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CADD to GIS Interoperability

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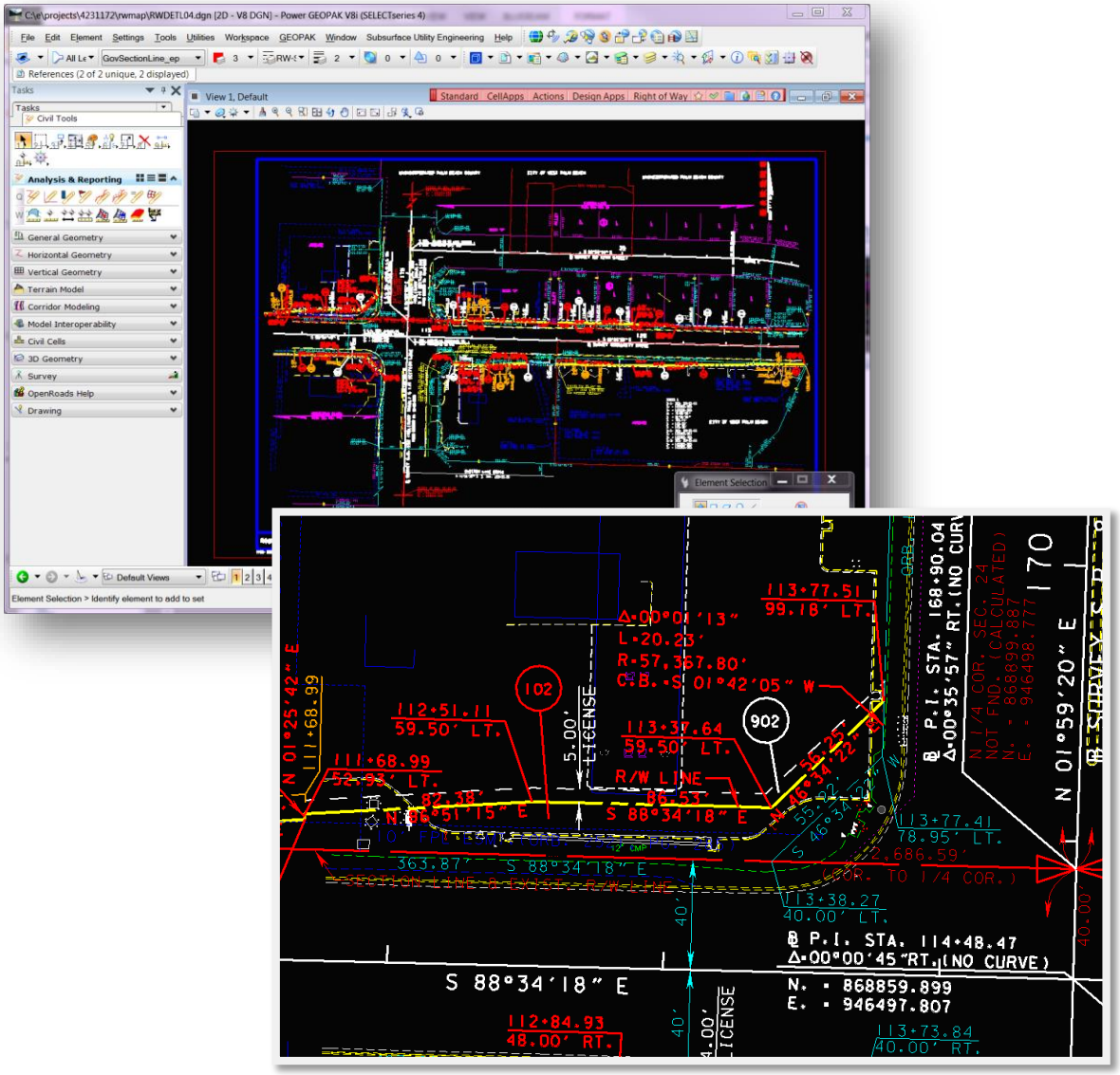
FDOT Central Office, Tallahassee, Florida

Overview

- Concept
- Goals
- Interoperability
- Implementation Plan
- Training
- More Information



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Concept

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Concept

- Create Right of Way GIS layers that are
  - Easy to use
  - One stop
  - Multi-user accessible
  - With a public facing portal
- For
  - Retrieval
  - Analysis
  - Storage
- Basis of mapping for all asset information
  - Easements
  - Utilities
  - Signage, etc.

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Concept

- Right of Way GIS layers
  - Alignments
  - Parcels
  - Right of Way Lines
  - Utilities
  - Roadway Assets

Goals

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Goals

- GIS Compatible products from CADD
- Limited number of products to ensure workflow and processes do not add burden to production schedules
- Create a State-wide database that is
  - Accurate
  - Comprehensive
  - Reliable

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Goals

- Utilize existing software
- Utilize existing staff
  - Knowledge
  - Skills
  - Abilities

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FDOT ROADS

RELIABLE, ORGANIZED, ACCURATE DATA SHARING

Interoperability

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The CIM & ROADS Initiatives

- Civil Integrated Management (CIM)
  - The process of collection, organization and managed accessibility to accurate data and information related to a highway facility to be used by a multitude of offices and for a multitude of purposes.
- Reliable, Organized, and Accurate Data Sharing (ROADS)
  - Improvement of data reliability and simplify data sharing across FDOT to have readily available and accurate data to make informed decisions.

Interoperability

- The transformation of data between formats
- What does this mean?
- How to do this?
- Why does it matter?

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Interoperability

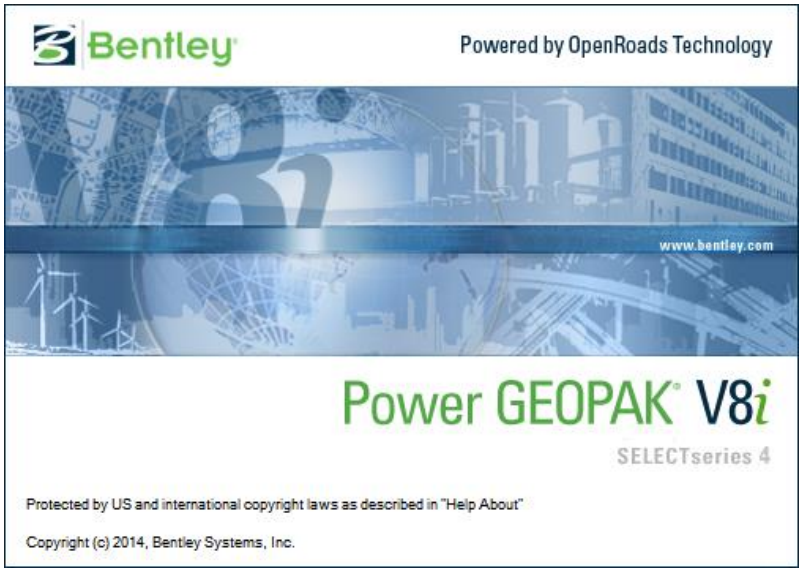
What does this mean?

- Current CADD software has the ability to build data in a way that is compatible with other formats
  - Such as GIS
- During the drafting process we can now take the line work that used to be strictly used for the production of a 2D paper display and use it to create data that can be used in many different ways and by many different offices and eventually the public

Interoperability

How to do this?

- Using existing FDOT software a workflow to create this data has been developed



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Interoperability

How to do this?

