The Value of GIS to Private Practice Firms

Concord Engineering & Surveying, Inc. (CESI)

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About CESI

- Founded 1978
- 30+ employees
- 5 PE’s, 7 PLS’s

Disciplines

- Civil Engineering
- Geotechnical Engineering
- Surveying

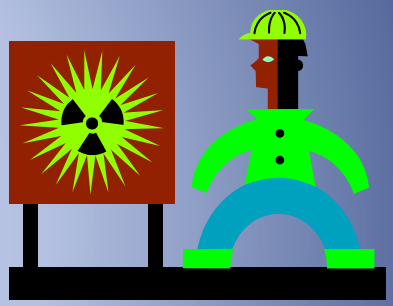
Services

Civil Engineering

- Preliminary and Final Site Plans
- Rezoning
- Street Design
- Utility Design
- Grading Plans
- Storm Water Treatment
- Erosion Control

Services

Geotechnical Engineering



- Phase I & II Environmental Site Assessment
- Certified Site Certification
- Wetlands Identification and Evaluation
- Geotechnical Soils Assessment
- Construction and Materials Testing

Services

Surveying

- Boundary
- Topographic
- Aerial
- Construction
- Rezoning
- Subdivision
- Special Projects (NC/SC, NCRR)

Value of GIS – Civil Engineering

Civil Engineering design relies on field surveys that accurately and precisely locate the boundaries, topography, and existing improvements on the property to be improved….

…..BUT....!

Value of GIS – Civil Engineering

…..Due Diligence requires obtaining as much existing information about a property as possible to do inexpensive approximations of the difficulty and cost of developing the anticipated improvements to see if it is worth the investment in accurate surveying and engineering design…..the accuracy of GIS is ideal for this use!

Value of GIS – Civil Engineering

Preliminary Site Planning

- PIN – indispensable for use in identifying property on multiple forms to multiple regulators, and to other subconsultants
- Parcel – size and shape of property
- Zoning – is the improvement allowed? By right? By rezoning?
- Streams and Wetlands – Are there sensitive areas that must be considered or permitted?

Value of GIS – Civil Engineering

Preliminary Site Planning (cont.)

- Floodzone – How much of the property is unusable because of flooding?
- Addresses – Invaluable in contacting adjoiners for rezoning
- Impervious Area – Are there existing buildings that must be considered? Impervious also determines stormwater treatment capacities.

Value of GIS – Civil Engineering

Preliminary Site Planning (cont.)

- Surrounding Uses – Whether from GIS data or from orthophotos, this information helps establish appropriate uses.
- Vegetation – Tree save areas? Clearing costs?
- Topography – Are slopes too steep to develop? Where to put erosion control?

Value of GIS – Civil Engineering

Schematic Grading/Stormwater Plan

- Topography – How much earthwork? Will the site balance? Where does the storm water system need to be installed?
- Vegetation – How much clearing? Tree save areas?
- Floodzone – What elevation is the 100-year storm? Are there stream buffers or floodplain restrictions?

Value of GIS – Civil Engineering

<u>Schematic Grading/Stormwater Plan</u> (cont.)

- Wetlands – Impacts? Mitigation?

Value of GIS – Civil Engineering

Preliminary Utility Layout

- Topography – Slope & fall
- Existing Structures - Where do services need to be installed
- Vegetation – Clearing
- Floodzone – Clearance above 100-yr flood
- Wetlands and Streams – Crossings and permitting

Value of GIS – Civil Engineering

Rezoning

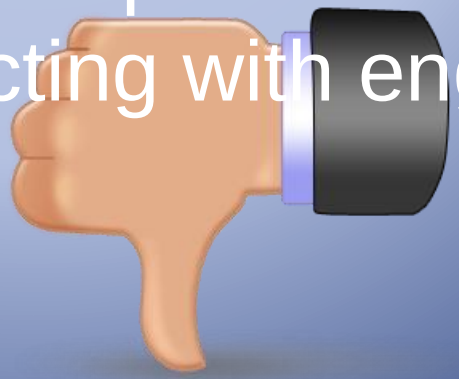
- PIN – For all those applications
- Zoning – What is it now and what does it need to be rezoned to?
- Uses – What is compatible and what is not?
- Address – Adjoining property owner contacts

Value of GIS – Civil Engineering

GIS provides a resource that aggregates information in one place, eliminating multiple trips to the tax office, the planning department, the register of deeds, the utility provider, seeking out USGS quad maps for topo and vegetation, site visits to see look for improvements on the property, etc. AND, it can all be done sitting in the office using the computer!!!!

