

The state of GIS activities in State Surveying Societies

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Many states have established a Geographic Information System (GIS) office and/or a GIS council where important GIS-related policies and standards are being formed and implemented. It is imperative that surveyors actively participate in the policy making and professional decisions made by these organizations. Surveyors should participate in these activities not only as individuals but, preferably, as a group representing a professional society. Last year, a survey was conducted among state surveying societies around the country to gather information on their GIS activities and their participation in GIS events held in their states. Forty states have responded to the survey. In this paper, the results of the survey are described, summarized, and analyzed. Very few state surveying societies were found to be actively involved in their state's GIS affairs. I present some activities that state surveying society GIS committees may wish to engage in to remedy this state of affairs. A nationwide coordination effort is needed to ensure that state-wide GIS activities work to enhance the provision of geospatial information to the public.

Geographic Information Systems have emerged as the decision-making tool of preference especially in local government. Many states, counties and municipalities are using GIS to manage location-based or spatially related tasks. To turn a GIS into an effective and productive management tool, it must be based on high-quality spatial data. The initial investment in creating comprehensive high-quality spatial data sets to support the ever growing applications of GIS in local government could be prohibitively high.

Many of these local government GIS offices create their GIS incrementally. To achieve this, they have developed mandatory GIS-based submission standards for spatial information submitted to them. This requirement has a direct impact on the submission of filed maps, tax maps, and other surveying grade products that are delivered to a number of state, county, and municipal offices.

It is thus critical that surveyors become involved in the creation and definition of digital submission standards because these activities will eventually have a direct impact on their professional practice. As a profession that is entrusted to protect and benefit the public in matters of property location, surveyors should seek to be involved in these types of decisions.

An example of a statewide GIS office is MassGIS (<http://www.mass.gov/mgis/>). MassGIS is the Office of Geographic and Environmental Information within the Massachusetts Executive Office of Environmental Affairs. Through MassGIS, the state has created a comprehensive, statewide database of spatial information for environmental planning and management. Recent legislation has established MassGIS as the official state agency assigned to collect, store, and disseminate geographic data in Massachusetts. The legislation gives MassGIS the mandate to set standards for geographic data to ensure universal compatibility. A significant part of the standards established by MassGIS are related to parcel-based datasets at a spatial resolution that could affect land surveying.

Another example of a statewide GIS effort is the New Jersey Office of GIS (OGIS), which has similar mandates as MassGIS. In addition to OGIS, New Jersey has a Geospatial Forum (https://njgin.state.nj.us/OIT_NJGF/index.jsp), where stakeholders of spatial information have the opportunity to collaborate and exchange ideas. These ideas eventually turn into public policy and public standards. To understand the function of the Forum, here are some of its objectives:

- Stimulate and encourage the advancement of an interdisciplinary, professional approach to the planning, design, operation, and use of GIS and related technology to meet the needs of public and private information providers, stewards, and users in New Jersey;
- Provide a forum for communication and coordination among the various professional disciplines that comprise the membership of the Forum;
- Bridge the gap between information producers, stewards, and users;
- Promote professional and educational development of the membership by providing opportunities for the exchange of knowledge and information;
- Provide a conduit through which the membership can reach consensus on GIS policies and standards as they relate to New Jersey's spatial data infrastructure; and
- Provide a mechanism through which the interests and concerns of New Jersey's GIS community can be directed to appropriate policy makers.

The Massachusetts and New Jersey examples demonstrate the level of GIS activities that are starting to take place around the country. Surveyors cannot afford to stay on the sideline and let other professions make important decisions that will more than likely affect the surveying profession.

Three years ago, the Geographic and Land Information Society (GLIS), a member organization of the American Congress on Surveying and Mapping (ACSM), has embarked

on a campaign to encourage surveyors to become involved in national and local GIS activities. One of GLIS's initiatives was to hold an annual special technical session on "the state of GIS activities in state surveying societies." This technical session is being held at the annual ACSM conference. The initial intent was to have members of state societies from around the country report on the GIS activities in their states, followed by an open discussion on possible coordination of a nationwide common GIS agenda. This format was found to be marginally successful.

