

THE American Surveyor

A FOOT IN THE PAST... AN EYE TO THE FUTURE

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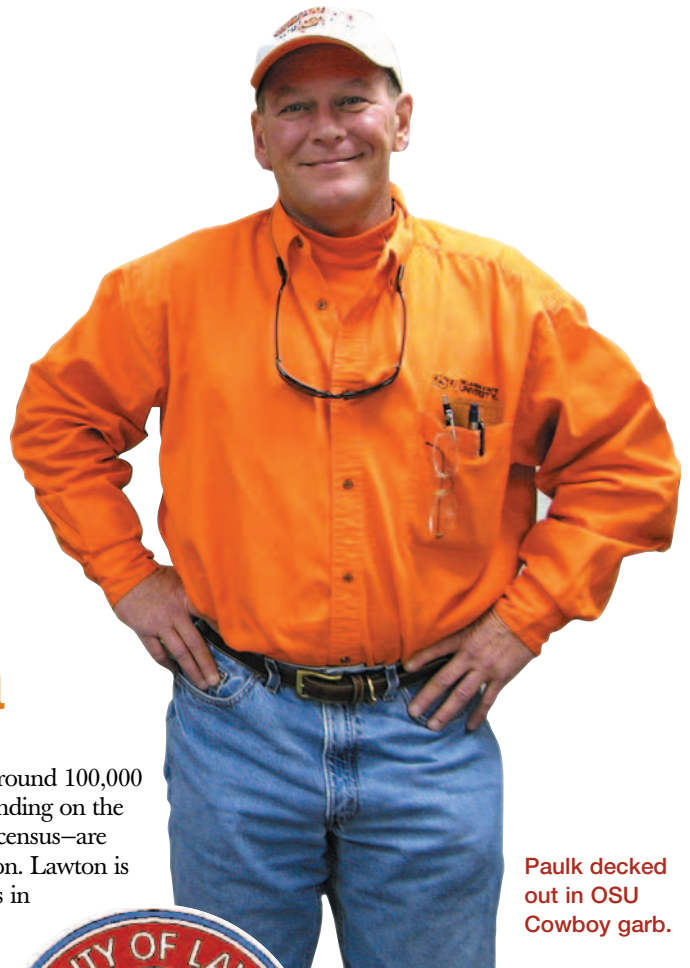
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ProFile

By Marc S. Cheves, LS

An Interview with Deral Paulk, LS, City Surveyor of Lawton, Oklahoma



Paulk decked out in OSU Cowboy garb.

It's one of those memories of growing up in Oklahoma in the 50s that ranks up there with sampling a plug of a fresh Rush Springs watermelon from the back of a farmer's truck on a sweltering summer afternoon... Every April, in commemoration of the Oklahoma Land Run of 1889, the sloped grassy playground of Grover Cleveland elementary school became the stage for a lively re-enactment of the event. In a bustling pageant of colorful homemade costumes we assembled our Radio Flyer wagons-turned-prairie schooners and bicycles disguised as horses along the edges of the playground. Pint-sized cowboys, pioneer families, sheriffs, soldiers and federal marshals waited impatiently for the noon-time gun that would signal the start of the race to claim a homestead—complete with stakes—on the open prairie of the playground. The greatest challenge, of course, was to pull a fast one on the guards and sneak across the borders “sooner” than the rest.

This year as the Sooner State marks the 115th anniversary of the Land Run, the landscape of the prairie has changed dramatically, and the population that began with approximately 50,000 settlers has swelled to more than 3 million. Oklahoma City, the capital, ranks first with more than a million residents in the metro area (and an operating oil well on the capitol grounds called Capitol Site No. 1). Next in line is Tulsa, and vying

for third place—at around 100,000 residents, and depending on the results of the latest census—are Norman and Lawton. Lawton is located more or less in the center of the southwest portion of the state and abuts the southern edge of Fort Sill, a beautiful 94,000 acre post. Part of Fort Sill lies within the Wichita Mountains, which, along with the Arbuckle Mountains farther east, are the ancient foothills of the Rocky Mountains. In addition to being a major training center for field artillery, Fort Sill holds another distinction: it is where the famous Apache Indian Chief Geronimo spent his last days, and where he is buried. Today, as the U.S. Army Field Artillery Center, Fort Sill remains the only active Army installation of all the forts on the Southern Plains built during the Indian wars, and contains a vast impact area where the distant whump of exploding artillery rounds can often be heard for miles around.