- Includes geospatial tools:
  - Interoperability tools
    - Map Manager
      - Attaches files and features from any supported graphical source (such as vector maps and raster images) and manage feature display
    - Feature Menu
    - Command Manager
      - Allows for the placing, editing, promotion, analyzation and browsing of feature attributes

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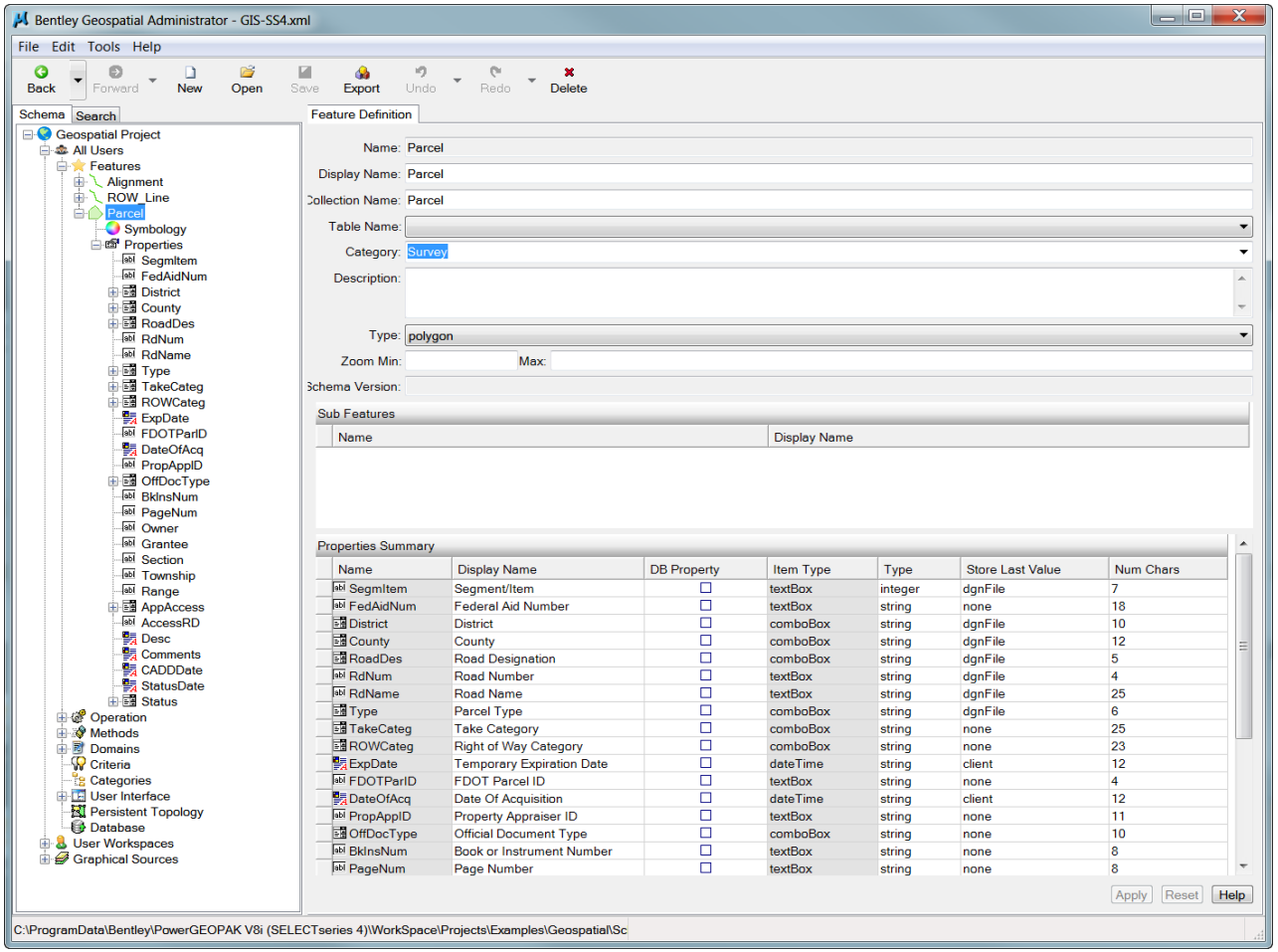
Interoperability

How to do this?

Bentley Geospatial Administrator



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File Edit Element Settings Tools Utilities Workspace GEOPAK Window Subsurface Utility Engineering Help

All Le Default 0 0 0 0 0

References (0 of 0 unique, 0 displayed)

Tasks

Tasks

Civil Tools

Analysis & Reporting

General Geometry

Horizontal Geometry

Vertical Geometry

Terrain Model

Corridor Modeling

Model Interoperability

Civil Cells

3D Geometry

Survey

OpenRoads Help

Drawing

Visualization

Animation

View 1 - Standard CellApps Actions Design Apps Right of Way

Element Selection

Default Views 1 2 3 4 5 6 7 8 X 1994.5904 Y 730.5496 Z -0.0000

Element Selection > Identify element to add to set

Default

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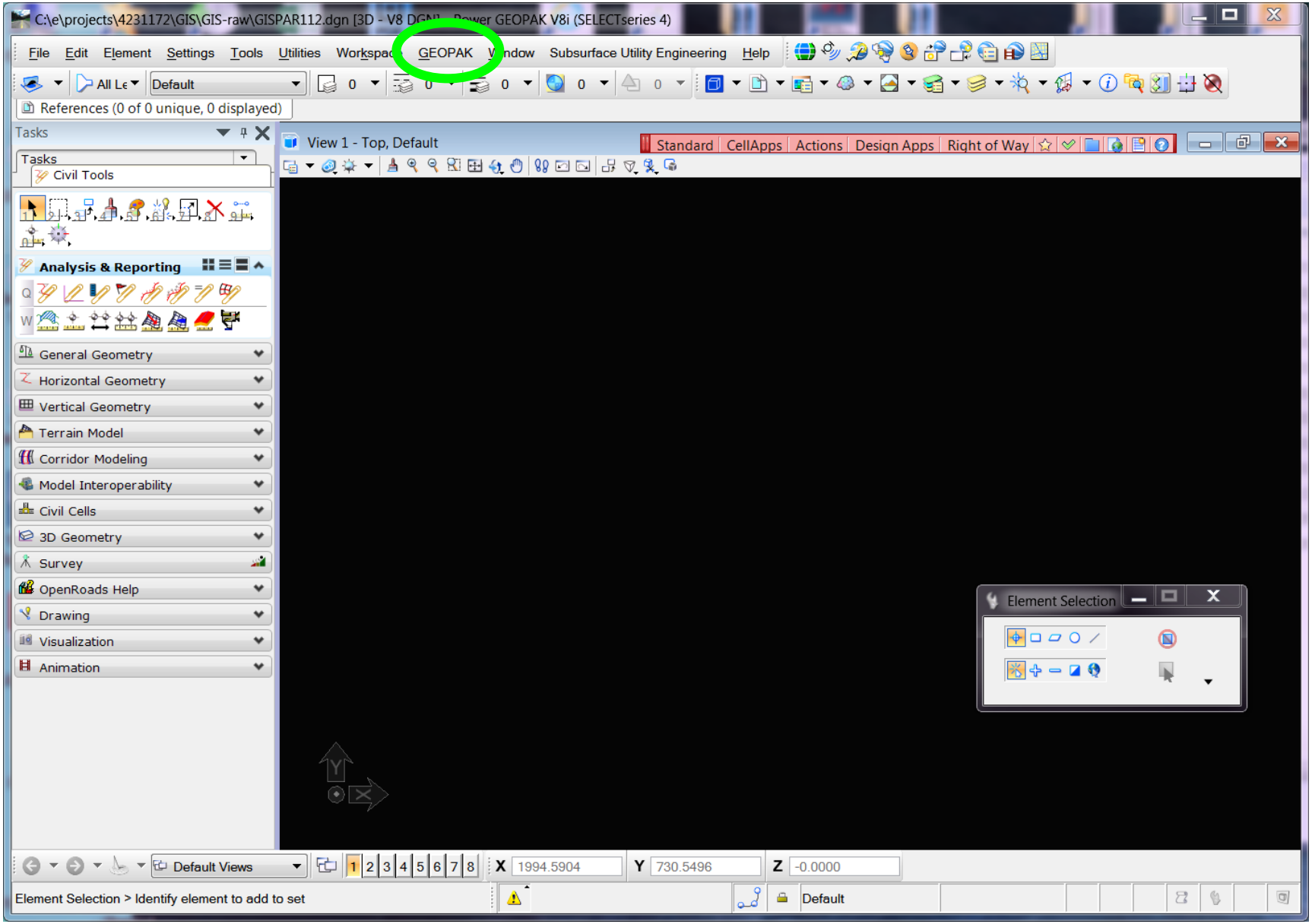

