Intersection Between CAD & GIS

PANEL DISCUSSION

ALASKA SURVEY AND MAPPING CONFERENCE – WED FEBRUARY 14, 2018

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Panel Members

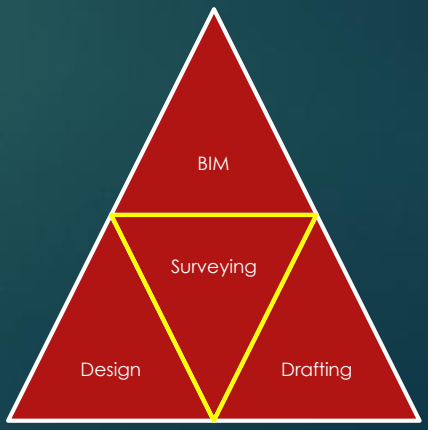
- Tripp Corbin (eGIS Associates)
- John Sharrad (Solution Engineer, ESRI)
- Kevin Robar (R&M Consultants)
- Anthony Robinson (PLS, Senior Land Surveyor, CRW)

The Issue:
They have different cultures, languages, tools and even coordinate systems..

- ESRI historically has been the leading software development company for GIS desktop and enterprise level applications.
- Autodesk has been the leading software development company for Surveying, Engineering, Design and Drafting (CAD) applications.

- Recently…

- Both Industries (GIS and CAD) have become more integrated.
  - Surveyors, Engineers, Designers are utilizing GIS data during planning stages and for bid preparations. GIS data is free (mostly) and available.
  - GIS analysts are absorbing as-built CAD for generating database layers. CAD data has survey –level spatial accuracy as well as important attribute information.



GIS & CAD

- Application similarities
  - Both used to compile maps of real-work conditions
  - Both can input and create and store survey-level data
  - Both are susceptible to GIGO
- CAD is used for DESIGN and DRAFTING
  - CAD is great for survey level precision
  - CAD is great for construction documentation/BIM
- GIS is used for DATAGATHERING, DISPLAY, ANLAYSIS
  - GIS is great for adding attributes to features
  - GIS is great for Displaying Multiple themes
  - GIS is great for Data Analysis

Formats and Definitions

ESRI	AutoDesk
Optimized for Large File Sized Datasets	Not Designed for Large File Sized Datasets
Data Gathering, Display, Analysis	Design and Drafting
Mandatory Reference System (PCS)	Not a Requirement to Work in a Projected Coordinate System
Database File Storage	File-Based File Storage
Optimized for Web Publishing	Primarily Paper / PDF Publishing
Can handle large areal computations	Built for smaller areal computations

Formats and Definitions

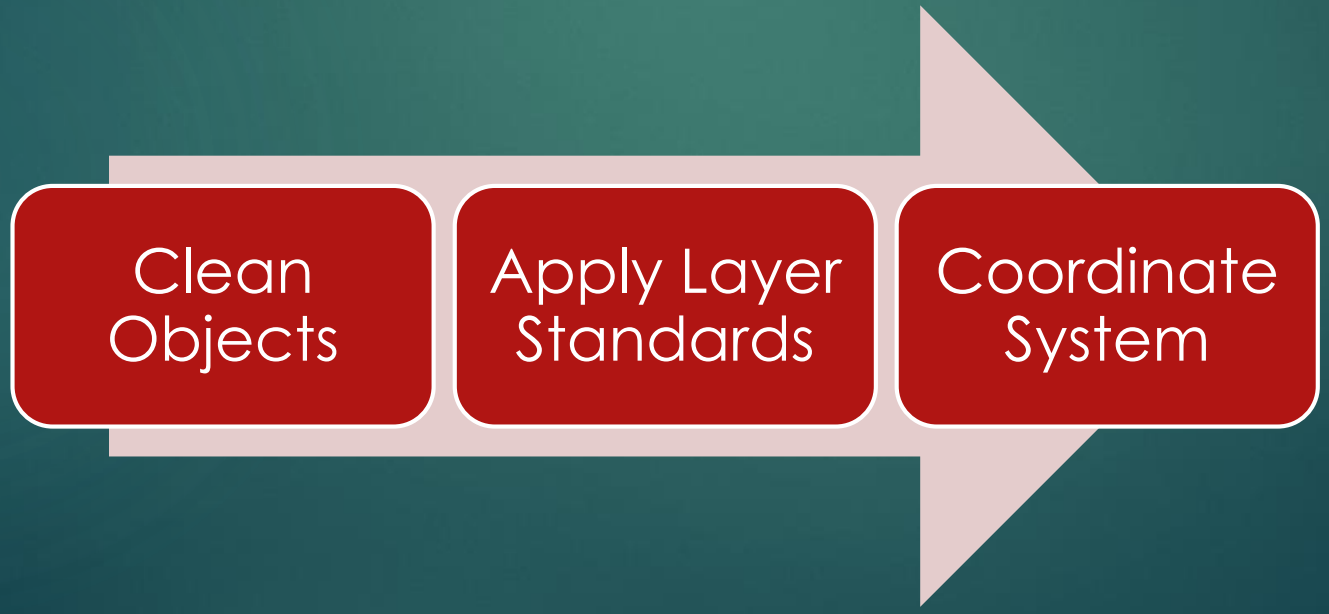
GIS	CAD
CAD File	Drawing File Types (DWG, DXF, DGN)
Geodatabase(Points, Lines, Polys etc.)	Drawing File (also typically contains Annotation, text styles, attributes, plot layouts, references)
Organized as a Feature	Organize using LAYERS or Levels
Feature Class	LAYER with a color or linetype
Feature	ENTITY
Schema	Drawing Template(DWT)
Data Store	DRAWING

Points of Discussion

Key Points
Coordinates – Surprising how many people don't understand coordinates. Often the biggest impediment in sharing data effectively. What must be done to enhance integration?
Local Conditions – Units, Scale Factors, Direction. Metadata storage and how to pass it on.
What is the best way to pass into GIS attributes from CAD?
When is it time to call in the Professionals?

GIS Needs

- Clean Layers (Delete / Map Cleanup)
- Data must be transformed – a "real" coordinate system
  - Can be in ground – but needs grid scaling factor
  - Can be in Grid
- Data *can* have attributes – Object data, text labels, link templates
- Data *can* have metadata – What is being supplied



CAD Needs (Map 3D)

- PRJ (Projection File recognized by CAD)
- Data *can* have Datum, Projection, Parameters
- Data *can* have Local Conditions: Units, Scaling Factor, Directions

Must Have Translators

- FME by SAFE Software: Readers and Writers capable of translating many layers into GIS features and vice versa.
- Blue Marble GeoCalculator
- Others?

Thank YOU!

- Questions
- Key points you think we should discuss
- Stories you have and how you solved them