ADDRESS_POINT enterprise data layer. - Develop a process to monitor items on the report of unlinked permits as the entries appear, age, and drop off.

Name	**Enhance CAD GIS Layer with Links to Map Scans**
Description	DPER staff currently cannot access the Critical Area Designation (CAD) scans unless they have ArcMap installed on their desktop. Providing licensing and training for ArcMap is prohibitively expensive. The CAD GIS layer will be enhanced to provide a link to the same CAD map scans that are now available in the LibTool extension provided by the KCGIS Center. This will allow DPER staff to obtain critical area information in the vicinity of permits they are processing more efficiently than is currently possible.
Interdependencies	None.
Status	In progress
Target	2018
Activity	- Change the schema of CAD layer - Add map scan paths to the CAD layer. - Add the most recent CAD scans to the LibTool system.

Name	**MBP Data View Integration**
Description	Develop an integration between KCGIS and the MBP Data View service (wherever it is located).
Interdependencies	VPN connection and coding for DB view.
Status	Exploratory
Target	2017
Activity	

4.4 DES – Facilities Management Division

4.4.1 Agency GIS Overview, Priorities, and Goals

Agency Mission – 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 manages and maintains the land, buildings, and other structures owned, leased, and operated by King County general government agencies.

Facilities Management Division functions for which future GIS support is planned or envisioned include:

- Managing County's Real Estate Portfolio
- Long-term Space Planning
- Lease Management
- Permit Management
- Facility Management

There is no organizational unit responsible for GIS functions within FMD. The FMD representative to the KCGIS Sterring Committee provides some internal coordination. Agency staff GIS skills continue to be concentrated in a very small number of individuals. At present, therefore, GIS resource use is predominantly limited to services purchased from the KCGIS Center, primarily in the form of mapping. The continuing long-term goal for FMD is for agency staff to become further trained and more proficient in using GIS data and software on their own.

FMD has a high quality color office printer available in the Real Estate Services Section, which is capable of producing color 11x17 prints. The division also has large scale plotter capabilities in the Capital Planning Section, due to the need there for architectural renderings and other CAD drawings. Additionally, through the Print Shop, FMD has access to large format printing and scanning. However, there is no GIS data server in FMD.

Staff using GIS software access licenses via the floating license pool.

Other FMD staff will be introduced to GIS capabilities and uses.

4.4.2 Ongoing and New Projects

Name	**Update Real Property Layer in KCGIS Spatial Data Warehouse (SDW)**
Description	Update and use defined process to ensure the Real Property layer in the SDW is an actual reflection of FMD managed property at any given time.
Interdependencies	KCGIS Center
Status	On-going
Target	December 31, 2018
Activity	▪ Perform updates to Real Property layer regarding property that has been purchased or sold.

Name	**NPDES Permits Viewer**
Description	Continue the joint project with WLRD that has the ability to view maps and inspection and compliance information related to federally mandated National Pollutant Discharge Elimination System (NPDES) Municipal Permit requirements.
Interdependencies	WLRD
Status	On-going
Target	December 31, 2018
Activity	▪ Developed view for NPDES information linked to parcel number. ▪ Update data in conjunction with WLRD.

Name	**FMD Permit Data Layer**
Description	FMD Real Estate Services administers permits for the use of County real property including road rights of way. To date those permits have not been spatially locatable although all of them include at least some location information. This effort will develop a data layer for the County Spatial Data Warehouse that maps the location of each permit and allows for geographic searches.
Interdependencies	KCGIS Center
Status	New and On-going
Target	December 31, 2018
Activity	▪ Coordinate mapping the geographic information and permit documents associated with Real Estate Services permitting activities. ▪ Create point and polygon layers with key attribute data including links to source documents.

Name	**FMD Franchise Boundary Layer**
Description	FMD Real Estate Services administers utility franchises. Each franchise applicant must submit a service area boundary. The KCGIS Center has assisted with mapping the franchise areas of existing franchises. This project will ensure that new and modified service area boundaries are mapped into the SDW in a timely manner.
Interdependencies	KCGIS Center
Status	On-going
Target	December 31, 2018

Activity	▪ Coordinate mapping the formal legal boundaries of utility franchise areas.

Name	**FMD RES Staff GIS Education**
Description	FMD Real Estate Services makes significant use of County geographic information but most have no formal knowledge of either the County's GIS implementation or GIS fundamentals. This effort will identify key FMD GIS users and ensure they have a good grounding in these subjects through a designated course of study including KCGIS Center provided training.
Interdependencies	KCGIS Center training services
Status	New and On-going
Target	December 31, 2018
Activity	▪ Identify key staff. ▪ Develop a focused GIS training plan for FMD staff. ▪ Monitor staff progress and evaluate results.

4.5 DNRP – Wastewater Treatment Division

4.5.1 Agency GIS Overview, Priorities, and Goals

WTD Background:

- King County protects water quality and prevents water pollution by providing wastewater treatment to 17 cities including the Muckleshoot Tribe and 17 local sewer utilities. The county's Wastewater Treatment Division (WTD) serves approximately 1.6 million people, including most urban areas of King County and parts of south Snohomish County and northeast Pierce County.

- The mission of WTD is to "protect public health and enhance the environment by collecting and treating wastewater while recycling valuable resources for the Puget Sound region."

- The WTD GIS team assists in this mandate by developing, interpreting, displaying, maintaining and providing access to spatially oriented data. This service enhances and supports WTD project planning, design, and operation strategies.

WTD GIS Team Organization:

- The WTD GIS Team consists of four FTE GIS Specialists matrixed to WTD from the King County GIS Center. This arrangement allows for the administrative management of the analysts coming from the KCGIS Center Manager, while day-to-day work-load management comes from the supervisor of the Comprehensive Planning Workgroup in the Planning, Inspections, Modeling, Monitoring and (GIS) Mapping Unit (PIM3) within WTD.

- The four specialists share responsibility for project support, cartography, and data maintenance with each specialist focusing in different areas including database administration and application development. The specialists are also focused on specific projects and programs within WTD.

The WTD GIS team provides the following services:

- Cartography: for presentations, reports, and analyses.

- Analysis: to answer questions regarding the wastewater system infrastructure, capacity, future needs, property, political boundaries, and population changes.

- Data development, maintenance, and updates.

- Database and geodatabase development, management, and integration including business analysis services

- Programming/Application Development: applications for individual, division, and county-wide use.

- User support.

WTD GIS Program Challenges:

- The application of GIS in WTD necessitates that GIS analysts assume additional roles in WTD including database administration, programming, web application development, and business analysis. The WTD GIS team manages data sets that are relied on for making decisions within the Wastewater Treatment Division. Many other data sets exist or are being created that need administration and integration with other systems. The GIS Team's expertise and institutional knowledge places them in a position to assume specific database management roles for the division. Projects are currently underway to integrate work programs and data with GIS data. Much of this integration will be managed by the WTD GIS group.

- Training in Web and database development, cartography, and ArcGIS application development are prerequisites for the WTD GIS team in order for it to meet future goals.

WTD GIS Cross Agency Issues – The WTD GIS team will:

- Continue to require support from Enterprise GIS section of the KCGIS Center on ArcGIS Server and WTD's efforts to integrate and expose data from disparate systems via GIS.

- Work with Seattle Public Utilities in a combined effort to geographically define the flow inputs within the CSO basins and optimize the integration between conveyance systems.

- Continue to work with Public Health to obtain and share septic system location information.

- Work with local sewer agencies to acquire sewer service data, water line data (when appropriate), and storm line data (when appropriate). An effort to collect updates from the local sewer agencies is currently underway.

- Embarking on a decennial effort to monitor flow and calibrate to upcoming census information. This is a multiyear effort with heavy reliance on GIS. It requires close coordination with contributing agencies and their advisory committee, MWPAAC.

WTD GIS Strategic Initiatives

- Cartography – The WTD GIS Team will continue working to expand and improve their current skills in cartographic science and art through the combined use of GIS software, digital illustration, graphic design, and publication tools. It is the group's goal to decrease or eliminate reliance on outside graphic design firms when a map or graphic is needed by developing the cartography and graphic skills including concept development, data collection, cartographic design, and cartographic production.

- Analysis – Several tools have been developed that allow the casual user to create basic maps and do powerful data queries with relatively little training. The software and data are accessible but neither is being used to its fullest potential. The WTD GIS Team will educate WTD managers about GIS and teach casual users the abilities that they already have but of which they might not be aware. Access to these tools and data, coupled with the knowledge of their existence and usage, will not only save time in the acquisition of project related data but will also provide information to the decision-making process that might otherwise be left out.

- Division Level Information Management – Numerous scattered data sets used by WTD are not being efficiently utilized in conjunction with other available data. These data are financial, asset management, engineering, inspection, maintenance, and monitoring related. WTD is developing a systematic approach to its data maintenance, organization, and development using GIS as a single point of access through which all of the division's data can be accessed and leveraged against other data. The current approach is to leave stewardship and management to the stewards' discretion but to provide the most robust access. A project plan has been developed through the recently phased out Intranet Data Access Application planning effort and the transition to individual funded projects has begun.

WTD GIS and KCGIS Relations

- Much of the data created for the WTD strategic initiatives are posted to the county-wide spatial data warehouse. This data can also be accessed through the King County GIS Data Portal site. To adequately support a breadth of needs, the WTD GIS team creates data to meet high standards as developed and documented by the KCGIS Center. In this way they not only support WTD, but also the county as a whole via efforts such as the Lower Duwamish Superfund cleanup, climate change work, the NPDES stormwater permit inventory, and equity and social justice support and analysis. The matrix management approach applied to the WTD analysts is effective in that the analysts support WTD's mission while still supporting county-wide GIS efforts through cross-departmental support, data development, and by sitting on workgroups and governance committees. It is crucial to the success of WTD that KCGIS maintains the infrastructure and standards that enable the robust use of GIS to meet its mission.

The WTD GIS Team consists of 4.0 FTE GIS Specialists matrixed to WTD from the King County GIS Center.

Depending upon funding and appropriate task availability, WTD hires interns every summer to support the WTD GIS group while gaining valuable work experience.

4.5.2 Ongoing and New Projects

Name	**Oneline Atlas Update**
Description	Update of atlas showing parcels, roads, and sewer conveyance in the WTD service area. King County WTD pipe and facility attributes is the focus. Current One-lines are on the intranet and completion of this atlas update will result in an update of the One-lines intranet site as a maintenance issue.
Interdependencies	None
Status	Not started
Target	Q4 2018
Activity	▪ Extensive cartographic work and atlas production in addition to data QA/QC and stakeholder evaluations.

Name	**Site Plan Development**
Description	Completing a data layer showing the wastewater facilities including building foot prints, easements, and land use. This will assist the division in maintenance, disaster planning and other activities. Data will provide integration with Computerized Maintenance Management System (CMMS). Benefits all WTD staff.
Interdependencies	WTD CMMS.
Status	80% complete.
Target	12/2017
Activity	▪ Research orthophotos, parcel data, as-builts, permits, and CMMS. ▪ Extract data. ▪ Update site plan dataset.

Name	**Sewer Agency Boundary Update**
Description	Update local sewer service boundaries for all contributing local sewer agencies. Benefits O&M, Planning, Capacity Charge, and other King County staff.
Interdependencies	Local Sewer Agencies.

Status	95% complete
Target	Q4 2017
Activity	▪ Review comprehensive plans and agency boundaries. ▪ Update agency boundaries.

Name	**Local Sewer Lines Update**
Description	A geodatabase of all local agencies' sewer facilities and local lines within the WTD Service Area. There is an ongoing effort to obtain the most up to date local sewer information as we proceed to enhance our systems capacity and verify connectivity between local sewers with the King County WTD system. Benefits WTD modeling, O&M, and Facilities Inspection staff.
Interdependencies	Local sewer agencies
Status	80% complete
Target	Q4 2018
Activity	▪ Contact local sewer agencies. ▪ Implement collected GIS data into WTD's FIRS database. ▪ Effort is ongoing as data are acquired.

Name	**Geolocate WTD Facilities**
Description	Acquire GPS readings for all manholes, pump stations, regulator stations and other facilities within the WTD sewer system. This will enable the WTD GIS team to create a positionally accurate dataset to assist WTD staff in planning and maintenance of King County sewers. Benefits WTD modeling, O&M, and Facilities Inspection staff.
Interdependencies	GPS Intern; WTD Conveyance Inspection and Flow Monitoring (CIFM) staff
Status	80% complete
Target	2018
Activity	▪ GPS facilities – now reliant on CIFM staff for less accessible assets. ▪ Conflate FIRS data to GPS information where appropriate.

Name	**Conveyance System Improvement (CSI) Database**
Description	CSI information and updates stored in a database; eventually accessed through the Web. Benefits WTD Planning staff. Driven by CSI Project update.
Interdependencies	None.
Status	25% complete.
Target	Q3 2018
Activity	▪ Collect all CSI data into database. ▪ Launch website access.

Name	**CSO Basin Description**
Description	Create system wide implementation of the CSO basin description model developed in 2009 to describe the impervious and pervious flow inputs for all CSO basins. Will allow for system wide dataset and increased repeatability and updates. Benefits WTD modeling, O&M, Planning, Industrial Waste, and Facilities Inspection staff.
Interdependencies	Seattle Public Utilities
Status	Not Started
Target	2019
Activity	▪ Transfer model for all individual basins to system wide model.

Name	**CIP Database**
Description	Create database of WTD CIP projects and related geographic features. For use in web map for accessing CIP data and tracking progress of projects.
Interdependencies	WTD finance/Prism DB
Status	30%
Target	Q3 2018
Activity	▪ Collect CIP data back to 2005 – complete. ▪ Create database tracking projects by project, data year, and budget – 50%. ▪ Create geographic features – 50%. ▪ Design and Create simple web map for access to associated data – Not started.

	▪ Link to PRSIM and provide access through web map – Not started.