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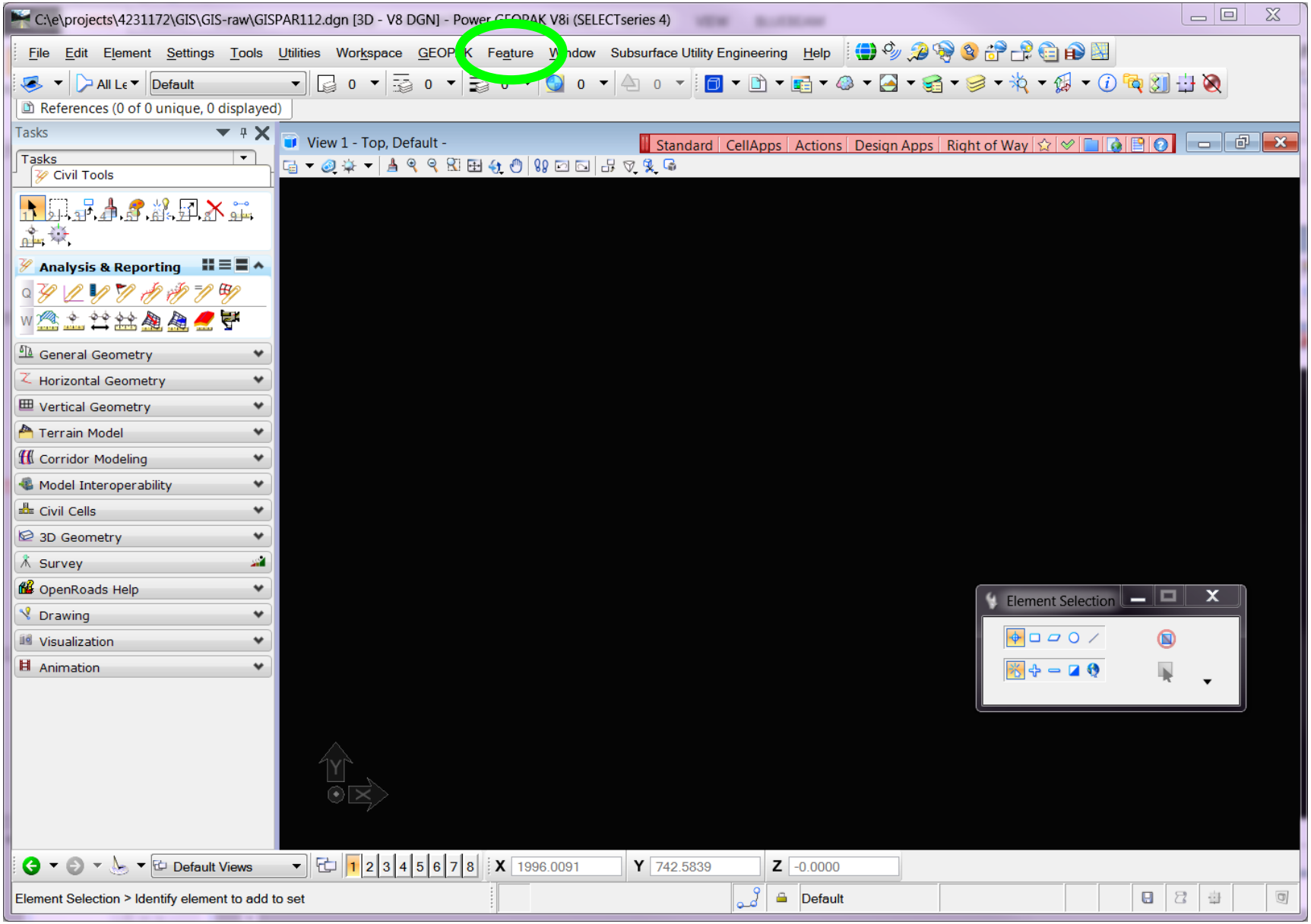

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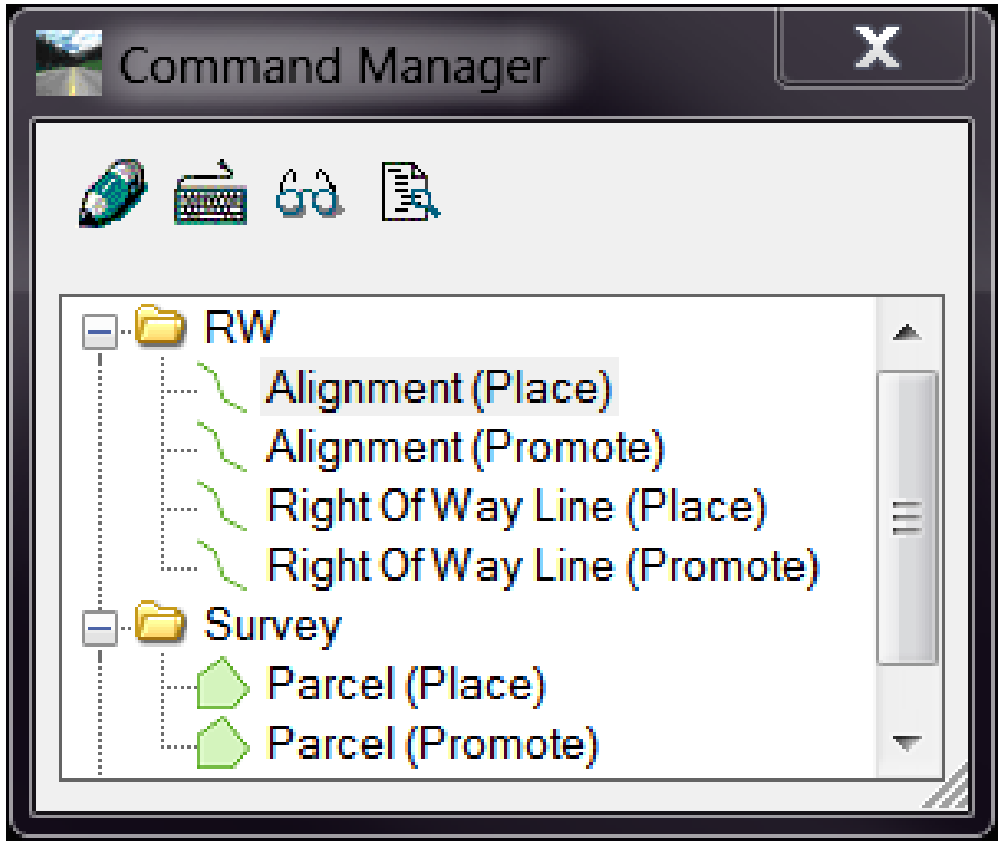
Command Manager Tree

Note: Commands are categorized by discipline in this example, but could be categorized/organized in other ways.



