SURVEY AND MAPPING PROFESSIONALS AND TECHNOLOGISTS

SOLUTIONS THROUGH TECHNOLOGY

Geomatics has been defined as "the science of measuring the natural and built environment."

BUT MCKIM & CREED TAKES A BROADER VIEW.

We expanded this definition of geomatics to include *"the science of solving problems and discovering solutions."*

As one of the largest and most comprehensive geomatics firms in the U.S., McKim & Creed understands that complete and accurate data is the foundation—the building block—of every project.

McKim & Creed was founded in 1978 by Herbert P. McKim, Jr, PE, PLS, and Michael W. Creed, PE, Ph.D. The firm began as a two-person company providing structural engineering services to architects. Today, McKim & Creed is a 600-person, employee-owned firm with 23 offices in seven states and licensed surveyors in 21 states. The firm provides geomatics and engineering services to public and private clients throughout the country, and its geomatics business unit provides approximately 40 percent of McKim & Creed's annual revenue.

McKim & Creed employees have raised more than $50,000 to find a cure for MS. In 2018, the company is participating in Bike MS events in North Carolina, Florida and Pennsylvania.

For four years, the company has been recognized as the No. 1 Surveying and Mapping Firm in the Southeast by Engineering News-Record Southeast. McKim & Creed has also been ranked among the Top 100 Land Surveying, Mapping and Geospatial Firms by Point of Beginning magazine, and one of the Top 25 Trenchless Design Firms by Trenchless Technology magazine.

Whether it is new design, construction, infrastructure monitoring, inspection, or understanding the existing physical conditions of an area, the ultimate success of any project relies on comprehensive and accurate data and analysis. We also understand that every project is unique and has its very own special requirements and conditions.

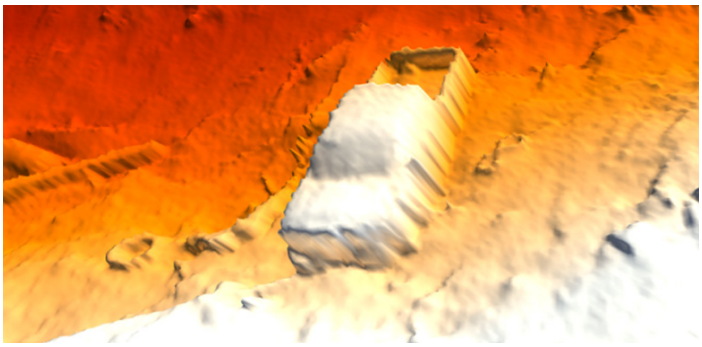
Although McKim & Creed services all markets, we are most widely recognized as transportation surveying and mapping experts and provide these services directly to Departments of Transportation as well as all the major transportation design engineers. Some examples of current of recent transportation projects include the Bonner Bridge Replacement, Outer Banks, NC; Tampa Bay Express (TBX) Phases 1 and 2, Tampa, FL; and the corridor of I-35E, one of Texas' 100 most congested roadways, that runs through Dallas and Denton counties. All 3 of these projects include data fusion from multiple technologies.

McKim & Creed understands that using a specific technology or a combination of technologies best suited for the project can often result in large savings to the customer in terms of both time and money as well as a comprehensive, accurate product that greatly contributes to the ultimate success of the project. Like a shipwright or a good mechanic, we understand using the right tool for the job is important.

FACTORS TO CONSIDER FOR PROJECT APPROACH PLANNING

- What is the main purpose of the survey?
- What are the accuracy requirements?
- What is the terrain and access to the site like?
- What are the safety concerns?
- What is the budget?
- What is the schedule?

For example, when the Wilmington, North Carolina police were investigating an insurance fraud case, McKim & Creed hydrographic surveyors used multibeam technology to uncover vital evidence.



McKim & Creed's multibeam sonar system helped police locate a Dodge 1500 truck in 35 feet of water. The vehicle was part of an insurance fraud investigation.

"*The multibeam survey technology was instrumental in obtaining a conviction in this case*," said William Van Trigt, Esq., Assistant District Attorney for New Hanover County.