According to the City of Lawton website, “Lawton was founded on August 6, 1901, when the Kiowa-Comanche-Apache reservation, the last of the Indian lands in the Oklahoma Territory, was opened by the federal government for settlement. A lottery was

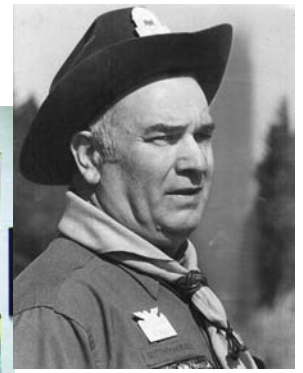


Today's municipal

used to distribute the land in 160-acre plots, rather than the unruly method of ‘land runs’ used previously in other parts of the Territory. A person wanting a claim had to register for the drawing. On July 10, 1901, registration opened at Fort Sill and at El Reno, Oklahoma. About 29,000 would-be homesteaders from all over the United States journeyed into the southwest Oklahoma Territory to register at Fort Sill during the 16 days registration was open. Another 135,000 registered at El Reno. Lottery planners in Washington, D.C. had not envisioned so many people wanting land in this part of the country. The drawing began July 29th at El Reno. Only 6,500 were lucky enough to be selected for a homestead in each of three districts, one of which was Lawton.”

In deciding to interview this issue's ProFile subject, City Surveyor Deral Paulk, several things influenced my decision. First, a personal connection, but more important, a chance to gain insight

Paulk and Porter's collection of survey memorabilia. The flag behind the case was given to Paulk by his father, and flew on a battleship in WWII.



Paulk's father as Scout Master



surveyors wear many hats.



Michael Porter, LS

Michael Porter, part of a two-man surveying shop

into the problems faced and solutions implemented by today's municipal surveyors. Within the confines of ever-shrinking budgets, Paulk's department pro-actively seeks work and wisely allots its resources to provide real value and benefit to the citizens of Lawton.

Readers who frequent www.rpls.com may quickly recognize Paulk by another handle: Trimble Man. But what they may not know is how Paulk wound up in the place he is today, and I thought readers might enjoy his story. Going back a few years, Paulk credits his father, a Scout Master and a field engineer with the FAA, with instilling in him a love for mathematics and an interest in surveying. (He claims that 50 percent of the regular visitors to rpls.com owe part of their survey roots to the Boy Scouts.) Paulk spent 20 years working for Topographic Inc. in Oklahoma City, where he rose to the rank of President of its Oklahoma Division. Paulk credits John Keating from Topographic as another one of his early mentors in his survey career.

Prior to accepting the city job in 1996, Paulk had met and started talking with Duane Brunner, who was the Lawton City Surveyor at the time. Brunner, who would soon be retiring, wanted someone to carry forward with the plans he had started implementing. He knew that the various city construction projects could benefit from having surveyor involvement from beginning to end. Paulk had been instrumental in implementing GPS at Topographic, and his skills would serve him well in Lawton (see more on Topographic and Brunner in sidebar).

Paulk, Oklahoma LS 1279, and licensed surveyor Michael D. Porter, Oklahoma LS 1514, run a two-man surveying shop within Lawton's Public Works Engineering Department. (Porter has been with the City for 13 years, and would have succeeded Brunner but for the fact that at the time, he wasn't licensed.) Today the department has five full-time engineers, two GIS CAD technicians, four construction inspectors and a secretary.

