

**CITY OF CARLSBAD  
CLASS SPECIFICATION**

**JOB SERIES:**                   **GIS TECHNICIAN**  
                                  **GIS ASSOCIATE ANALYST**  
                                  **GIS ANALYST**  
                                  **GIS ASSOCIATE SYSTEMS ADMINISTRATOR**  
                                  **GIS ADMINISTRATOR**

**DEPARTMENT:**       **GEOGRAPHIC INFORMATION SYSTEMS**

**DISTINGUISHING FEATURES AND SUMMARY DESCRIPTION:**

This objective of this job series is to process and deliver on service requests, data creation and database management activities and specialized GIS application programming.

The **GIS Technician** is the entry level position in the multi-level GIS job family. The GIS Technician creates and maintains the various layers of the city's geodatabase. The GIS Technician performs the more routine manual and computerized geographic information processing tasks that are assigned. The **GIS Associate Analyst** is distinguished from the GIS Technician by the Associate GIS Analyst's increased breadth of GIS technical expertise, and scope of departmental responsibilities. The Associate GIS Analyst level requires the ability to apply mid-level to advanced GIS techniques for analysis and product production for a variety of city clients. The **GIS Analyst** is the journey-level in the GIS Analyst series. The primary purpose of this position is to be the lead resource for the application of GIS technology to all city uses. The GIS Analyst sets up and manages complex projects involving GIS staff, city client staff, and IT resources, and produces advanced data products for all city clients. The **GIS Associate Systems Administrator** assists the GIS Administrator with implementing and maintaining geospatial databases, workflow automation, enterprise upgrades, and web applications which compromise the Enterprise GIS. Duties would include assisting with geodatabase replication, deploying internal and external web applications, and managing test and stage environments and scripting. The GIS Associate Administrator will also provide support for ArcGIS Enterprise and Portal as well as assist with maintaining the GIS technology roadmap. The GIS Associate Systems Administrator supports the GIS team in interfacing with Information Technology for all matters related to GIS software, networking, and server administration. The **GIS Administrator** is responsible for implementing and maintaining the various databases of spatial information making up the enterprise GIS, as well as the maintenance of client-side and server-based GIS applications. Additionally, the GIS Administrator organizes, coordinates, maintains, and upgrades system databases, software, and hardware. The GIS Administrator ensures that data quality and information is reliable and consistently maintained. The GIS Administrator serves as the technical liaison with the Information Technology Department for all matters related to GIS database and software systems.

## **ESSENTIAL DUTIES AND RESPONSIBILITIES**

### **GIS TECHNICIAN**

Operates a GIS workstation to create and maintain the wide variety of spatial information contained in an enterprise GIS that supports city operations. Performs related technical duties in the development, implementation, operation and maintenance of the city's enterprise geographic information systems.

Under direction, creates simple graphic displays and maps for various departments' needs.

Operates a variety of geographic information system input and output devices such as: scanners, printers, and large-format inkjet plotters.

Utilizes a variety of city systems to find and collect data for use in everyday work such as: Document Management System, Permit Processing System, and manual files. Researches and analyzes geographic and tabular data from public and private sources for integration into the city's enterprise GIS.

Within their work assignments, demonstrates an effort to improve operations, decrease turnaround times, streamline work processes, and work cooperatively to provide seamless and quality customer service.

Must be able to work under time constraints and deadlines, accomplish project tasks in cooperation with other employees.

Maintains and continually upgrades knowledge of GIS functionality, principles and practices. Attends and participates in local professional group meetings as required. Participates in online professional list serves and/or blogs. Stays abreast of new trends and innovations in the field of GIS, database design, and related hardware and software.

### **GIS ASSOCIATE ANALYST**

**Performs all the duties of the GIS Technician in addition to:**

Maintains and enhances GIS data sets according to evolving needs and resources including: editing spatial data, conducting office and field research, creating, calculating and editing of attributes and merging of data from different sources.

Utilizes Global Positioning System (GPS) receivers and data loggers to collect field data and post-process the results to the GIS. Configures software on field collection devices to optimize data collection work.

Utilizes all available information systems to search for and collect data required for GIS related tasks. Converts data received from outside sources to make it available for future projects. Downloads data from other systems.

Under direction, collaborates with other GIS staff and various city departments to understand their geographic data needs, and generates standard and customized products from the GIS such as Web-based applications, hardcopy maps, digital graphics and reports for users in all city departments.

