Geographic Information Systems (GIS) Analyst I/II/III

Definition

Under direction, compiles, evaluates, integrates, produces updates, and maintains spatial data and digital maps that are geographically referenced with data converted from a variety of sources such as maps, remote sensing devices, global positioning systems, surveys, historical records, and databases. GIS analysts use their skills to relate different types of data such as socioeconomic, demographic, administrative or political boundaries, land use, land cover, environmental, infrastructure, and transportation networks.

Distinguishing Characteristics

The GIS Analyst is distinguished from the position of Software Programmer in that the latter has responsibilities for the development and maintenance of information system application logic and programming code that stores, maintains, and displays numerical, textual, graphical, and other forms of electronic data outside of the geographic information system data formats. The GIS Analyst may be responsible for the creation and maintenance of application logic and programs, however such programming is related to the capture, store, manipulation, and display of geographic information and typically involves use of GIS software tools and language.

The GIS Analyst is distinguished from the Data Base Administrator (DBA) in that the latter is primarily responsible for logical and physical database design, modeling, creation, administration, tuning, backup, and recovery while the GIS Analyst's primary focus is to develop the means by which data is captured, maintained, manipulated, displayed, and reported. The primary function of the GIS Analyst is to produce geographic information that is valuable to the County. The DBA is responsible for the effective storage of such information in logical and physical database structures and to maintain data file and record integrity.

The GIS Analyst is distinguished from the Systems Programmer Analyst in that the latter is focused upon the configuration, installation, maintenance, monitoring, and support of application hardware platforms. The Systems Programmer Analyst may configure, produce, and execute system utility programs, configure and install operating system software, and configure and install application software including GIS software, however the Systems Programmer Analyst is not typically involved in the design, analysis, construction, and maintenance of GIS data or GIS application software programs and codes.

GIS Analyst I. This is the first, working level classification in the series. Incumbents perform routine computer mapping, data entry, and map production. The work is performed under supervision with the employee expected to perform with minimal direction. Incumbents in this classification possess appropriate technical expertise to create, update, and maintain local desktop and networked workgroup data sets. In

addition, GIS Analyst I incumbents perform GIS-related production and analysis tasks using off-the-shelf GIS software.

GIS Analyst II. This is the journey level class in the GIS Analyst series. This class is distinguished from the GIS Analyst I by the assignment of the full range of duties including the more difficult or complex work. The work of the GIS Analyst II may involve basic scripting of GIS spatial and mapping data, editing of VBA code for customizing ArcGIS graphical user interfaces, and creating and modifying macros to perform basic spatial operations. Incumbents have a high level of cartographic expertise using GIS software. This class requires incumbents to produce a variety of maps other processing output such as reports, and to resolve GIS system problems where GIS software, application, and data set installations are in use.

Employees at this level receive only occasional instruction or assistance as new or unusual situations arise. GIS Analyst II's are fully aware of the operating procedures and policies within the GIS work unit.

GIS Analyst III. This is the highest level in the GIS Analyst series. This class is distinguished from the GIS Analyst I and II by the assignment of the most complex and highly technical duties. Incumbents in this class function independently under broad policy guidance related to county-wide enterprise GIS and require only occasional instruction or assistance as new or unusual situations arise.

Incumbents have the highest level of expertise designing and integrating spatial and nonspatial databases, applying ESRI and GIS-related software products to a variety of operating systems, producing the most complex reports and visual representations, and resolving the most complex GIS system problems involving servers and clients where GIS software, application, and data set installations are in use. This class may be called upon to act as project or program lead over GIS Analyst I's and II's.

Duties Performed. The duties and responsibilities listed below are illustrative only. They are not meant to be a full and exhaustive listing of all of the duties and responsibilities of the classification.

1. Researches, collects, encodes, updates, and integrates information and data from various spatial and non-spatial, digital and analog sources. Performs quality checks on encoded data values and reviews output products for accuracy.
2. Models map layers, performs spatial analysis, generates reports, and performs quality control procedures using GIS software.
3. Designs and generates maps by specifying coordinate systems, scales, legends, feature symbology, and other cartographic techniques.
4. Researches and compiles data from various sources including county recorder maps, land record surveys, parcel and subdivision maps, thematic mapping, and topographic and maps and associated descriptive data created and maintained by other agencies.

5. Enters new map data through the use of digitizing devices, remotely sensed data capture instruments, and precision input of coordinate information through batch or interactive modes using knowledge of principles of cartography.
6. Develops and reviews requests for proposals and quotes, coordinates the procurement of contracts with vendors and other county departments, and administers contracts to ensure compliance with scope of work.
7. Provides technical assistance to County staff.
8. Writes, reviews, and tests GIS scripting and programs.
9. Presents analysis results derived from spatial databases and external tables using GIS software visual media tools.
10. Designs applications and utilities to automate GIS tasks and integrate new and existing systems.
11. Develops training programs to enhance the skills of GIS Analysts. Oversees GIS educational class courses, administration, and curricula.
12. Coordinates with other ITD personnel, vendors, and subcontractors on the implementation and integration of third-party products based upon the functional needs of clients.
13. May perform formal GIS needs assessments, describes the benefits of using GIS, advises clients regarding the evaluation of feasibility of applying GIS technologies to specific work flow processes, compares various system alternatives, makes recommendations for systems procurement and implementation, prepares time and cost estimates, and schedules installation of proposed systems.
14. May participate in educational and professional development programs to keep abreast of current developments.
15. May plan, organize, direct, and review the work of GIS team staff engaged in the development of digital geographic databases.
16. May manage GIS database creation and development projects, establish priorities and schedules for projects, and perform planning and analysis of budgets.
17. Performs additional related duties as required.

