

# Fiber Mapping Supports Network Growth

How should a small, agile fiber overbuilder decide where to expand next?

By Masha Zager / *Broadband Communities*

**G**reat Works Internet (GWI) is a small but fast-growing internet service provider in Maine. Though it began in the 1990s as a dial-up provider and then leased copper infrastructure to provide DSL service – it still offers DSL and even dial-up in some areas – its current business model, and the source of its growth, is as a fiber overbuilder.

GWI's fiber network serves thousands of commercial premises throughout Maine; at the same time, it is working with a number of small cities and towns to build municipal fiber networks through creative partnerships. For example, in South Portland, GWI committed to a citywide fiber build because the city government agreed to be the anchor tenant. In Sanford, GWI will operate and provide services on an open-access municipal network, and in Islesboro, it will be the operator of and sole service provider on a municipal network.

The secret to GWI's success lies in building fiber in the right places – that is, where it can make a business case. To do this, it must be able

to quickly and accurately predict the costs of reaching premises with fiber and the revenues from delivering services. That, in turn, takes a lot of data, as well as the capacity to analyze that data.

For several years, GWI worked closely with a mapping and GIS consultant, NBT Solutions, located in nearby Portland. Fletcher Kittredge, CEO of GWI, explains, “We would ask them for one-off data sets, such as the demographics of a town or the locations of all the businesses within half a mile of a fiber route. This was a niche that no one else was filling.”

But as useful as he found NBT's services, Kittredge wanted the flexibility to compare multiple scenarios and answer any question at any time – and that required his engineers to have access to mapping software. GWI began looking for web-based software that was easy to use, could interface easily with any external data set and had a pricing model suitable for small providers. Specifically, GWI wanted software that was priced so all departments could use it – not just engineering but also staff assigned to network inventory, planning, design, marketing, qualification, intelligence and reporting.

Though the software model GWI sought was becoming standard in other industries, no fiber mapping programs of that sort were yet available. So Kittredge began talking to NBT about developing the software his company needed. NBT was aware from its work with other small ISPs that challenges with network

A fiber network deployer needs to forecast the costs of reaching premises with fiber and the revenues from delivering services to those premises.

inventory and mapping were common, and it was already prototyping a mapping platform product that aligned closely with GWI's goals. A working partnership was born. For several years, GWI executives, sales staff and engineers worked closely with NBT to define the ideal platform, and in 2016, NBT launched VETRO FiberMap (*vetro* is the Italian word for "glass").

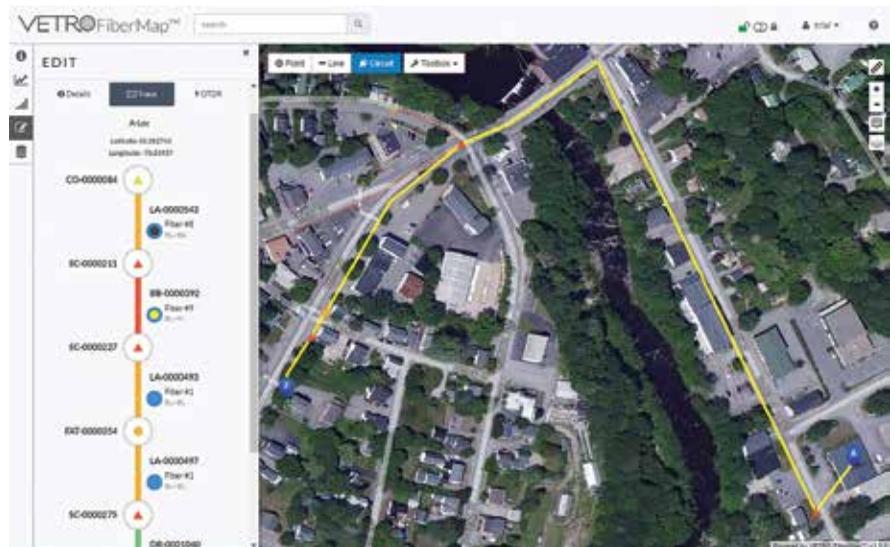
### AUTOMATION AND MORE

GWI quickly adopted VETRO FiberMap as a core business platform. It uses the platform to automate much of its workflow – for example, turning design documents into intelligent as-built mapping. As a result, Kittredge says, "We can do many more projects simultaneously. Overhead goes down, and there is better coordination between departments." In addition, operational information is more readily available than before – for example, the impact of a fiber cut can be calculated immediately.

Kittredge adds, "We gain back huge amounts of time and productivity, but that's not the only major aspect of ROI. Using VETRO has really allowed us to do business in a different and better way, with greater creativity and flexibility. It helps develop new business and explore new scenarios in a way that wasn't available to us before and in a way that is more profitable for us."