Value of GIS – Civil Engineering

One of the missing links (there may be others) is utility information!!! Since 9/11 most water and sewer utility providers do not allow the public to view the information in the system. This is inefficient for the engineer in private practice, and requires the public utility provider to spend more employee time interacting with engineers than is necessary.



Value of GIS – Civil Engineering

The private practice engineering community would strongly support public utilities providing them access to current GIS utility information. Local municipal and county GIS systems might even consider including non-municipal utility information in the database (gas, telephone, cable, etc.)

Value of GIS – Geotechnical Engineering

Geotechnical Engineering provides information about property needed to decide if a property is a sound investment, and if so, what type of soils and environmental issues will be encountered, allowing designers to incorporate those issues in the design, instead of those issues being encountered during site development in an unplanned and costly manner….

Value of GIS – Geotechnical Engineering

….part of the value of GIS is in being able to plan the site visit based on information of how much of the site is wooded and must have paths cleared for drill trucks to enter, where there are streams that will have to be crossed or avoided, where to access the property from the public road, etc. ….

Value of GIS – Geotechnical Engineering

....but GIS is of unique importance for two special types of due diligence – Phase I and II Environmental Site Assessments, and Certified Sites.

Value of GIS – Geotechnical Engineering

Phase I & II Environmental Site Assessments

- Wikipedia says a Phase I is - “a report prepared for a real estate holding that identifies potential or existing environmental contamination liabilities.”

Value of GIS – Geotechnical Engineering

- Wikipedia says a Phase II is – “an "intrusive" investigation which collects original samples of soil, groundwater or building materials to analyze for quantitative values of various contaminants…normally undertaken when a Phase I ESA determines a likelihood of site contamination.”

Value of GIS – Geotechnical Engineering

NC Certified Sites Program

- "A statewide inventory of industrial sites that have undergone a rigorous prequalification process to ensure they meet a consistent set of standards." http://www.thrivenc.com/locationtools/nc-certified-sites-program

Value of GIS – Geotechnical Engineering

GIS shows:

- Historical Parcel information that shows, for example, who are previous owners of smaller tracts that may have been incorporated into one larger tract. This allows investigation into what those previous uses may have been.

Value of GIS – Geotechnical Engineering

GIS shows:

- PIN numbers that facilitate use of locations services such as NC One Call

Value of GIS – Geotechnical Engineering

GIS shows:

- Historical orthphotos and topography that show historical uses that might not be noted elsewhere

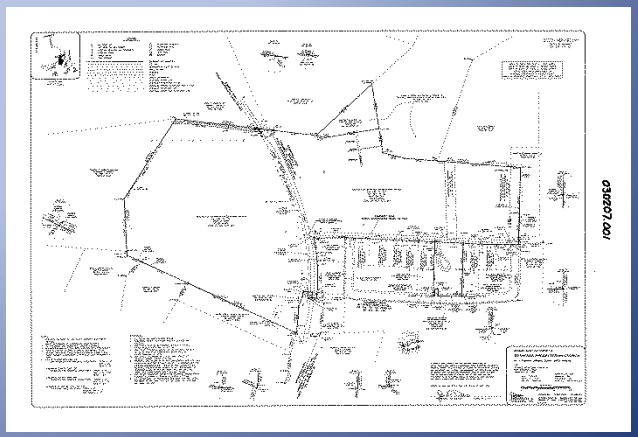
Value of GIS – Geotechnical Engineering

GIS shows:

- Many other things of value, such as building footprints that can be imported directly into reports, potential wetland areas, etc.

