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Seattle Tackles Broadband
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After hearing Google's February announcement that it would build a fiber-optic network bringing incredibly fast Internet -- 1 gigabit per second downloads and uploads -- to homes in communities of up to 500,000 people, Seattle Mayor Mike McGinn wasted no time. The next day, the mayor's office published a release outlining why Seattle is the perfect community for Google Fiber, making McGinn one of the first mayors to announce a city's involvement.

And Seattle may be a prime candidate, since its public agencies already are connected by almost 500 miles of the stuff. A few other factors also could provide a good base for expansion, whether by Google or the city itself. First, Seattle has a tech-savvy population -- a 2009 survey by the city found that about three-fourths of its households already have broadband access. And second, more than three-fourths would find even faster Internet speeds valuable.

But Google received 1,100 replies to its request for information (RFI), so it's a long shot for any community to win a broadband network that can achieve speeds beyond those outlined in the National Broadband Plan. Being the chosen community would score some major bragging rights, but perhaps the ultimate boast comes from communities that didn't apply for Google Fiber -- because they already have their own fiber-to-the-premise (FTTP), a.k.a. fiber-to-the-home (FTTH), network that serves homes and small businesses.

In fact, about 85 U.S. cities have their own municipal FTTP network, and Chattanooga, Tenn.'s deployment is the largest, serving about 170,000 premises. In addition, international cities like Amsterdam, Tokyo and Singapore -- and the whole continent of Australia -- are making huge public investments in FTTH networks. And so remains the question: Should cities and towns wait for the private sector to develop and upgrade the fiber-optic infrastructure, or should they take matters into their own hands?

This is the quandary in which Seattle finds itself. The city doesn't want to risk its stature as a technology and business hub, which could occur if it fails to match connection speeds present in other parts of the country -- and the world. So city officials are taking steps to decide whether Seattle should build its own fiber network or let private providers, which already connect homes and businesses, take care of it.

The seemingly easier option would be to let private providers extend fiber to homes and businesses. Currently three Internet service providers (ISP) serve Seattle, offering advertised download speeds of 12, 20 and up to 50 megabits per second (Mbps) on their networks. These companies maintain that they're serving their customers with the speeds they want, and if customers demanded more speed, they would provide it. Comcast, Seattle's biggest ISP, invested in its infrastructure and now offers up to 50 Mbps download speeds and 10 Mbps upload speeds for about \$100 per month. The demand for this "Extreme" tier speed, however, is "extremely low," says spokesman Steve Kipp. Later this summer, the ISP plans to offer 105 Mbps download and 12 Mbps upload speeds.

But the widespread belief is that, on the whole, current providers won't invest in an FTTH network on their own. This is why Google's project is so important: As stated in Time magazine, the project, if successful, could "be a spark to help push U.S. telecommunications companies toward more rapid development."

Current systems have fiber optics as part of their network, but fiber doesn't constitute the entire connection. Copper wire or coaxial cable runs between the fiber and the home or small business. While it can handle high speeds, copper cannot handle the bandwidth needed for next-generation Internet applications, says Seattle Chief Technology Officer Bill Schrier.

Schrier, also a blogger for Governing's sister publication Digital Communities, often cites expanding video applications as something a fiber-copper network won't be able to handle in a few years. "If you slap up an inexpensive HD camera right next to that HDTV, all of a sudden you have a high-definition video telephone," Schrier says, adding that such a setup can be used to visit doctors or attend classes remotely. But for HD, or even 3-D video apps, to work, they need equal -- and higher -- upload and download speeds, which copper wires and wireless networks can't easily accommodate. "It requires two-way, high-speed networking that only fiber optic cable to the homes and businesses can provide," Schrier says.

