

## **CHAPTER 22**

### **GEOGRAPHIC INFORMATION SYSTEMS**

#### **PURPOSE:**

This chapter establishes the administration and use of Geographic Information Systems to improve the quality and accessibility of Department's spatial information and support graphical analysis of georeferenced data.

#### **AUTHORITY:**

Sections 20.23(3)(a) and 334.048(3), Florida Statutes (F.S.)

#### **SCOPE:**

This chapter applies to District, Turnpike, and Central Office units with the Florida Department of Transportation that use Geographic Information Systems.

### **22.1 DEFINING GEOGRAPHIC INFORMATION SYSTEMS**

A Geographic Information Systems (GIS) is a technology that is designed to capture, store, manipulate, analyze, manage and present geographical data. It is the policy of the Department to deploy enterprise-wide GIS applications for its engineering, operations, planning and administrative functions.

Enterprise GIS is an organization-wide framework for the Department's communication and collaboration of shared GIS resources. Through structured integration of GIS components, enterprise GIS combines centralized management with decentralized operations and enables the Department to best leverage its GIS resources. A carefully planned enterprise GIS complements existing business processes and provides an efficient way to plan, analyze, and manage transportation infrastructure and related elements.

### **22.2 GOVERNANCE**

GIS is managed at a statewide level to leverage resources more effectively, increase productivity for operations, provide cost savings, and optimize benefits of the services the Department provides. The following management structure is in place to facilitate effective communication and coordination of GIS resources, activities, and people.

### **22.2.1 Department GIS Program Manager**

The GIS Program Manager serves as the designated GIS liaison to other GIS organizations including state, local, and federal agencies. The GIS Program Manager provides technical leadership for GIS strategy and initiatives by communicating best practices and guidelines to assist CO and the Districts with effective uses of GIS technologies. The GIS Program Manager also assists with identifying existing and emerging opportunities that improve the effectiveness of Department's programs through the use of GIS technology, procurement of GIS software, hardware and training, coordination of statewide GIS data and licensing, review and oversight for GIS projects submitted by offices and Districts, and development of technical standards, policies, procedures. The GIS Program Manager has responsibility/oversight for the procurement of GIS software, hardware, and training.

### **22.2.2 GIS Office Roles**

The GIS Supervisor oversees and supports the operational activities of the GIS Program Team, ensuring a high level of efficiency, accountability, productivity, and customer service. The GIS Supervisor also assists with providing strategic leadership through evaluation, support and training for other business systems and processes supporting transportation, as well as, initiating human resource management activities, such as recruitment, induction, performance management, occupational health, safety and diversity for staff. The GIS Project Manager coordinates and assists with the organization of work, determining resource requirements, data sources, short-term and/or long-term goals, strategies to achieve these goals, developing workflow documentation, monitoring progress and evaluating outcomes, as well as coordinating with other organizations or parts of the organization to accomplish these goals. GIS Analysts in FDOT use GIS to facilitate the visualization, analysis and interpretation of data for recognizing relationships, patterns, and trends in transportation. GIS Analysts recommend appropriate strategies in response to GIS analysis, as well as, provide maps, data, web maps, applications, tools, training and technical support as part of the project activities under the GIS Office.

### **22.2.3 District GIS Coordinators**

The District GIS Coordinators are the lead GIS representatives for the Districts and act as liaisons between the various committees and the District. This role includes sharing innovative ideas and solutions that support the Department's GIS Strategic Plan, collaborating on the development of GIS standards and best practices, as well as assisting in the creation and oversight of subcommittees and technical teams as needed. Additionally, GIS Coordinators/Representatives act as District advocates in obtaining GIS resources needed to leverage GIS data and technology effectively within the Department's strategic and technical framework. Other duties include but are not limited to: ensuring the adherence to the enterprise/District GIS goals; facilitating joint development of data; and coordinating GIS training. The District Coordinator stays

current with GIS technology changes, coordinates data requests from outside the agency, and helps develop spatial data access and dissemination.

#### **22.2.4 GIS Enterprise Infrastructure Support**

The GIS Administrator coordinates and collaborates with the Department's GIS Program Manager, Districts and Central Office business offices to recommend an effective and consistent vision for the Department's GIS resources and activities, supports the development and implementation of the Department's enterprise GIS Strategic Plan, and provides coordination of GIS technical support for information technology resources and projects. The GIS Administrator also provides technical review and oversight of GIS application projects submitted by offices and Districts to ensure project management controls are in place, assists with identifying existing and emerging opportunities, as well as, coordinating with the Office of Information Technology (OIT) on GIS technical activities required to support an effective enterprise GIS development. The ArcGIS Online (AGOL) administrator has full control and is responsible for the administration of GIS@FDOT, account usage, subscription status, and content management across the Department

#### **22.2.5 GIS Consultant Support**

Consultant Support is available to provide GIS services to Department. These services may include, but are not limited to: maintenance of GIS applications, application development and special GIS projects that support the Department's programs; data editing; data processing; and map production. The Consultant must be able to provide highly skilled geographic information systems staff to accomplish these services. All scope of services should follow Department procurement procedures and must be reviewed by the GIS Program Manager and the Director of Civil Integrated Management.

#### **22.2.6 GIS Data Stewards (GISDS) and Data Custodians (GISDC)**

GISDS are responsible for defining the business processes, business policies and the application requirements for their office/district. GISDS attend regularly scheduled Department GIS Meetings and often volunteer to prototype or participate in GIS Innovation. Communications on GIS Policy and Rules will be multi-directional between the GIS Office and the business area offices. GISDC are the business area experts responsible for the day-to-day technical management of the data and maintain data quality. GISDC lead the business rules acquisition activities as experts and use their knowledge, skills and abilities to apply GIS within their practices.

