



## **Connecting two worlds: Civil engineering and Telecommunications**

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Civil engineering firms with specialized telecommunications services offer a great value to clients involved in telecom projects. Following the near collapse of the industry in the U.S. in the early '90s, today there are tremendous opportunities due to the competitive challenges facing fixed line, cable TV and wireless operators as well as the technological advancements in fiber and wireless technologies. As network expansion continues, the need for land use, zoning and permitting will be required for the small network upgrades to large scale deployments. Opportunities also exist for fiber deployments which include new conduit planning in the Metropolitan Area Network (MAN) as well as planned private communities and multiple dwelling units (new and retrofits). Various state and local agencies have specific requirements which must be satisfied, leading to a need for the expertise provided by multi-disciplined engineering firms. Planning, zoning, environmental, structural construction and project management are all service capabilities to address before the various projects/upgrades can be accomplished. Civil engineers are one of many professions which design, research, manage and implement public works.

The telecommunications industry encompasses not only the traditional fixed line and cellular services, but also includes wireless and the Internet. The methods to deliver have grown from traditional copper based networks to fiber optics and satellites which create additional competitive opportunities. Cable companies have been offering traditional plain old telephone service through voice over Internet protocol technology, Internet service and video-on-demand. This is known as Triple Play, a bundled package which has opened the door for greater service developments. As a competitive solution, incumbent Local Exchange Carriers (LEC)-i.e. phone companies have answered cable's offering with Fiber To The Home (FTTH) service as they lay fiber-optic cable in neighborhoods, homes and offices to retain customers (or attract home buyers) with the promise of high speed Internet connections and enhanced entertainment services. In the wireless sector, advancements to deliver voice, Internet and video-on-demand are WiFi and WiMAX. While WiFi has served the industry in delivering high speed broadband in limited or 'focused' areas, WiMAX is an advanced wireless technology with a range of up to 30 miles offering city-wide, high speed, wireless Internet connections at prices much lower than DSL or cable. WiMAX has the potential to serve more expansive areas.

While cable providers and the incumbent LECs have emerged as the providers of Triple Play, as technology advances, so do the opportunities for 'niche' companies. The handheld device industry is creating increased opportunities by offering non-tethered networks to the user community. An example is the release of the iPhone from Apple, created to eliminate the need to carry multiple devices to 'stay connected.' And let's not forget about Google's recent announcement to support cell phone users with Internet searches utilizing Google's search application.

As the telecommunications industry continues to evolve and expand, the need to update the infrastructure is more urgent than ever. Antennas to provide WiMAX must be placed, additional fiber needs to be deployed and towers need to be erected. The demand for capacity due to the larger pockets of information that needs to be delivered is now more prevalent to handle all of these new services now being offered to consumers. Public safety and homeland security are an additional opportunity that must be addressed with inter-operability between police, fire, Coast Guard, and other public safety/first response agencies in the event of a disaster. The networks for tomorrow need to provide "any-to-any" and "anywhere-to-anywhere" connectivity options.

All of these opportunities illustrate a demand for the expertise of civil engineering firms that offer diversified services to design these infrastructure needs. Major retailers and developers should implement these advances in the telecommunications industry into their expansion and new-build projects. This will allow them to market the services-of-the-future that clients will be seeking. In addition to being able to assist in this arena, Bohler Engineering offers multi-disciplined civil and consulting engineering services, site planning, surveying, project management, telecommunications engineering, environmental consulting, landscape architecture and permit expediting.

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