As for the city taking matters into its own hands, Seattle has a history of doing so, Schrier says. In 1986, the city installed a fiber network for its internal telephone needs because it was cheaper than buying telephone service from the local provider. Over the next two decades, more of the city's public agencies became connected with fiber-optic cable. In 1995, a consortium of Seattle agencies agreed that the city would install fiber to any agency, and the agencies would pay for the installation, operation and maintenance. And in 2009, all of Seattle Public Schools was connected with fiber. Now almost 500 miles of fiber links schools, colleges, fire stations and other public agencies.

And over the past five years, building a fiber network to homes and small businesses has been a serious consideration. In 2004, then-Mayor Greg Nickels and the City Council commissioned a task force to determine how the city should provide state-of-the-art broadband access to citizens. At the time, it was thought that Seattle should follow Philadelphia's footsteps in offering citywide Wi-Fi, says Schrier, a member of the task force.

In 2005, the task force issued a report concluding that the city needed 20 to 25 Mbps bandwidth with "sufficient level of upstream bandwidth," but would eventually need 100 Mbps up and down to accommodate future services. The task force recommended pursuing an FTTP network as a long-term solution to providing fast, two-way Internet. It recommended encouraging private providers to work with the city to build the infrastructure, but also noted that the city should consider providing its own network.

In 2006, Nickels invited RFIs from private providers to build this FTTP network, offering incentives such as access to the city's available fiber, underground conduit, utility poles and staff. Private companies were interested in the network, but they didn't provide any financing information regarding building it in their RFIs, Schrier says.

In 2007, the city commissioned studies on the financial feasibility of building a network and how much residents wanted city-provided Internet. The survey found that more than 60 percent of Seattle households would buy city-provided fiber network services -- if the city offered lower prices. The cost estimate to build out such a system was about \$500 million, which could be paid back within 20 years. But the performance of these investments has been uneven. Although many municipal fiber networks get the market penetration necessary for success, as in Chattanooga, which has reached about one-third of its targeted market penetration since its launch, some examples raise caution. The network in Burlington, Vt., for example, is financially troubled -- it may not recover \$15 million to \$20 million of its investment.

The \$500 million cost stands no matter what business model Seattle chooses. Three potential models were outlined in the city's study:

- First, the city would build a network and provide services as a retailer, which requires uptake by approximately one-quarter of the market to be successful.
- Second, includes a wholesale option in which the city builds the network and allows other providers to use the pipe. It would need about one-third of the market to break even.
- A third option is to have a retail-wholesale hybrid, in which the city provides services over the fiber for five to seven years, and then opens the network to providers to offer service.

But Seattle could face legal problems if it builds its own network. ISPs have sued cities that created FTTH networks, citing unfair competition. (Read more about one town's legal troubles in pursuing a fiber network in *Bandwidth on the Bayou*, *Governing*, August 2009.) It wouldn't be something Seattle hasn't faced before though. In 1986, the city landed in court after deciding to build its fiber network for internal telephone use. The telephone provider feared that the city would compete with it by eventually offering commercial telephone service, Schrier says. But as long as it didn't, the court allowed the city to build the network.

Since taking office, McGinn, who advocated for an FTTP network as part of his campaign, has been meeting with Schrier and the heads of Seattle City Light and Seattle Public Utilities, the city's electric utility and sewage and water utility, respectively. The leaders are discussing how a fiber network could benefit residents by not only providing Internet access to media and information, but also for smart-grid applications and smart metering. The mayor is likely to provide some funds in his 2011-2012 budget for consultants and dedicated staff to research and create a business plan for how the city can extend fiber to residents and small businesses.

City Councilman Bruce Harrell, chair of the council's technology committee, says it's good that the city is going to use the next year to explore different business plans with updated information. "The question will come out as to whether we can compete -- whether any city can compete -- against a major ISP given their resources and other institutional knowledge," he says.

A year from now, city officials will have the information they need to determine if the private sector is able -- and willing -- to meet a need for more speed, or if the city needs to take action to provide fiber infrastructure. A cautious decision must be made, but whatever Seattle decides, it will need to keep up with other cities that are building up their tech infrastructures.