This year, a different, more proactive, approach was taken to the fact-finding mission. A survey was sent out to all 50 state surveying societies, requesting information on their GIS activities. They were also requested to provide information on GIS activities by other agencies and/or organizations in their states that may have an impact on the surveying profession. The survey was a collaborated effort between GLIS and the National Society of Professional Surveyors (NSPS). The survey instrument is presented and described in the next section. Then the survey results are analyzed in order to provide some insights into the state of GIS in different parts of the country as this relates to the surveying profession.

The survey

The survey was composed of ten questions. Forty states responded to the survey; ten did not. The states that did not respond to the survey included Georgia, Idaho, Illinois, Indiana, Kansas, Maryland, Oklahoma, Rhode Island, Washington, and West Virginia.

The first question of the survey was whether the state society has a GIS committee. If the state society had a GIS committee, additional information was requested on the committees' activities.

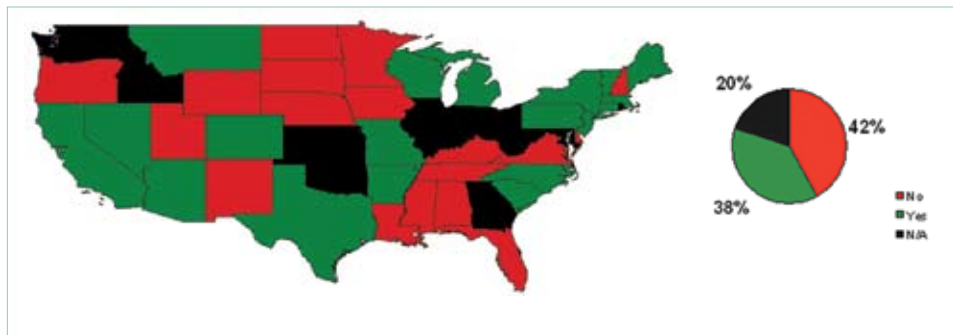


Figure 1. Surveyors' state societies that have or do not have a GIS committee. Not shown are Hawaii and Alaska because they do not have a GIS committee.

The importance of this question is twofold. First, the existence of a GIS committee within a state society presupposes that the society is actively involved in GIS. Second, the responses to this question made it possible to compare the agendas of different GIS committees around the country.

It is reasonable to assume that all U.S. surveyors face similar GIS challenges. Knowing what each committee is doing could lead to a better understanding of the challenges, which in turn could evolve into a common approach by the state societies to these challenges.

Figure 1 shows that the majority of the states societies do not have a GIS committee. This does not necessarily mean that individual surveyors are not involved in statewide GIS activities. It means that in most states societies, GIS is not high on the agenda. By inference, this means that the input provided to the decision making agencies does not represent the official positions of the surveying community, rather, those of individual surveyors who may or may not have other considerations in mind when forming their opinions. Therefore, a uniform approach and a common strategy of the surveying community may not be advocated and promoted.

The second question of the survey was whether the state society offers GIS seminars or workshops. Information about the type and level of the seminars/workshops was also requested.

In order for surveyors to become involved in GIS, it is necessary for them to become educated in it. GIS

workshops and seminars are the first step in this education process.

GIS workshops and seminars have different levels of covering the subject matter. They range from introductory, to beginners', to intermediate, to advanced instruction, and, finally to hands-on experiences.

I believe that hands-on workshops are the most effective in introducing GIS to surveyors. Hands-on workshops are most likely to clearly demonstrate the connection between the practice of surveying and the use of GIS; hence, they are potentially most likely to induce surveyors to undertake GIS projects.