And when our client needed an independent survey for volume calculations at a 185-acre reservoir site in Texas, McKim & Creed collected accurate data using unmanned aerial systems (UAS). The owner had been reluctant to use UAS due to poor past experiences, but was so pleased with the results that McKim & Creed was commissioned to collect volume calculation data every few months until excavation was completed.

When a Canadian company needed to build temporary dikes to hold water so diamonds could be mined, McKim & Creed configured, installed and provided training for a customized GPS position and monitoring system. This allowed crane operators to accurately track when, where and how much fill material had been placed.

McKim & Creed has more than 50 survey crews and provides airborne, mobile and terrestrial LiDAR/scanning; UAS (drones); subsurface utility engineering; and hydrographic and conventional surveying services for the energy, transportation, federal, oil & gas, land development, water and building markets.

"*We use our surveying tools to do much more than collect accurate data*," said Tim Cawood, PLS, who oversees McKim & Creed's geomatics business unit. "*We use our tools to meet our clients' challenges*." Those challenges include budgets, schedules and a quality, usable product that meets the objectives required by the customer.

McKim & Creed is consistently acknowledged as an industry expert, with requests for speaking engagements at international, national and local conferences. Furthermore, the company has won numerous awards for its geomatics work, including two Grand Conceptor Awards—the highest award given by the American Society of Engineering Companies of North Carolina—for its use of mobile LiDAR for transportation projects and a proof of concept involving UAS for coastal mapping.

The Diavik Diamond Mine is located in the Northwest Territory on Lac de Gras (French, for Fat Lake). The diamonds are located in ore deposits called kimberlite pipes, which are found beneath the waters of Lac de Gras. Approximately eight million carats of diamonds are produced at Diavik annually. To allow the open pit mining, dikes surrounding the kimberlite pipes are built to temporarily hold back the water. Using a combination of strategically placed GPS receivers, a customized HYPACK application and a DGPS hydrographic system, McKim & Creed's surveyors, HYPACK's programmers, Lac de Gras Excavation's operators and Diavik's engineers developed a procedure to install the filter blanket safely, efficiently and on schedule. (Photo Courtesy of Diavik Diamond Mine)

Included in McKim & Creed's subsurface utility engineering (SUE) fleet are six vacuum trucks and three vacuum trailers. Two of the vac trucks use water and/or air to safely and non-destructively expose buried utilities.

INVESTING IN TECHNOLOGY

McKim & Creed has become a leader in the geospatial industry because of its expertise, dedication to work, innovative solutions, and investment and application of cutting-edge technologies. These technologies include airborne, mobile and terrestrial LiDAR/scanning; UAS (drones); subsurface utility engineering; and hydrographic and conventional surveying services for the energy, transportation, federal, oil & gas, land development, water and building markets. McKim & Creed also provides industry leading back end GIS or BIM solutions using the comprehensive data we collect ourselves or data provided to us by our customer.

USING THE RIGHT TOOL FOR THE TASK

There are many factors to consider when planning a project approach and the technology needed to meet the project objectives. The FHWA and especially the FLH have some very exciting, but extremely challenging, projects regarding access, geography and topology.

The Blueridge Parkway is a very good example of that. So, if the FLH wanted to monitor a section of the BR Parkway for rock slide potential, a UAS or mobile lidar system or terrestrial 3D scanning would appear to be the best possible solutions. All three systems can measure millions of points very quickly with sub-centimeter resolution. Choosing one system over the other would be determined from additional factors, such as the distance the rock face is from the roadway, or the overall linear distance of the entire area to be monitored. McKim & Creed has all these tools available and always strives to use the best one for specific conditions of each project.

Throughout its 40+-year history, McKim & Creed has seen itself as more than an engineering and geomatics firm. "*Collecting and analyzing data is just part of what we do,*" Cawood explains. "*We are actually in the business of solving problems, discovering solutions by levering technology and making life just a little better wherever we can.*"

> "McKim & Creed has always been an early adopter of technology. Guided by the philosophy that we want to use the right tools to meet the objectives of the client, we have been able to stay on the cutting edge. That's an advantage that McKim & Creed offers — our resources, the technology we can bring to any situation. That's why people call us. Eighty-nine percent of our clients are return clients. We have clients that we've worked with for over 30 years."
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> **~ TIM CAWOOD, PLS**
> **PRESIDENT, GEOMATICS**