

Background Information Relating to Development of a Vision for Surveying (& Geomatics) in the United States

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Leaders in the surveying profession throughout the United States are currently engaged in spirited discussions about the future of our profession. Such (respectful) discussions should be very beneficial for the entire profession. An enormous amount of talent is being brought to bear on development of an appropriate vision.

“Content” is the focus of this document. “Process” is also needed. See 5.g below.

1. This document contains personal views developed on the basis of my [participation](#) in the surveying profession since 1968. Use/improve/ignore/discard as warranted.
2. I retired from teaching at NMSU July 1, 2010, but intend to [continue](#) professional activities – primarily promoting the GSDM and the use of 3-D digital spatial data.
3. Even though retired, on-going professional involvement also includes:
 - a. Serving as Secretary for the [Geomatics](#) Division of ASCE
 - b. [Participating](#) on ACSM Surveying Body of Knowledge Committee Chaired by Josh Greenfeld.
4. As the discussions of the future of surveying move forward, the following are offered for consideration:
 - a. Beginning assumptions need to be examined, discussed, and documented. With those in place, concepts and ideas are the building blocks. If, after due consideration, it turns out that subsequent conclusions are not consistent with beginning assumptions, revisions will be needed. It is an iterative process.
 - b. Sometimes it is difficult to consider ideas/issues independent of strong personalities. Although knee-jerk reactions and closing loopholes may be necessary or justified in some cases, developing a clear vision of the future should be the primary consideration. Attempting to build a vision for the future on the foibles of others should be avoided.
 - c. Surveying is a proud and noble profession. If we polish and enhance that reputation, we do not need to walk under an umbrella called geomatics.
 - d. On the other hand, the term “geomatics” is a fact. To some, surveying and geomatics may be synonymous. However, if needed, one way to differentiate surveying and geomatics is that surveying focuses on application of legal principles and concepts while geomatics focuses on details/applications of measurement technology and information management.

- e. There are geospatial data users in many disciplines, including surveying. Surveying does not have a monopoly on making measurements or using geospatial data. But, surveying does enjoy the unique niche of addressing issues related to boundaries, rights-of-way, and land ownership. That unique obligation should be high-lighted and kept “front-center” in all discussions as professional leaders consider the role of surveying in the broader geospatial data community. Although surveying does not have a monopoly on geomatics issues, we use those issues a lot and many of them are very important in surveying and to surveyors.
- f. Regardless of discipline, there is a legitimate difference between levels of occupational involvement. The role of technicians in various disciplines is absolutely essential and many persons (even without a college degree) can make valuable contributions to society and earn a decent living. Work related satisfaction comes from doing a good job well (even mortgage and lot surveys) and getting paid for it. Condescending to others is inappropriate unless their work is done carelessly, fraudulently, or in a sub-standard manner. The broad spectrum of the surveying profession needs to accommodate diversity in the kinds of work done, diversity in the level or technical rigor of the work being done, and in the diversity of those persons doing the work. Excellence and doing a good job well are unifying concepts in all cases.
- g. Education, regardless of discipline and whether formal or informal, is essential for successful participation in the multi-disciplinary arena of geospatial data applications. Many underlying surveying concepts may have changed little, but modern measurement practices are very different than only 15-20 years ago. Not only does one need to keep abreast of the technology but the evaluation of evidence in light of modern practices is also part of the challenge. Surveying policies, practices, and (minimum) standards need to be revised accordingly. Vendors should not be ignored, but it is probably not appropriate to make significant policy changes exclusively on the basis of vendor input. All professionals should contribute to and learn from the discussions, but persons with solid educational and experience credentials are best qualified to guide such revisions.
- h. Surveyors and surveying have a huge contribution to make in the broad geospatial data arena. Although other professionals (scientists, engineers, GIS personnel, and photogrammetrists) may be equally or more qualified in a given spatial data application, knowledge of local conditions and circumstances can help keep the surveyor at the forefront in providing quality geospatial data services. Business knowledge/skills are very valuable. See item 5.m on the list below.
- i. Professionals are expected to be knowledgeable of principles, practices, and limitations of any technology used in providing services and to take professional responsibility for quality and correctness of the end product. Carried to an extreme, that precludes use of consultants. Such a consequence is not intended but is mitigated by ones commitment to life-long-learning.

Boards of Licensure will likely have significant input on these issues. But issues of machine-control and use of Lidar data present significant challenges. Height modernization, use of real-time GPS networks (RTN), and FEMA elevations on Floodplain Maps also need to be included in the discussions.

