



You Can't Do Wireless Without Fiber... And It Won't Cure the Digital Divide

By Steven S. Ross ■ *Editor-in-Chief*

Wi-Fi, WiMAX or fiber? The question exposes one digital divide: Between municipal officials and the engineers who develop the standards the systems rely upon. For the engineers, the question is silly – each technology does something different, and the very existence of one makes the existence of the others possible and desirable.

A high-capacity Wi-Fi network is easier to build if a fiber backbone already exists. A fiber network that attracts high-tech industry will probably attract high-tech visitors who want to use their laptops and PDAs on a wireless network.

Unfortunately, for municipal officials struggling to keep track of fast-moving broadband technologies, Wi-Fi and WiMAX look like bargain-basement paths to broadband nirvana. True, it typically costs \$20 to “pass” a household with Wi-Fi, while fiber costs average about \$1,200. But providing service and support narrows the gap.

Many municipalities have already started down the wireless path. When we last totaled the roll in early May, we found 102 operating US municipal wireless networks (they are all Wi-Fi at this point) and 182 being considered. As we note in this month's cover story, there are 40 muni-run fiber networks.

Many municipal wireless networks concentrate on downtown areas, where travelers, shoppers and businesses most need access. In a small community, that might amount to a dozen nodes built at a cost of \$50,000 to \$100,000. But some municipalities are considering far more. Philadelphia wants to cover its entire 135 square miles with a wireless MAN (municipal-area network).

That raises a lot of issues. As we noted last month, we find little fault with most of the municipal projects we've seen. They're for the most part built in places

ill-served by private interests. And for the most part, the fiber nets are open access, open to the private interests who have often been opposing them. Also, one can make an economic argument – logical, although far from airtight – that broadband access is necessary for community development.

The arguments for big-city wireless networks are a bit different. One is that cheap or free wireless broadband will help bridge the digital divide. Frankly, we doubt it will have much effect. We've been slogging through a collection of 13 academic research papers on the subject (*Media Access: Social and Psychological Dimensions of New Technology Use*, edited by Erik P. Bucy of Indiana University Bloomington and John E. Newhagen, University of Maryland College Park; published by Lawrence Erlbaum Associates). The bottom line: Access to cheap computers and cheap Internet connections has little effect. Rich or poor, black or white, people find ways to use (and to pay for) computers and computer networks when they feel they need to. The fairly low cost of access now is not a major barrier.

I might add that this book is by academics, for an academic audience. It is not a collection of self-serving industry white papers.

Should municipalities spend money on wireless, then? In many cases, sure. If they can't afford fiber, and if incumbents aren't interested, why not? The cost issues arise, of course, mainly in sparsely populated areas, not big cities. What's more, all communities benefit from broadband connections to their mobile emergency responders.

But for major metropolitan centers, the idea of a citywide net, while politically attractive, will have to be justified on a case-by-case basis. Sure, given a choice, I'd rather do business in a community that makes wireless connections ubiqui-

ous. I find it annoying to fork over \$10 for a day's use of a lousy connection in a hotel – and my last two trips, both to Washington, DC, found one hotel with a non-functional system and the other with a signal so weak as to be almost useless. Broadband wireless connections are also a boon to local professionals who need to stay connected as they move about town. But all of us can afford to pay the price, and the price is dropping as providers realize their fees are driving away potential business.

There are also technical issues. Wireless (except for point-to-point wireless such as FSO and E-band) is not the way to go for businesses that need to keep their communications highly secure and reliable. There are also many sources of interference. Boston worries about how its proposed MAN would coexist with dozens of college nets there.

The latest Wi-Fi standard, IEEE 802.11n, has not yet reached the draft stage (that may happen in July; see article in this issue) and probably won't be final until 2007. Wi-Fi was never meant for MANs, although it is certainly used effectively for them. WiMAX, 802.16, is meant for MANs. It has a working standard, unwieldy and only for 10-66 GHz. Most WiMAX action is expected to be at 2 to 11 GHz. The draft for that part of the spectrum may also be approved this July in San Francisco and may be final by October.

The bottom line: Municipalities should indeed consider wireless MANs – but not if the only argument is its low cost. Money is money. And you get what you pay for. If you need fiber, figure out a way to get it; you'll soon want it for wireless backhaul anyway.