Name	**CSO Database**
Description	Create a database of CSO overflow data by event that can be rolled up into a 20yr rolling average report as required by WA Ecology.
Interdependencies	CSO Program
Status	90%
Target	Q2 2018
Activity	▪ Collect all event and overflow data going back to 1993 – complete. ▪ Build and populated database – complete. ▪ Normalize and QAQC data – 90%. ▪ Generate 20yr rolling average report as required by Ecology yearly – 90%. ▪ Add rain data – not started.

Name	**Off-line WTD Facility Viewer**
Description	Develop a WTD facility viewer application that can be used without internet/network connection (off-line) situation. Plan is to deploy the application for use in an emergency storm event or to field crews who go to the sites with no network or poor internet connectivity.
Interdependencies	None.
Status	Not Started
Target	2019
Activity	▪ Evaluate available tools. ▪ Design, develop, and deploy.

Name	**Industrial Waste Permit Access Tool**
Description	Design and build a web map which will display the property at which Industrial Waste Permits, and Discharge Locations are held. This benefits all WTD staff by providing means to click on properties and be able to receive all industrial waste permit information by property.
Interdependencies	PIMS Database, KCGIS Center Servers
Status	Phase 1 – Complete; Phase 2 - Underway

Target	12/2017
Activity	▪ Perform usability testing. ▪ Develop and add facility service areas. ▪ Evaluate ability to return scanned permits.

Name	**CIFM Development**
Description	Design and build a web map which will display information helpful for CIFM staff including depth to pipe for Onecall (Call before you dig) locates, flow monitor locations, and access to as-builts.
Interdependencies	PIMS Database, KCGIS Center Servers
Status	Beta developed
Target	12/2017
Activity	▪ Build prototype. ▪ Conduct usability testing. ▪ Add identified functionality. ▪ Make accessible via password outside King County network.

Name	**Connection and Extension Web Map for Editing**
Description	Design and build a web map which will allow maintenance of dataset depicting direct connections to the KC WTD conveyance system and extensions to the local sewer system.
Interdependencies	none
Status	Not started
Target	Q2 2018
Activity	▪ Needs assessment. ▪ Design, develop, and deploy.

Name	**FIRS Markup Tool**
Description	Design and build a web map which will allow for markups to the FIRS database by field crew. This will streamline the workflow for identifying errors and communicating updates.

Interdependencies	CIFM
Status	Not Started
Target	Q3 2018
Activity	▪ Needs assessment. ▪ Design, develop, and deploy.

Name	**Connection Database Development**
Description	Using current WTD GIS data to generate inventory of connections to KC WTD conveyance. Deliverable product is point feature class database structure and some sample data.
Interdependencies	WTD FIRS DB, CCTV DB, LPA files, local lines
Status	Started Q3 2017
Target	Q4 2017
Activity	▪ Design database schema. ▪ Research data sources: WTD FIRS DB, CCTV DB, LPA files, local lines. ▪ Develop data.

Name	**Sound Guardian Storymap**
Description	Develop ESRI's web tool to tell story of DNRP's SoundGuardian water quality monitoring boat and its work.
Interdependencies	WTD FIRS DB, CCTV DB, LPA files, local lines
Status	Phase 1 deployed Q2 2017, additional content in development
Target	Q4 2017
Activity	▪ Generate contents materials and organize. ▪ Develop story board. ▪ Develop web maps using ArcGIS Online platform. ▪ QA/QC materials and launch web site.

Name	**Lower Duwamish Storymap**

Description	Develop ESRI's web tool to tell story of projects related to the Lower Duwamish Superfund project.
Interdependencies	None
Status	Started Q3 2017
Target	Q1 2018
Activity	- Design narrative. - Collect content and organize. - Develop storyboard. - Develop, QAQC, and deploy.

4.6 DNRP – Water and Land Resources Division

4.6.1 Agency GIS Overview, Priorities, and Goals

WLR Mission:

- Serve as 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, WRIAs and associated watersheds, drainage, groundwater systems throughout the region).
- Serve as technical experts on King County's regional environmental quality for defining and implementing strategies for resource protection.

WLR GIS Program Organization:

WLR GIS program consists of three GIS analysts with a unique set up under the KCGIS Center matrix management structure. These analysts are housed within KCIT, working jointly with other technical experts to deliver services and products for WLR work programs, the DNRP Director's Office, and other department/division special programs. These three staff members receive project assignments from DNRP/WLR GIS, Visual Communication & Web unit manager based on areas of expertise and project workloads.

WLR GIS Services

GIS provides data, tools and analytical services to assist in policy analysis, planning and monitoring of the natural environment. WLR GIS staff create and manage integrated Web based GIS applications and other Web application tools for WLR programs. Multiple mandates include sustaining healthy watersheds, protecting public health, water and air quality, preserving open space, working farms and forests, ensuring adequate water for people and fish, and managing public drainage systems and protecting/restoring habitats. All data sets that are created and maintained by the following programs are available on the KCGIS Spatial Data Warehouse (PLIBRARY), and/or the DNRP Data Warehouse (DNRPLIB). WLR GIS also provides training and technical support to desktop users. Specific business functions include:

- ***Rural and Regional Services*** – GIS services for programs including WRIA/watershed support, groundwater management, Ecological Services, Noxious Weeds, Forestry/Agriculture, hazardous waste, acquisition, TDR, and basin stewardship.
- ***River & Floodplain Management*** – GIS data and analysis are used to predict and monitor flood hazard zones and provide basin-wide regional analysis.
- ***Science & Technical Support*** – Water quality and quantity, hydrologic assessment and analysis. Coordination with various data management and field activities to ensure efficient access to all relevant spatial data.
- ***Stormwater Services*** – GIS supports service delivery analysis, drainage investigation, and inspection services. Regulation, compliance, and NPDES permit compliance are also supported. Housing the stormwater asset inventory dataset for all of unincorporated King County.
- ***DNRP Director's Office*** – GIS is used for analysis of some regional policies, such as Open Space, Forest, Water, Energy and Air Quality/Climate change.
- ***WLR Division Director's Office*** – GIS is used for policy and funding analyses, and the development of work program funding strategies.

4.6.2 Ongoing and New Projects

Name	**Weed Watcher**
Description	Noxious Weed Program of WLRD needs a web-based application to compile weeds data collected by volunteers to help protect our natural resources in King

	County from the impacts of invasive plants. The application was launched in May 2012, but some more work needs to be done.
Interdependencies	SQL Server database, ArcGIS scripts and tools, ArcGIS Server map services.
Status	Maintenance
Target	Ongoing
Activity	▪ Maintain web application including viewer. ▪ Maintain GIS data.

Name	**Rivers Facilities Inventory Project**
Description	The River and Floodplain Management Section of WLRD needs an information system to manage flood protection facilities and properties and track changes over time. A flood protection facility includes levees and revetments. The application is launched in phases and is being actively used.
Interdependencies	SQL Server database, ArcGIS scripts and tools, ArcGIS Server map services.
Status	Maintenance
Target	Ongoing.
Activity	▪ Maintain web application including viewer. ▪ Maintain GIS data. ▪ Update and improve maintenance module. ▪ Add new condition assessment module.

Name	**WTRCRS – Maintenance**
Description	Data maintenance and new orthoimagery-based updates.
Interdependencies	In coordination with KCGIS Center and new orthoimagery.
Status	As needed.
Target	Ongoing.
Activity	▪ Update data as needed. ▪ New orthoimagery-based updates to WTRCRS.

Name	**WTRBDY –Maintenance**
Description	Data maintenance using new orthoimagery.
Interdependencies	KCGIS Center staff as time allows and WLR.
Status	As needed
Target	Ongoing.
Activity	▪ Update data using orthoimagery. ▪ Coordinate with WTRCRS updates.

Name	**ArcGIS Server and JavaScript API (JSAPI) Applications**
Description	Develop and maintain user-friendly ArcGIS Server and JSAPI applications. WLR maintains several JSAPI applications served on the Internet – Flood Photo Viewer, Sandbag Distribution Location Viewer, Salmon Watcher Viewer and Snoqualmie Riparian Viewer, TDR Property Map Viewer, Pesticide Free Public Spaces Viewer, DNRP CIP Viewer, PBRS Viewer and Municipal Office Buildings Viewer (Wayfinding), embedded maps for Hazardous Waste locations and farmland preservation land program. Other new JSAPI applications are in planning process or are in progress.
Interdependencies	None.
Status	In progress.
Target	Ongoing.
Activity	▪ Maintain existing applications. ▪ Develop new applications as needed.

Name	**Parcel Alert Lookup System (PALS) Application**
Description	Maintain PALS application that will allow County employees to identify potential safety issues (alerts) at specific parcels based on encounters with, or reported concerns about residents, dogs, weapons/firearms, hazardous conditions, etc.
Interdependencies	None.
Status	Maintenance
Target	Ongoing.
Activity	▪ Maintain the application.

Name	**Groundwater Application**
Description	The King County Groundwater Protection Program maintains a database of groundwater quality and water level data. The online application lets users search the data, run reports, export selected wells data or view data on the map.
Interdependencies	None.
Status	Maintenance
Target	Ongoing.
Activity	▪ Maintain the application.

Name	**Candidate Conservation Parcels Application**
Description	Maintain web application and GIS dataset with future acquisition priorities for WLRD.
Interdependencies	None.
Status	Maintenance
Target	Ongoing.
Activity	▪ Maintain the application.

Name	**PBRS Viewer**
Description	Develop and maintain an interactive mapping web application for PBRS program to show current use taxation properties participating in PBRS, Forestry and Agriculture programs.
Interdependencies	None.
Status	Maintenance
Target	Ongoing.
Activity	▪ Create and maintain GIS layers. ▪ Create and maintain the application.

Name	**ESJ iMap**
Description	Maintain a map viewer and map services showing demographic data layers along with different WLRD program data layers such as Stormwater and Rivers datasets.

Interdependencies	Various datasets
Status	Maintenance
Target	On going
Activity	▪ Maintain the application.

Name	**Landslide Hazard Analysis and Viewer**
Description	Maintain a viewer showing analysis data.
Interdependencies	None.
Status	Maintenance
Target	Ongoing.
Activity	▪ Maintain the application.

Name	**Stormwater Field Data Collection**
Description	Maintain map services, data, database replication and ArcGIS Mobile project for Stormwater data collection.
Interdependencies	ArcGIS Collector
Status	Maintenance
Target	Ongoing
Activity	▪ Maintain map services and data database replication.

Name	**Noxious Weeds Field Data Collection**
Description	Maintain map services, data, and ArcGIS Mobile project for noxious weeds data collection.
Interdependencies	ArcGIS Collector
Status	Maintenance
Target	Ongoing.
Activity	▪ Maintain map services, data and ArcGIS Collector project.

Name	**Poverty Bay Shellfish Contamination Study**
Description	
Interdependencies	
Status	Maintenance
Target	Ongoing.
Activity	▪

Name	**AFI (Agriculture, Forestry, and Incentives) Program Arc Collector App**
Description	Data collection for Agriculture Program
Interdependencies	Various layers
Status	In progress
Target	Ongoing
Activity	▪ Data collection

Name	**Cityworks for Stormwater Services**
Description	There has been an ongoing need for an asset/data management solution within SWS (Stormwater Services Section) that can act as a primary solution to support all SWS programs. Currently, staff must work in multiple applications to compile data needed to perform their jobs. These multiple systems require greater effort because many people must be utilized to perform relatively simple work or reporting tasks. The current applications being used also are not scalable in that they can support ever changing water quality regulations under NPDES permit compliance or taking potential future challenges such as managing ROW assets. This is impacting many existing applications (e.g. Source Control). Many asset/data management solutions are available on the market, but Cityworks was chosen as the best fit for SWSS based on its flexibility, GIS-centric design, cost and integration with KC Roads. Additional key points are listed below.
Interdependencies	SQL Server database, ArcGIS Server map services.
Status	In progress
Target	Ongoing.
Activity	▪ Implementation

Name	**Regional Food Metrics**
Description	Goal is to show related food metric data in GIS
Interdependencies	ArcGIS Server
Status	In progress
Target	Ongoing.
Activity	▪ Develop datasets and viewer

Name	**Report a Weed App**
Description	
Interdependencies	The KCGIS Center is leading this effort.
Status	In progress
Target	Ongoing.
Activity	▪

Name	**Snoqualmie Farm, Fish, Flood Ecosystem Management Decision Support System**
Description	
Interdependencies	
Status	In progress.
Target	Ongoing.
Activity	▪

Name	**Stream Bug Monitoring Habitat Field Data Collection**
Description	
Interdependencies	ArcGIS Server Map Services
Status	In progress.
Target	Ongoing.

Activity	▪

Name	**WLRD Streams & Lakes (Hydrography) Improvement Project**
Description	*Problem Statement* WLR has several stream/river GIS datasets which suffer from the following issues. ▪ No clear process for update and peer review. ▪ Lack of data standards and terminology (e.g. defining a stream vs artificial channel vs stormwater). ▪ Inadequate supporting information (e.g. perennial, intermittent, fish bearing, natural vs man-made, etc.)--*this has caused several; siloed stream layers to be created where one would be more effective.* ▪ No responsible program manager. ▪ Updates are not incorporated from other agencies (e.g. DPER). *Proposed Solution* 1. Evaluate the USGS' NHD (National Hydrography Dataset) methodology and terminology as a framework to store King County's stream data. 2. Conduct business analysis to determine additional requirements King County may have for an improved stream layer. 3. Migrate KC's existing stream data into an improved stream layer using "best of breed" analyses. 4. Update business processes and workflows to support continuous improvement of the stream layer.
Interdependencies	
Status	In progress
Target	Ongoing
Activity	▪

Name	**Patrol Map Book App**
Description	
Interdependencies	
Status	Planning
Target	Charter
Activity	▪ Planning

Name	**Raging River Channel Migration Zone Study**
Description	
Interdependencies	
Status	Planning
Target	Charter
Activity	▪ Planning

Name	**Re-write Custom Mapping Applications**
Description	
Interdependencies	
Status	Planning
Target	Charter
Activity	▪ Planning

Name	**WLRD Property Workflow Standardization/Modernization & Create Tracking and Search Tool(s)**
Description	Develop WLRD-wide procedures for property inventory management. Develop and maintain a web application with web front end to track WLRD property interest by each program such as flood, Stormwater etc.
Interdependencies	
Status	Planning
Target	Charter
Activity	▪ Planning

4.7 DNRP – Parks and Recreation Division

4.7.1 Agency GIS Overview, Priorities, and Goals

The King County Parks and Recreation Division operates and maintains an extensive system of parks, trails, facilities, and recreational programs throughout unincorporated King County. This system includes heavily-used sites of major regional significance, such as Marymoor Park and Cougar Mountain Regional Wildland Park, a system of regional trails which are popular for both recreation and everyday commuting, and a large and growing network of backcountry trails.

