

How Can We Improve the Future for Surveying in New Mexico?

Earl F. Burkholder, PS, PE, F.ASCE – August 2011

“Be careful what you wish for – you may get it.” Throwing caution to the wind, this article attempts to develop a proactive vision for the surveying profession in New Mexico. Recognizing an element of truth in the opening phrase, I’ll suggest that it doesn’t matter what I think because the best vision for surveying in New Mexico will be one that includes the collective wisdom of many.

“You’ll never know what you can do unless you try” is another cliché that may apply. OK, let’s try! The future of surveying in New Mexico will be what we make it. If we discuss the issues and address the challenges in a proactive manner, we can accomplish some rather impressive things for ourselves, for the surveying profession and for society. Current technology and knowledge can be used to enhance existing capability in various parts of the surveying profession. The challenge is formulating a vision, establishing an appropriate organization, agreeing upon a mission, and implementation. Will appropriate funding be a pre-emptive challenge?

The City of Las Cruces and Doña Ana County are currently working on a strategic planning document called “One Valley, One Vision 2040.” The idea is to start with current circumstances and to look at what the future of this area could be in 30 years acknowledging such factors as population trends, existing resources, aspirations for quality of life, and the political realities of coordination/cooperation. A link to the planning document can be found using a Google (or related) search.

With the advent of the digital revolution and pervasive use of electronic gadgets, the information surveyors work with is primarily 3-D digital spatial data. Given that trend, surveyors and others now work routinely with GIS systems and spatial data. However, the planning document does not include the spatial data infrastructure as a tool that contributes to the success of the plan. My contribution to “Vision 2040” is a suggestion to include planning for development of the spatial data infrastructure and coordination of spatial data use in addition to other factors.

From the surveying perspective, planning for efficient development of the spatial data infrastructure could include some combination of several options. The following paragraphs are a summary of the input provided to the planning process.

The idea of creating of an Office of State Surveyor has been around for some time. A comprehensive plan for Doña Ana County does not depend upon existence of a State Surveyors Office, but local planning efforts should be aware of the bigger picture with regard to the use of spatial data. **Regardless of the organizational structure, coordination of local efforts, accountability, and working to a common standard are important.** The organization by which those goals can be accomplished could range from an Office of the State Surveyor to a State Agency/Department to a Division within a State Agency to a city-wide effort to a county-based

project to private networks. Many discussions are needed to identify the best combination for New Mexico.

1. Examples of existing state agencies whose mandate is use of spatial data:
 - a. North Carolina Geodetic Survey
<http://www.ncgs.state.nc.us/mission.html>
 - b. South Carolina
<http://ors.sc.gov/geodetic/geodetic.html>
 - c. Missouri
<http://www.dnr.mo.gov/geology/aboutus.htm>
2. Examples of states that have a State-Wide GNSS Survey Network :
 - a. Washington State
<http://www.geodesy.cwu.edu/monitor/WSRN/>
 - b. Ohio
<http://www.dot.state.oh.us/Divisions/ProdMgt/Aerial/Pages/VRSTRK.aspx>
 - c. Wisconsin
<http://www.ngs.noaa.gov/heightmod/Wisconsin.shtml>
 - d. Other than finding the collective will and funding to do so, there is nothing magic about state-run networks. Many other state, public, and even private networks exist.
3. Proposal by New Mexico Professional Surveyors (NMPS)
 - a. Web site of NMPS
<http://nmips.org/>
 - b. Proposal by NMPS Thurow/King
<http://www.globalcogo.com/NMStateSurveyor.pdf>
 - c. Example of Nebraska Office of the State Surveyor
<http://www.sso.nebraska.gov/>
4. New Mexico Geographic Advisory Council
<http://www.gac.state.nm.us/>
 - a. Strategic Plan
http://www.gac.state.nm.us/docs/NMGSP_finaldraft_0108.pdf
 - b. Memorial
http://www.doit.state.nm.us/docs/reports/HJM81_geospatial_info_services.pdf
 - c. City of Albuquerque
<http://www.cabq.gov/gis/survey.html>
5. Tied into local efforts to enhance cooperation/coordination
 - a. White paper by Burkholder/Chavez
www.globalcogo.com/whitepaper.pdf
 - b. NM Height Modernization effort
www.globalcogo.com/htmod-update.pdf
 - c. Follow-up to white paper
www.globalcogo.com/white-papr-update.pdf

- d. Description of vendor-specific network being used in NMSU surveying program
<http://smartnet.leica-geosystems.us/>
- 6. Possible contributing and benefitting organizations
 - a. New Mexico Department of Transportation
 - b. New Mexico Department of Information Technology
 - c. New Mexico Department of Licensing & Regulation
 - d. New Mexico Department of Taxation and Revenue
 - e. Utilities and Irrigation Districts
 - f. Counties/Cities
 - g. Academic – both instructional and research
 - h. Private Sector
 - i. Military
- 7. Possible organization for Doña Ana County
 - a. Separate entity established under local control/administration
 - b. Integrated with state/federal contributions and efforts
 - c. Run and administer a real-time network
- 8. Technical Basis and use of The 3-D Global Spatial Data Model
 - a. Global Standard - Functional Model and Stochastic Model
 - b. Accommodates existing datums, coordinate systems, and practice
 - c. Already defined and available to use – matter of deciding to do so.
 - d. Examples developed while teaching in NMSU Surveying Engineering Program.
 - i.) Static GPS network with standard deviations
www.globalcogo.com/nmsunet1.pdf
 - ii.) Using GPS to establish elevation at Reilly
www.globalcogo.com/ReilElev.pdf
 - iii.) Generating a 2-D plat from 3-D GPS data
www.globalcogo.com/3DGPS.pdf

There is a lot of talent in New Mexico that can be brought to bear on the challenge – whether sponsored and implemented by a single “private organization,” established under some “MOU” (such as City of Las Cruces, Dona County and NMSU), established under some “regional” plan (City of Albuquerque), established in conjunction with a yet-to-be-established (and funded) height modernization project, or established and administered by an existing state agency (DOT or other). Whatever effort is made to improve future use of the spatial data infrastructure can be greatly enhanced by the involvement and contributions of individual persons and collectively by the surveying profession.