#### **22.2.7 GIS Strategic Advisor/OIT Manager**

The GIS Strategic Advisor coordinates and collaborates with the Department's GIS Coordinator, steering committees and business offices to recommend an effective and consistent vision for the Department's GIS resources and activities, supports the development and implementation of the Department's enterprise GIS Strategic Plan and provides coordination for GIS technical support for information technology resources and projects. The GIS Strategic Advisor also provides technical review and oversight for GIS application projects submitted by offices and Districts to ensure project

management controls are in place, assists with identifying existing and emerging opportunities and coordinates with Office of Information Technology (OIT) on GIS technical framework activities required to support effective enterprise GIS development.

## **22.3 DISTRIBUTED ENTERPRISE GIS**

GIS shall be centrally managed as an enterprise technology supporting a decentralized architecture. This architecture is characterized by both centralized and distributed applications, databases and web services. Many datasets remain in the stewardship and storage of the data owner, but enterprise standards for data quality, metadata, format and access are defined to allow efficient data sharing.

### **22.3.1 Application Services**

Application Services within OIT, provides support and direction for development of GIS applications to ensure cost effective solutions and availability to other Departmental assets. Application Services shall be kept apprised of current and planned GIS initiatives throughout the Department and this information shall be directed to the Application Services Manager.

## **22.4 ARCGIS DESKTOP LICENSES**

ArcGIS for Desktop is the platform that GIS professionals throughout the Department use to manage their GIS workflows and projects, and to build data, maps, models, and applications. It is also the foundation for deploying GIS across the department and onto the web. ArcGIS for Desktop is also used to publish and share geographic information with others.

In order to leverage the Department's licensing of the ArcGIS Desktop software from Esri and to take advantage of available cost savings, all Department ArcGIS Desktop licenses are managed under the Department Primary Esri customer number and a strategic set of license managers distributed throughout the Department. Access to the ArcGIS Desktop software is provided through a link on the Department GIS SharePoint page.

### **22.4.1 License Maintenance**

Beginning fiscal year 2015/2016 all ArcGIS for Desktop maintenance are funded through the Department PRIMARY customer number and cost center.

### **22.4.2 New License Purchases and New Users**

Members of the Department's workforce offices are responsible for justifying and purchasing new ArcGIS for Desktop licenses when needed. However, all new ArcGIS

for Desktop licenses and extensions are purchased under the Department PRIMARY customer number. Subsequent annual maintenance is funded through the Department PRIMARY customer number.

New ArcGIS for Desktop users must contact their group's GIS Coordinator and request access to the software. If the group's GIS Coordinator is administering a secondary license manager, he/she is responsible for determining who has access to the software within his/her user group. Otherwise, the group's GIS Coordinator is responsible for requesting new user software access from the Department GIS Coordinator.

### **22.4.3 License Manager Configurations**

The Department has implemented a primary, secondary, and backup license manager strategy. The Primary License Manager hosts all ArcGIS for Desktop concurrent licenses and related extensions assigned from Esri. These licenses are the source for transferring District/Office licenses to the Secondary License Managers. All single use licenses and associated extensions permanently reside on the Primary License Manager.

Secondary License Manager installations are available for existing sites that have more than five concurrent ArcGIS for Desktop licenses. Existing sites with five or less concurrent licenses utilize the Primary License Manager as their license host. Those sites implementing a Secondary License Manager obtain their licenses through the license transfer procedure. Administrators of Secondary License Managers are only authorized to transfer the same number of concurrent licenses that were included in their final annual maintenance agreement for fiscal year 2014/2015. In addition, administrators are required to submit license utilization logs to the Department GIS Coordinator.

### **22.4.4 Backup License Manager**

The Department has implemented a Backup License Manager of the Primary License Manager. The Backup License Manager resides on a server hosted by the Turnpike Enterprise.

### **22.4.5 Esri Technical Support**

Representatives from each user group are included in a list of authorized personnel that may call Esri for Technical Support. This list is maintained by Department PRIMARY and Esri.

## **22.5 ENTERPRISE GIS FRAMEWORK**

The GIS Framework (the Framework) was developed by the Department in support of enterprise GIS decisions from the GIS Functional Steering Committee (FSC) as directed by the Executive Board. The Framework provides a common set of GIS commands and capabilities that are to be used in the development of the Department GIS websites. By using the Framework, GIS workgroups in the Districts and CO develop and share customized tools and features. This ability to leverage the GIS expertise throughout the Department is a critical component of the goals and objectives outlined in the GIS Strategic Plan.

The Enterprise Framework handles user interface generation, security, and user interaction. GIS Tools/Components implement application logic only, relying on the Enterprise Framework to handle other details listed above. Capabilities created on the Framework shall use Web services and/or the ArcGIS Server Javascript API. This approach allows the Department to leverage all Central Office and District development efforts and reduce duplication.

The Framework shall be updated, maintained and distributed by Application Services, in collaboration with the Department GIS Coordinator, the GIS FSC and all Department GIS developers.

## **22.6 ARCGIS ONLINE**

GIS@FDOT is the Department's organizational account for ArcGIS Online. ArcGIS Online is a subscription based service, therefore a limited number of members and usage credits are available. Accounts shall be disseminated across offices and Districts based on current desktop license usage and business needs. There are four levels of user privileges established for members of GIS@FDOT: Account Administrator, Local Administrator, Internal Publisher, and Internal User. Each District and functional area shall have at least one local administrator to assist with user and content management.

Refer to the GIS@FDOT\_Best Practices document available on the Department's GIS SharePoint site.

### **TRAINING:**

None required.

### **FORMS:**

None required.