The Parks and Recreation Division focusses on four primary business functions:

- Capital Planning and Land Management - Perform and coordinate long-term planning and management for sites and facilities; prepare annual and long-term Capital Improvement Programs.

- Facility Maintenance and Site Management - Maintain and improve parks, trails, and facilities; acquire and manage open space; and restore and conserve natural resource lands.

- Recreation and Event Services - Provide primary recreation services for residents in unincorporated areas of King County; maintain a world-class aquatic center and a highly acclaimed outdoor concert and entertainment venue.

- Business Development and Partnerships - Plan and implement recreational and educational programs, facilities, and amenities, in partnership with other public agencies and corporate sponsors.

The Parks GIS Program supports the Division's work in all of these areas using an allocation of 1.0 FTE. This staffing allocation is shared by two professional GIS analysts, who are matrixed to the Division through the King County GIS Center and are supervised by the Parks GIS Program Manager. These staff members are affiliated with KCGIS Center Client Services and Enterprise Operations, which enables ready access to the specialized services and advanced expertise available from staff members in those units when needed for Division projects.

The Parks GIS Program provides Division managers and staff with a complete range of GIS products and services. These include data development and maintenance, data interpretation and analysis, map design and production, application development and maintenance, Web-based mapping and information services, end-user training, and project consulting. The majority of products and services are provided on request to managers and staff within the Division's administrative offices in Seattle, but requests are also received and processed for managers and staff working in outlying administration and maintenance offices, as well as at individual parks.

During 2017 and 2018 the Parks GIS Program is supporting the Division on numerous projects and initiatives. Parks GIS is also providing support to key site management and resource planning efforts, as well as enhancing critical property acquisition information to ensure parks are managed in compliance with funding and deed restrictions.

The work of the Parks GIS Program is subject to two key interagency dependencies. The first of these is that the accuracy and reliability of its products and services depend to a large extent upon consistent, timely maintenance of data by the staff of other County GIS programs. The second key dependency is that of access to the specialized skills and advanced expertise of the KCGIS Center Client Services staff and Enterprise Operations staff. Both groups are open, approachable, and supportive of the needs of Parks GIS, but the availability of specific staff at specific times can be limited due to heavy demands which are often placed upon them.

The Parks GIS Program has a relatively specialized focus and, therefore, plays a limited role in the overall KCGIS enterprise. There is a small amount of interaction with the GIS programs in other divisions of DNRP, but little or no involvement with GIS programs in other departments. Parks GIS maintains the small number of enterprise data layers for which it has responsibility and is actively

involved in the initiatives and operations of the KCGIS Steering Committee and the KCGIS Technical Advisory Committee.

4.7.2 Ongoing and New Projects

Name	**Parks Asset Management Project - Lucity Database Integration**
Description	Expand, improve, and update the ParkProp and PSAFI databases to encompass all relevant feature and facility types, as well as all significant attributes for each feature and facility type. Coordinate this effort closely with the design and development of the Parks Lucity asset management database and ensure compatibility between these databases and with Parks GIS applications, processes, and other resources.
Interdependencies	Reliable operation and availability of the KCGIS Spatial Data Warehouse and ArcGIS Desktop and Server software; Availability and access to complete, accurate current spatial and tabular data for Parks properties, facilities, and management units; Cooperation and coordination with Lucity database development team to ensure complete, reliable integration of these databases.
Status	In preliminary design phase
Target	2018 - End of Second Quarter
Activity	▪ Consult with clients to determine business needs, identify appropriate solutions, define requirements, establish project scope and schedule, and coordinate on status and progress. ▪ Update and enhance existing data attribute tables using new and/or newly updated data. ▪ Support and assist client implementation of new and enhanced data attribute tables in planning, operations, and management.

Name	**Trail Data Segmentation**
Description	Create, test, and implement Python scripting to assemble complete trail segments which connect junction pairs or trailheads with junctions within the trail network. Use these scripts to generate a complete spatial data layer of trail segments. Develop web applications and web mapping services to enable use of these trail segments for route planning and evaluation, as well as trail planning and maintenance.
Interdependencies	Reliable operation and availability of the KCGIS Spatial Data Warehouse and ArcGIS Desktop and Server software; Availability and access to complete, accurate current spatial and tabular data for trails and trail-related features.
Status	In progress
Target	2017 - End of Fourth Quarter

| Activity | ▪ Consult with clients to determine business needs, identify appropriate solutions, define requirements, establish project scope and schedule, and coordinate on status and progress.
▪ Design, develop, test, and deploy new Python scripting for assembling complete trail segments.
▪ Design, develop, and populate a new spatial data layer of trail segments.
▪ Design, develop, test, and deploy new web applications and web mapping services to implement use of the new trail segment data. |

Name	**ParkFinder Enhancements**
Description	Continue design and development of key enhancements to ParkFinder, to add functionality and optimize its use on all devices. Create and implement ArcGIS Online overlays to incorporate Park Alerts, to notify the public of closures, revisions, and special events. Coordinate with Parks staff and park users/user groups to identify additional potential enhancements, determine which should be developed, and proceed with these as necessary and appropriate.
Interdependencies	Reliable operation and availability of the KCGIS Spatial Data Warehouse and ArcGIS Desktop and Server software; Availability and access to park and facility data, park planners and managers, and park users/user groups for guidance, priorities, assistance, and feedback.
Status	In progress
Target	2018 - End of Fourth Quarter
Activity	▪ Consult with clients to determine business needs, identify appropriate solutions, define requirements, establish project scope and schedule, and coordinate on status and progress. ▪ Design, develop, test, and deploy all new ParkFinder enhancements identified in consultation with the client. ▪ Design, develop, test, and deploy new ArcGIS Online overlays for ParkFinder.

Name	**TrailFinder Enhancements**
Description	Continue design and development of key enhancements to TrailFinder, to add functionality and optimize its use on all devices. Create and implement ArcGIS Online overlays to incorporate Trail Alerts, to notify the public of closures, revisions, and special events. Coordinate with Parks staff and trail users/user groups to identify additional potential enhancements, determine which should be developed, and proceed with these as necessary and appropriate.
Interdependencies	Reliable operation and availability of the KCGIS Spatial Data Warehouse and ArcGIS Desktop and Server software; Availability and access to trail and facility data, trail planners and managers, and trail users/user groups for guidance, priorities, assistance, and feedback.

Status	In progress
Target	2018 - End of Fourth Quarter
Activity	- Consult with clients to determine business needs, identify appropriate solutions, define requirements, establish project scope and schedule, and coordinate on status and progress. - Design, develop, test, and deploy all new TrailFinder enhancements identified in consultation with the client. - Design, develop, test, and deploy new ArcGIS Online overlays for TrailFinder.

Name	**Mobile Mapping Project for King County Trails**
Description	Transmap Corporation will work under contract to Parks to inventory images of the King County trail network, collect linear data about trail surface conditions and use a remote lidar (Light Detection and Ranging) sensing array to create new inventories of trail surfaces and trailside assets. These products will be used to create visualizations of specific portions of trails to support planning and maintenance needs.
Interdependencies	Reliable operation and availability of Transmap Corporation image and data collection vehicle and equipment; Availability and access to trails and trailside facilities and assets; Cooperation and coordination with King County trail planners and managers.
Status	In progress
Target	2018 - End of First Quarter
Activity	- Consult with clients to determine business needs, identify appropriate solutions, define requirements, establish project scope and schedule, and coordinate on status and progress. - Update and enhance existing spatial data layers using new and/or newly updated data. - Update and enhance existing data attribute tables using new and/or newly updated data. - Incorporate newly updated data into design and development of visualizations for specific portions of trails

Name	**Trip Counter Data Project**
Description	For the Parks Automated Trip Counter program, develop and deploy an online data portal with the ability to automatically gather and host the data collected continuously by the trip counters which have been installed throughout the King County regional trails system. Provide both internal and external users with simple, efficient access to these trail use data to support their trail planning and management needs, as well as to enable accurate analysis of actual trail use.

Interdependencies	Reliable operation and availability of the KCGIS Spatial Data Warehouse and ArcGIS Server software; Availability and access to the continuous data feed from the trip counters; Cooperation and coordination with the trip counter manufacturer, Eco-Visio; Availability of KCGIS application development and DBA staff; Availability and access to King County trail planners and managers, and to trail users/user groups for guidance, priorities, assistance, and feedback.
Status	In progress
Target	2018 - End of Second Quarter
Activity	- Consult with clients to determine business needs, identify appropriate solutions, define requirements, establish project scope and schedule, and coordinate on status and progress. - Update and enhance existing data attribute tables using new and/or newly updated data. - Design, develop, test, and deploy new applications and/or web mapping and information services. - Design, develop, test, and implement enhancements and improvements to existing applications and/or web mapping and information services. - Revise existing maps as necessary to incorporate new and updated information. - Design and produce new maps to address client business needs.

4.8 DNRP – Solid Waste Division

4.8.1 Agency GIS Overview, Priorities, and Goals

The King County Solid Waste Division provides transfer and disposal services for solid waste materials to residential and non-residential customers, as well as commercial disposal services, throughout King County. The Division operates eight geographically dispersed transfer stations, two rural drop boxes, and the Cedar Hills Regional Landfill in Maple Valley, which is the only operational landfill within the County. The primary goal of these activities is to conserve natural and renewable resources in King County by providing customers with readily available services and by promoting public awareness of conservation, recycling, and the benefits of participation in the Division's programs.

The Solid Waste Division comprises five operational units:

- Engineering Services Section - Plans and manages the development of transfer stations, new landfill areas, and the closure of completed landfill areas at the Cedar Hills Regional Landfill, as well as facility inspections, engineering support for facility operations and maintenance, and environmental compliance monitoring and reporting.

- Enterprise Services Section - Provides a variety of financial management and support services for the Division, including contract technical support and oversight, operating and capital budget development and monitoring, economic forecasts, and internal audits.

- Operations Section - Operates the Division's transfer stations and the Cedar Hills Regional Landfill and administers the capture and management of byproducts of decomposing waste, such as methane gas.

- Strategy, Communications and Performance Section - Performs and coordinates ongoing data analysis and evaluation, long-term strategic planning, and policy development for the Division, as well as coordinating internal and external communications and producing the Comprehensive Solid Waste Management Plan and the Division's annual report and rate studies.

- Recycling and Environmental Services Section - Develops and manages programs for food scrap recycling, household hazardous waste, green building, construction and demolition material recycling and reuse, product stewardship, brownfields and contaminated sites, and other waste prevention and recycling topics.

The Solid Waste GIS Program supports the Division's work in all of these areas using an allocation of 1.0 FTE. This staffing allocation is shared by two professional GIS analysts, who are matrixed to the Division through the King County GIS Center and are supervised by the Solid Waste GIS Program Manager. These staff members are affiliated with KCGIS Center Client Services and Enterprise Operations, which enables ready access to the specialized services and advanced expertise available in those units when needed for Division projects.

The Solid Waste GIS Program provides Division managers and staff with a complete range of GIS products and services. These include data development and maintenance, data interpretation and analysis, map design and production, application development and maintenance, Web-based mapping and information services, end-user training, and project consulting. The majority of products and services are provided on request to managers and staff within the Division's administrative offices in Seattle, but requests are also received and processed for managers and staff working at outlying division facilities, including the eight transfer stations and the Cedar Hills Regional Landfill. These include maps and reports used for a variety of planning, management, and maintenance purposes.

During 2017 and 2018 the Solid Waste GIS Program is supporting the Division on several key projects and initiatives. A major focus is on customer route mapping and travel-time analysis to support demand management analysis and planning for the County's transfer stations. Data management,

mapping, and analysis also continue in support of recycling and environmental service programs for County residents and businesses, including the Green Schools program, Wastemobile events, and the Community Litter Cleanup Program.

The work of the Solid Waste GIS Program is subject to two key interagency dependencies. The first of these is that the accuracy and reliability of its products and services depend to a large extent upon consistent, timely maintenance of data by the staff of other County GIS programs. The second key dependency is that of access to the specialized skills and advanced expertise of the KCGIS Center Client Services staff and Enterprise Operations staff. Both groups are open, approachable, and supportive of the needs of Solid Waste GIS, but the availability of specific staff at specific times can be limited due to heavy demands which are often placed upon them.

The Solid Waste GIS Program has a relatively specialized focus and, therefore, plays a limited role in the overall KCGIS enterprise. There is a small amount of interaction with the GIS programs in other divisions of DNRP, but little or no involvement with GIS programs in other departments. Solid Waste GIS maintains the small number of enterprise data layers for which it has responsibility and is actively involved in the initiatives and operations of the KCGIS Steering Committee and the KCGIS Technical Advisory Committee.