Figure 2 shows that two-thirds of the state societies are not actively involved in educating their members in GIS. While GIS educational opportunities may be available in some of the "blue" states in Figure 2 there is a difference between general GIS workshops and those specially designed by surveyors for surveyors. Surveyors are more open to become engaged in new technology if they see their peers do so.

Only two states (NJ and NV) offer hands-on GIS workshops in which surveyors have the opportunity to experience GIS firsthand. An important seminar that potentially could generate interest in GIS is a seminar on "real-world experiences with GIS." The seminar is composed of four-to-five short presentations on GIS projects performed by fellow professional land surveyors. Each presentation is followed by a short Q & A session where the attendees have the opportunity to interact with the presenter. This type of

that is concerned with the “creation of intelligent maps and databases that enable public and private decision makers to make better informed and timelier decisions in a wide array of governmental areas” (<http://www.nsgic.org/>).

Members of NSGIC include senior state GIS managers and coordinators. NSGIC members are actively involved in the coordination and application of geospatial technologies in their states. Therefore, the involvement of surveyors (as a community) in the activities of these organizations is very important.

Only five states responded that their state does not have statewide GIS coordinating offices or councils. In those that have, decisions are being made on data sets and standards with or without the participation of the surveying community. This should be a strong enough incentive for state societies to become actively involved in the GIS affairs in their states.

The fifth and the sixth questions sought to elicit information on whether there are local GIS conferences in the state and local chapters of other GIS associations such as URISA (Urban and Regional Information Systems Association) or GITA (Geospatial Information and Technology Association).

Both URISA and GITA are intensely involved in local government GIS activities and, as a result, they are important players in GIS development. They organize local or regional GIS conferences in which local GIS issues and needs are presented and discussed.

If they are not already doing so, surveyors should participate in the activities of these associations and in their conferences. However, their participation should not be limited to attending conferences and meetings; they need to become engaged in conference planning committees and, perhaps, become officers of these associations.

High-level participation in state and regional GIS activities is one way of ensuring that surveyors meaningfully participate in the definition of GIS issues and the development of policies regulating

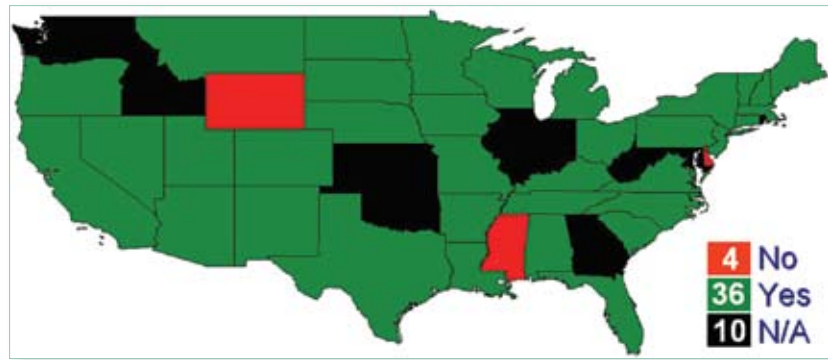


Figure 5. States where GIS conferences are organized by the non-surveying community. Not shown are Hawaii (yes) and Alaska (no).

them, rather than having to comply with standards and regulations mandated by others.

Figure 5 shows that thirty-six out of the forty states participating in the survey have a local GIS conference. This means that in ninety percent of the states, GIS specialists have the opportunity to provide input in the development of GIS activities in their states.

Only two states responded that the level of involvement of their surveying societies in these endeavors is high. These two state societies are sponsors of the local GIS conferences and participate in setting the agenda of the meetings. The remaining thirty-four states indicated that their involvement is confined to participating in activities organized by others, often on an individual basis.

The seventh and eighth questions were whether the state society holds an annual map and/or GIS competition. Many states have been holding a map competition for quite some time. The purpose of these competitions is to showcase well executed maps. High-quality winning maps can be a great educational resource.

