FDOT’s Enterprise Geographic Information System (GIS)

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Enterprise GIS Agenda

- Background
  - GIS Strategic Plan

- Application Development
  - FDOT Enterprise GIS Framework
  - Applications using the Framework
  - Next Steps for the Framework

- What’s Next
  - GIS resources and initiatives
Background

- GIS Strategic Plan (2008-2011)

- **GOAL 1:** Increase the use of GIS to improve business processes, increase productivity, enhance decision support, and reduce costs.
  - **Objective 1:** Increase the integration of GIS technology into enterprise business and engineering applications.
    - Embedded framework available for Aps.
    - Safety Office using for crash analysis on framework.
    - OIS has included geospatial question into the project scope methodology (MACS).
**Background**

- **GIS Strategic Plan (2008-2011)**

- **GOAL 2:** Extend the use of maps and other GIS tools/data to improve communication and the quality of services provided within the Department and to DOT partners, governmental entities, and citizens.
  - **Objective 1:** Increase the integration of GIS technology into enterprise business and engineering applications.
    - All districts have a GIS coordinator.
  - **Objective 3:** Establish standardized base maps and other core GIS tools that support comprehensive transportation needs.
    - Base maps part of framework.
    - S&MO finalizing aerial base map.
    - Framework supports library of tools and widgets.
Background

- GIS Strategic Plan (2008-2011)

- GOAL 3: Identify and implement the appropriate technical architecture to best support office-level, district, and enterprise GIS needs of the Department.
  
  - **Objective 1**: Research and recommend cost-effective technical infrastructure options to increase access to standard supported GIS tools and decrease total cost of ownership. Base maps part of framework.
    - Enterprise framework implemented.
    - Central Office server consolidation complete
  
  - **Objective 2**: Research and recommend GIS software licensing options that provide access to GIS tools at the right level to those who need it, in the most cost-effective manner.
    - No valid savings with pooled licensing. Could be some savings by pooling ArcGIS Advance due to cost between primary & secondary license.
Background

- **GIS Strategic Plan (2008-2011)**

- **GOAL 4:** Establish and maintain consistent standards and guidelines that leverage department and external geospatial resources to drive efficiencies.
  
  - **Objective 1:** Adopt Metadata Standards (i.e. description, projection/scale, source, update frequency, format, etc).
    
    - GIS Functional Steering Committee adopted metadata standards

  - **Objective 5:** Adopt interoperability standards for GIS data to be imported/exported to other spatial data formats (i.e CADD).
    
    - Various purposeful areas are being researched. Bentley and Autodesk are integrating “Feature Attribution” within CAD environment which are being tested as we speak.
Background

- GIS Strategic Plan (2008-2011)

- GOAL 5: Establish a cohesive governance model that supports organization-wide management and utilization of geospatial information.
  - **Objective 1:** Establish department policies and procedures that define both strategic and operational governance structures. GIS Functional Steering Committee adopted metadata standards
    - Policy 000-010-002 Geographic Information Systems is completed.
  
  - **Objective 2:** Establish clear and formal lines of communication throughout the GIS Community.
    - All districts are actively participating in GIS functional steering committee.
Background

FDOT GIS Community

All existing and potential spatial data providers, users and viewers within FDOT to include FDOT consultants

- FDOT GIS Information website
- Executive Committee
- Management Steering Committee
- CO-OIS Infrastructure Representative
- FDOT GIS Coordinator
- District 1 GIS Coordinator
- District 2 GIS Coordinator
- District 3 GIS Coordinator
- District 4 GIS Coordinator
- District 5 GIS Coordinator
- District 6 GIS Coordinator
- District 7 GIS Coordinator
- Turnpike GIS Coordinator
- Central Office GIS Coordinator
- State Material GIS Coordinator

2014 Design Training Expo
Background

◆ GIS Strategic Plan (2013-2015)

- Vision
  - GIS will be a standard tool commonly used throughout the Department to support transportation decision making.