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C:\e\projects\4231172\GIS\GIS-raw\GISPAR112.dgn [3D - V8 DGN] - Power GEOPAK V8i (SELECTseries 4)

File Edit Element Settings Tools Utilities Workspace GEOPAK Feature Window Subsurface Utility Engineering Help

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Horizontal Geometry

Vertical Geometry

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Model Interoperability

Civil Cells

3D Geometry

Survey

OpenRoads Help

Drawing

Visualization

Animation

View 1 - Top Standard CellApps Actions Design Apps Right of Way

RW

Alignment (Place)

Alignment (Promote)

Right Of Way Line (Place)

Right Of Way Line (Promote)

Survey

Parcel (Place)

Parcel (Promote)

Default Views 1 2 3 4 5 6 7 8 X 2006.1215 Y 757.3416 Z -0.0000

Element Selection > Identify element to add to set

Default

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Place Parcel

Segment/Item: Fed Aid #:
District: County:
Road: Number:
Road Name:
Parcel Type:
Take Category:
Right of Way Category: Exp Date: 8/ 7/2015
FDOT Parcel ID:

Date Of Acquisition: 8/ 7/2015
Property Appraiser ID:
Official Document Type:
Book or Instrument #: Pg #:
Owner:
Grantee:

Section: Township: Range:

Apparent Access:
Access Road:
Description: Comments:

Drafting Date: 8/ 7/2015
Status Date: 8/ 7/2015 Status: Open

Interface

Place Parcel

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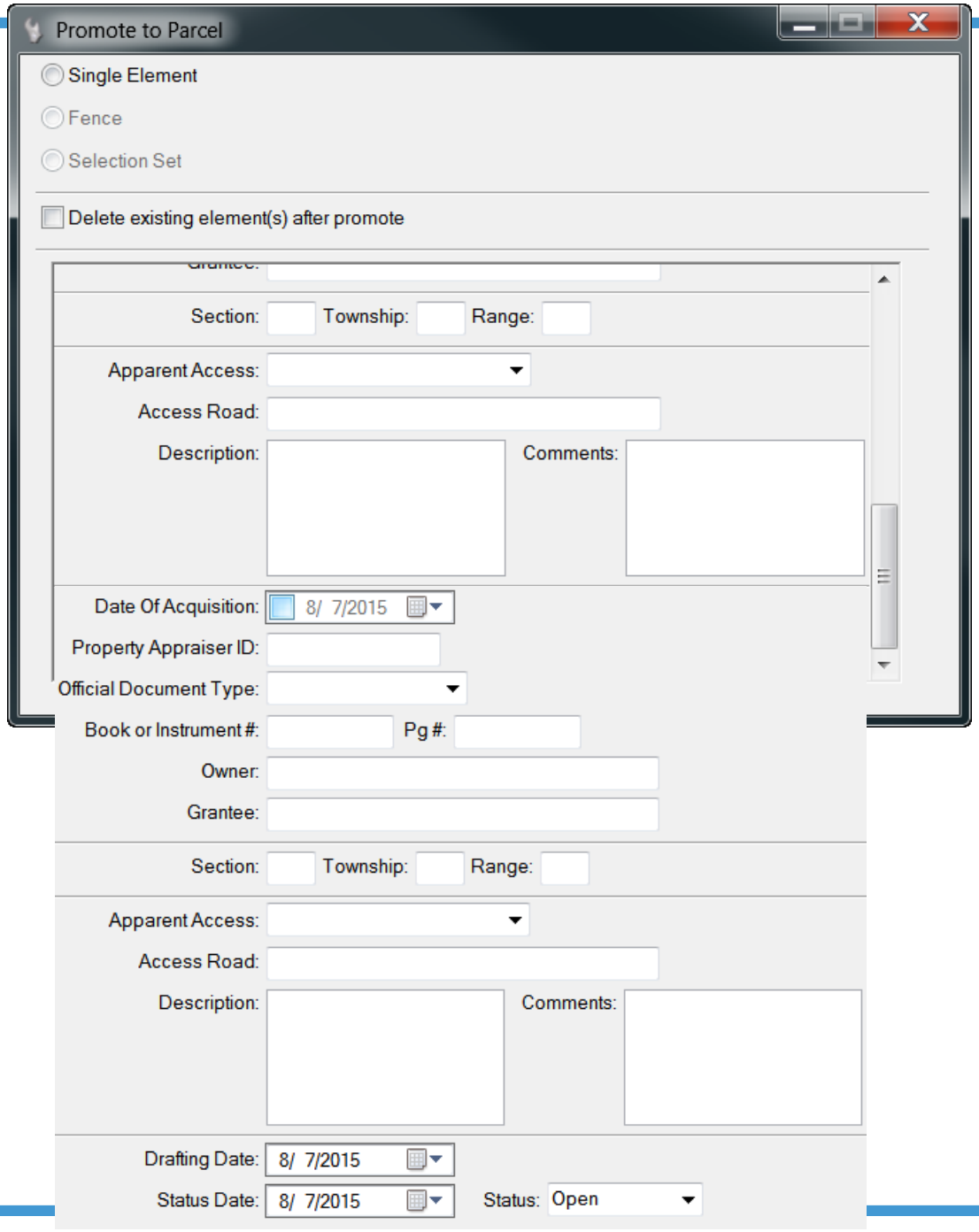

