

2011 State Summary Report

This is the sixteenth (16th) year that the GIS-T Symposium has conducted a survey of GIS activities at State DOT's. The survey was administered using a web-based survey instrument. The survey's purpose is to inventory the current state of practice, identify potential needs, and discover wide ranging topics for discussion. The result was a ninety-two percent (92%) response, with forty-six (46) respondents. The responses were down from ninety-eight percent (98%) in 2010.

GIS Organizations Structure and Development Stage

A highest percentage of States responding, forty-seven percent (47%), report having an organizational structure consisting of a GIS core unit, providing technical support to a much larger group of end-users throughout the agency. This is up from forty percent (40%) in 2010. Generally unchanged from last year is the forty percent (40%) citing an "enterprise" GIS organization with agency-wide data integration.

This year, the organizational location of GIS core units is evenly distributed between Planning (39%) and Information Services (39%) with 22% reporting other locations. In 2010's results, Planning had a slight edge. The tie could be the result of fewer respondents or some state's efforts to consolidate information technology functions including GIS. Unchanged from last year, seventy-three percent (73%) of the states responded having 13 core staff between one (1) and ten (10). Within that group a slight majority reported between six (6) and ten (10).

Forty-five percent (45%) of the States reported having a certified GIS professional on staff. That represents a ten (10%) increase over 2010 figures. However, only thirteen percent (13%) of respondents claimed certification was an important hiring consideration; that count is unchanged from the 2010 survey.

The allocation of GIS staff time across core functions hasn't changed much since the 2010 or 2009 surveys. The emphasis is still on road base map development and enhancement with twenty-two percent (22%). The second highest accounted staff time went to Web Application Development up slightly to eighteen percent (18%). GIS technical support and training was practically unchanged at sixteen percent (16%) while LRS maintenance dropped slightly from seventeen percent (17%) to thirteen percent (13%).

Fifty-seven percent (57%) of respondents outsource less than thirty percent (30%) their GIS application development work. The majority spend less than \$500,000.

GIS Software

Respondents were asked to identify what software products were used for GIS analysis and web mapping by core and user staffs. Twelve (12) separate products from six (6) different vendors were identified. The most widely used products are from Esri® in both core and distributed user groups; Bentley Microstation® was also prevalent. To a lesser

degree states cited Intergraph® and Caliper® products and finally, AutoCAD® and MapInfo®.

Most States use commercial relational database management software (RDBMS) in combination with GIS software to manage their geo-spatial data. Oracle® is used by forty-four percent (44%) of the States, either alone or in combination with other database software. Other commercial database software used by the States includes SQL Server® (33%), and Microsoft Access® (18%). The use of Microsoft® SQL Server is unchanged from 2010, but states citing Access is from fifteen percent (15%) in 2010.

At fifty-eight percent (58%) and Oracle Spatial® at thirty-eight (38%) are the principal software packages used to manage the geo-spatial attributes in enterprise data warehouses. These numbers represent a slight change from 2010; ArcSDE® fell four (4) points while Oracle Spatial® rose three (3) points. These are modest changes since 2009.

The reader should note that software questions permitted multiple answers from the same responder.

Web Applications

Questions were asked pertaining to web application development and costs. States' expenditures in this arena are wide ranging in the areas of hardware, software, services, data, and other needs.

Like the GIS desktop tools, the Esri® products represent a large percentage of deployments at fifty percent (69%).

Road Centerline Networks and Other Geo-Spatial Databases

A key component of most transportation GIS activities is the road centerline network database. All but one (1) respondent reported that they maintain a digital road centerline database. Both the spatial accuracy and coverage of these databases continue to improve. Sixty percent (60%) of the States report that their road centerline databases have a spatial resolution of 1:5,000 scale or better. Much of the improved accuracy has been achieved through the use of high-resolution ortho-imagery and/or kinematic GPS. With respect to coverage, over seventy-five percent (75%) of the states report that their road centerline database includes all public roads; this is up from seventy percent (70%) in 2010. With the slight drop in respondents, these numbers reflect little overall change.

Benefits and Costs of GIS Applications

Several questions introduced in 2006 regarding the perceived benefits and costs of geospatial technology were asked again in this year's survey. Enterprise data integration continues to be cited by most respondents, sixty percent (60%) as yielding the greatest benefit and also cited as the most costly/difficult to implement. Asset Management remains high in 2011. Asset Management was second to Data Integration in both benefits and cost. Trending third for benefits was Public Information Portals, but was fourth in cost.

Current Activities

Respondents were asked to list up to four of their current GIS activities for the *Roll Call of States*. Listed activities were grouped into similar categories and then ranked based on the number of times that they were cited by the respondents. Table 1 lists those GIS activities cited five or more times by the State DOTs. New to the table for 2011 is Data Sharing /Coordination, meanwhile, Safety / Crash Analysis returned after a one (1) year absence. Falling off the list from 2010 were Road centerline database development / enhancement, Road Inventory Management, Roadside features / Activities, and 5-1-1 / Emergency Operations.

<u>GIS Activity (Categories with at least 5 citations)</u>	<u># of Citations</u>
Development of web-based GIS applications / Portals	16
Migration to new GIS software / Hardware /Architecture	12
Asset/Pavement Management	11
Enterprise Applications	10
HPMS	8
Geotechnical / Environmental / Cultural Analysis	8
Data Sharing / Coordination	8
Mapping / Base Maps	7
Safety / Crash Analysis	6
Location referencing system	6
GPS / Field Collection / Mobile	6

Table 1 - High priority GIS activities at State DOT's

The top four items on the list are all enterprise related. They imply GIS continues to expand in business areas enterprise wide. The development of web based applications and portals, both Intranet and Internet, reflect the use of GIS for transparency, and data access and integration. Migrations to increased computing power and the latest technology are indicative of increased use and positions GIS for enterprise implementations.

HPMS continued to appear in similar numbers to 2010. The GPS / Field Collection / Mobile category was interesting because most of the respondents cited it in conjunction with Outdoor Advertising. Just as interesting were two categories that just missed the five citations, Project / STIP Visualization and Enterprise Resource Planning (ERP). Whether they will trend into the list next year is, of course, unknown. However, they both appeared this year without being identifiable categories from previous years.