4.8.2 Ongoing and New Projects

Name	**Demand Management Analysis and Planning**
Description	A major focus on customer route mapping and travel-time analysis, to support demand management assessment for King County's transfer stations and to support greater progress toward meeting equity and social justice objectives in Solid Waste operations. Includes analysis and mapping of customer volumes, trip origins, and operational service areas for all currently active transfer stations. This will support management and planning needs for balancing current customer loads at existing transfer stations. It will also enable improved, more effective planning for future facilities whose capacity and locations will optimize efficiency of access for customers while minimizing environmental impacts of the growing volume of trips made by the general public to these facilities.
Interdependencies	Reliable operation and availability of the KCGIS Spatial Data Warehouse, the DNRP GIS data server, and ArcGIS Desktop and Server software; Availability and access to accurate, detailed data for transfer station customer volumes, trip origins and routes, and traffic counts on adjacent roadways.
Status	In progress
Target	2018 - End of Second Quarter
Activity	▪ Consult with clients to determine business needs, identify appropriate solutions, define requirements, establish project scope and schedule, and coordinate on status and progress. ▪ Acquire copies of suitable existing data and/or other non-digital sources of information. ▪ Update and enhance existing spatial data layers using new and/or newly updated data. ▪ Update and enhance existing data attribute tables using new and/or newly updated data.

	▪ Perform spatial and/or network analysis and produce maps, charts, and reports to present findings and recommendations.

Name	**GIS Support for Solid Waste ESJ Objectives**
Description	Increased and more diverse GIS-based demographic analysis and mapping, to support greater progress toward meeting equity and social justice objectives in Solid Waste programs, operations, events, and activities throughout King County. A major focus of this effort will be support for significant increases in outreach and education programs to provide and improve services to currently unserved and underserved communities.
Interdependencies	Reliable operation and availability of the KCGIS Spatial Data Warehouse, the DNRP GIS data server, and ArcGIS Desktop software; Availability and access to accurate, detailed demographic data for all applicable ESJ factors; Cooperation and coordination with SWD program planners and managers to research and identify unserved and underserved communities and to design and develop appropriate GIS-based products and services to support their work.
Status	In progress
Target	2018 – End of Fourth Quarter
Activity	▪ Consult with clients to determine business needs, identify appropriate solutions, define requirements, establish project scope and schedule, and coordinate on status and progress. ▪ Conduct research on suitable existing data and/or other non-digital sources of information. ▪ Acquire copies of suitable existing data and/or other non-digital sources of information. ▪ Perform spatial and/or network analysis and produce maps, charts, and reports to present findings and recommendations. ▪ Support and assist client implementation of findings and recommendations in policy development, planning, operations, and management.

Name	**Recycling and Environmental Services Program Support**
Description	Application development, data development/data management, mapping, and spatial analysis in support of SWD's recycling and environmental service programs for County residents and businesses. These include Construction and Demolition materials recycling, the Green Schools program, Wastemobile events, Illegal Dumping reporting, tracking, and mitigation, and the Community Litter Cleanup Program.
Interdependencies	Reliable operation and availability of the KCGIS Spatial Data Warehouse, the DNRP GIS data server, and ArcGIS Desktop software; Availability of design and development assistance from KCGIS Center staff; Cooperation and coordination with SWD program planners and managers, to ensure availability and access to

	program and event information, and for design and development of appropriate GIS-based products and services to support their work.
Status	In progress
Target	2018 – End of Fourth Quarter
Activity	▪ Consult with clients to determine business needs, identify appropriate solutions, define requirements, establish project scope and schedule, and coordinate on status and progress. ▪ Update and enhance existing spatial data layers using new and/or newly updated data. ▪ Update and enhance existing data attribute tables using new and/or newly updated data. ▪ Incorporate new and/or newly updated data into existing applications and/or web mapping and information services. ▪ Design, develop, test, and implement enhancements and improvements to existing applications and/or web mapping and information services. ▪ Design and produce new maps to address client business needs. ▪ Perform spatial and/or network analysis and produce maps, charts, and reports to present findings and recommendations.

Name	**Application Enhancement**
Description	Continuing enhancements to existing applications and increasing use of ArcGIS Online, to enable more flexible and effective responses to customer requests and access for the public to mapping and information about Solid Waste facilities, programs, and events.
Interdependencies	Reliable operation and availability of the KCGIS Spatial Data Warehouse, the DNRP GIS data server, and ArcGIS Desktop software; Availability of design and development assistance from KCGIS Center staff; Cooperation and coordination with SWD program planners and managers, to identify areas of needed or desired application improvement or enhancement.
Status	In progress
Target	2018 – End of Fourth Quarter
Activity	▪ Consult with clients to determine business needs, identify appropriate solutions, define requirements, establish project scope and schedule, and coordinate on status and progress. ▪ Design, develop, test, and implement enhancements and improvements to existing applications and/or web mapping and information services. ▪ Design, develop, test, and deploy new applications and/or web mapping and information services.

Name	**Facility Siting Support**
Description	New rounds of criteria-based spatial and demographic research to support site selection and evaluation processes for proposed transfer stations and other Solid Waste facilities throughout King County.
Interdependencies	Reliable operation and availability of the KCGIS Spatial Data Warehouse, the DNRP GIS data server, and ArcGIS Desktop and Server software; Availability of design and development assistance from KCGIS Center staff; Cooperation and coordination with SWD program planners and managers to research and identify appropriate site search criteria and to review and provide feedback on the results of each phase of candidate site selection.
Status	In progress
Target	2018 – End of Third Quarter
Activity	▪ Consult with clients to determine business needs, identify appropriate solutions, define requirements, establish project scope and schedule, and coordinate on status and progress. ▪ Conduct criteria-based site selection analysis to locate suitable candidate sites for client facility development and/or other business purposes. ▪ Produce maps, charts, and reports to present findings and recommendations. ▪ Support and assist client implementation of findings and recommendations in policy development, planning, operations, and management.

Name	**CLCP Site ID Reference Application**
Description	A new ArcGIS Online Web Map which will enable staff and managers from Solid Waste and its partner agencies to efficiently retrieve, map, and review information about litter sites and cleanup events which have been handled by participants in the Community Litter Cleanup Program. This capability will facilitate improved oversight and planning for this essential and highly beneficial community partnership.
Interdependencies	Reliable operation and availability of the KCGIS Spatial Data Warehouse, the DNRP GIS data server, and ArcGIS Desktop and Server software; Availability of design and development assistance from KCGIS Center staff; Cooperation and coordination with SWD program planners and managers to define application requirements, assist with testing and refinement, and support training and deployment of the final application.
Status	In preliminary design phase
Target	2018 – End of Second Quarter
Activity	▪ Consult with clients to determine business needs, identify appropriate solutions, define requirements, establish project scope and schedule, and coordinate on status and progress.

	▪ Design, develop, test, and deploy new ArcGIS Online Web Map.

4.9   DOT – Transit

4.9.1 Agency GIS Overview, Priorities, and Goals

Metro Transit is the primary agency for public transportation throughout King County. Metro is admired nationwide for our innovative transit services, pioneering green practices, and visionary approach to meeting the transportation needs of King County's growing population. Metro offers many transportation services and products that support and connect our people with their communities, helping make life easier for everyone.

Metro Transit uses GIS in a variety of ways to address operations, analysis and planning. GIS reaches into virtually every section of Transit and is a pillar upon which much of Metro's systems rest on.

Metro uses GIS in various system throughout the division. GIS plays a critical role in providing service to public transit riders across King County. GIS is used for planning, scheduling and real-time operations. Metro's GIS users perform a variety of GIS tasks including data systems management, data stewardship, analysis, visualization and cartography.

The Service Development section uses GIS to maintain stop and route data, analyze service needs based on service guidelines, plan and schedule service, and prepare maps for service changes and community outreach. The Operations section relies on GIS to manage service at the Transit Control Center, provide training materials using the Route Book and Electronic Qualification System, and manages comfort station data. The Customer Information Technological Resources & Solutions (CITRS) section provides immediate notification of service issues to the riding public, manages Trip Planner, the internal ATIS system and a number of other systems using GIS. Systems Development & Operations provides support for, and development of, operational GIS solutions. Strategy & Performance use GIS to measure service/route performance and forecast future service requirements. Paratransit & Rideshare Operations use GIS to generate the program's service area and meet its geospatial reporting needs.

GIS users in Transit include transit planners, communication specialists, functional analysts, and GIS analysts. There are approximately 40 users with a sophisticated ability to use GIS for cartography and geographic analysis and another 20+ users who use GIS regularly with a limited skillset. GIS software used within Transit includes ArcGIS Desktop and most available extensions, ArcGIS Online, ArcGIS Pro, TIMs (a replacement for Metro's previous homegrown GIS called "GIS toolbox"), HASTUS GEO, INIT MobilePlan and ITCS, Tableau, Power BI, Remix and R.

GIS users in Metro often work in isolation from other users and may only be aware of the GIS work being performed within their section or unit. These users may not have developed relationships with the GIS Center and therefore are not aware of the resources of the GIS Center. Further, management is not always aware of the possibilities of making spatial information the cornerstone of data management which has led to challenges integrating data from disparate sources.

Transit currently holds a quarterly meeting of GIS users to review, discuss and share current non-enterprise GIS data that is being used/created. It also serves as a resource for discussing new trends and to showcase projects that are currently being worked on. This is an ad hoc meeting without formal structure.

4.9.2 Ongoing and New Projects

Name	**HASTUS Geo Module**
Description	Geo is a module of HASTUS, which is used to create transit schedules for buses, streetcar, monorail, light rail, and King County operated water taxi. Service Development staff periodically import specially formatted shapefiles into Geo.

	This allows staff to use HASTUS to locate stops and trace revenue and non-revenue routes correctly with respect to TNET.
Interdependencies	KCIT
Status	Continuous
Target	At least bi-monthly; more often as necessary.
Activity	

Name	**Electronic Route Qualification System**
Description	The Electronic Route Qualification System is an ArcGIS Online-based system hosted in Moodle, an online open-source training platform. Transit operators use this system to learn and review routing information.
Interdependencies	None.
Status	Soft launch is complete.
Target	Full launch with the Fall 2017 service change and refinement through 2107 and 2018.
Activity	▪ Full launch and refinement.

Name	**Comfort Station Management Lean Process**
Description	This process has identified the necessity to link comfort station GIS data with scheduling data to ensure compliance with division comfort station policy. This will improve operator access to comfort station throughout service area.
Interdependencies	KCIT
Status	Scoping project and getting approval from King County for a new technology project
Target	
Activity	▪ Beginning to conceptually develop an application to integrate comfort station and scheduling data.

Name	**Route Book Online**
Description	This project will port the biannually-published 600-page Route Book to an ArcGIS Online format. The Route Book is a training tool for transit operators and contains over 230 maps.

Interdependencies	None.
Status	In development
Target	Completion by Fall 2018
Activity	▪ Completion of prototype, testing and deployment.

Name	**Adverse Weather Reroutes**
Description	Complete data set of adverse weather reroutes
Interdependencies	KCIT
Status	Near completion
Target	Early 2018
Activity	▪ Continue development.

Name	**Trolley Overhead Dataset**
Description	Complete data set of trolley overhead
Interdependencies	None
Status	50% complete
Target	End of 2018
Activity	▪ Continue development.

Name	**System Evaluation**
Description	Geographic data processing and mapmaking for an annual report
Interdependencies	None
Status	Continuous
Target	October each year
Activity	▪

Name	**Bus Stop Analysis**
Description	Use GIS to research conditions prior to stop consolidation or upgrade.
Interdependencies	KCIT (data)
Status	Ongoing
Target	Quarterly
Activity	▪ Continuous.

Name	**Strategic Plan Progress Report**
Description	Geographic data processing and mapmaking for a biannual report
Interdependencies	None Continue development.
Status	Continuous
Target	June each year
Activity	▪

Name	**Speed and Reliability Report**
Description	Geographic data processing and mapmaking for an annual report
Interdependencies	None
Status	Continuous
Target	September each year
Activity	▪

Name	**Regional Remix Pilot**
Description	PSRC-sponsored use and evaluation of Remix sketch planning software
Interdependencies	None
Status	Ongoing
Target	June 2018 (contract expiration)

Activity	- Produce long-range plan network in Remix for use in PSRC's T2040 plan update (complete) - Use Remix for sketch planning as needed - Conduct mobility analyses for proposed restructures

Name	**Transit Business Intelligence and Research Database**
Description	Project designed to link disparate transit datasets together and provide real-time or near-real-time access to data
Interdependencies	AVL, APC, OBS, M5, ORCA, Enterprise GIS, and others and the project progresses
Status	Project formation phase
Target	In current waterfall state: end of 2018 for RFP; end of 2020 for delivery In proposed Agile state: sprints to begin Q1-Q2 2018
Activity	For Metro, project management / continue development

Name	**GTFS Trip Data**
Description	Use GTFS data to create GIS feature classes of TLinks with trip/route level data and Stops with trip level data
Interdependencies	KCIT (GTFS data in data portal)
Status	Ongoing
Target	Twice yearly after March and September Service Changes
Activity	Continue development

Name	**Service Change Mapping**
Description	Use GIS to create new/potential bus routes layers for evaluation and analysis trip
Interdependencies	None
Status	Ongoing
Target	Three/four times yearly: March, June, and September Service Changes and for Ordinance packages when needed
Activity	Continue development

Name	**Transit Information Mapping System**
Description	Application developed to replace GIS Toolbox
Interdependencies	KCIT
Status	Launch date July 31, 2017
Target	Completion by August 2017
Activity	▪ Launch, promotion and communication

4.10 King County Elections

4.10.1 Agency GIS Overview, Priorities, and Goals

The mission of King County Department of Elections is to conduct fair, open and accurate elections and to be a leader in providing inclusive elections and voter access. We actively identify and work to remove barriers to voting at both the individual and community level by strengthening relationships within the community and governmental partners and providing an opportunity for county voters to participate in their government.