- j. Education and training are different but both are important. Neither should be emphasized to the exclusion of the other. An over-simplified view is that education involves acquisition of knowledge (in college) while on-the-job training is associated with developing the skills needed to accomplish a given task. Finding the right balance is an on-going challenge, especially for educators, because people learn in different ways, at different rates, and often at different times. A certain amount of hands-on use of equipment for measurements and computations greatly enhances the class-based learning experience but too much time spent on training while in college detracts from the time needed to establish a solid foundation of concepts. Summer and/or intern employment for students can be very beneficial because it provides an opportunity for one to integrate knowledge/skills before taking on the responsibilities of productive full-time employment.
- k. Apprenticeship is a proven entry mode for various trades (and professions). Surveying has accommodated apprenticeship for many years with numerous accounts of success. But, as Dr. Gibson points out in his article in the American Surveyor (see item 5.j on the list below), the perceived stature of surveying suffers due to the absence of a uniform degree requirement. I applaud Dr. Gibson's position and will whole-heartedly support a 4-year degree requirement for surveying. However, if and as we do that, we need to be careful to find a way to preserve the mentoring benefits associated with apprenticeship entry into the profession. I am confident that challenge can be met – I just don't know how. Any ideas?
- l. Question – when and how does one learn how to learn? I have often pondered that question during my teaching career and, although I don't have the answer, I am convinced it changes from person to person. With that said, I will continue to support 4-year degree requirements that contain appropriate surveying content, but we need to be aware that a college degree devoted to surveying also needs sufficient emphasis on critical learning in addition to learning measurements, deed descriptions, coordinate geometry, computers, and data collection procedures. ABET includes life-long learning as an outcome and most surveying and/or geomatics ABET programs at least give it lip service. My observation and opinion is that we (especially surveying educators) need to devote more attention to “learning how to learn.”
- m. Process and content are both needed. Imbalance or exclusion of one or the other is a recipe for disaster. See item 5.g below.
- n. Consider the following comparison questions. Which part of each one is correct? I do not know the answers and maybe the answers are not important. A definition is characterized as being bidirectional and given as “necessary

and sufficient” or “if and only if,” A description may be valid one way, but not necessarily the other. The comparisons below are descriptive and may be valid both ways, valid only one way, or not valid at all. The point is we need to be careful with superior/subordinate and causation/correlation relationships. Yes, it does make a difference whether we use definitions or descriptions in our discussions. I have been presumptuous enough to provide my version of the answers for the following. But, whatever the answer is, the vision for surveying needs to accommodate same.

- Is Surveying part of Photogrammetry or is Photogrammetry part of Surveying?

EFB answer: Neither is correct.

- Is Surveying part of GIS or is GIS part of Surveying?

EFB answer: It depends upon your perspective.

- Is Surveying part of Engineering or is Engineering part of Surveying?

EFB answer: Both are correct.

5. The following resources were used in formulating opinions about the future of surveying. Follow each link for more information.

- 1955 Grinter Report identifies many good educational [policies](#).
- 2004 ASCE Body of Knowledge is one (good) [example](#).
- 2007 “Challenge/Opportunity for Spatial Data Users Worldwide” [EFB](#).
- 2008 ASCE Body of Knowledge 2nd Ed. contains implementation [details](#).
- 2008 A [Case](#) for Greater ASCE Involvement in ABET Accreditation of Surveying Engineering Programs – ASCE Geomatics Division (EFB).
- 2008 “The 3-D Global Spatial Data Model” [book](#) by Burkholder
- 2009 “Process and Content” NMPS [column](#) by Burkholder
- 2010 Surveying Body of Knowledge by Josh Greenfeld
www.fig.net/pub/fig2010/papers/ts03g%5Cts03g_greenfeld_4372.pdf
- 2010 Evolution of a National Voice for Surveying by NSPS Officers
http://www.acsm.net/_data/global/images/NSPS/NationalVoice.pdf
- 2010 “Licensure by Apprenticeship: Effects on the Surveying Profession” by David Gibson - <http://www.amerisurv.com/content/view/7413/153/>
- 2010 Federal Geospatial Summit – NGS web cast May 2010
http://www.ngs.noaa.gov/web/news/Successful_Summit.shtml
- 2010 ABET 2009 Annual Report - http://www.abet.org/annual_report.shtml
- 2010 “Talent – Are You Buying or Selling” NMPS [column](#) by EFB
- 2010 Abstract of [presentation](#) by EFB to be made at ASCE Texas Section meeting October 2010, El Paso, Texas.

Note – more information will be added in subsequent postings. EFB 7/06/2010