Under direction, assists in the maintenance of desktop GIS software; applies patches, and troubleshoots technical problems. Owns and responds to Service Desk tickets and gives problem solving assistance.

Utilizes Python, C#, HTML and JavaScript to customize applications and automate GIS processes.

Assists in training city staff in the use of appropriate GIS applications.

Maintains documentation for administrative and record keeping purposes, system documentation and training materials, and adheres to change control and security procedures and protocols set by the Information Technology department.

Responds to public inquiries in a courteous and professional manner. Provides information within the area of assignment. Resolves complaints in an efficient and timely manner. Assists in monitoring, evaluating, and improving the efficiency and effectiveness of service delivery methods and procedures.

Maintains and continually upgrades knowledge of GIS functionality. Attends and participates in local professional group meetings, reviews online tech resources and blogs; stays abreast of new trends and innovations in the field of GIS, database design, Web mapping and related hardware and software.

## **GIS ANALYST**

**Performs all the duties of the GIS Associate Analyst in addition to:**

Performs complex geoprocessing and geospatial analysis, and designs and produces advanced cartographic products.

Acquires spatial information from diverse sources. Refines and manipulates data including the merging data from dissimilar sources. Documents data sets, applications and procedures.

Leads the collaboration with other GIS staff and various city departments to understand their geographic data needs and generates standard and customized products from the GIS such as Web-based applications, hardcopy maps, digital graphics and reports for users in all city departments.

Leads, in collaboration with the Associate GIS Systems Administrator, the maintenance of desktop GIS software; applies patches, and troubleshoots technical problems. Owns and responds to Service Desk tickets and gives problem solving assistance.

Leads the development of data quality and cartographic standards and helps define best practices for GIS operations. Makes recommendations to the GIS Manager on software acquisitions and configurations. Assists in the maintenance of GIS and related software systems.

Provides information, resources, support and assistance to users of GIS software and/or custom applications. Responds to inquiries and gives problem solving assistance.

Assists in training city staff in the use of GIS on an individual basis or in a classroom setting.

## **GIS ASSOCIATE SYSTEMS ADMINISTRATOR**

### **May perform duties within the series in addition to:**

Under the direction of the GIS Manager, supports the GIS Administrator in the design, development, and implementation of the GIS to meet various needs and functions of various city departments.

Performs ArcGIS Enterprise and Portal monitoring, system maintenance and performance tuning.

Assist with the maintenance of the enterprise geodatabases and uses relational database technologies to prepare and deliver GIS products and applications.

Utilizes scripting to automate workflows and increase efficiencies.

Designs and deploys web applications.

Participates in the development and implementation of goals, objectives, policies, and priorities for the enterprise GIS.

Maintains and continually upgrades knowledge of GIS and associated technologies.

Participates in local professional group meetings and stays abreast of new trends and innovations in the field of GIS, web applications, and system scaling and tuning.

## **GIS ADMINISTRATOR**

### **May perform duties within the series in addition to:**

Under the direction of the GIS Manager, participates in the design, development, and implementation of the GIS to meet various needs and functions of various city departments.

Coordinates with other GIS staff to plan, design, and implement procedures that enhance access and responsiveness of GIS.

Maintains enterprise geodatabases and uses relational database technologies to prepare and deliver GIS products and applications.

Develops automated programs to make routine database maintenance procedures more efficient.

Designs and develops tools for displaying or retrieving GIS information from relational databases using modern database utilities and develops strategies for integrating GIS with other existing city databases and applications.

Configures and maintains intranet/internet web-based GIS applications.

Administers GIS servers and workstations including application software upgrades and patches, and the addition and configuration of peripheral devices.

Utilizes Python, C#, HTML and JavaScript to customize applications and automate GIS processes

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Researches and provides recommendations for computer hardware and GIS software purchases. Establishes projected equipment and supply requirements.

Participates in the development and implementation of goals, objectives, policies, and priorities for the enterprise GIS.

Maintains and continually upgrades knowledge of GIS functionality. Attends and participates in local professional group meetings, online professional list serves and/or blogs; stays abreast of new trends and innovations in the field of GIS, database design, and related hardware and software.

May supervise or provide direction for the work of other GIS personnel.

## **JOB SERIES KNOWLEDGE AND ABILITIES:**

### **GIS Technician**

- Must know how to use ESRI ArcGIS software to enter, edit and output geographic information, and be familiar with the Windows operating system and file systems.
- Be proficient in the use of standard hardware such as Windows workstations, scanners, digitizers, large format inkjet plotters, office printers.
- Know the methods and techniques of designing and creating basic cartographic products.
- Be familiar with the geographic concepts of location, scale, resolution and generalization.
- Must be able to apply knowledge of the principles and practices of effective customer service.
- Basic project management principles to facilitate own work in small group processes.

