Slow and Steady Wins the Fiber Race

Three communities find success in incremental fiber network builds.

By H. Trostle / *Institute for Local Self-Reliance*

Any city can improve its connectivity without breaking the bank – but it takes foresight, planning and relationships. From a small town of 6,000 to a city of more than 160,000, municipalities across the country have built state-of-the-art fiber optic infrastructure with common sense, creative financing and community support. Holland, Michigan; Eugene, Oregon; and Erwin, Tennessee, provide blueprints for successful incremental approaches to municipal fiber optic networks.

HOLLAND, MICHIGAN
Population: 33,543 (2016 est.)
Area: 17.35 square miles
Claim to Fame: Tulips

> *"One of our key strategies is [that]we are building fiber for our community. Does our community want it or not? We're not going to build fiber to the community if [people] say, 'You know what? We're good.' You need to have that relationship with your community. You need to be open."*
>
> *– Pete Hoffswell, Holland Broadband Services Manager*

On the shores of Lake Michigan, what began as a Dutch outpost is now a tourist town of 30,000 that has spent more than 20 years steadily building out a fiber network.

The state of Michigan placed some restrictions on building municipal networks in 2005, but Holland was grandfathered in. The city's municipal electric utility had provided wholesale internet service to some businesses since the 1990s.

Holland Board of Public Works (BPW) built its first fiber optic loop in 1992 to better manage its electric and water systems by remotely operating the electric switches and water pumps. The loop was only 17 miles of 48-count fiber optic line, but it provided the foundation for later development.

For years, when a property owner wanted to connect a building to the network, BPW charged the owner the total cost of the new build up front. This connection fee of $2,000 limited the number of customers. Because BPW thought more local businesses could benefit from the network, it introduced a new cost recovery model in 2013 – applying the revenues it expected to earn from the new connection toward the build cost. By building out carefully at first and managing its finances well, BPW was able to grow the system quickly. By the end of 2016, the city had at its disposal 76 miles of fiber backbone with more than 150 total route miles and 288-count fiber.

Six small ISPs lease dark fiber from the city for a monthly fee of just over $.01 per foot per strand. The city also offers an active Ethernet service for large businesses. Because the network was built out at their request, it mostly reaches large commercial customers today.

However, in the summer of 2017, Holland launched a new pilot project aimed at residential and small business subscribers – a GPON that covers 158 buildings and 450 potential customers. For this service, BPW has decided to offer services directly but is still designing the network to be open access in the future.

A municipal utility needs the community to build and maintain support for projects of this kind. In this case, the Holland Fiber group urged

Not just tulips anymore: Holland, Michigan, reaps the benefits of a municipal fiber network.

BPW onward. Composed of activists and business leaders, Holland Fiber educated the community, highlighted public support and encouraged the city to explore all its options. It maintained the HollandFiber.org website as a centralized location where residents could learn about the potential benefits of the city's decisions.

This tangible community support encouraged the city to look at innovative ways to finance the project. The city eventually settled on an incremental approach and is considering other approaches for further expanding the network across the community. As it rolls out fiber, public excitement is building as well.

EUGENE, OREGON
Population: 166,575 (2016 est.)
Area: 43.74 square miles
Claim to Fame:
    University of Oregon Ducks

"It's busier downtown. There's more stuff happening; there's more business in those office buildings. They're here because of the fiber,

which then has a positive feedback loop. There are more restaurants, there's more other activity. So, it just keeps growing and growing and growing. But it wouldn't be happening without the fiber."

– Anne Fifield, Economic Development Planner

Just a few hours from Portland, Eugene is home to the University of Oregon and a center of commerce in Lane County. Downtown Eugene is running out of parking spots, and many buildings have zero vacancy because of the fiber network the city only recently began to take full advantage of.

Back in the 1940s and 1950s, the Eugene Water and Electric Board (EWEB) built a series of underground electrical conduits in the downtown area and included a space for communications lines. Now, EWEB can pull microducts through this ancient system and quickly deploy fiber to each building.

Like many community utilities, EWEB installed fiber in the 1990s for internal communications. It connected

county agencies and the school district on a fiber loop that had spare capacity and now leases some dark fiber in the downtown area to ISPs.

The utility charges building owners about $2,000 to install fiber to a property. In the pilot area downtown, 16 buildings are fully connected. Some businesses have already expanded, including one that landed a contract it won only because of the fiber network. Eventually, 120 downtown buildings will have the opportunity to connect to the network, and eager residents and businesses are asking when EWEB will expand beyond that initial area.