The King County Elections GIS 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 supports Election Department division business programs by providing digital map production services, data creation, integration, maintenance and analysis, internet based services of available map products, and Election Service Center (ESC) and Ballot Drop Off Location (BDOL) lookup applications. GIS is used in many aspects of the department's business functions including but not limited to:

- *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 29A.76 and 29A.76B)* and annual precinct maintenance *(RCW 29A.16.040, RCW 29A.16.050, and RCW 29A.16.070).* 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 Director of Elections performs many of the business functions of the "County Auditor" (with exception to Recording & Licensing duties). 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 29A.76.020).* 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.

- *Election Support* – Jurisdictions in King County can conduct as many as four 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, petition qualification and verification, production of the Local Voters Pamphlet, ballot drop box location and analysis, 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* 29A.08.125*)* requires the Auditor's 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.

- *Public Information* – Election GIS maps, data and applications are used to aid in the delivery of public information. District information is depicted using GIS for all the department map series products available hard copy or via the Internet. The "Find My District" application allows the public to establish their election voting districts within an interactive mapping application. The Voter Registration and Turnout applications provide valuable tools for the public and our stakeholders.

We will continue having representation on the GIS Steering Committee and GIS Technical Advisory Committee to provide input while aligning with department strategic initiatives.

The services provided by KCE GIS staff include GIS data analysis, voter data analysis, census demographics, cartographic production and map sales. These services are also provided to the general public and clients outside the county organizational structure. Ninety different map products are produced and maintained and are also available as PDFs on the Elections website. KCEGIS also has twenty-four data layers available on the King County Data Portal Site and two interactive public facing maps and applications for voter turnout and voter registration.

The GIS Supervisor reports to the Director of Elections for operations and maintenance of Election related work programs and interfaces with the appropriate department staff for coordination of cross-departmental projects. Customer service for both internal and external clients is reviewed and approved by the GIS Supervisor, sometimes in coordination with the Leadership Team. This is accomplished by coordinating special projects and requests with the KCGIS Center, to determine which agency should respond to the requests.

The Elections Department has one FTE GIS Specialist-Senior position, one FTE GIS Specialist-Journey position and two FTE GIS Specialist-Entry positions. One of the Entry positions is allocated at .8 GIS and .2 IT Services. All of these positions will receive job assignments and report to the GIS Supervisor. These analysts perform duty assignments supporting five basic business areas: political redistricting, election district boundary maintenance, voter registration and election support, map production, and customer service. Duties and job responsibilities are shared between GIS staff, with the division of labor coordinated and assigned by the GIS Supervisor. Although the workload is distributed evenly between staff members, one GIS Analyst is primarily 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 of the district datasets, one GIS Analyst handles special data requests and all production related issues, and one GIS Analyst rectification of voter addresses. Staff will also be working on various GIS projects, providing data maintenance, integration, data QC, and election specific application development.

4.10.2 Ongoing and New Projects

Name	**Election Management System Operation and Maintenance**
Description	Elections GIS Election Information Management System (EIMS) specific support, including district, precinct, precinct portion, street and voter address maintenance.
Interdependencies	Working with departmental divisions and vendor DFM Associates
Status	In progress.
Target	Ongoing project
Activity	▪ Complete yearly precinct alterations ordinance. ▪ Perform minor taxing district boundary maintenance including annexations, transfers of territory, mergers, and dissolutions. ▪ Update voter registration database with new addresses. ▪ Petition validation. ▪ Continue developing enhanced editing processes and procedures. ▪ Testing new EIMS versions.

Name	**Precinct Alteration Project**
Description	Prepare and implement an ordinance altering precincts annually to accommodate city annexations, precinct balancing and election administrative maintenance.
Interdependencies	King County Council and political parties.
Status	Q1 and Q2
Target	Annual
Activity	▪ Analysis of over and under sized precincts, annexation areas and citizen input. ▪ Create the legislation package including maps of all precincts being altered. ▪ Implement the changes adopted by the council in the election management system. ▪ Integrate the changes and post all KCEGIS datasets. ▪ Produce new King County Council district, Legislative district and city maps with precinct detail. ▪ Create legislation to define King County District Court electoral districts.

Name	**Position Accuracy Improvements (PAI)**
Description	Realign Election district data to KC Assessor's PAI.
Interdependencies	Availability of staff resources, coordination with KC Assessor's Office.
Status	In progress.
Target	Ongoing project
Activity	▪ Coordinate with Assessor cadastral updates. ▪ QC geography. ▪ Integrate changes and repost all KCEGIS's datasets.

Name	**Voter Geocoding and Address Rectification**
Description	Continue to geocode voter addresses and refine address databases by reporting inconsistencies to data stewards. Increase participation in county wide addressing work group. This will be the groundwork to explore the feasibility of using a GIS point file to replace the street segment file in the election management system.
Interdependencies	Availability of staff resources, addressing workgroup, cities, DPER, KCGIS, E911.
Status	Ongoing.

Target	Q4 2018
Activity	▪ Rectification of voter addresses with CASS and NCOA.
	▪ Boundary comparison, reconciliation and documentation.
	▪ Geocode voters based on KC address database.
	▪ Evaluate and research miscompares.
	▪ Report back to addressing authorities to resolve discrepancies.

Name	**Taxing District Boundary Review**
Description	Review of taxing district boundaries in coordination with KC Assessor's Office to resolve any discrepancies.
Interdependencies	Availability of staff resources, coordination with KC Assessor's Office; individual taxing districts.
Status	On hold.
Target	Q4 2018
Activity	▪ Coordinate with KCA to review district sets.
	▪ Compare KCA districts to Elections GIS districts.
	▪ Resolve any discrepancies.
	▪ Establish backup plans.
	▪ If there are discrepancies between DOA and Elections data that require immediate attention these will be reviewed regardless of the project status or timeline.

Name	**Voter Registration Mapping Application Enhancements**
Description	Adding demographic data to our current Voter Registration mapping application
Interdependencies	KC GIS Center and WLRD.
Status	In progress.
Target	Q3 2017.
Activity	▪ Update descriptive data and pages.
	▪ Adding census data for language, income, poverty, race, and ethnicity.
	▪ Build map template.
	▪ Submit for peer review.

Name	**Statewide Election Management System Assessment**
Description	Evaluation of Election Management Systems with the possibility of implementing a new system by the year 2018
Interdependencies	Departmental divisions, vendors and WA Secretary of States' Office
Status	In progress
Target	Q4 2018
Activity	▪ Request for Information (ROI) from vendors. ▪ Site visits and presentations on system requirements from vendors. ▪ Evaluations, reference checks, site visits or conference calls with other counties doing business with the vendors. ▪ Possible data conversion efforts. ▪ Possible implementation and training on a new system.

Name	**Ballot Drop Box Location Analysis**
Description	New Law SB5 472 requires one ballot drop dox per 15,000 registered voters and one-drop box in each city, town and census designated place with a post office. This has increased our number of boxes to a required 86 locations within King County.
Interdependencies	Departmental divisions and vendors
Status	In progress
Target	Q2 2018
Activity	▪ 54 BDOL locations installed and in use for the Primary 2017 Election. ▪ Location analysis for 32 additional BDOL locations by 2019 Primary. ▪ Mapping analysis for best scored locations. ▪ Mapping analysis and policy for opening BDOLs during Special Elections.

4.11 King County Sheriff's Office

4.11.1 Agency GIS Overview, Priorities and Goals

- Within the King County Sheriff's Office (KCSO), GIS services are provided by two groups: The Communications Section of the Technical Services Division, and The Research, Planning & Information Services Unit (RP&IS) of the Technical Services Division. Collectively, the GIS program vision, mission, and objectives are:

  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 a useful 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.

- The Communications Section of the Technical Services Division has one full-time GIS Specialist who is responsible for maintaining GIS Geofile response information including various district and jurisdiction boundaries, street and address changes, business types and other location-specific information. Time is also spent training and providing guidance to other personnel in use of GIS software, Geofile requirements and procedures, troubleshooting techniques, and maps. In addition, maps are designed and created for community education and planning purposes as time allows. These requests are primarily internal and occur sporadically.

- The Research, Planning & Information Services Unit (RP&IS) of the Technical Services Division currently has primary responsibility for providing GIS services for crime analysis related purposes. RP&IS is a multidisciplinary unit with crime analysis being the primary responsibility of the unit. This unit has no personnel with full-time GIS responsibilities. However, 5.0 RP&IS FTE's are proficient with ArcGIS 10.x and use it as the primary tool for creating and completing GIS related projects.

- The RP&IS supervisor currently coordinates all GIS activity for the RP&IS Unit, as well as performing a substantial amount of non-GIS related data and information technology business functions. 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 or zone) to each of the five ArcGIS 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, Metro Transit Police 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/selected data maintenance.

- Research, Planning & Information Services/Crime Analysis Unit personnel utilize the STREETS file (tabular data) maintained by the Communications Center technical support staff as one source for geocoding address/crime-related data. Data is also mapped by precinct or city based on latitude/longitude information collected through the CAD software. Due to the critical functions performed by the Sheriff's Office - notably E-911 dispatching - maintaining its own street data has become imperative to accurate and timely emergency response. In the future, another source of street/address data may be re-evaluated and configured to meet the needs of the Sheriff's Office. Until then, the STREETS file meets the minimum requirements of the current version of the CAD system.

- One challenge for the GIS program is obtaining server space to house the large orthophoto imagery files that would be useful in the CAD system map (known as Maverick Map). Another

challenge is keeping up with changes to the street file used for 911 dispatching. However, the latter challenge also lends well to an opportunity for the Sheriff's Office: Increased collaboration and data sharing with other PSAPs, primarily Valley Communications and NORCOM. These regional communication agencies are maintaining their own GIS data, and since geographic service areas overlap in many instances, there is potential to share updates and insights that are useful to all agencies involved. As Next Generation 9-1-1 grows closer to being reality, having mutual and overlapping data amongst communication agencies will be increasingly important. Common locations, such as hotels and gas stations, are continuously added and updated in CAD. Such point files are uploaded directly to Maverick Map. Along with other data layers specific to the Sheriff's Office, they serve as a visual reference for Communication Specialists and patrol officers as they take calls and follow up with appropriate action.

- Major strengths of the GIS program are that polygon boundary file updates reflecting new annexations are very timely, and the entire staff has a general working knowledge of GIS and its applications within the Sheriff's Office Communications Center. One major weakness is that the common data storage and management framework for ArcGIS, the geodatabase, is not currently utilized. Instead, data is maintained in a shapefile format for use by the CAD system. This makes sharing data with other agencies more cumbersome as the data must be transformed before it is exchanged, and some of the prime functionality of a geodatabase is lost.

- The Communications Center is currently using Tiburon CommandCAD Version 2.9.1. Prior to that, Version 2.3 was in use. Data was prepared and transformed for the upgrade and analyzed in a test environment before the upgrade went live. Version 2.9.1 does not require data conversion from shapefile to TI File, and is able to geocode point addresses. It still falls back on street address ranges if the address point cannot geocode. When geocoding by intersection, the system has the capability of creating "virtual intersections" between any type of line data (river, trail, etc.).

4.11.2 Ongoing and New Projects

Name	**Sound Transit Jurisdictional Data Acquisition**
Description	The KCSO contracts with Sound Transit to provide police services to its customers. The heavy rail and bus service routes extend into Pierce County and Snohomish County, so there may be a need integrate Pierce and Snohomish GIS data into the 911-CAD system. This will be even more important when light rail expands beyond King County borders in the future.
Interdependencies	KCGIS Center for Pierce and Snohomish County data coordination.
Status	Completed
Target	N/A
Activity	- Identified point, line, and polygon data needed for Pierce and Snohomish County and determined where reliable and up-to-date versions can be obtained. - New information has been incorporated into CommandCAD and Maverick Map. - The new version of CommandCAD has been implemented and new 3-county map display is the norm.

Name	**Maverick Map Improvements**
Description	Explore ways to improve the currency and completeness of data layers and attributes provided to Maverick Map.
Interdependencies	Possibly KCSO IT staff for interaction with the Communications Center Knowledge Base.
Status	Ongoing
Target	Upgrade completed June 2016
Activity	▪ New version of CommandCAD (2.9.1) went live in June 2016. ▪ The Knowledge Base remains a separate source of information and is not tied to CAD ▪ MaverickLVS (Location Verification Service) processes all location based information for CAD, including common place names. ▪ Regular updates for key datasets continue to be of utmost importance.

4.12 Metropolitan King County Council

4.12.1 Agency GIS Overview, Priorities, and Goals

The nine 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 and motions, 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 County Council are provided at two levels, dependent upon the complexity of the GIS service needed. Simpler GIS services are provided to the Council by its central staff, a non-partisan group of professionals that support the council's legislative committees. The central staff uses GIS to support the council in its policymaking role by analyzing geographic data currently available through the King County GIS Center. This existing data is presented to the Council in the form of maps, graphics, data files, reports, and spatial analysis. Complex GIS services requiring the generation and analysis of new data or the creation of more detailed mapping are provided through the King County GIS Center on a reimbursement basis.

The objective of using GIS capabilities at each level of complexity is to provide data and information that will assist council members 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.

The County Council does not have a stand-alone GIS unit, but uses a policy analyst to serve as a liaison between the legislative branch and the broader GIS community, and for coordinating training, procuring data, routing requests, and enlisting the help of other departments on complex projects. The policy analyst also serves as the Council representative to the KCGIS Steering Committee.

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, but are not limited to:

- parcels,
- concurrency and road mitigation payment system,
- land use and zoning,
- critical areas,
- council district boundaries,
- voting precincts,
- city boundaries,
- potential annexation areas,
- street network and annotation,
- parks, trails and open space,
- natural resources lands (agriculture, mining and forestry),
- hydrology,
- urban growth area boundary,
- aerial imagery, and
- Assessor quarter-section maps.