- Mission
  - Support an organization-wide framework for the governance of GIS technology that will facilitate effective management, communication and collaboration of shared geospatial data and resources.
Background

- **GIS Strategic Plan (2013-2015)**

  - **Goals**
    - Increase the use of GIS to improve business processes, increase productivity, enhance decision support, and reduce costs.
    - Extend the use of maps and other GIS tools/data to improve communication and the quality of services provided within the Department and to DOT partners, governmental entities, and citizens.
    - Identify and implement the appropriate technical architecture to best support the local and enterprise GIS needs of the Department.
    - Establish and maintain standards and guidelines that leverage department and external geospatial resources to drive efficiencies.
    - Establish a cohesive governance model that supports organization-wide management and utilization of geospatial information.
Background

- **GIS Strategic Plan (2013-2015)**

Goals and Objectives

- **GOAL 1:** Increase the use of GIS to improve business processes, increase productivity, enhance decision support, and reduce costs.
  - **Objective 1:** Continue with the integration of GIS technology into enterprise business and engineering applications via the utilization of the GIS Enterprise Framework.
  - **Objective 2:** Reduce time and overhead costs associated with locating and accessing important geospatial information by leveraging existing resources such as the FDOT GIS Clearinghouse and/or other resources.
  - **Objective 3:** Promote awareness of the DOT clearinghouse and encourage participation within the GIS community to contribute datasets and applications that can be shared.
Background

- GIS Strategic Plan (2013-2015)

Goals and Objectives (cont’)

- **GOAL 2:** Extend the use of maps and other GIS tools/data to improve communication and the quality of services provided within the Department and to DOT partners, governmental entities, and citizens.
  - **Objective 1:** Increase our presence on the internet by creating and maintaining a public facing portal for Department GIS resources
  - **Objective 2:** Support GIS partnerships with external entities for sharing of GIS data and resources.
  - **Objective 3:** Establish standardized base maps and other core GIS tools that support comprehensive transportation needs.
Background

- GIS Strategic Plan (2013-2015)

Goals and Objectives (cont’)

- **GOAL 3:** Identify and implement the appropriate technical architecture to best support office-level, district, and enterprise GIS needs of the Department.
  - **Objective 1:** Increase access to standard GIS tools.
  - **Objective 2:** Research and recommend GIS software licensing options that provide access to GIS tools at the right level to those who need it, in the most cost-effective manner.
  - **Objective 3:** Explore requirements needed to implement internet technologies such as ESRI’s ArcGIS Online
  - **Objective 4:** Explore and adopt mobile devices or mobile mapping capabilities
Background

**GIS Strategic Plan (2013-2015)**

Goals and Objectives (cont’)

- **GOAL 4**: Establish and maintain consistent standards and guidelines that leverage department and external geospatial resources to drive efficiencies.
  - **Objective 1**: Adopt a standard GIS procedure that supports previously adopted standards for Metadata and Enterprise GIS data.
  - **Objective 2**: Adopt interoperability standards for GIS data to be imported/ exported to other spatial data formats (ie CADD).
  - **Objective 3**: Research and recommend a financial alternatives to support enterprise, district, and office-level GIS initiatives.
  - **Objective 4**: Create documentation and/or procedures for consultant development on GIS web applications via the GIS Enterprise Framework
Background

- GIS Strategic Plan (2013-2015)

Goals and Objectives (cont’)

- **GOAL 5:** Establish a cohesive governance model that supports organization-wide management and utilization of geospatial information.
  - **Objective 1:** Ensure department policies and procedures that support both the strategic and operational governance are followed.
  - **Objective 2:** Continue with clear and formal lines of communication throughout the GIS Community.
  - **Objective 3:** Promote the awareness, education and marketing of FDOT GIS resources through Department GIS user groups.
Enterprise GIS Framework

Vision

GIS Power Users
(100+ Users)

GIS Desktop Tools
- ARC Info
- ARC Editor
- ARC View
  - Produce Maps
  - Spatial Analysis

Proposed: Centrally Managed ESRI Licenses
- Single Use
- Concurrent Use
- Server/Infrastructure

Internet

Other FDOT Users
(9,500 Potential Users)

GIS WebPortal

GIS Functions provided via intuitive interfaces
- Visual Representation of Business Data
- Integration of Business & GIS Data
- Spatial Analysis

Proposed: GIS WebPortal Concept:
- Maintain ONE common set of resources, administered once
- Provide a connection between all the resources
- Provide access to EVERYONE, not just power users
Enterprise GIS Framework

Key Terms

- **Framework**
  - A collection of software components structured into three layers that provide foundation, support, and application services. The framework is one website and is driven by a configuration model that allows for flexibility in exposing functionality and creating unique user interfaces.

- **Architecture**
  - The structure(s) of the system, which comprise software components, the externally visible properties of those components and the relationships between them.