Interface

Promote to Parcel

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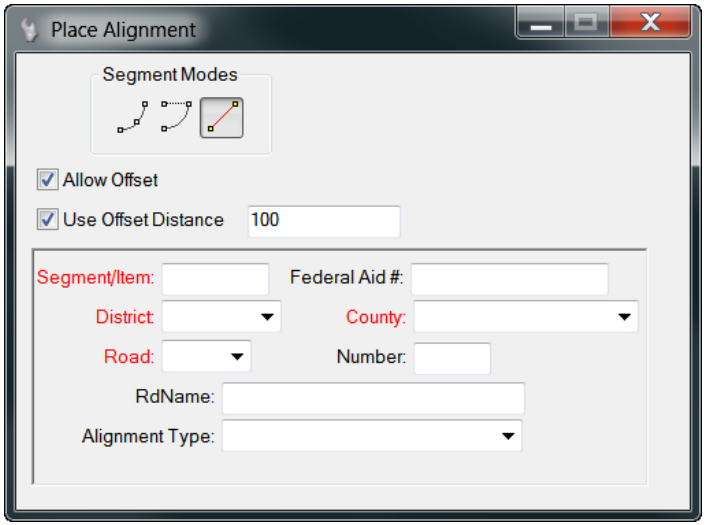
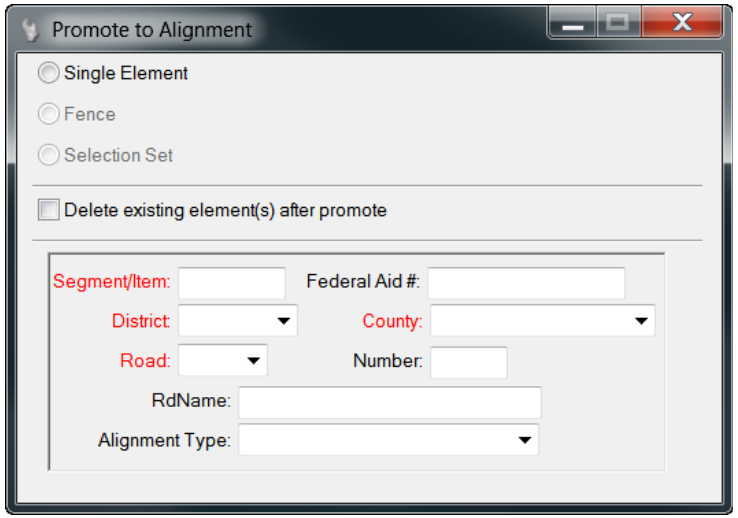
Interface

Place and Promote Alignment





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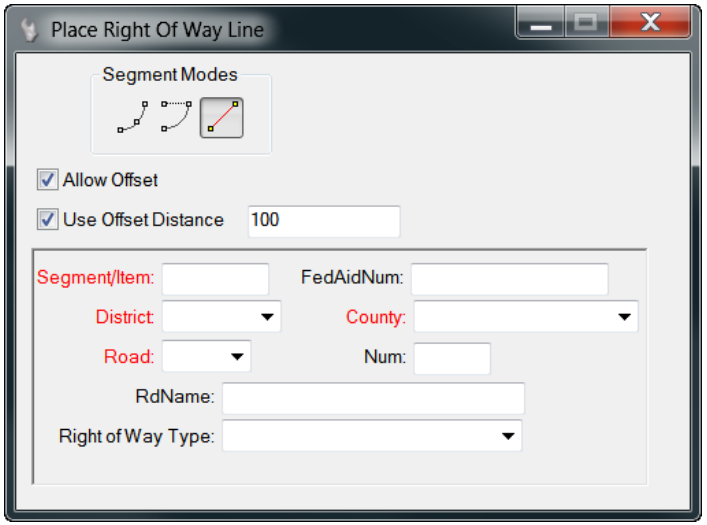
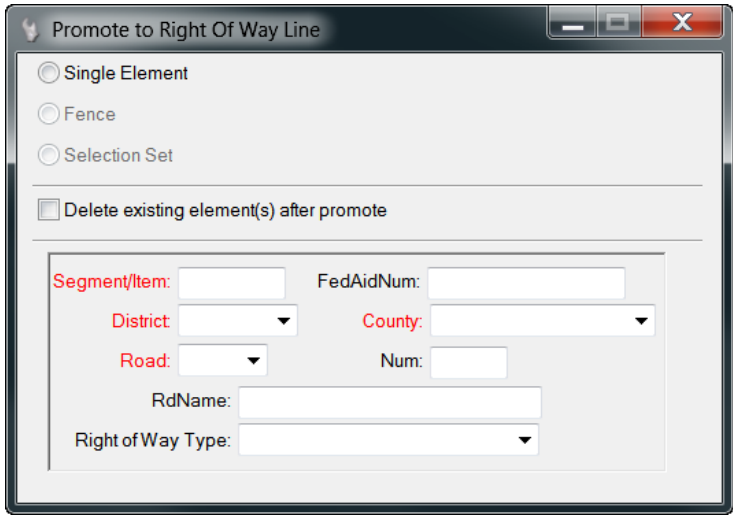
Interface

Place and Promote

Right of Way Line





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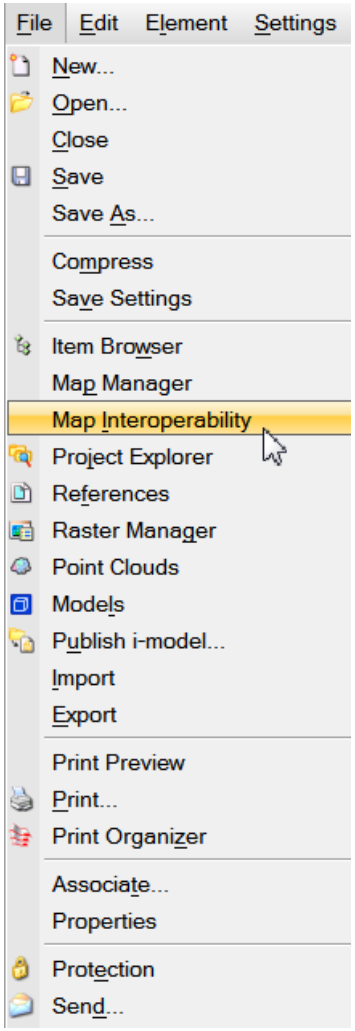
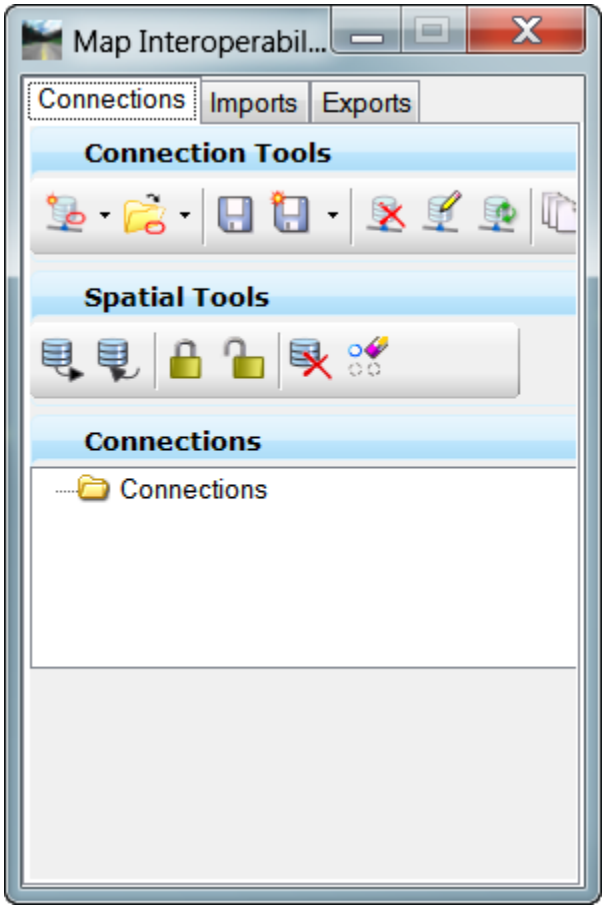
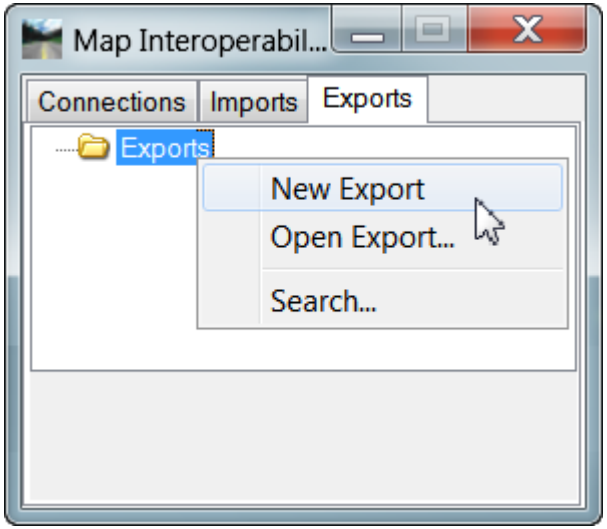
Export to GIS