The same holds for GIS map competitions. Viewing and reviewing what other surveyors do with GIS mapping products is a very important educational and professional experience, providing an understanding of what different types of products surveyors could be delivering to GIS clients. I believe participation in such competition could serve as an incentive for surveyors to become involved in GIS projects and widen the scope of services they are able to provide to their clients.

Seventeen states regularly hold a map competitions, but only six states have a

GIS competition (Figure 6). The majority of state surveying societies do not hold any competition.

This is somewhat surprising, given the professional pride that surveyors take in their work, and the educational experience that such competitions provide.

If, for some reason, their state societies do not offer GIS competitions, surveyors are encouraged to participate in competitions conducted by local GIS associations or state GIS offices. This will expose their work to GIS specialists and local government decision makers.

The ninth question in the survey was whether the state surveyors’ society participates in events such as the GIS Day. Taking place every year in mid-November, GIS Day is a grassroots event that provides a forum where users of GIS technology demonstrate real-world applications making a difference in our society.

An important feature of GIS Day is the interaction with students in the K-12 range, showing them the technology and applications of spatial information. For surveying societies, GIS Day offers an unprecedented opportunity to raise the awareness of the surveying profession among high-school students.

Surveying is an aging profession. The median age of a professional land surveyor in the country is 50 years plus. Therefore, one of the biggest challenges of the surveying profession is to recruit the next generation of surveyors.

Several years ago, NSPS launched the Trig-Star program, a trigonometry problem solving contest. The primary goal of the Trig-Star program is to introduce the surveying profession to high school students as an attractive career option.

Last year, GLIS launched the High School GIS Competition (<http://www.glismo.org>) to foster increased awareness of GIS careers among high school students.

GIS Day can be used for that very purpose. It could be used as another opportunity for surveyors to raise awareness of their profession. Surveyors' societies must take advantage of every opportunity that could lead to the

the responses would give us an in-depth insight into the state of GIS within the surveying profession. For example, it would be interesting to find out whether there is a correlation between the existence of a GIS committee and the degree of surveyors' involvement in GIS activities in their state. In this section some of these cross-question analysis and correlations will be presented.

An appropriate response could be forming a GIS committee that would become actively involved in the formation and definition of the submission requirements. After all, they may have a direct impact on the way surveyors conduct their work and deliver their products to clients.

My analysis shows that only fourteen states (28 percent) have both a GIS committee and submission requirements. This does not mean that the GIS committees are really involved in the formation of the submission standards. In fact, some states reported that their GIS committee is inactive or that its mission is just to guard against others performing work that they consider to be illegal practicing of surveying. Nevertheless, having a GIS committee in place has the potential for it to become involved.

More troubling is the finding that in eight states which have requirements for submitting surveying products in a GIS format, the surveying societies in those states do not have a GIS committee to monitor and participate in formulating these requirements (Figure 7).

Next I examined the correlation between the existence of an official state GIS office or council and a state society GIS committee. One would expect that if the state has an official GIS office or a policy making council, the state society would have a GIS committee to interact with these bodies. The mission of the GIS committee would be to represent the

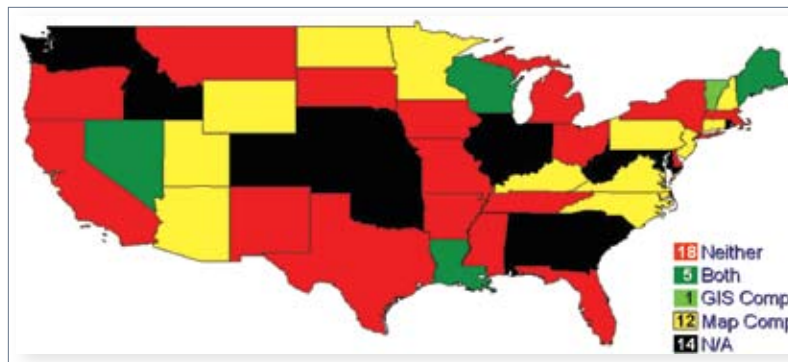


Figure 6. States with map and/or GIS competitions. Not shown are Hawaii (neither) and Alaska (both).

rejuvenation of the surveying workforce. This is why the participation in GIS Day by state surveying societies is so important.

