

Guest Editorial
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The purpose of this Guest Editorial is to:

- Look at a big picture view of the burgeoning geospatial industry.
- Acknowledge the significant contribution that engineers, surveyors, and others make to society with regard to the use of spatial data.
- Suggest that engineers and surveyors both need to be pro-active in exploring mutual benefits that can be realized through increased collaboration.

Having served two terms as Editor of the Journal of Surveying Engineering (JSE), I should be able to write this guest editorial with the bold confidence of a seasoned professional. That is not the case. In writing a soon to be published book on the global spatial data model (GSDM), I became acutely aware of my own limitations. Since Professor Burtch took over as Editor of the JSE 10 years ago (Burtch also served two terms and now Dr. Soler is the Editor), I have continued to grow professionally but I have also come to realize that technology and spatial data practice are advancing faster than I can keep up. With that said, I'll comment on two consequences. First, I am humbled by visionary predecessors who set their sights high and provided inspirational leadership for those of us who follow. Second, I am awed by the diversity and talent of those persons responsible for generating and using spatial data on a daily basis. Both extremes are part of the burgeoning geospatial industry that includes an ever expanding list of disciplines and organizations (really individuals) who are making enormous contributions to society in a wide range of applications. The predictions of those visionary leaders 20 years ago who claimed the global positioning system (GPS) - now a component of the multinational global navigation satellite system or GNSS - would become a global utility have been proven correct. Collectively, society now takes GNSS positioning for granted and it seems incomprehensible that we should ever attempt to get along without it.

With the advent of the space age and computerization of nearly everything, spatial data are now characterized as digital and three-dimensional (3-D). The processes and products of surveying and mapping activities are much different now than they were as few as 15-20 years ago and surveyors are now using tools of which our fathers only dreamed. But, in my opinion, the exponentially increasing number of spatial data users is even more dramatic than the evolution of technology. My observation is that spatial data literacy within the general population is on a healthy ascent and that the "technology geeks" of the younger generation readily adapt to working in the digital environment without realizing "you can't do that." GNSS positioning tools are now being used by novice and expert alike in a wide range of applications. The irony is that some of us in the more traditional "measurement" professions find ourselves struggling to stay current. The crux of this editorial is to ask how we (specifically surveying and engineering) can work together to improve our services to society as related to the use of digital spatial data?

For the record, I am a surveyor who also has a great affinity for engineering. Historically, surveyors have been included in the pool of measurement professionals who serve the public in activities such as locating boundaries, creating subdivisions, establishing line and grade for

construction, making topographic maps, generating nautical charts, establishing both horizontal and vertical geodetic control, and a host of other activities. Some surveying activities have only ancillary impact on the public but when it comes to establishing or re-establishing property boundaries, the public is directly affected. Many engineering activities (especially civil) also have a direct impact on the public and professional licensure is used as one mechanism to protect the public health, safety, and welfare against incompetent or fraudulent practice. That is as it should be - for both surveying and engineering.

Please let it not be said that I am against licensure. I have willingly devoted my career to surveying and surveying education because, good or bad, it is also my hobby. The profession has been very good to me and I am unequivocally committed to excellence in same. Furthermore, my intent is to support fully the various licensure boards in upholding their statutory mandate. But, a point to keep in mind is that licensed professionals (e.g. surveyors and engineers) are not the only persons using spatial data and that there are many talented persons contributing to growth of the spatial data industry who have no need or desire for licensure. I cringe when I hear statements to the effect that having a license means that one is qualified as a spatial data professional (e.g. overseeing development of a GIS) or that not having a license means one is not qualified to offer services directly to the public (e.g. photogrammetric mapping). Yes, the licensing process denotes achievement of certain minimum qualifications and many persons have unselfishly contributed to development of the licensing process. Their efforts are to be lauded because, in addition to protecting the public, licensure lends integrity to our professional stature. But, unless education, testing, and experience requirements are enhanced and diligently monitored, licensing will not, in itself, provide a reliable or exclusive discriminator as to what constitutes competence in the generation, use, and presentation of digital spatial data.

Space limitations in an editorial preclude an exhaustive examination of the definitions of surveying and engineering. Besides, protecting the public should be recognized as being more important than arguing over perceived differences in definitions. A common challenge for the engineering profession, the surveying profession, and the various boards of licensure is to fulfill the obligation of protecting the public. Admittedly, protecting the public is the statutory role for licensing boards while members of the professions may have a greater loyalty to the profession. Nonetheless, the licensing boards and the various professions they regulate should work together because goals of professional service and Canons of Ethics among the various disciplines are viewed as largely compatible with goals of the licensure boards. My aspiration is that we focus on the common portion of those challenges and explore collaborative policies that will be mutually beneficial to all parties. The public will be the primary beneficiary.

For many years surveying was viewed as a part of civil engineering. But, during the past 30 years, surveying has matured as a separate distinct profession capable of making a large contribution to the collection, analysis, and use of spatial data. Surveying has come a long way, surveying is moving in the right direction, and many talented persons are capably leading the surveying profession. However, it is also well established that engineers (not just civils) still use and rely on many forms of spatial data. Some of those data are a product of the design process but many spatial data are provided by surveyors, some by planners, some by photogrammetrists, and others are obtained from spatial databases developed by others. Regardless of the source, a legitimate question is, "Who is responsible (can be held accountable) for the accuracy, appropriateness, and integrity of those data?" One short answer is that the engineer who stamps the plan is responsible. Or, a surveyor might be expected to

stamp and sign as being responsible – especially if the plan shows the location of property or boundary lines. In some cases there may be multiple signatures attesting to specific content on the same document. While such practice may protect the public under a given scenario, the short answer is inadequate and begs several larger questions that should also be considered.

For example, who is responsible for the accuracy, appropriateness, and integrity of spatial data generated and stored in a database by federal agencies, state or local agencies, utility companies, the military, corporations, businesses, individuals, academic institutions, or vendors? Does it make any difference if those data are generated by scientists, engineers, photogrammetrists, surveyors, geodesists, planners, geographers, cartographers, researchers, economists, aviators, hobbyists, technicians, or a novice? Or, what steps should be taken to certify the authenticity or to control the proliferation of electronic files of spatial data in addition to paper documents? And, what is the role of a geographic information system (GIS) in the whole discussion? Is a GIS really just a tool as some suggest or is there a formal designation for those GIS'ers who are making large contributions in the geospatial data policy and management arena?

These are tough questions and, in a way, they are not fair because they've been offered in a generalized context of spatial data instead of the more traditional setting of engineering, geodesy, photogrammetry, surveying and mapping. However, the broader context should be considered as various parties discuss possible collaborative endeavors. My ulterior motive for framing the questions as I did is to lead the reader to agree that the challenges are larger than any one discipline can handle. In my opinion, we need to pool our talent, learn from each other, discuss priorities, listen to other professionals, brag about our successes, and work together as we participate in the on-going digital revolution.