

## ***Radar Tomography - a New Geophysical Technology that Reduces Risks for Design-Builders***

Contributed by Rob Kelly

Unmapped subsurface utilities – the ever-present risk for owners, developers, designers and constructors – are being identified in survey-grade accuracy, no matter their type of construction, with ***radar tomography (RT)***. This new technology, long in development by Witten Technologies, Inc., is now available in Georgia through a marketing agreement with United Consulting in Norcross.

Hayne Palmer, the Manager of United Consulting's Geophysical Department says, "The new RT technology markedly expands our wide array of geophysical services with a capability that allows our clients to "see" the subsurface with heretofore unheard of accuracy up to 72 inches in depth, depending on ground and soil conditions.

Palmer, a professional geologist with over 20 years of applying geophysical technology to site assessments, further explained that, "This improved accuracy of RT means that owners and engineers can design-build with greatly reduced risks of excavating the unexpected, whether a conductive utility or one made of concrete, plastic or vitrified clay."

"The 3-dimensional view of subsurface conditions is what really makes RT an exciting advancement for Subsurface Utility Engineering (SUE) over our conventional ground penetrating radar," explained Palmer. "RT has the ability to deliver plan-view slices of the subsurface in color in depth increments of *one inch*. This means that the planning for excavation or avoidance of a utility is almost surgical in accuracy, potentially reducing construction costs and delays."

RT is a form of synthetic aperture radar that uses an array of ground penetrating radar (GPR) antennae, laser positioning, and advanced signal and image processing algorithms to produce the 3-dimensional imagery of the near subsurface. In addition, a video can be produced of this imagery. This is done by showing sequential plan-view slices of the subsurface descending down to the depth limit of the RT.

Witten Technologies' publications also remind users that while RT was designed for locating utilities it has proved useful in related applications such as for archeology, forensics, cemeteries, underground tank detection, and pavement/tarmac assessment.

Palmer emphasized that "RT is a great addition to the wide variety of geophysical tools used by his staff. It complements standard single-channel GPR, electromagnetic instruments, and seismograph sensors. Over even surfaces the two-meter wide RT array can be driven at 1 to 2 miles per hour for rapid scanning of large areas." The traditional instruments can tackle tighter, uneven terrain.

Currently, RT is being used by United Consulting to scan the roadway for the Georgia Department of Transportation's widening and relocation of Georgia Highway 411 in Bartow County. This first major project in Georgia for the use of RT will consist of surveying over 350,000 square feet of roadway prior to construction to avoid the risks of damaging vital utilities.

For further information, interested readers can read technical details about RT in the December 2006 issue of *Design-Build Dateline*, The Journal of the Design-Build Institute of America, or contact Hayne Palmer at United Consulting at 770-582-2796 or [hpalmer@unitedconsulting.com](mailto:hpalmer@unitedconsulting.com).