Using VETRO allows GWI to determine where to build networks and to build them more quickly. "Combining demographic and geographic information is very powerful," Kittredge says. "Say you had a set of technical data that told you in great detail how much it would cost to build a network and another big data set with demographic information. That could allow you to make more accurate and fine-grained decisions about what you do." Also important, Kittredge says, is VETRO's ability to combine owned and leased fiber on the same map and to combine existing with planned networks.

GWI's clients, both commercial and municipal, can also make better-informed decisions as a result of



Combined view of the physical and logical network depicting a fiber circuit

the VETRO analyses. "Having the ability to create what-if scenarios and line them up with the needs of both individual customers and people like economic development officers and municipalities has been a game changer for us," Kittredge says. "Now we can sit with them and say, 'Here's what happens if we do this part of town and these people get connected.' We can give them a much more accurate figure on cost, and it makes a huge difference. Suddenly, an abstract topic with lots of uncertainty becomes very concrete, visual and easy to understand."

### MANY SOURCES OF DATA

The information GWI maps and analyzes through VETRO comes from various sources, internal and external; much of the demographic and project data is stored in Salesforce. VETRO uses application programming interfaces (APIs) to access data from a wide variety of platforms and to expose the physical network mapping to external systems. GWI leverages these APIs to integrate VETRO with its provisioning system (which was developed in-house) and its billing system, Tucows Platypus.

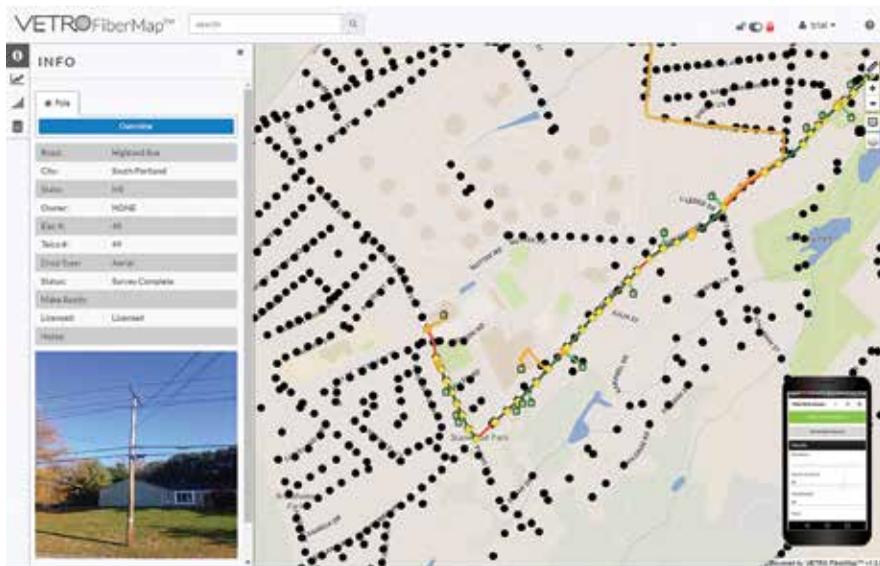
Kittredge says, "We know that growing our business is going to require intelligent use of various applications

and finding ways to make them work together and complement one another. The unique value of the APIs that power VETRO is that they allow us to bring the network map together with other cloud-based applications like Salesforce to vastly increase our overall productivity."

### ACCESS FOR ALL

Will Mitchell and Sean Myers, VETRO FiberMap's co-founders, explain their thinking about the features that GWI and their other clients find most useful. Mitchell says, "Some ISPs have engineering firms or in-house staff lay out network maps in a desktop GIS or on Google Earth, and that map gets stranded or stuck in the back office on one laptop on an engineer's desk or on paper. So we tried to create a platform that would give access to the entire organization for different business uses. ... We expose the network map in a way that it can be accessed by other systems and by all business units."

Unlike most network mapping developers, Mitchell and Myers steered NBT clear of traditional CAD and GIS back ends, such as Esri, which are feature-rich but not specifically tailored to fiber networks. Developing their own platform on an open-source geospatial technology stack allowed them to create



Simple field inventory with Fulcrum App integration

software that was less expensive than comparable programs, much more flexible, simpler to upgrade and easier for network operators to learn. “First-time users who never used any GIS programs are starting network designs in an hour,” Mitchell says. “We’ve gotten really good feedback around that.”

Inspired by the “fiberhood” concept of demand aggregation, they tried to make the VETRO platform useful for identifying clusters of potential customers. Planners can access sales and marketing information and “see leads popping up on the map.” Information about leads can be streamed directly into the network map database from a CRM program, a web-based sign-up tool or a third-party demand capture application. Using local market geodata built into the platform, ISPs can estimate the number of homes and businesses along a route or in an entire area from business point databases, from municipal assessing records and/or from state 911 address points. These same lists of addresses can also be used for outbound marketing once a neighborhood or route is selected.

