2008 NSDI CAP Category 5

Building Stewardship Capacity for Structures and Transportation Geodata within the Iowa Geospatial Infrastructure

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Project title: Building Stewardship Capacity for Structures and Transportation Geodata within the Iowa Geospatial Infrastructure - **Interim Report**

Organization: Iowa Geographic Information Council

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http://www.iowagic.org/

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Data themes: (list)

> Structures (building footprints derived from statewide lidar project)
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> Transportation (road centerlines from Iowa DOT LRS database)

Ancillary framework data themes collected and used in this project

Ortho-imagery (2006, 2007, 2008 NAIP imagery; 2' 4-band imagery for NW Iowa 2007)

Elevation (1 meter DEM derived from lidar: bare earth, shaded relief and 2' contours)

Project Narrative

Project description:

This project will develop a process to provide structures and transportation data from Iowa to the NSDI and maintain those data layers over the long term. The project involves four main activities: 1) members of the Iowa Geographic Information Council will seek agreements for the stewardship of a structures GIS framework layer by local governments and others in Iowa, 2) development of a GIS technical infrastructure needed to support the maintenance and stewardship of the structure data by developing a web editing service, 3) upgrading a critical ortho-imagery server used in a variety of base mapping application and data development processes throughout the state, and 4) development of a extraction and translation service to automate transportation data flow from Iowa DOT's Linear Referencing System and Geographic Information Management System (GIMS) and store it in a centralized road centerline layer. Both the framework structure layer and transportation layer will be available through the Iowa Geospatial Data Clearinghouse, a component of the Iowa Geospatial Infrastructure.

Tasks, highlights, challenges, and accomplishments:

Task 1) *Seek agreements for the stewardship of a structures GIS framework layer by local governments and others in Iowa.* No agreements for data stewardship yet due to delays in rolling out structures data layers by DNR. Tested software to extract building footprints from lidar data, but waiting for delivery of additional lidar data from statewide project in October, before beginning.

Using the return on investment data from our 2007 50 States Grant, we have submitted two proposals (totaling $1M) to state funding sources that will greatly impact the structures stewardship. The first project will work with county GIS programs to move data into the county GIS data repository. This data will be made available to state GIS programs which will help us to label structure footprints with addresses, parcel IDs, structure type and other information. The second project will build a geocoding service and create address points for all buildings in the state. This will again require county data that will be useful in attributing the structure footprints extracted from the lidar data. If funded the first project could begin as early as January 2009 and the second project begin in July 2009.

Task 2) *Development of a GIS technical infrastructure needed to support the maintenance and stewardship of the structure data by developing a web editing service.* The GIS technical infrastructure has been established at Iowa State University's GIS Research and Support Facility. The web editing service is being programmed by staff there. Currently the editor is being tested with pre-existing building data derived from 2006 Polk County Lidar (produced by NGA for the National Governor's Conference). A

web service has been built and is in the testing phase. The editing service includes display of the pre-edited structures, orthophotography, and other spatial data layers as overlays for ease of editing the building footprint data. Typical challenges of this phase have been setting up the editing service in ArcGIS Server 9.2 and adding and expanding features as testing is carried out.

Task 3) *Upgrading a critical ortho-imagery server used in a variety of base mapping application and data development processes throughout the state*. The orthophotography server infrastructure has been upgraded and is being used to supply the web editing service with the base orthophotography data as well as the building footprint data. No new challenges in this task are anticipated. New data has been loaded from the state's 2007 leaf-off ortho project (with funding assistance from USGS Iowa State Liaison office). The ortho server will expand with new acquisitions in the western half of the state in the spring of 2009, and eastern part in 2010. New 2008 color NAIP imagery is currently being delivered and will also be loaded on the orthophotography server. The combination of these two ortho programs will form the base imagery for the structure web update tool for the foreseeable future. The statewide NAIP 2008 orthos will also be used to update DOT road centerlines.

Task 4) *Development of a extraction and translation service to automate transportation data flow from Iowa DOT's Linear Referencing System and Geographic Information Management System (GIMS) and store it in a centralized road centerline layer.* Iowa DOT continues to work on a new version of their LRS road centerline data, which will be publicly available in early 2009. DOT has announced that they will be rolling out their own WMS and WFS services in November 2008 with their road centerlines. This should greatly facilitate the project team's efforts to build an ETL process to extract features and attributes from the LRS model stored in Spatial Oracle, and create a cartographic road product stored in a central database in ArcSDE. Using something like the ESRI Interoperability Tools, we should be able to provide National Map with a process to connect to the DOT WFS and using the ANSI framework exchange schema, extract standardized transportation data layers.

DOT has in place data sharing partnerships with 30 local governments for transportation data. Later this fall we will be discussing with DOT's Transportation Data Group integration of this partnership program with IGI/NSDI data stewardship efforts.

FYI, AASHTO TIG has awarded Iowa DOT a grant to promote "Multi-Level LRS", based upon the NCHRP 20-27 model. With this grant a ML LRS lead states team has been formed to provide assistance, education and experiences with other states. The lead states team is comprised of Iowa, California, Wisconsin, Minnesota, North Carolina and Ohio. The goal of this project is move towards a standard transportation model for the US.

Challenges:

1) Standards for structures data seem to be non-existent except for the best practices model schema (http://bpgeo.cr.usgs.gov/model/).

We are having difficulty interpreting some of the fields and domains from this schema

and would appreciate some guidance from USGS and/or other states. Perhaps there is some documentation in the HSIP area that is not readily available on the Internet.

2) We are encountering institutional challenges when collecting local data for distribution in the state spatial data infrastructure, and developing data stewardship partnerships for maintenance:

   a) some local data producers charge for data, sometimes charging $1000's, which limits use by other government agencies, and others who can not afford these costs

   b) some local data producers charge private companies for data, which complicates administration of state and federal data distribution systems

   c) some local data producers have licensing agreements, while allowing use by other agencies, limits use by 3rd parties

   d) most local data producers do not have the resources to regularly update state managed data layers, such as transportation (though DOT does have agreements with 30 counties currently, out of 99), hydrography or structures. Agreements requiring local data producers to frequently update state managed GIS layers with mandated attribution, accuracy standards or metadata requirements without state support are not viewed as equitable.

We hope to address the institutional issues over the course of the next 3-5 years through joint projects with local data producers that enhance cooperation and result in mutually beneficial efforts. Our 2007 50 States CAP grant (http://www.iowagic.org/igi) has documented that the best business model for local GIS programs is to make the data as widely available as possible. In addition, it is in everyone's best interest to help as many county offices as possible to effectively use GIS within their daily programs. Counties that only use GIS for a limited number of applications are not breaking even on their investment, which compels them to try to sell the data to recoup the start-up costs. State programs in turn must get over their desire to only get what they can out of county GIS programs without recognizing resource needs or supporting GIS data maintenance efforts in some fashion. This local equity issue is relevant to the Federal Government and NSDI as well. While federal agencies in Iowa have repeatedly cooperated with state agencies on GIS projects, there is a need to find ways for them to collectively assist local data producers as well, in some tangible way. IFTN may be one part of the solution. Both the state and federal governments need to understand that this process will take some time and effort.