Qualifications

A combination of experience, education, and training which substantially demonstrates the following knowledge and abilities.

GIS Analyst I:

Some Knowledge of:
1. Principles and techniques of GIS database design and data models.
2. Spatial and geographic data sources, cartographic principles, geographic data analysis techniques, and GIS software operations and products.
3. Cartography and geography including methods for describing the location and distribution of land, sea, and air masses.
4. Capabilities of available computer hardware and software.
5. UNIX and Windows operating systems.

6. County geographical database, image catalogs, data dictionaries, and metadata.
7. Map composition, features, and themes.
8. ArcInfo AML and ArcView Avenue legacy scripting languages.
9. Engineering and surveying principles and practices, algebra, trigonometry, and analytic and coordinate geometry.
10. Application functionality of remote sensing devices.
11. Third-party geographic information system software and utilities; installation parameters, and options for typical application software packages.
12. Principles and techniques of system administration.
13. Security methods for managing confidential data.

Ability to:
1. Administer GIS training within the county.
2. Make presentations using visual media tools.
3. Gather, organize, and evaluate complex data, draw logical conclusions, and make effective recommendations for database and application development.
4. Plan work flows.
5. Diagnose and analyze systems failures.
6. Work independently under limited supervision, exercise initiative within established procedural guidelines, and organize and prioritize work to meet established deadlines.
7. Communicate effectively both orally and in writing when making presentations and creating documents such as user guides.
8. Establish and maintain effective work relationships.
9. Read, understand, and interpret documents of complex technical and geographic subject matter.
10. Follow oral and written instructions.
11. Apply County and industry standards and policies.

GIS Analyst II: In addition to the GIS Analyst I knowledge and abilities listed above:

Working Knowledge of:
1. ArcGIS VBA scripting languages.
2. SQL and relational databases.

Ability to:
1. Evaluate systems, assess needs, and perform cost and benefit analyses.
2. Supervise the development, conversion, and integration of spatial GIS coverages, databases (spatial and non-spatial), and metadata.
3. Produce FGDC-compliant data structures and models.
4. Gather, analyze, and evaluate technical information (including performing field surveys) and data sources using approved best practices to achieve cost-effective conclusions.
5. Read and interpret different types of construction plans and maps.

6. Write clear and concise GIS systems specifications, bid proposals, training manuals, technical standards, and other documentation.
7. Interface with vendors on the integration of multiple, GIS-related, third-party products.
8. Develop reports, maps, and other data products.

GIS Analyst III: In addition to the GIS Analyst I and II knowledge and abilities listed above:

Thorough Knowledge of:
1. ArcSDE and ArcIMS scripting languages and languages used for PC and database applications (such as XML, VB, HTML, MapObjects, C++, Oracle databases and Java).
2. The principles and techniques of project management.
3. OLE/COM interoperability issues and practices

Ability to:
1. Manage multi-faceted projects (including vendor contracts), plan, coordinate, and review the work of others.
2. Design relational databases and develop GIS data models.

Examples of Experience/Education/Training

The knowledge, skills, and abilities listed above may be acquired through various types of experiences, education, or training, typically:

GIS Analyst I:
Education and Experience: Completion of coursework leading to a two- (2) year degree in engineering, drafting, cartography, or other GIS-related field, and one (1) year of progressively responsible technical engineering, drafting, or cartographic experience; **OR** two (2) years performing duties equivalent to an ITS Technician III, Communications Technician III, Data Center Operations Technician III, or Telecommunications Technician III in Monterey County may also qualify.

GIS Analyst II:
Education and Experience: Completion of coursework leading to a two- (2) year degree in engineering, drafting, cartography, or other GIS-related field, and three (3) years of progressively responsible technical engineering, drafting, or cartographic experience **OR** five (5) years of progressively responsible technical engineering, drafting, or cartographic experience.

GIS Analyst III:
Education and Experience: Completion of coursework leading to a two- (2) year degree in engineering, drafting, cartography, or other GIS-related field, and ten (10) years of progressively responsible technical engineering, drafting, or

cartographic experience. At least two years of the experience must include project management and/or lead supervision.

Required Conditions of Employment

As a condition of employment, the incumbent will be required to:

1. Successfully pass a modified background investigation.
2. Possess a valid California Class "C" driver's license with a satisfactory driving record or be able to provide suitable transportation that is approved by the appointing authority.
3. Work occasional nights and weekends.
4. Occasionally work under adverse conditions, such as inclement or hot weather.

Physical and Sensory Requirements

The physical and sensory abilities required for this classification include:

1. Sight in order to read computer screens and standard computer printouts.
2. Ability to input computer data.

Class History

Class Code:
GIS Analyst I – 16G23
GIS Analyst II – 16G24
GIS Analyst III – 16G25
Established Date: April 8, 2003
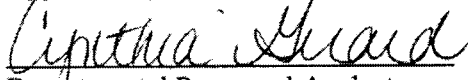Revised Date: N/A
Former Title: N/A

Bargaining Unit: J
EEO Category: PP/P/P
Work Group: 13/3/3
Worker's Comp. Code: 8810

Approved by:

Cynthia Guard
Departmental Personnel Analyst

Tom More
CAO/HR Senior Personnel Analyst

June 23, 2003
Date

June 19, 2003
Date

CPS Consultants: KBW
2/10/03