Lawton maintains an extensive network and uses both real time sub-meter and post-processed static to populate their survey database of information. The Oklahoma DOT relies extensively on CORS, and Lawton cooperates not only with the DOT but the local BLM representative, Richard Widmark, LS, as well. According to Paulk, cooperation with local surveyors, in general, is excellent.



In front of Paulk are project reports, each demonstrating a successful outcome.

When Paulk came onboard in 1996, the City was in the midst of a \$35 million sewer project. As part of the project, 150 GPS points were established for aerial control. This work utilized a local private contractor, North Fork Surveying out of Snyder, Oklahoma. (Phil Stevenson, one of the North Fork owners, has been one of the leading proponents of GPS in Oklahoma). Today, using a Trimble 4600, Paulk and Porter have brought the total of GPS monuments up to 641.

Oklahoma has a PLSS corner filing requirement. More than 250 Certified Corner Records have been filed by the department. At the beginning of Paulk's tenure, the City had very few bench marks. Enough bench marks have now been installed for FEMA to upgrade Lawton from a Category 9 to a Category 8, which has resulted in a rate reduction for flood insurance. A current project is expected to further reduce Lawton to a category 7.

Paulk told about several interesting projects they've been involved with. One was a hydrant project they did using ProXR's with OmniStar. Another project involved geo-referencing existing storm sirens—very important in a state known as Tornado Alley. Once the data was brought into the city's GIS, decisions about placing 15 more sirens was made simpler. The sophisticated siren system can be actuated by emergency personnel via cell phones in the event that actual storm conditions can be observed. Paulk's department handles the 911 maps, and is in the process of adding building footprints for E-911. He said they have a great relationship with Fort Sill, and in fact, a City of Lawton 42-inch water line runs across the post.

Paulk related another story about the time they were looking for the line in an area that had once been a B-52 bombing range. When the range officer heard that they were in the area, his eyes got large, due to the existence of unexploded ordnance. He also smiled as he recalled an instance where they had left a backhoe trailer parked in an area, and were working quite some distance away. To their amazement, they watched as artillery rounds were walked across the area until the trailer was destroyed by a direct hit. When he told this story, *my* eyes grew large. These are the kinds of stories that must make it difficult for range officers to sleep at night.

Paulk believes strongly in continuing education, and to that end, both he and Porter teach classes at the Oklahoma State University extension campus in Oklahoma City. Paulk teaches GPS and GIS, and Porter teaches CAD (both are devoted OSU Cowboy fans—Pistol Pete rules!). Paulk feels that the legal aspects of State Plane Coordinates on legal descriptions are something that surveyors really need to pay attention to. He is also an ardent supporter of the TrigStar and MathCounts programs.

Paulk says there is excellent cooperation between the various units of the Lawton city government. His section is responsible for maps for all the other city departments, as well as maps for City Council presentations. He's proud of the fact that maps can now be generated in 10 minutes as opposed to the three weeks it used to take.

While in many towns the GIS is under the IT department, in Lawton it's under the Engineering Department, and the Engineering section is 100 percent behind the efforts of the survey section. The GIS, although not publicly available



At work in 20° weather on one of Lawton's 42-inch water mains.

The Rest of the Story





**A little survey humor.
Warning: don't try this at home.**

yet, hopes to use MapGuide. The Engineering Department uses AutoCAD Map because their GIS software can't be used for design work, but Map can handle the GIS work. For computations, Paulk and Porter use Eagle Point, and are able to accomplish 100 percent of the linework with careful field coding.

Paulk and Porter act as a two-man crew, and handle all of the necessary fieldwork and office work. He claims that they can gather 400-500 points a day, and can kick out a finished map within a day. They take lots of digital images of the projects, and with AutoCAD Map, routinely link photo data with drawings. Paulk and Porter coordinate closely with the city's Right of Way Department, and Paulk indicated that a real plus for them is having two people in that department available for courthouse research.