Then ISPs can draw boundaries on the map, guided by lead clusters, to define a potential build area and estimate the costs and return on investment for that area. Mitchell says,

“We find that it’s facilitating real-time collaboration – before, an engineer might have to send a Google Earth file or a PDF map to the planning team to enable them to work together.”

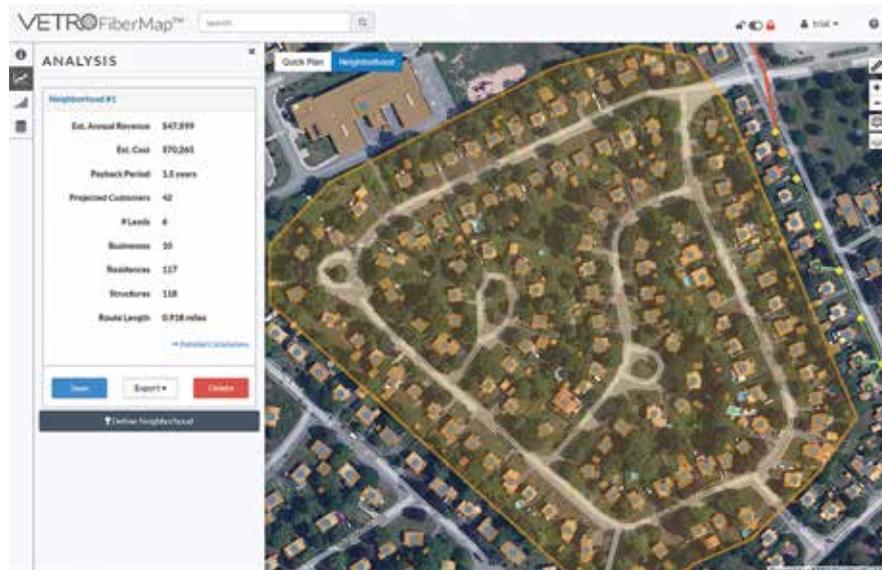
Providers use this demand aggregation process to choose which town to connect next or to prioritize neighborhoods in towns they are already building. Some startup ISPs are building in an “agile” manner – that is, incrementally and iteratively, making

microtargeting decisions as they go along with the help of VETRO.

Though they aimed to help engineers and planners work together more closely, Mitchell and Myers tried to make salespeople more independent of engineers. When salespeople can answer questions from potential customers without help from engineers, they qualify leads and bring in revenue sooner. Salespeople can use VETRO to quickly answer questions about the cost of connecting a premises to the network or to determine whether capacity is available to add an extra customer to an existing route.

Myers explains, “Companies used to have fiber in the mapping tool and circuits in a separate spreadsheet. We’re replacing not just the map but the spreadsheet. The circuits data base and the fiber availability are all in one place. And it goes beyond that – the entire provisioning and circuit activation workflow can be facilitated with VETRO serving as the bridge between the physical network and the logical.”

The platform has specialized use cases as well, with targeted viewer applications built atop the open GIS. For example, a dark fiber operator can expose its network on the VETRO platform to enable customers to



Neighborhood and route based analysis tools provide quick ROI modeling.

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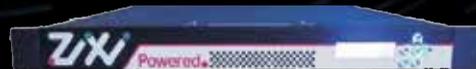
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The internet of things and smart city buildout will make possible even more use cases for VETRO. “You can’t build a smart city using dumb maps,” says Mitchell.

get quotes easily; a customer could simply log in and run a route trace on a specific strand of fiber to get an IRU quote. Sales qualification apps, field data collection on smartphones, automated design engine integration and more are offered by direct or integrated third-party specialty components. The internet of things and smart city buildout will make possible even more use cases as hybrid networks and fiber-connected small cell sites proliferate and modern, agile, open-API mapping tools become increasingly

important. “Imagine trying to make massive numbers of microgeographic decisions using CAD-based drawings that cannot be queried. You can’t build a smart city using dumb maps,” Mitchell says.

To offer maximum flexibility to their customers, Mitchell and Myers made their platform open to as many sources and types of geographic information as possible. Providers generate a great deal of the network mapping data, but there are plenty of other sources, such as municipalities (for poles, conduits,

rights-of-way and other assets) and property developers (for layouts and utility footprints of new developments). Myers says, “In the past, a provider had to go to City Hall, request a download and then upload the information. Now the city can make the information available as map services, publish it and let the provider know the URL.”

GWII’s Kittredge sums up his experience with next-generation mapping this way: “We thought that moving to the cloud this way would be really expensive and time-consuming, but it turned out that it wasn’t at all. It happened much quicker and at a much lower cost than we expected. If I had known that, I would have done it years ago.” ❖

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