

BLM Develops Cost-Effective, Dynamic Approach to Telecommunication Site Plans

*By Belle Craig
and Brent McBeth*





With the communications industry exploding, cellular telecommunications is one of the fastest growing industries in the United States. Recently, this industry successfully lobbied Congress to sell (at auction) a portion of the federal frequency spectrum to allow for even more industry growth. Federal agencies have been mandated to begin using narrow band frequencies and to change from analog to digital radio communications systems by 2004. As the industry grows and the agencies adjust to meet the changing technology and narrow banding mandate, maximizing the use of existing sites is critical—as is the need for new sites. Mountaintop sites on public lands primarily in the West have long provided essential locations for television, radio, microwave and now cellular links.

To manage this growth, government agencies and the industry must have access to accurate, up-to-date information on each existing site, including management goals and direction. Additionally, the industry requires accurate quality geo-referenced data of facility locations for network propagation studies.

Historically the development of communication site plans has been somewhat cumbersome and expensive. As-built plans of individual facilities are generally schematic, and leases are established by lots with reference to legal subdivisions. Actual locations of facilities (on the ground, as-built) may not really exist as described in the lease. The lack of accurate communication plans has resulted in user conflicts and in unclear management and direction of future sites. To respond to demand, local government agency units have spent tens of thousands of dollars to have priority sites surveyed and communication site plans developed. Once done, this approach only becomes a snapshot in time. The plan becomes obsolete as soon as facilities on the site change.

Congress has challenged the Bureau of Land Management (BLM) to develop communication site plans and has funded the work with a portion of the rents received from communication site rights-of-way (known as 1492 monies). With that funding, the Idaho State Office of the BLM has developed a very cost effective and dynamic approach to the problem.

The key ingredient to any communication site inventory and subsequent site plan is an accurate map showing current, as-built facilities. The facilities must be tied to geo-referenced control points and displayed in geo-referenced computer-aided design drawings to serve realty-planning needs and to accommodate future map updates. Ideally maps should show topography with 1-foot or 2-foot contours in all areas that have existing or future potential for development. Maps should be drawn at a scale of 1-inch = 20-feet to 1-inch = 40-feet, depending upon the size of the site and density of existing facilities.

During the course of a communication site survey, permanent reference monuments need to be established to control all current and future survey work at the site. All control

monuments need to be geodetically referenced (horizontally and vertically) to the National Spatial Reference System (NSRS). The direction of all lines should refer to the true meridian. All control monuments need to have surveyed ties to monuments of the Public Land Survey System (PLSS). By satisfying these requirements, legal descriptions for the rights-of-way can be verified as to corrections from as-built survey data.

In addition, all relevant resource data, from Geographic Information Systems (GIS) can be used in conjunction with the site map to properly manage the communications site. All buildings, towers, guy lines and anchors, microwave beam paths, fences, fuel tanks, buried utility lines, overhead utility lines and pole locations, access roads and parking areas, property lines, vegetation and rock outcrops, location of control monuments, and other rights-of-way must be accurately surveyed and shown on the resulting map.

To begin this comprehensive mapping by the BLM in Idaho, 20 priority sites were selected.

For each, a combination of standard survey methods, global positioning system (GPS), and aerial photographic interpretations were utilized. Case folders and lease information records were researched. Photographs of each facility were taken to document existing facility locations and conditions. User data, plat map information, and reference quad map data were also gathered for each site. The survey data was then entered into AutoCad to develop the site map drawing.

Because most of the primary end users of this information (realty specialists, managers, and eventually the public and industry) do not have access or working skills with AutoCad or other data display programs, all the information was placed with dynamic links on the Web. The AutoCad drawing file is saved in a web drawing format (dxf) so that the data can be viewed on the Internet while maintaining most of the three-dimensional functionality of the data. AutoDesk provides a free Plugin software download enabling the users' browser to view and manipulate the map data. Other information is

The lack of accurate communication plans has resulted in user conflicts and unclear manage and direction of future sites.

converted and/or scanned into the HTML format and linked.

The final step is to add standard language and stipulations that are then dynamically linked in the Web environment to automatically produce a communication site plan. Any change in site data or information can then be readily updated through these dynamic links to produce an immediate updated site plan. Future maintenance of the site map will be accomplished by requiring the communication site users that add new facilities to take the AutoCad file, survey their facilities as built to the same geo-referenced control that was established in the original map, manipulate the file, and return it to the agency to be re-posted to the Web file. A new

communication site plan can then be produced to reflect the changes.

With this new process, the average cost per site is \$5,000 to \$7,000, including the site survey, analysis, data manipulation, linking, and posting the data to the Web. By comparison, a recent contracted communication site plan that produced only a static map cost over \$90,000.

Complete working files for all 20 sites in Idaho will initially be posted to the State of Idaho Intranet site. Once the data is completed, it will then be made accessible on the Internet. The process is currently being shared with other BLM and Forest Service offices and specialists. ■

Belle A. Craig is a registered Professional Land Surveyor in the states of Colorado and Idaho. Graduate of Fort Lewis College, Durango, CO (B. Sc. 1989). As Geodesist for the Bureau of Land Management in Boise, Idaho, she oversees of the use GPS technology in BLM Idaho, for both GIS and surveying applications, in addition to doing project work.

Brent McBeth is a Resource Specialist working for both FS and BLM, stationed at Provo, Utah. Graduate of BYU, Provo, UT (B. Sc. 1973). He has national responsibility for development and management of Special Use, ServiceFirst, and Sustainability web pages and national implementation of communication site survey and management planning.

For Members Only

Right of Way magazine would like to increase the exposure of all IRWA members by recognizing their achievements in the right of way industry. The number of active men and women continues to grow in this profession and so each issue aims to follow their paths, spotlighting members and highlighting chapter news and events. We invite each chapter to participate in bringing awareness to the successes of our members.



For William J. Schweitzer, becoming the newly appointed Director of the Ada County Highway District, the only countywide highway district in the State of Idaho that maintains and operates 1,861 miles of roads and streets, is “an extremely unique opportunity.”

“It’s rare for someone with a right-of-way background to make it at the pinnacle of this organization,” Schweitzer said. “I never anticipated that the road would take me to becoming a director.”

With a public works career that spans more than 22 years at the federal, state and local levels of government, J. Schweitzer incorporated innovative management techniques and institutional improvements as ACHD’s former Right of Way Division supervisor. He has also worked for the Salt River Project Agricultural Improvement and Power District and the United States Bureau of Reclamation (Boise, Idaho and Phoenix, Arizona).

As Director of ACHD, J. Schweitzer serves as the liaison to the Chamber Transportation Committee, presiding over the Capital Improvement Citizen’s Advisory committee, meeting with the Consulting Engineers of Idaho and belonging to the APWA.

A native of Boise, J. Schweitzer attended the University of Arizona and Boise State University where he obtained a bachelor’s and master’s degree in Public Administration. ■