- **Core data layers**
  - Collection of enterprise data layers maintained by Database Administration (DBA). These data layers are utilized by FDOT personnel throughout the organization.
Enterprise GIS Framework

Key Terms *(cont.)*

- **Web Services**
  - Web Services represent an extension of the concept of off-the-shelf software to that of software delivered as a service. They are building blocks that enable developers to build and aggregate applications and services from local and remote resources for a range of clients.

- **Services Oriented Approach**
  - An approach to architecture design which separates functions into distinct units, or services, that developers make accessible over a network in order to allow users to combine and reuse them in the production of applications.
Enterprise GIS Framework

- Enterprise GIS Framework
  - The application architecture upon which all Enterprise GIS applications will be built.

- GIS Embeddable Framework
  - The application architecture which enables a GIS application built on the Enterprise GIS Framework to be embedded within a business web application (examples later in presentation).

- GIS District Framework
  - District implementation of the Enterprise GIS Framework.
Framework Applications

- GIS Enterprise View (GEV)
  - The **FIRST** GIS web application built on the Enterprise GIS Framework.
  - The GEV is NOT the Enterprise GIS Framework *(big time misconception!)*
  - The GIS Enterprise View (GEV) application lets you view, query, and analyze the department’s spatial data. The application contains Safety, Work Program, RCI and more enterprise systems data.
  - The application also links to other enterprise wide systems such as PSEE, EIP, and Video Log based spatial data.
GIS Enterprise View (GEV)

GIS Enterprise View (GEV) can enhance day to day business decision-making by providing access to a wide array of transportation related data, easy to use GIS tools, and an intuitive application interface.
Aerial Photography Look Up System (APLUS)

APLUS guides you through the steps needed to search, request and download aerial photography from the Department’s Aerial Photography Archive Collection.
State Safety Office GIS (SSOGIS)

SSOGIS is included in the Florida Traffic Safety Portal and services as a central location for the exchange and sharing of tools, data, information, and ideas among the traffic safety professionals in Florida.
ONE-STOP PERMITTING

Apply for utility permits, check the status of permits, download approved permit packages, utility maintenance notifications, access GIS map location feature and more online.
**Project Suite Enterprise Edition (PSEE)**

The GIS module provides geographical information about the selected Project on an **embedded** interactive map. This module leverages the FDOT Enterprise GIS Framework to display the interactive map and its features.
Embedded Framework Application

FDOT Tracker

FDOTTracker is used throughout FDOT to log and track correspondence with the general public and FDOT employees.
Right of Way Properties

This site provides information about properties that may be available for purchase or lease from the Florida Department of Transportation.
Florida Permanent Referencing Network (FPRN)

This is a web based map providing the current statuses of nearly 100 Continuously Operating Reference Stations (CORS) located throughout Florida.
**District 7’s Transportation Data Viewer (TDV)**

A web-based application that serves a wide array of GIS data to all users that are "inside" the FDOT firewall.
Turnpike - GEV
The Turnpike Enterprise has implemented a unique query tool specifically related to Turnpike data.
Demonstration
What’s Next

◆ **GOAL 1:** Increase the use of GIS to improve business processes, increase productivity, enhance decision support, and reduce costs.

  ▪ **Objective 1:** Continue with the integration of GIS technology into enterprise business and engineering applications via the utilization of the GIS Enterprise Framework.

    – Many applications are being developed and migrated into the enterprise framework.
What’s Next

◆ GOAL 2: Extend the use of maps and other GIS tools/data to improve communication and the quality of services provided within the Department and to DOT partners, governmental entities, and citizens.

- **Objective 1:** Increase our presence on the internet by creating and maintaining a public facing portal for Department GIS resources

- **Objective 2:** Support GIS partnerships with external entities for sharing of GIS data and resources.
  - *The implementation of ArcGIS Online will assist with this objective.*
GOAL 2:
Extend the use of maps and other GIS tools/data to improve communication and the quality of services provided within the Department and to DOT partners, governmental entities, and citizens.

Objective 1:
Increase our presence on the internet by creating and maintaining a public facing portal for Department GIS resources. The implementation of ArcGIS Online will assist with this objective.
What’s Next

◆ **GOAL 3:** Identify and implement the appropriate technical architecture to best support office-level, district, and enterprise GIS needs of the Department.

- **Objective 1:** Increase access to standard GIS tools.
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## What’s Next

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<th>Current Desktop Licenses at FDOT (15 Customer Numbers)</th>
<th>Proposed Desktop Licenses at FDOT (1 Customer Number)</th>
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- **GOAL 3:** Establish and maintain consistent standards and guidelines that leverage department and external geospatial resources to drive efficiencies.

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Questions?

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