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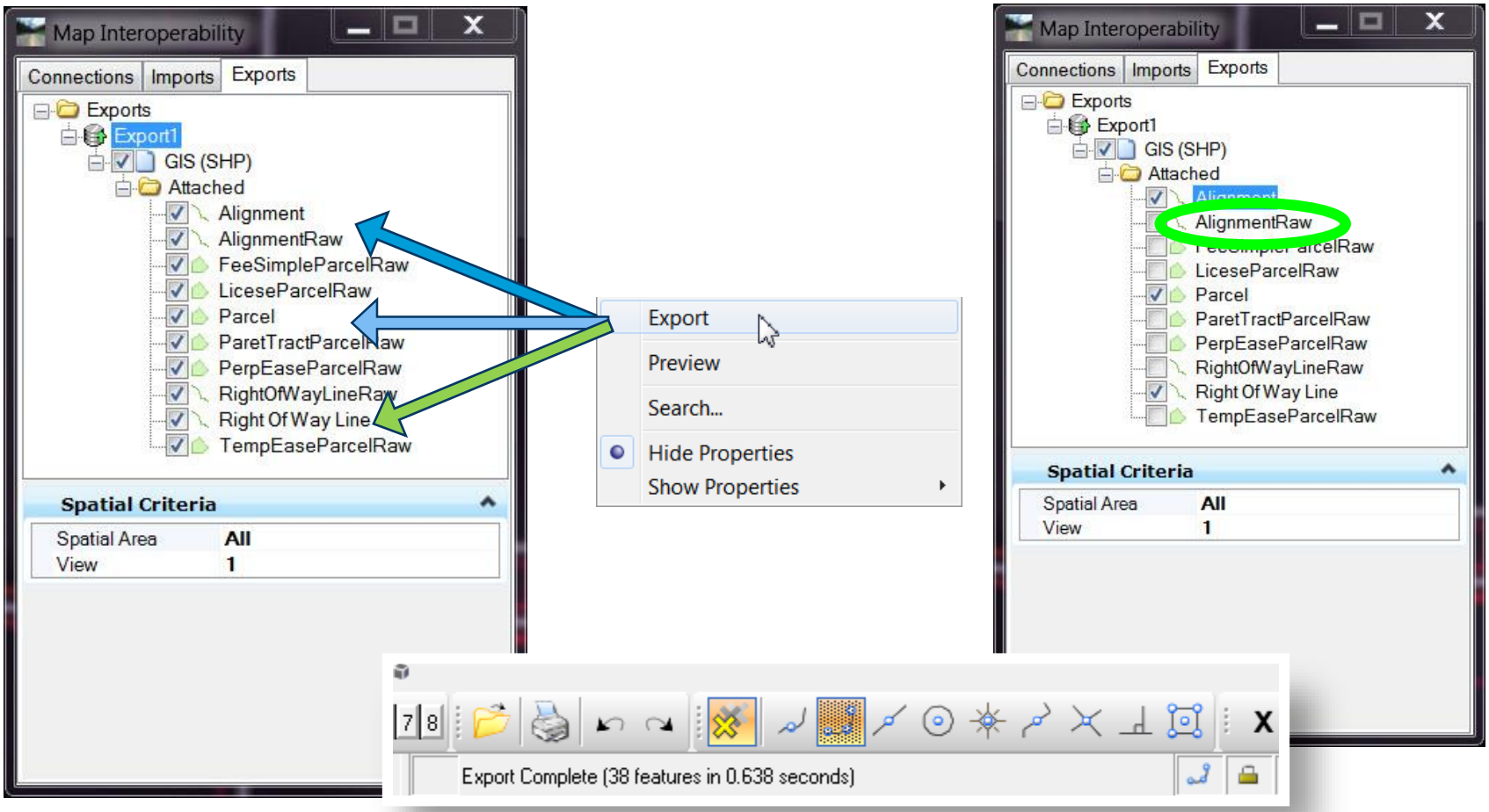
Exporting Options



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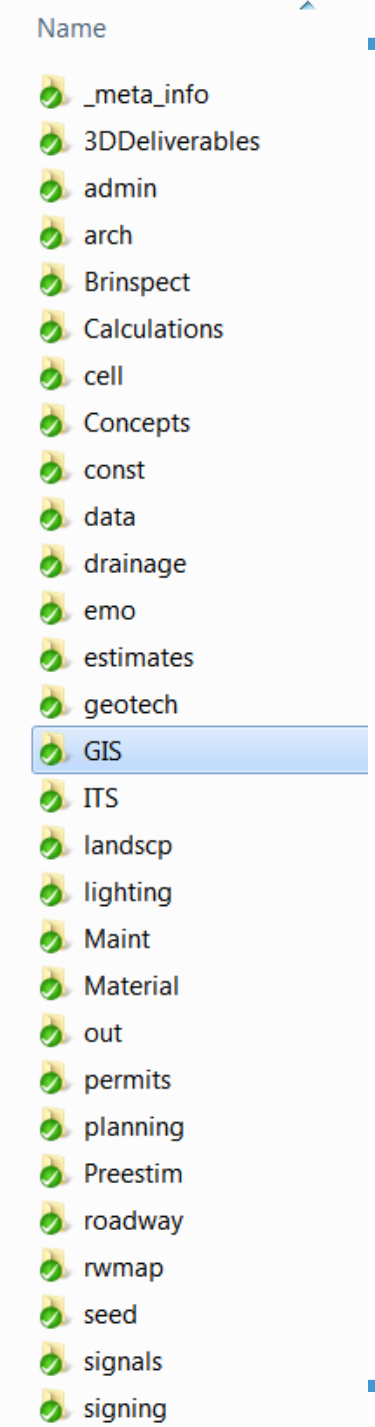
Project Template

Storage of all things GIS



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Interoperability Why does it matter?