Value of GIS - Surveying

Many of the uses for GIS in Surveying overlap those for Civil and Geotechnical Engineering, but in addition, Surveying property has the basic need of property descriptions contained in deeds and recorded maps, both for the subject property and adjoining properties…



Value of GIS - Surveying

Surveyors must compare the description of the subject property with adjoining property to identify any discrepancies that need to be evaluated during the field survey. GIS provides an important schematic view of the properties and the reference information that allows retrieval of the deeds and maps from the Register of Deeds online system.

Value of GIS - Surveying

This valuable resource allows research of property information to be done quickly, easily, and remotely. With GIS property can be researched in counties far afield without the time and expense of staff traveling to-and-from a distant courthouse, and is especially beneficial if additional research is required, eliminating multiple trips.

Value of GIS - Surveying

But, in addition to the use of **public GIS**, the use of **GIS** software makes the integration of multiple types of information needed for large projects much easier and efficient than possible with typical CAD software.

Value of GIS - Surveying

Some examples:

NC/SC Boundary Line Survey

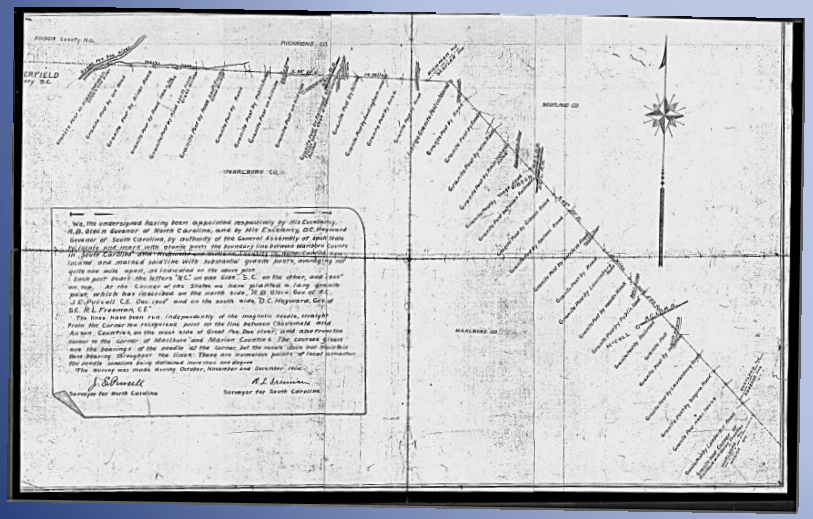
- GIS used to incorporate NC and SC GIS information into one database for orientation and comparison…

Value of GIS - Surveying

…and to add in other information such as historic grants…

Value of GIS - Surveying

…and the ability to “rubber sheet” unscaled drawings onto survey information…

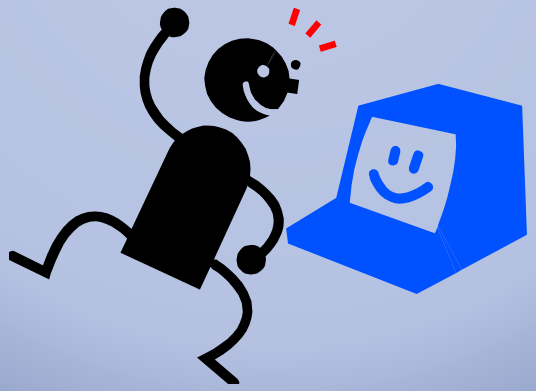


Value of GIS - Surveying

…this type of application works well for incorporating many types of information for similar, large projects such as the NCRR Corridor Monumentation Survey, large mixed-use properties such as the Charlotte Motor Speedway, and preparation of exhibit and presentation maps for court cases, etc.

Value of GIS

GIS, both public and private, is an important tool providing speed, efficiency, and streamlined access to today's professional design services community!



Questions?