



By Joel Leininger, LS

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Topography is Dead; Long Live Topography

Over lunch recently with a couple of colleagues, I mentioned the impending demise of field-run topography and, its close cousin, the impending demise of construction stake-out (or setting out, or layout, depending on your part of the country) – all due to advances in technology that, in my opinion, are unstoppable. This prompted a lively discussion as to the accuracy of my prediction and what to do about it.

Come and Get It!

In the 60s there was a popular bumper sticker that read, “What if they gave a war and nobody came?” Similarly, we, the historical providers of topographic data, can ask ourselves, what if we offered field-run topographic data, and no one wanted it? Let’s examine.

labor-intensive and time consuming. Nevertheless, clients ponied-up the money, because the results demanded it.

When aerial methods became available, the dramatic cost savings ensured a healthy market for the product. I am not old enough to remember when aerial topography was in its infancy, but I am willing to bet that it was some time before civil designers became comfortable using it, despite its lower cost (or maybe because of it). But lower cost is a difficult temptation to withstand. These days only crazy people order field-run topo for sites of any size. Typically, large design projects use aerial topographic data for the bulk of the site, only supplemented by field-run data where critical tie-ins are anticipated – such as at existing roads and utilities. Thus, where 75 years ago a 30-acre site might have required 20 to 30 field crew days (and a corresponding amount of office time)

Remember, it was not the surveyors who decided this was the more efficient method, *it was the clients*, with the concurrence of the site designers. And who could blame them? The designers ended up with sufficiently accurate and complete topography, faster and at lower cost.

Hey Buddy, Want Some Topo?

If design-quality topo could be obtained for 1-percent of the cost of aerial topography, would clients be interested? How about if there were no required lead times? This is the promise of satellite-derived topography. With a few clicks of the mouse, a designer can have a ready-to-design-with base map of the project.

I have been amused in recent years watching the angst among surveyors over whether to grant photogrammetrists surveying licenses. In general, the theory is that if aerial firms are supplying topographic maps in large quantities, and if topographic maps are supposed to be the exclusive domain of licensed surveyors, then we’d better license the photogrammetrists or our licensing is a sham. All of which, it seems to me, is akin to rearranging deck chairs on the *Titanic*. In fact, as a class, photogrammetrists are more at risk from satellite data than are surveyors. Surveyors typically offer customers services other than topography, but very few aerial firms make that claim.

Predictions are always dangerous, but I’ll hazard one here anyway: in 25 years, few surveyors will be supplying any topographic data, and, unless they morph themselves into another market, *there will be no photogrammetrists*.

Think I’m joking? Today I used Google Earth three times to check out

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Effective planning requires knowledge of the playing field.

Who are the consumers of field-run topography and why? Essentially, civil designers require accurate information about existing conditions in order to design improvements that properly interface with them. Effective planning requires knowledge of the playing field (no pun intended). But obtaining this type of information historically was

to obtain design-quality topography, more recently the site would have been flown (after setting ground control) and then supplemented with spot checks in specific areas. The primary motivation for the change in procedure, of course, is time and cost. Aerial data for the site could cost as little as what three or four field crew days would cost.

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ground conditions: once to get a fuller understanding of off-site improvements, and twice to assist me in proposal development. This, without getting out of my seat, and without spending a dime. Three years ago a service like this was unthinkable; I have *socks* older than that. I realize that Google Earth does not currently have every spot on earth at a resolution sufficient to help us, but in many areas one can easily pick out people (actually, their shadows) on sidewalks. *Wow!* Things are ramping up, folks, and some of our services are like wax headed toward the flame. To paraphrase Mark Antony in Shakespeare's *Julius Caesar*, I come not to praise topography, but to bury it.

It is only a matter of time before design-quality topography is available for free or at nominal cost over the Internet. And it may be a short time, at that. There are obstacles remaining, of course, but there is *big money* focusing on this market, and rapid progress is inevitable. Remember, the litmus test is not perfection; it is merely being good enough to facilitate the design. Especially for mass-graded sites, where intricate tie-ins are few, the quality may well be good enough right now.

There remain outstanding issues, such as who will supplement the satellite data with utility inverts, or areas under some sort of impenetrable canopy etc.; who will supply up-to-the-minute data when year-old data is inappropriate? These are small problems in the great scheme of things, and will no doubt be solved on a case by case basis.

Invisible Hand of the Market

Lest some be tempted to try and thwart this progress in the name of preserving "turf," let me point out that over time the market will always find the most efficient methods to get a job done. That is why aerial topography largely supplanted our field topography. One cannot force designers to use a particular type of site data, because there is no requirement to use data at all! Designers alone decide how comfortable they are with understanding site conditions, and what they rely upon to get that way.

Short of shooting down the satellites, this cannot be stopped. I, for one, am delighted. *A*