State Summary Report

This is the seventeenth (17th) 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 the same as in 2011.

GIS Organizations Structure and Development Stage

A highest percentage of States responding, forty-eight percent (48%), report having any organizational structure consisting of a GIS core unit, providing technical support to a much larger group of end-users throughout the agency. This is slightly up from forty-seven percent (47%) in 2011. Generally unchanged from last year is the thirty-nine percent (39%) citing an "enterprise" GIS organization with agency-wide data integration.

This year, the organizational location of GIS core units was weighted towards being located in an Information Services office (36%). Thirty-three percent (33%) of the respondents had their GIS core unit within a planning office with fifteen percent (15%) reporting other locations. For this year's survey the question on staffing was adjusted to ask for the number full-time and part-time employees, as well as the number of on-site and off-site contractors. The average size for GIS staff was ten (10) full-time and six (6) part-time employees with four (4) on-site and six (6) off-site contractors.

Forty-four percent (44%) of the States reported having a certified GIS professional on staff. This is pretty consistent with 2011 figures. Seventeen percent (17%) of respondents claimed certification was an important hiring consideration; that count is an increase from the 2011 survey. The allocation of GIS staff time across core functions hasn't changed much since the 2011 or 2010 surveys. The emphasis is still on road base map development and enhancement with twenty percent (20%). The second highest accounted staff time went to Linear Referencing System development and maintenance at nineteen percent (19%). Web Application Development was the same as last year at eighteen percent (18%). Data warehouse development and maintenance was at seventeen percent (17%) while GIS technical support and training was unchanged at sixteen percent (16%).

GIS Software

Respondents were asked to identify what software products were used for GIS analysis and web mapping by core and user staffs. Ten (10) 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-eight percent (48%) of the States, either alone or in combination with other database software. Other commercial database

software used by the States includes SQL Server® (35%), and Microsoft Access® (13%). The use of Microsoft® SQL Server went down slightly from 2011, and states citing Access are down to thirteen percent (13%) from 2011.

ArcSDE at sixty-one percent (61%) and Oracle Spatial® at thirty-five (35%) are the principal software packages used to manage the geo-spatial attributes in enterprise data warehouses. These numbers represent a change from 2011; ArcSDE® jumped eleven (11) points and Oracle Spatial® rose one point. 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-nine percent (69%) 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, almost seventy percent (70%) of the states report that their road centerline database includes all public roads; this is down from seventy-five percent (75%) in 2011. With the same level of participation as 2011 the decline may be due to different states responding to the survey compared to last year's survey.

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 2012. 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.

GIS Activity (Categories with at least 5 citations) # of Citations

Development of web-based GIS applications / Portals	25
Asset/Pavement Management	14
Enterprise Applications	10
Road Inventory Management	10
Migration to new GIS software / Hardware / Architecture	9
Transportation Planning	8
Location referencing system	8
HPMS	8
Geotechnical / Environmental / Cultural Analysis	8
Data Sharing / Coordination	8
GPS / Field Collection / Mobile	7
Mapping / Base Maps	7
Right-of-way	6

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

The top five 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. Activities related to transportation planning, road inventory management, and location referencing system are indicative of the need for prioritizing projects within constrained budgets and the need for accurately locating assets to combine activities in a cost efficient manner.