My survey found that only six state surveying societies (Arizona, California, New Jersey, Nevada, Texas, and Wyoming) have been participating in GIS Day events. This is rather disappointing, given the surveying profession's urgent need to rejuvenate its ranks.

The tenth question in the survey was whether a four-year degree should be mandatory for licensure. The purpose of this question was to attempt to correlate the state society's GIS activities with the educational requirements for surveying licensure. The hypothesis was that as more surveyors become college graduates, they will exhibit the tendency to expand their practice into new territories, such as GIS. The findings are discussed in the next section.

Analysis of findings

While the answers to individual survey questions provide snapshots of the state of GIS in state surveying societies, combining

First I examine the relationship between the existence of a state society GIS committee and the existence of local government (municipal or county) requirements for submitting survey products in a GIS format. The rationale for this analysis is that if submission requirements are being mandated, one would expect surveyors to respond to these requirements pro-actively.

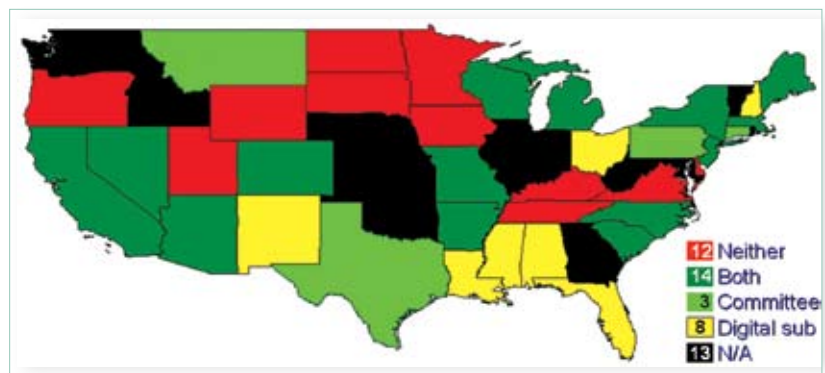


Figure 7. The relationship between the existence of a GIS committee and digital submission requirements. Not shown are Hawaii (neither) and Alaska (digital submission).

surveying community in GIS activities and initiatives taking place at the state level.

Only sixteen states (less than one-third of the total participating in the survey) have both a GIS committee and an official GIS office or council. An additional seventeen states have an official state GIS office but no GIS committee. This means that in at least one-third of the states, professional surveyors are not represented in the discussions and the decision making that may affect their livelihood.

While surveyors may be involved in state-level GIS activities on an individual basis, their involvement does not have the same impact as when their professional society is involved. It's a known fact that individuals do not always advocate what is best for the entire community, and surveyors are not an exception. Sometimes they represent other interests. However, with a GIS committee in place, the combined needs of the profession and the state are more likely to be better served. The results of this analysis are presented in Figure 8.

The third analysis aimed to correlate the existence of a society GIS committee with the availability of GIS conferences organized by the state or by non-surveying associations. Having a GIS committee could facilitate more active involvement of surveyors as a community in local GIS conferences. This could lead to a conference with special tracks on GIS for surveyors and special tracks on surveying for GIS specialists.

I found that the nineteen states that have a GIS committee also have a local GIS conference. However, in seventeen states in which local GIS conferences are being held, the surveying society does not have a GIS committee. These conferences are probably not as useful to surveyors as they could have been if the society had an active GIS committee. The results of this analysis are shown in Figure 9.