Right of Way Mapping maps Parcel

FDOT acquires Parcel

No standard workflow for Parcel Data delivery to GIS

Parcel delivery

- R/W Mapping provides Parcel line work if requested and time permits (no data)
- Parcel shapefiles obtained from secondary source (i.e. County Prop App)
- GIS creates Parcel and data (attributes) directly in GIS from ROW map

Parcel received by GIS (no standard delivery method)

Import Parcel into GIS database

Parcel and data reside in GIS local database

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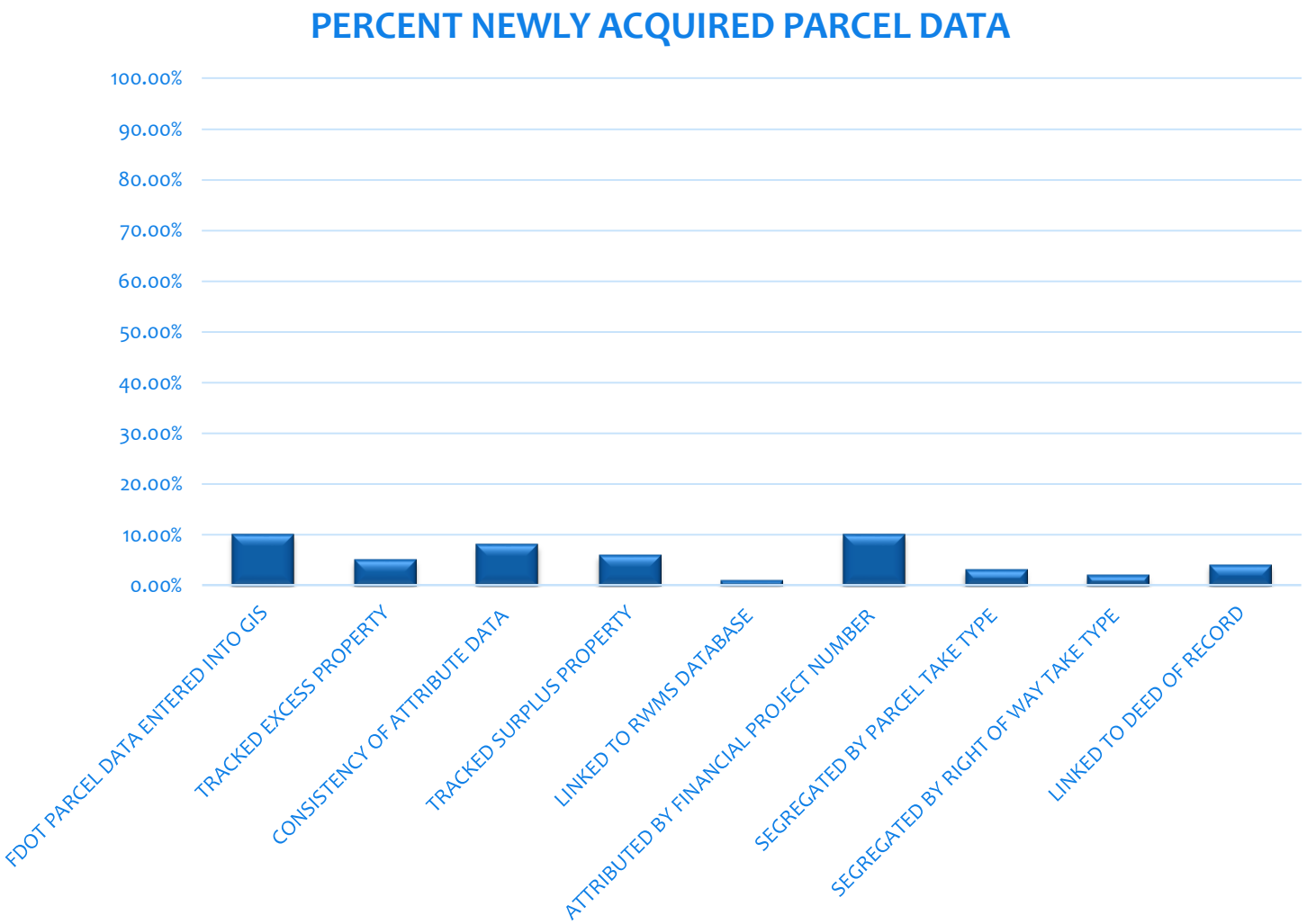
Interoperability Why does it matter?



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Interoperability Why does it matter?

Right of Way Mapping maps Parcel

- Includes known attributes and saves file in the **Project Tree** in the GIS folder for that project

→

FDOT acquires Parcel

↓

Parcel delivery

- Right of Way Mapping notifies GIS Office of Parcel data availability

→

GIS Office

- Exports Parcel data from CADD file
  - Shapefile
  - File geodata base

↓

Parcel and data reside in State-wide GIS database

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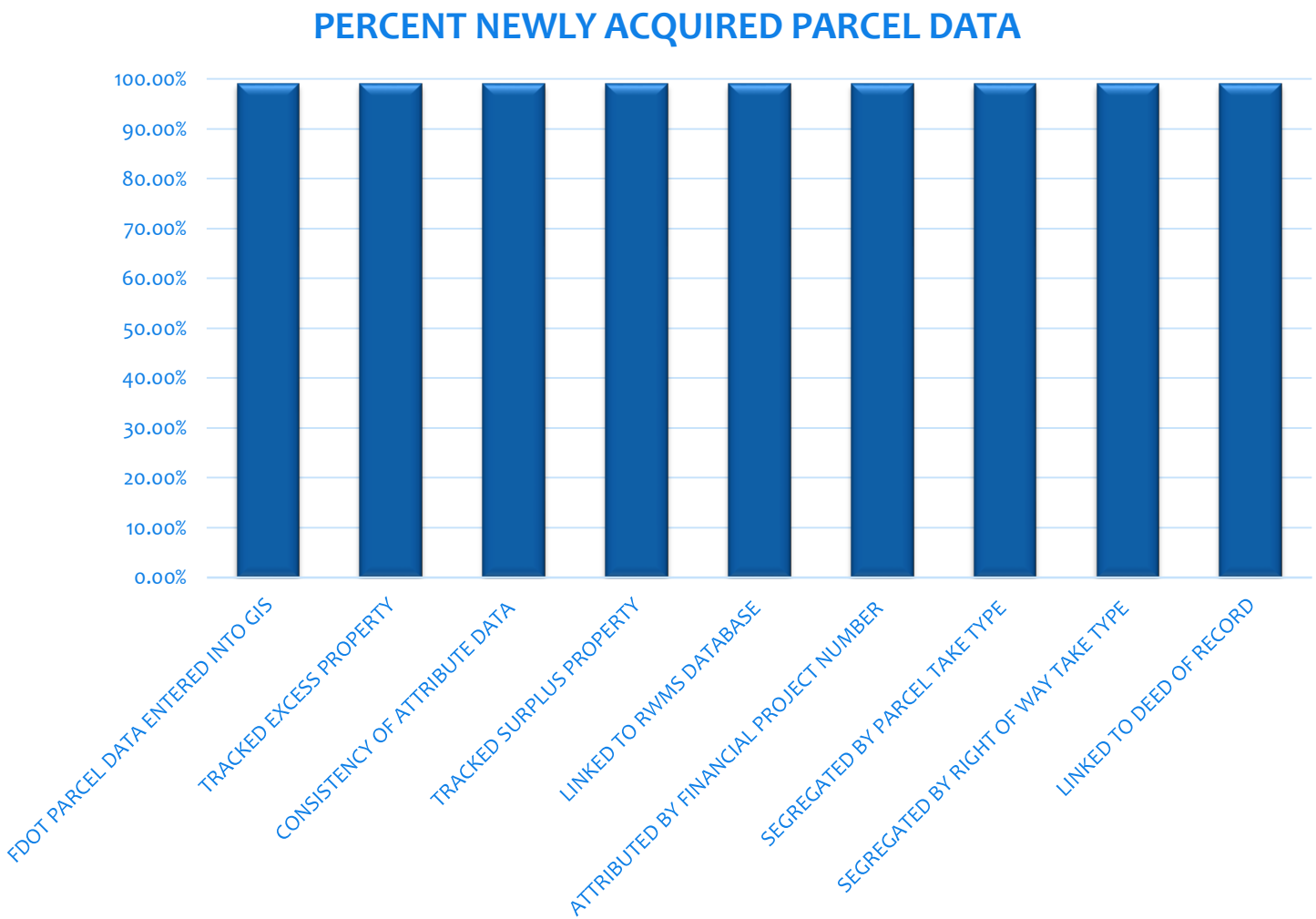
Interoperability Why does it matter?