### **GIS Associate Analyst**

Knowledge and abilities required of the GIS Technician in addition to:

- GIS concepts, including techniques of spatial analysis, and basic geographical concepts of location, scale, resolution and generalization.
- Must have moderate to advanced knowledge of the use Esri ArcGIS software to enter, edit and output geographic information, create and publish Web maps and apps and be familiar with the Windows operating system and file systems.
- Knowledge of the use of GPS receivers and programming of data loggers to collect and post-process field data.
- Familiar with the various methods of data collection and in the sources of spatial data available and appropriate for use by local agencies.
- Be proficient in the use of standard hardware such as Windows workstations, scanners, digitizers, large format inkjet plotters, office printers.
- General knowledge of municipal agency GIS uses, within planning, public works, parks and recreation, and public safety departments.
- Basic project management principles to facilitate own projects.
- Must be able to apply knowledge of the principles and practices of effective customer service.
- Able to write scripts to automate processes and customize GIS software via Python, C#, HML and JavaScript.

## **GIS Analyst**

Knowledge and abilities required of the GIS Associate Analyst in addition to:

- GIS concepts, including advanced techniques of geoprocessing and spatial analysis, and geographical concepts of location, scale, resolution and generalization.
- Advanced knowledge and experience in the use of Esri software and extensions for visualization and analysis as well as publishing of Web services and deploying Web maps and applications.
- Experienced in the various methods of data collection and in the sources of spatial data available and appropriate for use by local agencies.
- Knowledge of the use of GPS receivers and the programming of data loggers to collect and post-process field data.
- Be proficient in the use of standard hardware such as Windows workstations, scanners, digitizers, large format inkjet plotters, and office printers.
- Able to write programs in Python and/or C# to automate GIS processes and customize interfaces.
- General knowledge of municipal agency GIS uses, within planning, public works, parks and recreation, and public safety departments.
- Map production; methods and techniques of conducting research and analyzing geographic and other related data.
- Effective customer service practices.
- Principles of project management to manage the technical aspects of departmental projects.
- Pertinent federal, state and local laws, codes, and regulations.

## **GIS Associate Systems Administrator**

Knowledge and abilities required of the GIS Analyst in addition to:

- Experience with Python scripting and workflow/data automation.
- Advanced knowledge in troubleshooting complex GIS architectures.
- Be comfortable managing both Portal and AGOL environments.
- Develop GIS applications. Including web-based applications.
- Ability to analyze complex problems and logically identify solutions.
- Ability to analyze a variety of geographic and mapping data and develop logical conclusions and solutions.

## **GIS Administrator**

Knowledge and abilities of the GIS Associate Systems Administrator in addition to:

- Comprehensive knowledge of geographic information systems (GIS) theory and practices, as well as with general principles and practices of enterprise information technology systems and structures.
- Geographic concepts of location, scale, resolution and generalization.
- Advanced ArcGIS skills.
- Operation and maintenance of plotters, digitizers, and scanners.
- Working with relational database systems, specifically MS Access and SQL Server, and in the creation and maintenance of the systems.
- Proficient in the use of Python, C#, HTML and JavaScript to customize applications and automate GIS processes.

- Creating and analyzing complex land-based data systems involving interdepartmental interactions. Requires familiarity with techniques of spatial analysis of areas and networks.
- Project management principles and techniques to manage system administration tasks and conversion/implementation projects.

## **EDUCATION AND EXPERIENCE**

### **GIS Technician**

Equivalent to an associate's degree or equivalent coursework from an accredited college or university or technical or vocational school with major course work in geography, planning, landscape architecture, civil engineering, natural resources, or computer science including coursework in GIS. A bachelor's degree is desirable.

At least two years of experience using ESRI ArcGIS software in the development and maintenance of a multi-user geographic information system. Experience interpreting topographic maps, engineering improvement plans, and "as built" plans is also required.

### **GIS Associate Analyst**

Equivalent to a bachelor's degree from an accredited college or university with major course work in geography, planning, landscape architecture, civil engineering, natural resources, or computer science including coursework in GIS.

At least three years experience using ESRI ArcGIS software in a municipal or related environment of diverse user needs. Experience in assessing client needs and translating them into GIS products and services.