The Council is underutilizing GIS, both as a mapping and analysis tool. The central staff could be better utilizing GIS as a visual communication and analysis tool, and the councilmembers would benefit by having more information at their disposal when making policy decisions. The council members' personal staff could be utilizing GIS or GIS applications to assist with constituent relations, and as a method of better understanding the geographic, demographic, and other characteristics that define each council district. However, to better utilize GIS would take significant more policy staff time and expertise. Because the work of the legislative branch is often confidential from other branches of government, Councilmembers may not be able to utilize the KCGIS Center for their GIS needs without losing that confidentiality.

The Council contributes a significant amount of money each year to the overhead for the KCGIS Center, when the Council does not participate fully in GIS it does not reap the benefit of this investment, and in effect subsidizes the GIS activities of other departments.

Potential training needs for 2017 are initial courses in the latest version of ArcGIS for the GIS coordinator or any staff requesting or needing such training. Staff members from other legislative branch offices (such as the Auditor, Ombudsman, and Tax Adjustment) may utilize such training to help in their case analysis and management. The council pays for GIS training with resources from its general training fund.

4.12.2 Ongoing and New Projects

Name	**GIS for Policy Decision-making**
Description	Continue, and where appropriate, expand use of GIS data for decision making process. For example, in 2016, when the Council was considering changes to marijuana zoning, policy staff used GIS to provide a range of information on locations for marijuana businesses, state and local-mandated buffers, and the area within zoning districts to inform the Council's policy decisions.
Interdependencies	Data is often generated by the Executive branch, often DPER, KCGIS or PSB-Regional Planning, that policy staff then use and manipulate to reflect the Council's policy direction.
Status	On-going
Target	On-going
Activity	▪ Produce maps, spatial analysis, and information to Councilmembers.

4.13 Office of Performance, Strategy and Budget

4.13.1 Agency GIS Overview, Priorities, and Goals

The mission of the Office of Performance, Strategy, and Budget (PSB) is to provide sound analysis and tools to improve King County performance. PSB business functions are organized into four sections: The Budget and Business Planning section is responsible for developing each two-year budget for King County government. The Performance and Strategy section leads organizational performance management and guides strategy development so that King County delivers quality services, makes informed and transparent decisions, and achieves its goals. The Lean Continuous Improvement section focuses on delivering more value to the people of King County by eliminating waste in our work processes. The Regional Planning section works with issues of land use planning, facility planning, demographics and governmental coordination in the Puget Sound region, King County and unincorporated King County.

PSB's GIS work program has two centers of focus. The Regional Planning section has a GIS Program Manager that oversees ½ FTE of matrix support from the KCGIS center. A GIS/Executive Analyst (PSB GIS Coordinator) provides support to the remaining PSB sections and as an extension to the Executive Office. The PSB GIS Coordinator also controls an annual pool of client services hours from the KCGIS center including banked hours not utilized from previous years. The PSB GIS Coordinator and the Regional Planning GIS Program Manager cooperate to ensure smooth functioning and lack of redundant GIS effort within PSB. Both GIS staff represent PSB on the King County GIS Steering Committee.

The PSB GIS Coordinator supports a variety of products (King County Budget support documents, and other Budget and Proviso support databases) and research/analysis responsibilities (demographics, buildable lands) that have a strong geographic analysis/mapping component. PSB'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 researchers, and analysts usually want data and map coverages or shapefiles with which to do their own unique analysis.

The PSB GIS Coordinator successfully developed a pilot methodology to calculate a fair fee to charge utilities as a function of the local property value and the amount of right-of-way land used. Currently PSB is working with the Facilities Management Division and KC GIS Center staff to implement a franchise fee methodology by the end of the year 2017. A review and possible adjustment of the franchise fee methodology will be conducted in 2018. Other major PSB GIS projects planned to extend into 2018 include participation in the US Census Bureau Local Update of Census Addresses (LUCA) and data collection for the state mandated Buildable Lands initiative.

GIS Matrix Services support was established for the new Regional Planning section at the beginning of 2015. The GIS Program Manager facilitates GIS support for: Countywide Planning Policies; Growth Management Planning Committee coordination; Puget Sound Regional Council coordination; growth forecasting; and King County Comprehensive Plan updates. GIS support consists of data development, mapping, and analysis for various themes (e.g. potential annexation areas, urban growth boundary, comprehensive plan landuse, resource lands). The GIS Program Manager receives GIS requests directly from the Regional Planning staff and draws on the breadth of experience and expertise found among the full staff of the KC GIS center. Over half of the matrix support hours and provided directly by the GIS Program Manager.

In 2015 a new Comprehensive Planning Manager was hired in the Regional Planning section. He successfully led the development of an improved cartographic style for the 2016 major comp plan update and initiated a significant effort to improve the historic comp plan data and implement a database to automate research and fully document the source of each data change. This effort has started with a database of urban growth area designations tracking all changes from 1984 to present.

To follow-up on those successes, a series of additional data projects are planned starting in the second half of 2017 and extending through 2018. The compilation of all zoning changes is expected to extend beyond 2018 as extensive research will be required for rezone data. Other planned projects for the Regional Planning section include expanding the current tribal lands layer to cover six counties, and updating the Planning map service used by iMap with several additional layers to improve citizen access to planning data.

4.13.2 Ongoing and New Projects

Name	**Buildable Lands Data Collection & Workflow**
Description	Develop and implement a new data collection workflow to support the State mandated Buildable Lands initiative.
Interdependencies	All cities in KC, DPER, PSRC, KCA, KCGIS Center
Status	Not Started
Target	2021
Activity	▪ PSB will conduct an examination of the data available from the KC Assessor to determine if a more efficient method can be found to calculate achieved net densities ▪ Develop work flows for doing buildable lands analyses, taking into account new regulations and the need to coordinate closely with KC cities. ▪ Assemble countywide zoning layer and documentation

Name	**LUCA 2020 participation**
Description	LUCA is a voluntary, once-a-decade opportunity for governments to add, correct or delete addresses on the lists and maps used to conduct the decennial census.
Interdependencies	KCGIS Center, US Census Bureau
Status	Not Started
Target	2018
Activity	▪ Attend a LUCA promotional workshop or access information at the LUCA Web site. ▪ Download the Census Address Count List for your jurisdiction. ▪ Determine and assemble local address sources. ▪ Update address list with information needed for LUCA: ▪ Determine LUCA materials format. ▪ Develop address review strategy. ▪ Review and update LUCA materials. ▪ Receive address feedback.

Name	**Franchise Fee Methodology Review**
Description	Review and make needed adjustments to method for Franchise Fee calculations established in 2017. This project will be recurring on a five year cycle.
Interdependencies	Facilities Management Division
Status	Not Started
Target	2018
Activity	▪ Review fees that were calculated. ▪ Review applicant responses and challenges to calculated fees. ▪ Review the cost of data creation ▪ Evaluate cost to benefit ▪ Develop adjusted fee calculation methodology

Name	**Historic Landuse Planning Database**
Description	Improve the historic landuse planning data layers and implement a database to automate research and fully document the source of each data change.
Interdependencies	KCGIS Center, DPER
Status	In Progress
Target	2019
Activity	▪ Database design ▪ Historic source research ▪ Data editing ▪ Metadata development ▪ Application development to provide access to new database

Name	**Tribal Land Data Development**
Description	Expanding the current tribal lands layer to cover six counties and focus on documenting legal reservation boundaries with references to establishing documents.
Interdependencies	KC DNRP, KCGIS Center
Status	Not Started

Target	2019
Activity	▪ Data layer design ▪ Research reservation source documents, with assistance from DNRP director's office staff. ▪ Data editing ▪ Meta data development

Name	**iMap Planning Data Map Service Redesign**
Description	Updating the Planning map service used by iMap with several additional layers to improve citizen access to planning data.
Interdependencies	KCGIS Center
Status	In Progress
Target	2017
Activity	▪ Finalize requested layer list ▪ Design layer symbolization ▪ Implement changes in map service ▪ User Acceptance testing ▪ Change Management for iMap publication

5 Summary Information

5.1 Staffing

5.1.1 KCGIS Center

Working Title	Focus	Class	Status	% GIS
KCGIS Center Manager	Staff management and organization, program oversight and strategic planning	IT Enterprise Mgr. II	FTE	100
GIS Business Development and Marketing Manager	Business development and marketing	IT Project Mgr. II	FTE	100
GIS Programmed Services Manager	Supervision of GIS programmed services	IT Supervisor I	FTE	100
GIS Data Coordinator	Data management and coordination	IT Project Mgr. II	FTE	100
GIS Application Developer	Web applications	GIS Spec. – Master	FTE	85#
GIS Application Developer	Desktop applications, utilities, and matrix support to Airport	GIS Spec. – Master	FTE	75#
GIS Database Administrator	Database administration, SQL Server, ArcSDE	GIS Spec. – Senior	FTE	100
GIS Analyst	Cadastral data coordination	GIS Spec. – Journey	FTE	100
GIS Analyst	Raster data development and analysis	GIS Spec. – Senior	FTE	100
GIS Requested Services Manager	Supervision of GIS programmed services	IT Supervisor I	FTE	100
GIS Senior Cartographer	Publication cartography	GIS Spec. – Senior	FTE	95#
GIS Training Coordinator	GIS training services and Client Services project support	GIS Spec. – Journey	FTE	100
GIS Analyst / Trainer	Client Services project support, GIS training services, and matrix support to DPER	GIS Spec. – Journey	0.8 FTE	100
GIS Analyst	Client Services project support	GIS Spec. – Journey	FTE	100
GIS Analyst	Client Services project support and matrix support to PRD	GIS Spec. – Journey	FTE	75#
GIS Analyst	Client Services project support	GIS Spec. – Journey	FTE	100
GIS Application Developer	Web and desktop applications and matrix support to RSD and DPER	GIS Spec. – Master	FTE	55#
GIS Analyst	Matrix support to DPER and OPSB, Client Services project support	GIS Spec. – Master	FTE	25#

Working Title	Focus	Class	Status	% GIS
GIS Analyst	Matrix support to WTD	GIS Spec. – Senior	FTE	#
GIS Analyst	Matrix support to WTD	GIS Spec. – Senior	FTE	#
GIS Analyst	Matrix support to WTD	GIS Spec. – Senior	FTE	#
GIS Analyst	Matrix support to WTD	GIS Spec. – Journey	FTE	#
GIS Analyst	Matrix support to WLRD	GIS Spec. – Senior	FTE	#
GIS Analyst	Matrix support to WLRD	GIS Spec. – Senior	FTE	#
GIS Analyst	Matrix support to WLRD	GIS Spec. – Senior	TLT	#
GIS Analyst	Matrix support to PRD and SWD	GIS Spec. – Journey	FTE	#
GIS Analyst	Matrix support to PRD, SWD, and Airport	GIS Spec. – Senior	FTE	#

\#   For matrixed and loan out positions, % GIS is allocated to each supported agency's staffing table

5.1.2 Department of Assessments

Working Title	Focus	Class	Status	% GIS
GIS Specialist	GIS	GIS Spec. – Senior	FTE	75
Mapping Unit Supervisor	Mapping and Abstract Section supervision	Mapping Supervisor	FTE	45
GIS Specialist	Cadastral maintenance and other department maintained layers	GIS Spec. – Journey	FTE	95
GIS Specialist	Cadastral maintenance and other department maintained layers	GIS Spec. – Journey	FTE	95
GIS Specialist	Cadastral maintenance and other department maintained layers	GIS Spec. – Journey	FTE	95
GIS Specialist	Cadastral maintenance	GIS Spec. – Entry	FTE	95
GIS Specialist	Cadastral maintenance	GIS Spec. – Entry	FTE	95
GIS Specialist	Cadastral maintenance	GIS Spec. – Entry	FTE	95
Various – Appraisers, programmers	Analysis, implementation and application development	Various	FTE	⊗

⊗   Difficult to quantify

5.1.3 Department of Permitting and Environmental Review

Working Title	Focus	Class	Status	% GIS
Lead GIS Analyst§	Task coordination, data development, data documentation, county wide GIS coordination, data analysis, map production, end user education, application design	GIS Spec. – Master	FTE	25#
GIS Analyst§	Application development	GIS Spec. – Master	FTE	15#
GIS Analyst§	Data development, map production	GIS Spec. – Journey	FTE	10#

§ Matrixed from KCGIS Center
# For matrixed positions, % GIS is allocated to each supported agency's staffing table

5.1.4 DES – Emergency Management Division

Working Title	Focus	Class	Status	% GIS
E-911 PSAP Mapping Administrator	Support GIS mapping for the E-911 Program Office and 12 PSAPs	GIS Spec. – Senior	FTE	100
E-911 PSAP Mapping Analyst	Support the E-911 GIS Mapping Administrator, E-911 Office, and 12 PSAPs	GIS Spec. – Journey	FTE	100

5.1.5 DES –Facilities Management Division

- No dedicated GIS staff.