The final analysis focused on whether there is a correlation between the four-

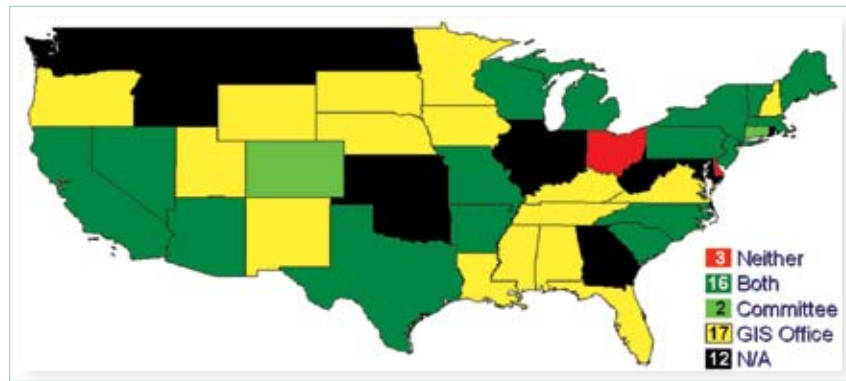


Figure 8. The relationship between the existence of a GIS committee and a state GIS office or council. Not shown are Hawaii (only GIS office) and Alaska (neither).

year degree requirement for licensure and an existence of a GIS committee. It is reasonable to assume that college-educated professional land surveyors are more likely to be aware of GIS and its importance to surveyors.

The results of my analysis which are shown in Figure 10 do not strongly support this assumption. One possible reason for this could be the fact that even though more and more states are introducing the four-year degree requirement for licensure, the

A practical GIS plan for state surveying societies

In order for surveyors to become involved in GIS activities and participate in the decision-making process, they need to, first and foremost, recognize the importance of GIS. They need to acknowledge that their state's plan for GIS may have an impact on their professional practice. This recognition will, hopefully, be followed by the establishment of a standing GIS committee in their state societies. The

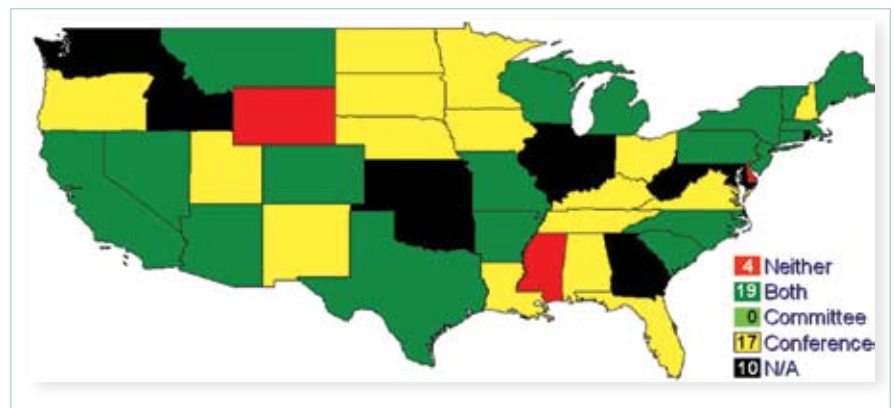


Figure 9. The relationship between the existence of local GIS conferences and a state society GIS committee. Not shown are Hawaii (has a GIS conference) and Alaska (neither).

overwhelming majority of current licensed surveyors were licensed on the basis of apprenticeship.

In addition, in the current leadership of the state societies there are very few individuals with a college degree in surveying. Thus, as the number of college graduates increases, the involvement of the societies in GIS should increase as well. The experience in New Jersey supports this notion.

objective of the committee should be to promote GIS in their own community and promote surveying in the GIS community.

