

The Google Fiber Series

David Scott, founder of Kansas City FiberNet, Birch Telecom and Avid Communications, has been following the development of fiber-optic communications for 30 years. In a series of articles, he interprets the significance of the Google's announcement that Kansas City, Kan. and Kansas City, Mo. will be the first locations for its gigabit-fiber-to-the-home network.

Thirty Years of Fiber-Optic Communications

Prior to the invention of fiber-optic communications, copper wires and microwave signals carried the nation's telecommunications traffic, which was overwhelmingly voice. Serious work on using glass fiber to carry telecommunications signals began in the 1950s and gained momentum in the 1970s.

Commercial applications began in the 1980s, most notably when Sprint Corporation announced plans to build the nation's first all-fiber-optic long distance network, completed in just a few year's time.



Fiber-optic lines carried far more traffic than copper or microwave facilities. They use thin glass strands made from silica that are about as thick as a human hair. Many coated strands are bundled in a single cable. With the digital signal blinked out by high-speed lasers, a single fiber can carry thousands of voice conversations, far more than the entire microwave facility depicted in the following photo.

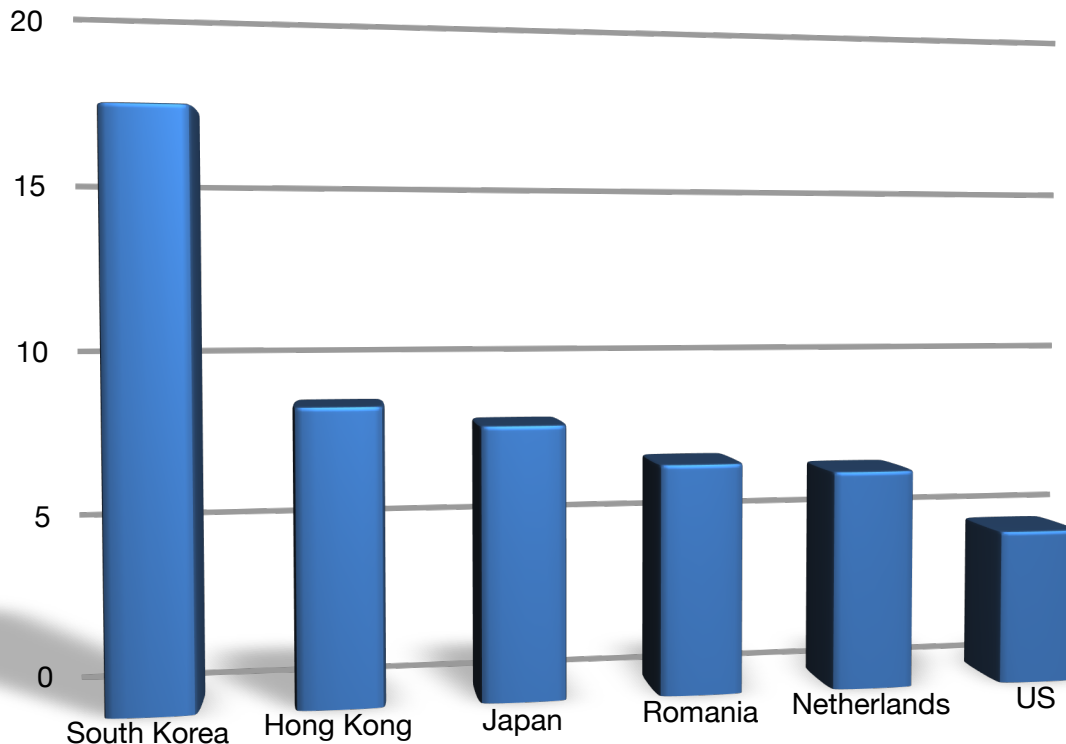


As the technology has advanced, the amount of information that could be transmitted over a fiber has continually grown. Fiber is largely immune to interference. It can transmit high data rates over long distances with no errors. Unless the cable is cut, it is unaffected by environmental conditions, especially rain, which plays havoc with microwave signals and can seriously disrupt communications over copper lines as the cables age and take in moisture.

It has been clear since the 1980s that the ultimate objective would be to deliver an all-fiber network directly to homes and businesses. But after decades, few have a fiber connection, instead relying on the copper “drops” (the final portion of the network from the telephone pole into the home or business) that have been the industry standard with relatively little change for a century or on the coaxial cable lines that cable TV (CATV) companies have deployed over the last 40 years.

The United States lags many developed countries in fiber-optic use. Currently the US ranks no better than 16th in Internet connection speed, and that is largely a measure of our continued reliance on old technologies in some portion of the network.

Top 5 Internet Countries and #16 USA



Recently that has begun to change. Of the major phone companies, Verizon has placed the most fiber in the “last mile” of the network, while major companies like AT&T are pursuing an approach that would continue using a portion of the copper network indefinitely. CATV companies generally continue their

reliance on coax. Independent phone companies, many serving smaller towns and rural areas, spurred by government subsidies, are constructing all-fiber networks. Paradoxically, the larger cities lag far behind these smaller communities.

Thus the stage is set for Google. It's business hinges on fast, open Internet access. The company has long carped about the slow speed of fiber deployment by AT&T, Verizon and others, and taken its battle to keep the Internet open and unrestricted for all to Congress and the Federal Communications Commission. And now the two Kansas Cities become the battleground in this war between giant information companies. For at its heart, that is what the Google Fiber project is about.