5.1.6 DNRP – Wastewater Treatment Division

Working Title	Focus	Class	Status	% GIS
GIS Analyst§	Combined Sewer Overflows program, operations and maintenance, Web applications, database development	GIS Spec. – Senior	FTE	100#
GIS Analyst§	Water Reuse program, Conveyance System Improvement projects, Biosolids	GIS Spec. – Senior	FTE	100#
GIS Analyst§	Conveyance System Improvements projects. Combined Sewer Overflows program, Web data/applications viewer	GIS Spec. – Senior	FTE	100#

Working Title	Focus	Class	Status	% GIS
GIS Analyst√	Decennial Flow Monitoring Project, Storm Drain System Management, Local Line Development	GIS Spec. – Journey	FTE	100#

§   Matrixed from KCGIS Center
\#   For matrixed positions, % GIS is allocated to each supported agency's staffing table

5.1.7 DNRP – Water and Land Resources Division

Working Title	Focus	Class	Status	% GIS
GIS Analyst§	Image processing, landcover classification, geoprocessing applications, general WLR GIS analysis projects	GIS Spec. – Senior	FTE	100#
GIS Analyst§	ArcIMS (iMap), ArcGIS Server and JSAPI Web applications, ASP.NET Web applications, general WLR GIS analysis projects and relational databases	GIS Spec. – Senior	FTE	100#
GIS Analyst§	Forestry, agriculture, land ownership, noxious weeds, current use assessment, open space and general WLR GIS analysis projects	GIS Spec. – Senior	FTE	100#

§   Matrixed from KCGIS Center
\#   For matrixed positions, % GIS is allocated to each agency's staffing table

5.1.8 DNRP – Parks and Recreation Division

Working Title	Focus	Class	Status	% GIS
GIS Analyst§	Parks and Recreation database maintenance, data analysis, map design and production, Web services, and application development	GIS Spec. – Senior	FTE	25#
GIS Analyst§	Parks and Recreation database maintenance, data analysis, map design and production	GIS Spec. – Journey	FTE	50#
GIS Analyst§	Parks and Recreation database maintenance, data analysis, map design and production, and application development	GIS Spec. – Journey	FTE	25#

§   Matrixed from KCGIS Center
\#   For matrixed positions, % GIS is allocated to each supported agency's staffing table

5.1.9 DNRP – Solid Waste Division

Working Title	Focus	Class	Status	% GIS
GIS Analyst§	Solid Waste database maintenance, data analysis, map design and production, Web services, and application development	GIS Spec. – Senior	FTE	50#
GIS Analyst§	Solid Waste database maintenance, data analysis, and map design and production	GIS Spec. – Journey	FTE	50#

§   Matrixed from KCGIS Center
#   For matrixed positions, % GIS is proportioned to each affected agency's staffing table

5.1.10 Department of Public Health

Working Title	Focus	Class	Status	% GIS
EMS Program Manager	Data analysis, project management, map production	Project/Program Manager II	FTE	40
Epidemiologist	Data analysis, project management, map production	Epidemiologist II	FTE	30

5.1.11 DOT – Roads Services Division

Working Title	Focus	Class	Status	% GIS
Strategic Business and Operation Section (SBOS) Manager	Section management	Manager	FTE	5
Asset Management Project Manager (SBOS)	Asset and technical services management	Managing Engineer	FTE	10
GIS Programmer (KCIT-DOT-IT)*	Application development	GIS Spec. – Master	FTE	25#
GIS Analyst (KCIT-DOT-IT)*	Data modeling, ArcSDE, and analysis	GIS Spec. – Senior	FTE	75#
GIS Analyst (SBOS)	Map production and data development and analysis	GIS Spec. – Journey	FTE	100
GIS Analyst (SBOS)	Map production and data development and analysis	GIS Spec. – Journey	FTE	100
GIS Programmer§	Application development	GIS Spec. – Master	FTE	50#

*   Matrixed from KCIT-DOT-IT
§   Matrixed from KCGIS Center
#   For matrixed positions, % GIS is allocated to each supported agency's staffing table

5.1.12 DOT – Metro Transit

▪   No dedicated GIS staff.

5.1.13 DOT – King County International Airport

Working Title	Focus	Class	Status	% GIS
Business Analyst	Define and capture data requirements, data creation, data analysis, data maintenance, map production, and GIS coordination.	Project/Program Manager III	FTE	50
GIS Analyst§	Application Development	GIS Spec. – Master	FTE	25#
GIS Analyst§	Application Development	GIS Spec. – Senior	FTE	25#

§   Matrixed from KCGIS Center
#   For matrixed positions, % GIS is allocated to each supported agency's staffing table

5.1.14 King County Elections

Working Title	Focus	Class	Status	% GIS
GIS Supervisor	Coordination of GIS and program management	IT Services Supervisor	FTE	50
GIS Analyst	Data development, data integration, data maintenance and GIS analysis	GIS Spec. – Journey	FTE	80
GIS Analyst	Data development, data integration, data maintenance, GIS analysis and map production	GIS Spec. – Journey	FTE	80
GIS Analyst	Data development, data maintenance, GIS analysis, and map production	GIS Spec. – Entry	FTE	80
GIS Analyst	Data development, data maintenance, GIS analysis, and map production	GIS Spec. – Entry	FTE	65

5.1.15 King County Sheriff's Office

Working Title	Focus	Class	Status	% GIS
RP&IS Supervisor	Research/planning, information/data systems planning and management, supervision, crime analysis	Research and Technology Supervisor	FTE	15
Crime Analyst	Crime analysis and mapping	Project/Program Manager II	FTE	15
Crime Analyst	Crime analysis and mapping	Project/Program Manager II	FTE	15
Crime Analyst	Crime analysis and mapping	Project/Program Manager II	FTE	15

Working Title	Focus	Class	Status	% GIS
GIS Specialist	CAD system support, data maintenance	GIS Spec. – Journey	FTE	90

5.1.16 Metropolitan King County Council

Working Title	Focus	Class	Status	% GIS
GIS Coordinator	Assist staff in utilizing GIS, liaison between Council and broader GIS community, coordinate training, procure needed data, route requests, enlist help of other departments or KCGIS Center as needed.	Legislative Analyst	FTE	5

5.1.17 Office of Performance, Strategy and Budget

- No dedicated staff.

5.1.18 Department of Community and Human Services

Working Title	Focus	Class	Status	% GIS
DCHS Coordinator	Department/division performance measures, as reflected in annual business plan, AIMs High, DCHS Annual Report, other communication and presentations. GIS role is limited to coordination with other division programs in the annual DCHS GIS O&M work plan	Functional Analyst III	FTE	1
GIS Technical User	DCHS representative on KCGIS Technical Committee and DCHS lead GIS technical user	Community Development Coordinator	FTE	20

5.2 Licensing

- The following table provides counts for Esri software licensing. All software is covered by the county's Enterprise License Agreement (ELA) with Esri.

ITEM	Total Quantity Seats to be Deployed
Esri Software Licensing	
ArcGIS for Desktop – Concurrent and Single Use	
Basic, Standard, Advanced	Uncapped
ArcGIS for Desktop Extensions – Concurrent and Single Use	
ArcGIS 3D Analyst, ArcGIS Spatial Analyst, ArcGIS Geostatistical Analyst, ArcGIS Publisher, ArcGIS Network Analyst, ArcGIS Data Reviewer, ArcGIS Schematics, and ArcGIS Workflow Manager	Uncapped
ArcGIS Enterprise – Standard/Advanced	
AecGIS Enterprise Workgroup, ArcGIS Enterprise	Uncapped
ArcGIS Enterprise Extensions	
ArcGIS 3D Analyst, ArcGIS Spatial Analyst, ArcGIS Geostatistical Analyst, ArcGIS Network Analyst, ArcGIS Schematics, and ArcGIS Workflow Manager	Uncapped
ArcGIS Server	
Basic, Standard, Advanced	Uncapped
ArcGIS Enterprise Additional Capability Servers	
ArcGIS Image Server, ArcGIS GeoEvent Server	Uncapped
ArcGIS Engine – Single Use	
	Uncapped
ArcGIS Engine Extensions – Single Use	
ArcGIS 3D Analyst, ArcGIS Geodatabase Update, ArcGIS Spatial Analyst, ArcGIS Network Analyst, and ArcGIS Schematics	Uncapped
ArcGIS Runtime	
Lite, Basic, Standard, Advanced	Uncapped
ArcGIS Runtime Extensions – Single Use	
ArcGIS Runtime Analysis Extension	Uncapped
Mapping and Charting Solutions – Concurrent and Single Use	
Esri Production Mapping for Desktop	Uncapped
ArcGIS Developer Annual Subscription	
Professional Level	7
Insights for ArcGIS Enterprise	
Named User Term License	28
Insights for ArcGIS Online	
Named User Term License	5
ArcGIS GeoAnalytics Online	
Up to four (4) cores	1

Esri Software Licensing	
ITEM	**Total Quantity Seats to be Deployed**
Community Analyst	
Add-on to ArcGIS Online term license	5
Business Analyst Web App	
Add-on to ArcGIS Online term license	5
ArcPad	
	1
Esri CityEngine	
Basic	1
ArcGIS Monitor	
Up to 28 cores monitored	1
ArcGIS Navigator for ArcGIS Online	
Term license	25
ArcGIS Online Subscription	

Level 1
    Level 2
    Annual Credits
	200
	500
	250,000

ArcGIS Enterprise	
Level 2	500

5.3 GIS Data

5.3.1 Enterprise Vector and Tabular Data

- Information for the county's enterprise vector and tabular data can be obtained from the online Spatial Data Catalog at https://kingcounty.gov/services/gis/GISData/metadata.aspx. This catalog includes all data sets that are available from the Spatial Data Warehouse. Point, line, polygon, and annotation data are stored as shapefiles and geodatabase feature classes. Tabular data are stored in DBF and as geodatabase tables. All data listed in the Spatial Data Catalog are considered enterprise data because they have been cleared for sharing and are available to any GIS user in the county. The KCGIS Center also provides two download sites providing enterprise data to external agencies and the public. The King County GIS Open Data site is based on Esri's Open Data solution. The King County GIS FTP Data Download Portal is a legacy site, which provides download capability for individual data objects or for thematic bundles. Access to both download sites can be found at https://kingcounty.gov/services/gis/GISData.aspx#download.

5.3.2 Enterprise and Project Raster Data

- Information for the county's raster data sets can be obtained from two sources. Enterprise raster data is cataloged at http://kcgisinternal.dnrp.kingcounty.lcl/intranet/sdc/index.htm#Raster. These are data sets that generally cover all, or a large portion of the county. Project level raster data are listed in the Project Image Library Catalog at http://kcgisinternal.dnrp.kingcounty.lcl/intranet/DataTopics/ProjectImageData/htmserve/index.htm. These data sets were generally obtained to support a specific project or business need, and typically cover a small portion of the county. In some cases these data sets are used to update an enterprise raster data set.

5.3.3 Agency Vector Data

- Information for the agency maintained GIS data can be found at http://kcgisinternal.dnrp.kingcounty.lcl/intranet/DataTopics/AgencyData/index.htm. These are data sets the steward agencies have decided do not rise to the level of publishing to the Spatial Data Warehouse. The reasons for this vary, but typically have to do with information security, or a very narrow audience of interest.

6 KCGIS Center Services

The KCGIS Center services can be grouped into two areas. These include the centralized services provided by Enterprise Operations, and the technical and professional services provided by Spatial Services. This section provides an overview of services provided by Enterprise Operations and Spatial Services.

<u>Enterprise Operations</u>

KCGIS Governance Structure Support – Administrative support to the GIS Steering and Technical Advisory committees for their activities, as well as administrative and professional support to the committees for special projects. Also included in this service are professional and technical support to help develop and serve as custodian of KCGIS standards and best practices, as well as coordinate drafting and publication of the biennial KCGIS O&M Plan.

KCGIS Priority Initiatives – Professional and technical support to priority work initiatives as identified by the GIS governance committees. The level of staff commitment to priority initiatives is significant and is usually in the range of 2.0 FTE each year. See Section 3 of this document for a detailed discussion of the current priority initiatives.

KCGIS Program Coordination – Facilitate coordination and communication across the organizational boundaries of King County agencies. This is in part accomplished by administering and staffing interagency groups such as the KCGIS Users Group and the GIS Application Developers Group. Support is also provided on an ad hoc basis to facilitate discussion and resolution of cross agency GIS issues as they arise.

Regional GIS Coordination – Represent the interests of the KCGIS community at the regional, state, and national level. This includes providing professional and management support to regional GIS initiatives and collaborations such as imagery and lidar acquisitions.

Marketing – Develop targeted communications about the services of the KCGIS Center, with the goal of increasing awareness and use of KCGIS resources and services, in order to enhance the efficiency of government operations, and to broaden the financial base supporting KCGIS.

Spatial Data Warehouse (SDW) – Oversee management of all components of the enterprise SDW including; the server and software infrastructure that comprise the SDW; the processes that control and monitor the SDW including database administration, data loading, and data access; and the procedures that keep SDW contents logically organized and thoroughly described with accurate and complete metadata.

KCGIS Center Website – Manage all components of the KCGIS Center Internet and intranet websites including the Spatial Data Catalog, the map compendium page, and GIS Data Portal, as well as Web pages describing our programs and services.

GIS Enterprise Applications – Oversee development and maintenance of utilities and applications to support the enterprise GIS, agency GIS professionals, and GIS end-users. These services include scripts and programs that perform automatic updates, batch processing, and system integrity checks; applications that support and enable agency GIS data stewards, and Web based and desktop applications that provide access to varying levels of GIS functionality for end-users with GIS skills ranging from novice to advanced.

GIS Data Coordination, Acquisition, Maintenance, and Distribution – Oversee management of GIS data including: a cross agency data inventory and coordination function to maintain the integrity of the SDW and promote continuous data improvement (this includes support to the King County Assessor to integrate parcel data edits into the county's cadastral base); an acquisition program to obtain and organize GIS data from local, regional, state, and federal agencies; a stewardship program to maintain a set of data layers as an enterprise service; and a distribution function to make KCGIS data available via an Internet data download portal.

Contract Management – Negotiate and manage vendor and consultant contracts for GIS software and services, as well as contracts with external agencies where the KCGIS Center is the service provider.

GIS Education and Outreach – Promote the use and benefits of GIS technology to county staff, local agencies, and the public through a variety education and outreach programs. Examples include briefings, seminars, and user and interest groups.

Spatial Services

KCGIS Center Spatial Services meets the GIS needs of any internal or external client seeking services. Customers include county staff needing maps or spatial analysis, GIS end-users or professionals who need training or specialized technical assistance, and managers needing skilled staff to help meet project or peak workload demands.

KCGIS Center Spatial Services are provided on a full cost reimbursable basis. There are two costing models; hourly labor rates and matrix staffing services based on a contracted level of service. Hourly labor rates range from $122 - $180 per hour. These rates assume 122 billable hours per month per staff member, and apply to trained, experienced, multi-skilled GIS professionals able to work in a variety of specialty areas. Included in calculating the hourly billing rate are individual salary, paid leave, and benefits, KCGIS Center overhead costs for management, training, materials, and supplies, and other central overhead costs passed on to the KCGIS Center. Spatial Services rates include 5.43 percent KCIT Mandated and Business Foundation (MBF) costs.