One of the first tasks of a GIS committee is to identify the major GIS stakeholders in the state; in other words, find out where critical GIS decisions are being made and who makes them. A good place to start is the web site of the National States Geographic Information Council (NSGIC) (<http://www.nsgic.org/>), which lists all

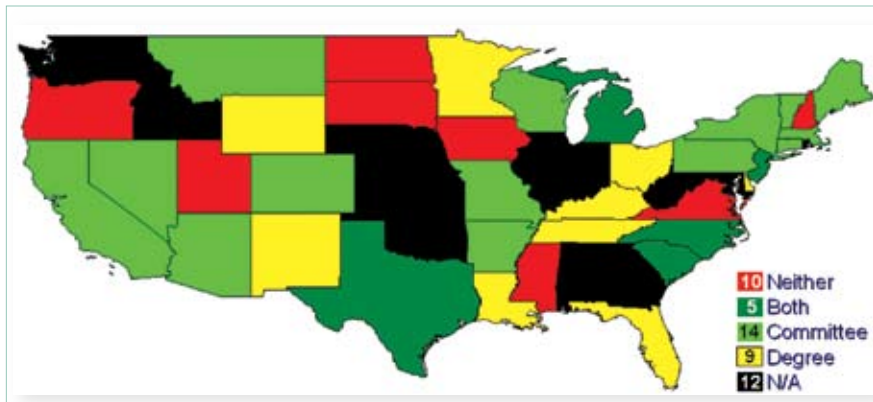


Figure 10. Relationship between the four-year degree requirement for surveying licensure and the existence of a state society GIS committee. Not shown are Hawaii (neither) and Alaska (neither).

the official and unofficial GIS offices in each state. The state society GIS committee should contact the state's GIS offices or council and offer to participate in their activities. Using this first lead, a list of all other state and non-state GIS agencies (NGOs) and GIS associations should be compiled. A liaison to these offices should be appointed, and the GIS committee should regularly discuss the activities of these organizations. This will give surveyors access to the most influential GIS players in their state.

It is suggested that the GIS committee create a subcommittee that will work on GIS standards for digital submission of survey information in a GIS format. A standards subcommittee could develop submission standards and present them to the GIS community. It is our experience that the GIS community is actually looking for such initiatives from the surveying community.

It is also suggested that the GIS committee establish a subcommittee on GIS education. The mission of the education subcommittee would be to develop GIS seminars and workshops for members of the state surveying society. GIS seminars for surveyors are most effective when they are designed and implemented with the surveyors' viewpoint in mind. Seminars focusing on practical applications and examples are preferable. The GIS education subcommittee should also become involved in the local GIS conference planning committees. Serving on conference planning committees will enable the surveying society to offer surveying educational opportunities for GIS specialists, in addition to creating an attractive program for surveyors.

Another suggestion for the GIS committee is to institute a GIS project competition and/or showcase where the best selected projects are featured at the society's annual conference and/or at the local GIS conferences. It is expected that this will have a positive impact on the surveying as well as the GIS community. Both communities will gain knowledge of the valuable role of surveyors in GIS undertakings.

Involvement in GIS Day activities should also be considered. As mentioned earlier, GIS Day can be a great vehicle for promoting surveying careers among school-age youngsters. Inviting high-school students to participate in GIS and GPS hands-on projects and showcasing what surveyors do is a very important instrument for recruiting future surveyors.

It is also suggested to consider promoting a high-school GIS competition (similar to the one established by GLIS). The competition could consist of an

actual GIS project conducted and presented by students. The evaluation of the projects should be based on originality, execution, and presentation. Special prizes should be awarded for projects that are related to surveying, preferably at a public awards ceremony.

Finally, the GIS community chair should reach out to other state society GIS committees and coordinate with them a national agenda for state GIS activities. GLIS would be a great facilitator for this collaboration. One way to make this happen and encourage direct and open communication among GIS committees is for them to become affiliate members of GLIS.

To sum up, a nationwide collaboration among state surveying societies would benefit not only the local surveying community but also the public that is served by the surveying profession. Currently, only a handful of state societies have a solid track of GIS activities. Surveyors like to say that GIS stands for "Get It Surveyed". It's time

Acknowledgement

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