When I inquired about unique problems that he faces, Paulk immediately responded with unfunded mandates/con-

sent orders and declining budgets. Municipalities are forced to comply with many regulations for which they have no funding. In Paulk's case, these include regs from the Oklahoma Department of Environmental Quality, the Water Resources Board and the EPA. One particular project had been delayed for two years as they waited for an archeological study to be completed.

On top of this are various regulations promulgated by city and state codes and the Oklahoma Board of Registration for Surveyors and Engineers. The department's well-maintained but elderly Topcon total station is years past the age that most private sector firms would have had it replaced. The department is also waiting for funding that will allow it to modernize its GPS equipment with RTK to further save time and money for city projects.

As for the future, Paulk looks forward to the day when GPS and total stations are combined to enable position gathering at the same time angles are being turned. He would like to incorporate the new Thales MobileMapper and Navcom RTK base station into the workflow for GIS projects.

Anyone who has lived or worked for any length of time in Oklahoma will tell you about the strong work ethic that is evident in people across the state. Perhaps it comes as no surprise then that the State Motto is *Labor Omnia Vincit*,

which translated means "Labor Conquers All Things." The work ethic I witnessed in Lawton is no exception. While we were there, Paulk laid more than a dozen project reports on the table and quickly showed how, in each one, the constant money-saving ethic of the Engineering Department was evident. A schedule of field work is established and everything they do has an outcome-based measuring element. Because the survey group has shown its value, it is involved (as Duane Brunner had envisioned) in every project from beginning to end, and it is relied upon by a variety of city agencies for its unique contribution. Larger municipalities are sometimes overwhelmed by the sheer magnitude of the work, not to mention the lack of funding, but Porter says that Lawton, containing 40 square miles, is small enough that projects actually get finished.

I thoroughly enjoyed my visit with these folks from a professional as well as a personal perspective. Events set in motion by Sergeant Brunner are playing out in a way that the townspeople may not see, but the work they're doing allows Paulk and Porter to go home at the end of the day with a sense of satisfaction over a job well done. And by the way, did I mention that Paulk and Porter are Oklahoma State Cowboy fans? *A*

Marc Cheves is Editor of the magazine.



For many of us, the longer we live, the more we experience the weaving of past events and cross paths with individuals who leave a lasting impression on our lives. The timing of those events is often remarkable and unplanned. The people and places mentioned in this article are a good example of that.

When my father returned home from active duty as a Seabee in the mid-40s, my parents lived in Lawton, which is where I was born. Shortly thereafter we moved to Oklahoma City. In 1963 I was hired by Mr. John Keating to work for his company, Topographic Engineering. Forty years later, as this issue of the magazine was going to press, I received a wonderful letter from Mr. Keating (you can read his letter in the Feedback section on pg. 75).

Then, in 1967, after enlisting in the US Army, I did part of my training as an artillery surveyor at Fort Sill. Shortly thereafter I was transferred to Germany, where Master Sergeant Duane Brunner and I worked on a survey crew for the 4th Battalion, 41st Field Artillery out of Schwabebisch Gmuend. Our mission was to establish wartime launch sites for Pershing nuclear missiles. Of course, this was in the day before technology, and our crew used a T-2, double-taped all distances, and performed calculations with log tables. Needless to say, our crew—with Sergeant Brunner, an instrument operator, a note keeper, two chainmen, two computers, and a crew chief—cut quite a swath as we surveyed across southwest Germany. (Pictured left: Master Sgt. Brunner & Crew, 1970; Right: Retired Sergeant Major Brunner today)

Sergeant Major Brunner, originally from Nebraska, retired from the Army in Lawton. When he first applied for his Oklahoma license, the Board turned him down due to the fact that most of his experience came from the military. He eventually obtained his license and went on to become the President of the Oklahoma Society of Land Surveyors. The survey group in the City of Lawton has had four OSLS presidents, starting with Brunner's predecessor, Joe Scheller. Paulk has been president, and Porter is president-elect. —Marc Cheves