Eugene is financing the network through connection fees, urban renewal bonds and a federal grant. About 50 percent of the pilot area lies within two urban renewal districts, which are similar to tax increment financing zones in other states. They enable the city to encourage economic development within the zones by borrowing against future tax revenue increases. A small grant of $1.9 million came from the federal Economic Development Administration.

Eugene's project is part of a larger effort to improve connectivity throughout Oregon. EWEB is working with the Lane Council of Governments and the Technology Association of Oregon to ensure that the city has a robust connection to the rest of the region. The council previously deployed a dark fiber network throughout Lane County, using a federal stimulus grant. The expertise and institutional memory of the Lane Council of Governments has been helpful to EWEB in pursuing the pilot project.

A priority for Eugene in coming years is to share its fiber network with nearby, smaller communities to ensure the entire region, not just downtown Eugene, thrives.

ERWIN, TENNESSEE
Population: 5,920 (2016 est.)
Area: 3.6 square miles
Claim to Fame:
Citywide FTTH network

"We've looked at this for many years, and finally the time was right, and we acted. A lot of things go into making the decision to build a fiber-to-the-home network: the system, the demographics, the customers per mile. I just really feel like we're in the greatest place of all times in being able to make that decision and do what's right for our community."

– Lee Brown, Erwin Utilities General Manager

Erwin, Tennessee, is not the first place anyone would think to look for world-class connectivity. Tucked between the Blue Ridge Mountains and the Cherokee National Forest, Erwin relies on tourism as its economic base. However, this small Appalachian town built a citywide FTTH network that outperforms most networks in large urban areas. The town is expanding the network to serve people outside city limits who are otherwise without broadband internet access.

Like Holland and Eugene, Erwin began its fiber story around 1999, but this little Tennessee town wasn't thinking about the internet at that time. Erwin's residents wanted better television service. The town considered three types of networks: a traditional cable coax system, a hybrid fiber-coax system and a full fiber-to-the-home network. After studying the issue, the town decided not to build anything immediately but to keep in mind the fiber-to-the-home plan for the future.

About 10 years later, Erwin decided to revisit the idea. A new study put the cost of building out fiber to the whole town at an out-of-reach $27.5 million and estimated a 17-year payback period. The town's utility took a different approach while staying well within the restrictions the state imposed.

In 2012, Erwin built a fiber network to support communications among the electric, water, and wastewater systems and connect six county schools. In 2014, using that backbone, it built a pilot FTTH project to see whether residents were interested in a full fiber-to-the-home system. It connected the first customers in early 2015, offering only broadband and voice services.

The network most certainly piqued residents' interest – so much so that, between connecting residents and leasing excess capacity, the town's utility found bankrolling a network expansion easy. About 1,200 customers were involved in the pilot project. Each network phase paid for further development. Erwin's electric system owns the fiber, and the fiber optic division leases it from the electric system, as is common with municipal electric utilities. The fiber division continues to pay its own way and is not subsidized by the other utilities.

Erwin Utilities' fiber engineer, John Williams, thinks the incremental approach helped the project succeed. "I think one of our biggest advantages is the efficiency we can do on a small scale, so if we already know what we need to do … if we start out small, it was just an easier sell to make. It was not quite as big an investment, and then it gave us the opportunity to kind of learn as we went, too, because every day that goes by, you learn something new, and make it better."

Now most residents can get a gigabit on an FTTH connection inside city limits, but Erwin has continued to expand beyond city limits. Its goal is to make sure the entire electrical system's footprint, which extends to some outlying communities in the mountains, has access to the network. Erwin expects to finish this by the end of 2018.

CONCLUSION
These communities are vastly different in population, geography and finances, and each city developed its own incremental build strategy. Erwin is the smallest but also the furthest along in ensuring that its residents have full access to the 21st-century economy. Eugene is transforming by redeveloping its downtown, relying on a 1950s electric conduit system and urban renewal districts. And Holland found success by building on grassroots community support. These are only three of many communities that have built networks using this incremental approach.

From Santa Monica, California, to Auburn, Indiana, cities across the country have developed strategies to build out high-speed fiber networks in small phases. These networks serve different needs, such as providing business connectivity or home internet service, but they all have grown over the years. In every one of these communities, some citizens wanted to deploy more quickly. But these decisions are made collectively, by communities or at least city councils.

In more than 10 years of working with communities, ILSR has seen ambitious local activists and leaders push for a citywide network and refuse to compromise. Sometimes that strategy has led to success, but more often it has led to nothing. An incremental build may have periods of rapid deployment followed by decades of inaction, or it can be simply a slow, steady expansion of an existing fiber network. Either way, it is approximately "a gajillion" times better than doing nothing. ❖

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