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Implementation Plan

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Phase 1 Products

Acquired Parcels

Right of Way Lines

Alignments

- Centerlines
  - Survey
  - Construction

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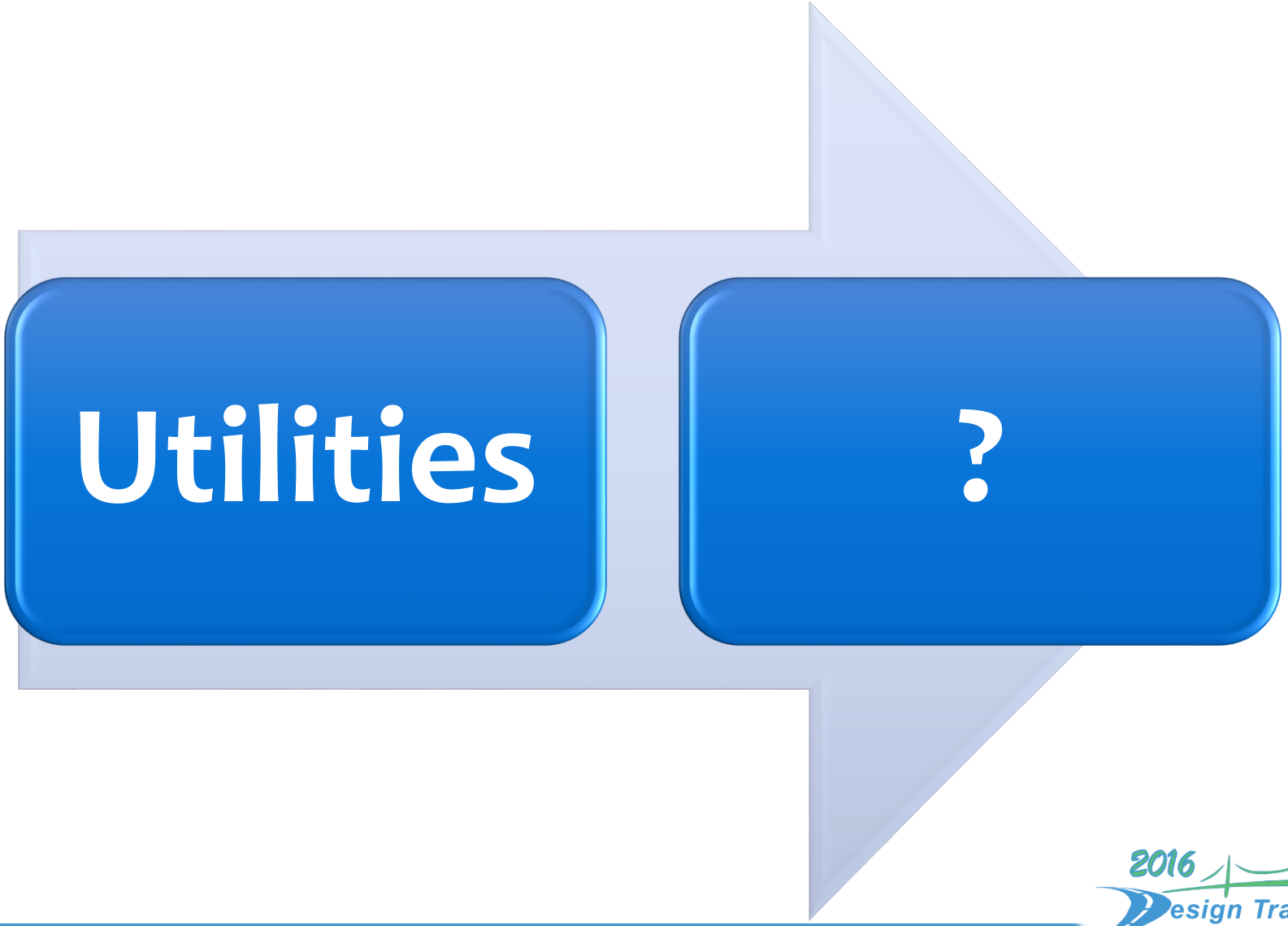
Phase 1

- Right of Way Mapping staff
  - Already producing these elements, now just add data readily available during the initial drafting of Right of Way plans
  - Coordinate/communicate with GIS staff that data is ready for ingest into GIS
- Creating an inventory of the acquisition of parcels, alignments and right of way lines
  - Digital and easily incorporated into other processes and analysis

Phase 2 Products



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Phase 3 Products

Historical Data

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Training

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Training

- July 27th a hands on webinar
- Planning visits to the Districts for workshops

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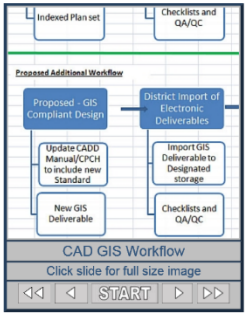
CADD/GIS Interoperability

Overview
CAD to GIS Process
Implementation Plan/Schedule
Future Discipline and Features
Contact Information

Photo Slideshow



Overview

With the Departments' recent creation of an enterprise Geographic Information System (GIS) and increasing customer demand for geographic information to aid in making critical management decisions, a cost effective and efficient system for passing valuable computer assisted drafting and design (CADD) data to our GIS environment is needed. With that goal in mind the Texas A&M Transportation Institute (TTI) was brought in to examine FDOT's current systems, practices and processes to develop a strategic implementation plan to manage this valuable data. For more information please see the **TTI Final Report** (PDF).

Building on the TTI research we have identified and focused on several initial primary features to be passed to GIS, and have developed the workflows and processes required to accomplish this goal. We took advantage of our existing licensed products, and our current CADD delivery standards, to make this new GIS deliverable fit seamlessly into our production plans.

CAD to GIS Process

Create GIS features in either of our CADD environments per the FDOT CADD Manual. Export features and publish to GIS and create new layers for consumption by our GIS customers. Initial focus is on right of way lines, parcels and centerline (alignment). For more details, see the **CAD/GIS Interoperability Presentation** (PowerPoint, 10MB) and **CADD-GIS Guidelines** (PDF, 11.6MB)

Implementation Plan/Schedule (estimated)

Project Scope/Research and Testing: March 2013-February 2014
District Pilot Project: Estimated to begin March 2014
Implementation: Coincide with the release of the 2014 FDOT software

Future Discipline and Features

We anticipate the next features to be added to CADD and exported to GIS, will be Utility features. Also, we will be looking at this process in reverse, using GIS data to reference into the CADD environments.

Contact Information

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http://www.dot.state.fl.us/surveyingandmapping/Inno-CADGIS.shtm

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Questions?

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  - 850-414-4389
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- John Hazlip
  - Staff Surveyor
  - 850-414-4415
  - John.Hazlip@dot.state.fl.us

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RELIABLE, ORGANIZED, ACCURATE DATA SHARING

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