

Deploying Fiber Faster and Cost-Effectively With Microtrenching

This technique is gaining popularity across the country because it costs much less than other deployment methods and can be done in days instead of weeks.

By Deborah Kish / *Fiber Broadband Association*

The gold standard for high-speed internet is fiber, and even though the total cost of ownership (TCO) for fiber is far less expensive than its competing technologies, some people argue that fiber deployment is cost-prohibitive in some scenarios. But a somewhat new construction technique is worth considering for cost-efficient fiber construction: microtrenching.

Though it has been used since at least 2013, microtrenching is increasing in popularity across the U.S. As with any new technique, it's viewed with some confusion and skepticism.

MICROTRENCHING VS. OTHER TECHNIQUES

Microtrenching entails digging a narrow trench (1 to 2 inches wide and up to 2 feet deep) to lay multiple conduits of fiber or coax across highways, sidewalks, crosswalks, parking lots and driveways. It's an alternative to horizontal direct drilling (HDD), in which a 3- to 5-foot-deep hole is dug and a tunnel created (under roadways, sidewalks etc.). Pipes made from PVC, polyethylene, polypropylene, ductile iron or steel are pulled through the drilled hole, and the fiber or coax conduits are snaked through. The controversy between the two techniques is that microtrenching can disrupt everyday activities such as commuting, walking or parking in the areas of construction; HDD does not, making it seemingly more desirable without recognizing the added benefits of microtrenching cost savings.

Google has used microtrenching to accelerate Google Fiber for years in cities such as Austin, Texas, and Charlotte, North Carolina, at various depths. Most recently, Google has successfully focused on "shallow trenching," in which a trench only 6 to 12 inches deep and 1.25 inches wide is dug. This allows for even faster and cheaper deployments and is typically well under the depth of standard mill and pave operations.

Other companies, such as Crown Castle, have found that a 2-inch-wide microtrench with a depth ranging from 16 to 26

inches has been very successful in several cities. To date, more than 50 miles of fiber have been deployed by microtrenching throughout Southern California, predominantly in Los Angeles, with significantly less impact to the city's busy streets than other methods would have caused.

MICROTRENCHING POPULARITY INCREASES

In 2013, New York City was one of the first cities to adopt microtrenching, and some cities are now encouraging it as the preferred technique to deploy fiber unless there is a substantial reason to use an alternative.

For example, in California, Senate Bill 378, the Broadband Deployment Acceleration Best Practices Act of 2021, amends the Permit Streamlining Act to allow microtrenching. It calls for improved access to high-speed internet across the state and declares that microtrenching is a quick, cost-effective way to install fiber.

Currently, more than 30 states either are amending existing rules or creating new mandates for the quick deployment of broadband to accelerate and streamline related projects. The New York City Department of Information Technology & Telecommunications and the Department of Transportation started a pilot program after Hurricane Sandy to speed fiber deployment. It formalized microtrenching as a viable construction option.

California's move to accelerate fiber also has ties to natural disasters. In 2017, drought conditions caused 21 fires in five counties, damaging existing copper facilities. More recently, Los Angeles adopted a microtrenching ordinance to accelerate the installation of fiber underground.

TIME AND MONEY

The California Best Practice Act laid out the benefits of fiber rather explicitly, and the use of microtrenching as a technique makes deployment more appealing because of cost and time savings.

Fiber Provides A Superior Experience To Other Types Of Broadband RVA Broadband Experience Index, 2019

	FTTH	Cable	Wireless	DSL/FTTN	Satellite
2019 BEI	98%	65%	38%	38%	1%
2019 ALTERNATIVE BEI	99%	69%	47%	45%	14%



Index based on 2019 RVA consumer survey measurements (and 2017 FCC Data)

- Net Promoter Score
- Reliability
- Upload Speed
- Download Speed
- Latency

FiberBroadband
Accelerating the
Connected Future

RVA LLC
Market Research & Consulting

A survey conducted by RVA for the Fiber Broadband Association indicated fiber to the home provides a better user experience than other broadband types.

Historically, fiber has a reputation as being expensive to deploy. But the bulk of the expense is not the fiber itself but the installation and associated restoration. The amount of time it takes to dig and lay the fiber, coordinate with the Department of Transportation, ensure safety, and handle all the moving parts of a fiber installation project means customers will wait a while before they reap the benefits of high-speed internet access.

Traditional open trenching costs roughly \$400 per linear foot (the cost varies state by state). Microtrenching costs *one-fifth* as much. A fiber project can be installed with microtrenching in much less time than with other methods – in some cases hours

instead of days. Another benefit: Microtrenching is easily compatible and does not interfere with already scheduled street maintenance programs. In many cases, shutting down an intersection takes half as much time as it would otherwise, meaning traffic can get back to normal faster. That means less congestion and aggravation for commuters, not to mention half the construction time, less equipment, lower labor costs and so on.

WHY FIBER?

Fiber optics is the most effective medium to provide high-speed internet access to households and businesses. It is future-proof – once fiber is in place, the transmission

capacity can be increased to supply whatever bandwidth is needed. This is particularly important given today's growing need for reliable internet access as remote learning, remote work and telehealth become more mainstream.

Fiber is more reliable because it is not subject to electrical interference or interference from naturally occurring weather conditions and is protected from most natural disasters, such as wildfires in California and hurricanes in the South and northeastern United States. Fiber provides a more consistent and reliable service based on speed and lower latency, resulting in a better end-user experience compared with competing mediums.

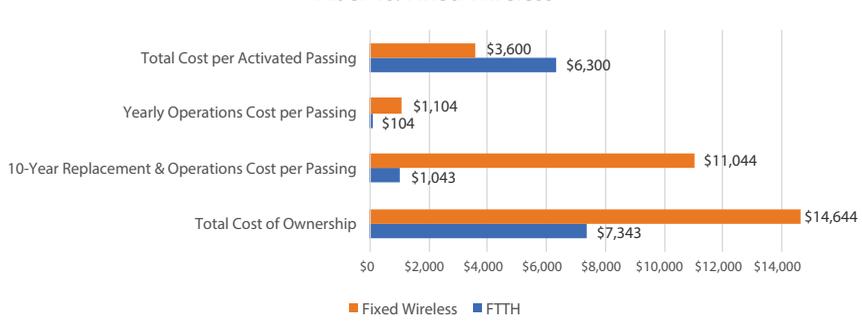
For a service provider, over time the cost to operate a fiber-to-the-home system is significantly less than it is for other types. That's because unlike wireless or even hybrid fiber coax networks, all-fiber networks do not have operational costs for preventative maintenance.

For example, research indicates that though the initial deployment cost for fiber is more expensive than fixed wireless, the TCO demonstrates that fiber ends up being half the cost of fixed wireless over time.

Overall, fiber is a win-win because it provides a better user experience and serves as the foundation for other services, such as those 5G provides. It helps advance precision farming and serves as the underlying medium behind smart-grid projects and edge computing. It also creates jobs and builds communities and economies. Microtrenching to deploy fiber simply means getting to the gold standard faster. ❖

Total Cost of Ownership (TCO)

Fiber vs. Fixed Wireless



The total cost of ownership for fiber is far less than for fixed wireless,

Deborah Kish is the vice president for research and marketing at the Fiber Broadband Association. Contact her at dkish@fiberbroadband.org.