2017-2018 Standard GIS Spatial Services Hourly Billing Rates

Administrative Services:	$122.00
GIS Analyst (GIS Journey Level):	$128.00
GIS Analyst (GIS Senior Level):	$135.00
Senior Cartographer:	$141.00
GIS Programmer (GIS Master Level):	$141.00
GIS Project Manager:	$154.00
GIS Consultant:	$154.00
GIS Center Manager:	$180.00

A special GIS Technician billing rate is available for long term multi-month data development or data maintenance project work. This special billing rate assumes 144 billable hours per month per GIS Technician (GIS Journey level only). This rate applies to trained GIS technicians for standard repetitive GIS data development or maintenance work only (e.g. digitizing, geocoding, etc.). It is also limited to projects with a minimum duration of three months or more fulltime, and which involve ongoing production-level data development via established methodology. This special billing rate is set at $122.00 per hour.

Matrix staffing services are provided to agencies that agree to a defined level of service based on FTEs. Rates are fully loaded as described above, although there are some cost efficiencies gained because a higher billable hours per month calculation is used to compute the rate.

KCGIS Spatial Services management is the point of contact for service requests and customer relationship management. The range of services provided by Spatial Services includes:

Mapping – Spatial Services annually produces hundreds of maps for meetings and publications. Rapid turn-around times and incorporation of custom data are standard features of this service.

Publication Quality Cartography – Spatial Services provides specialized cartography services that combine the flexibility of GIS with the artistry of graphic design. Spatial Services map products have won national and international awards. Examples of products created include brochures, booklets, graphics for outdoor signage, and posters.

GIS Analysis and Reporting – Combining and analyzing GIS data sets is often needed when generating policies, making critical business decisions, or conducting research or investigations. Spatial Services has extensive experience performing a wide variety of complex analyses and incorporating the results into reports or presentations.

Custom Data Requests – Spatial Services fills custom data requests at the hourly GIS Analyst rate (plus materials). All data requests that include aerial imagery and Lidar (elevation) data are considered custom requests as the preferred format and spatial extent of each request is almost always unique.

GIS Data Development and Maintenance – Spatial Services provides a full range of data development and maintenance services for improving or updating existing GIS data, creating new GIS data, or for integrating non-GIS information into GIS compatible formats.

GIS Application Development – Making GIS information available on the Internet or via a customized desktop interface increases the utility and visibility of that information. Spatial Services has created a number of significant applications for a variety of customers.

GIS Training Services – Spatial Services offers GIS training courses at the King Street Center (KSC) computer training facility or on-site at a client's facility. Courses are taught by experienced KCGIS Center trainers. Development of custom courses is an important component of this service. Tuition varies based on cost factors but is generally extremely cost-effective when compared to training offered by other vendors. Spatial Services also rents the KSC facility to external GIS training consultants to enhance the range of available training opportunities, and King County staff members are frequently eligible for discounts on tuition. Revenue received in rent is used to seed a training credits program that allows King County agencies to accumulate and use the credits to pay for any GIS training offered at the KSC facility.

GIS Mentoring – Mentoring is available from Spatial Services. Free support is provided in reasonable, brief increments to both internal and external GIS users. This service is intended to resolve issues and problems that can be cleared up during a phone conversion, an email exchange, or a brief meeting. More comprehensive mentoring programs that cover ongoing or significant needs can be arranged at the standard Spatial Services hourly rates.

GIS Services Express – Spatial Services offers a packaged service, which includes eight hours of free consulting time and discounts for King County training in exchange for a commitment by the client to a block of 100 hours of service. This service is available to any agency seeking help with their GIS program. It provides a mechanism to receive a bundled package of GIS services, and is an excellent opportunity for agencies looking to implement their own GIS capabilities, but needing guidance and help to get started.

GIS Project Management and Consulting Services – Spatial Services offers skilled project management and consulting support. Typical services in this area include GIS needs assessment, GIS staff hiring assistance, GIS implementation, and GIS infrastructure review and design.

7   KCGIS Committees

7.1 GIS Steering Committee (GSC)

Details regarding the roles, responsibilities, and structure of the GIS Steering Committee are provided in section 2.2 of this document. Presented here are the membership listing, the committee's charter, and committee member job description.

The GIS Steering Committee publishes its agendas, minutes, and other documents to the GIS governance SharePoint site.

7.1.1 Membership

Agency	Sub-Agency	Representative
Assessments	--	Christie Most
Permitting and Environmental Review	--	John Backman
Executive Services	Performance, Strategy and Budget	Nanette Lowe
Natural Resources and Parks	Parks and Recreation Solid Waste	Greg Stought
Natural Resources and Parks	Wastewater Treatment	Shaun O'Neil
Natural Resources and Parks	Water and Land Resources	Mark Preszler
Transportation	Road Services	Mike Crippen
Transportation	Transit	Jonathon Bez
Transportation	Transit	Phil DeVault
Transportation	Airport	Vanessa Chin
Dept. of Information Technology	KCGIS Center	George Horning – Chair
Information Technology	E-911 Program Office	Khalid Khan
Office of Strategy, Performance and Budget	Regional Planning	Paul McCombs – Vice Chair
Sheriff's Office		Miranda Brewer
Council		Erin Auzins
Executive Services	Facilities Management	Michael Kulish
Public Health	Emergency Medical Services	Dmitri Sharkov
Elections	IT Services	Dave Wilson

7.1.2 Charter

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King County
GIS STEERING COMMITTEE (GSC)
Charter
2/19/2016

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Purpose:

This charter establishes roles, membership, and guidelines for the GIS Steering Committee (GSC).

Role:

The role of the GSC is to set goals and objectives for the King County GIS program, to ensure goals and objectives are realized by reviewing and approving a coordinated GIS work program, and to establish related performance measures and review performance. The GSC shall:

- Establish standards and expectations for the King County GIS Center addressing enterprise GIS infrastructure reliability, resilience, and performance.

- Collaborate with GIS Technical Advisory Committee (GTAC) to develop performance metrics that reflect the standards and expectations established for the enterprise GIS infrastructure.

- Collaborate with GTAC to establish a schedule and format for periodic reporting of the performance metrics established above.

- Determine a base Service Level Agreement (SLA) for KCGIS Center services including, but not limited to, response timeframes, incident notifications, and planned maintenance.

- Collaborate with the GTAC to identify, rank, and establish a portfolio of GIS priority initiatives and projects.

- Provide semi-annual review, comment, and direction to the GTAC and the KCGIS Center towards fulfillment of the GIS priority initiatives and projects established above.

- Develop agency GIS business cases and work programs, and publish an annual countywide GIS work plan.

- Establish and manage subcommittees as needed to address specific GIS needs and priorities.

Leadership:

The committee will be chaired by the KCGIS Center Manager or his/her designee. The KCGIS Center Manager serves in an ex officio capacity and does not have a vote in matters before the GSC. A Vice Chair will be elected by the GSC to carry out the duties of the Chair when the Chair is not available.

Membership:

- Every customer agency (department, division, or work group as appropriate) shall be entitled to a seat on the GSC, with appointment made by agency director or equivalent.

- Agency IT-SDMs may serve as ex officio members of the GSC.

- The list of GSC members will be reviewed and updated annually.

- The GSC ground rules will contain a membership statement of expectations including, but not limited to attendance, participation, and appreciation for the value of GIS, to which all members will adhere.

Operating Assumptions and Guidelines:

- GSC meetings will be held quarterly.
  - Additional meetings may be scheduled, as-needed.

- Standing agenda items, which will be addressed at every meeting include:
  - Updates from GTAC on new GIS technology and future trends in GIS.
  - Reliability, resilience, and performance of enterprise GIS infrastructure.
  - Status of active projects and priority initiatives.
- Any GSC member may place an item on the agenda for discussion.
- The GSC will use project portfolio management best practices, to include identifying, prioritizing, authorizing, managing, and controlling projects and priority initiatives.
- The GSC will develop standard voting criteria for selection of projects and priority initiatives, which will be incorporated into the GSC ground rules.
- The GSC shall establish ground rules for the documentation of meeting minutes and other notes, posts to SharePoint, email, or other distributions.
- The GSC will establish other ground rules as needed for its operation.
- The GSC shall elect a Vice Chair at the first regular meeting of each calendar year.
- The GSC will establish subcommittees that include members from the GSC, GTAC, and any relevant subject matter experts as necessary to accomplish specific objectives. GSC members will have the authority to appoint chairs for the subcommittees. The subcommittee chair will have the authority to fill vacancies and increase or decrease the membership of the subcommittees under the GSC's discretion.
- The GSC and the GTAC will jointly review their charters annually.

7.2 GIS Technical Advisory Committee (GTAC)

Details regarding the roles, responsibilities, and structure of the GIS Technical Advisory Committee are provided in section 2.3 of this document. Presented here are the membership listing and the committee's charter.

The GIS Technical Advisory Committee publishes its agendas, minutes, and other documents to the GIS governance SharePoint site.

7.2.1 Membership

Representative	Agency	Group
George Horning - Chair	Information Technology	GIS Center
Jeffery Gregg – Vice Chair	Information Technology	Application Support
Paul Alley	Information Technology	Data Services
James Bach	Transportation	Road Services
Debbie Bull	Information Technology	Application Support
Adam Cabrera	Information Technology	Software Engineering
Shari Cross	Natural Resources and Parks	Wastewater Treatment
Nick Hetrick	Natural Resources and Parks	Water and Land Resources
Michael Jenkins	Information Technology	Software Engineering
Harkeerat Kang	Information Technology	Software Engineering
Mike Leathers	Information Technology	Data Services
Paul McCombs	Information Technology	GIS Center
Christie Most	Assessments	
David Ostanski	Information Technology	Application Support
Lisa Owen	Information Technology	Application Support
Katrina Sroufe	Elections	
Evelyn Torres	Information Technology	GIS Center

7.2.2 **Charter**

King County
GIS TECHNICAL ADVISORY COMMITTEE (GTAC)
Charter
Revised 10/23/2018

Purpose:

This charter establishes roles, membership, and guidelines for the GIS Technical Advisory Committee (GTAC).

Role:

GTAC serves in an advisory role to the GIS Steering Committee (GSC) and to the King County GIS Center. The GTAC shall:

- Assist to establish of standards and expectations for the KCGIS Center addressing enterprise GIS infrastructure reliability, resilience, and performance.

- Collaborate with the GSC to develop performance metrics that reflect the standards and expectations established for the enterprise GIS infrastructure.

- Collaborate with the GSC to establish a schedule and format for periodic reporting of the performance metrics established above.

- Provide GSC with recommendations for a base Service Level Agreement (SLA) for KCGIS Center services including, but not limited to response timeframes, incident notifications, and planned maintenance.

- Collaborate with the GSC to develop a biennial GIS work program that encompasses a detailed approach to meeting the standards and expectations associated with enterprise GIS infrastructure reliability, resilience, and performance in order to maintain existing GIS data and functionality.

- Collaborate with the GSC to identify and establish a portfolio of GIS priority initiatives and projects in order to fulfill GIS betterment objectives or for development of new or improved GIS functionality.

- Oversee completion and provide periodic performance reports to the GSC on the annual GIS work program and the project portfolio as established above.

- Provide strategic and technical guidance reports to the GSC to include the following:

  o Operation and maintenance of the enterprise GIS infrastructure reliability, resilience and performance.

  o Development and enhancement of the County's GIS program for betterments or enhancements.

  o Approaches to support the GIS business cases and work programs identified by the GSC.

  o Emerging GIS industry trends and opportunities.

  o Recommendations for GIS architecture, standards, and best practices.

  o Recommendations for training for GIS technical staff and end-users.

Leadership:

The committee will be chaired by the GIS Center Manager or his/her designee. The KCGIS Center Manager serves in an ex officio capacity and does not have a vote in matters before the GTAC. A

Vice Chair will be elected by the GTAC to carry out the duties of the Chair when the Chair is not available.

Membership:

The GTAC is to be comprised of 15-18 members (one alternate allowed per member) who demonstrate expertise in various GIS/IT skill sets, have extensive experience related to the King County enterprise GIS environment, or are responsible for GIS framework data. Areas of expertise listed below should be represented on the GTAC. Individual members may represent multiple areas. The committee shall consist of no less than five (5) members from King County Information Technology (KCIT), who will be appointed by the KCGIS Center Manager and KCIT management. KCIT will also have the option to appoint a database architect. The remaining seats will be available to participating agencies and those members will be nominated and approved by the GSC.

Areas of expertise include: Database Administration, Database Design, Application Development, Scripting, Data Architecture, Data Editing, Web GIS, Mobile GIS, GPS Technology, Survey, GIS Integration, Geodetics, Advanced Spatial Analysis, Location Based Analytics, Server Virtualization Environment, and Web Server Administration.

GIS framework data layers include: Parcels, Transportation, Hydrography, Administrative Boundaries, Elevation, and Orthophotography.

The membership list will be reviewed and updated yearly. Members of the GSC may also serve on the GTAC simultaneously.

Operating Assumptions and Guidelines:

- GTAC Meetings will be held every other month.

    o Additional meetings may be scheduled, as-needed.

- Decisions will be made by consensus of committee members or designated alternates present.

- The GTAC may establish subcommittees to research and make recommendations to the committee. These subcommittees will include adequate subject matter experts as necessary to accomplish specific objectives. GTAC members will have the authority to appoint chairs for the subcommittees. The subcommittee chair will have the authority to fill vacancies and increase or decrease the membership of the subcommittees under the GTAC's discretion.

- The GTAC will establish ground rules as necessary for its operation.

- The GSC and GTAC will jointly review their charters annually.