### **GIS Analyst**

All education required of the GIS Associate Analyst in addition to:

At least four years of progressive experience designing, implementing, and maintaining GIS databases and applications, along with substantial GIS project experience utilizing a wide range of GIS software tools and specialized extensions. Needs to know how to use one of several programming languages such as Python, C#, HTML or JavaScript.

### **GIS Associate Systems Administrator**

All education required of the GIS Analyst in addition to:

At least five years of experience in enterprise GIS activities including at least three years of experience in geodatabase replication, deploying and managing GIS services and supporting web applications.

### **GIS Administrator**

All education required of the GIS Associate Systems Administrator in addition to:

At least five years of progressive experience designing, implementing, and maintaining complex geodatabases in a relational environment, principally with ESRI SDE and MS SQL

Server. Must also have substantial GIS project experience using ESRI GIS software products, and programming experience with Visual Basic, C++ and/or C#.

### **ESSENTIAL MENTAL AND PHYSICAL REQUIREMENTS FOR THE GIS SERIES**

The conditions below are representative of those that must be met by an employee to successfully perform the essential functions of the job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential job functions.

#### **Language Ability:**

- Requires ability to compare, count, differentiate, measure and/or sort, assemble, copy, record and transcribe data and information. Must be able to classify, compute, tabulate, and categorize data. Must be able to advise and provide interpretation to others on how to apply policies, procedures, and standards to specific situations.
- Needs to be able to use a variety of descriptive data and information such as: a variety of plans; resolutions; maps; reports; computer software operating manuals; procedures; guidelines; and routine correspondence.
- Must be able to communicate orally and in writing, clearly and concisely and in a non-technical manner with city personnel at all levels; consultants; vendors; and the general public.
- Needs the ability to read, analyze, and interpret general business periodicals, professional journals, technical procedures, or governmental regulations. Must be able to write reports, business correspondence, and procedure manuals. Needs to effectively present information and respond to questions from groups of managers, clients, and the public.

#### **Mathematical Ability:**

- Knows how to apply mathematics, including basic algebraic, plane geometric and trigonometric formulas. Must be able to demonstrate ability to calculate percentages, fractions, decimals, volumes, ratios, and spatial relationships. Needs to be able to interpret basic, descriptive statistical reports.

#### **Judgment and Situational Reasoning Ability:**

- Must be able to use functional reasoning and apply rational judgment when performing diversified work activities. Needs to be able to analyze data and information using established criteria to determine consequences and identify and select alternatives.

#### **Physical Requirements:**

- Needs to be able to operate equipment and machinery with some requiring rapid adjustments such as a computer keyboard and terminal, digitizer, plotter, blue line printers, photocopier, calculator, drafting instruments, and engineer and architect scale. Must be able to coordinate eyes, hands, feet and limbs in performing skilled movements such as rapid keyboard use. Needs to be able to recognize and identify degrees of similarities or differences between characteristics of colors, textures, and forms associated with job-related objects, materials, and tasks.
- Must be able to exert light physical effort in sedentary to light work, typically involving lifting, carrying, pushing and pulling of up to 30 pounds. Tasks may involve extended periods of time at a keyboard or workstation.

- Needs to be able to perform frequent downward flexion of neck, side-to-side turning of the neck, fine finger dexterity and grasp to manipulate the keyboard, telephone, writing instruments, papers, books, manuals, and reports.
- Job entails occasional walking, standing, bending, stooping, climbing, reaching at and above shoulders and twisting at the waist. On an infrequent basis, the incumbent must be able to squat and kneel.
- Work may involve occasional outdoor fieldwork. Overtime and attending meetings outside regular work hours may be required. Work environment is professional and team oriented. This position is impacted by urgent time deadlines due to various reporting and filing requirements. There is some repetitiveness in program coding, a need for extreme accuracy, and paying attention to detail. Additionally, there is a need to be able to shift attention before tasks are completed to be able to balance user demands, telephone and other interruptions.
- Must be able to drive and maintain a California Class C Driver's license or ability to arrange transportation for fieldwork or visits to other city facilities when necessary.

This classification specification does not constitute an employment agreement between the employer and employee and is subject to change by the city and the needs of the city and requirements of the job change.

The City of Carlsbad is an Equal opportunity Employer. In compliance with the Americans with Disabilities Act, the city will provide reasonable accommodation to qualified individuals with disabilities and encourages both current and prospective employees to discuss potential accommodations with the employer.

DATE APPROVED: January 11, 2021