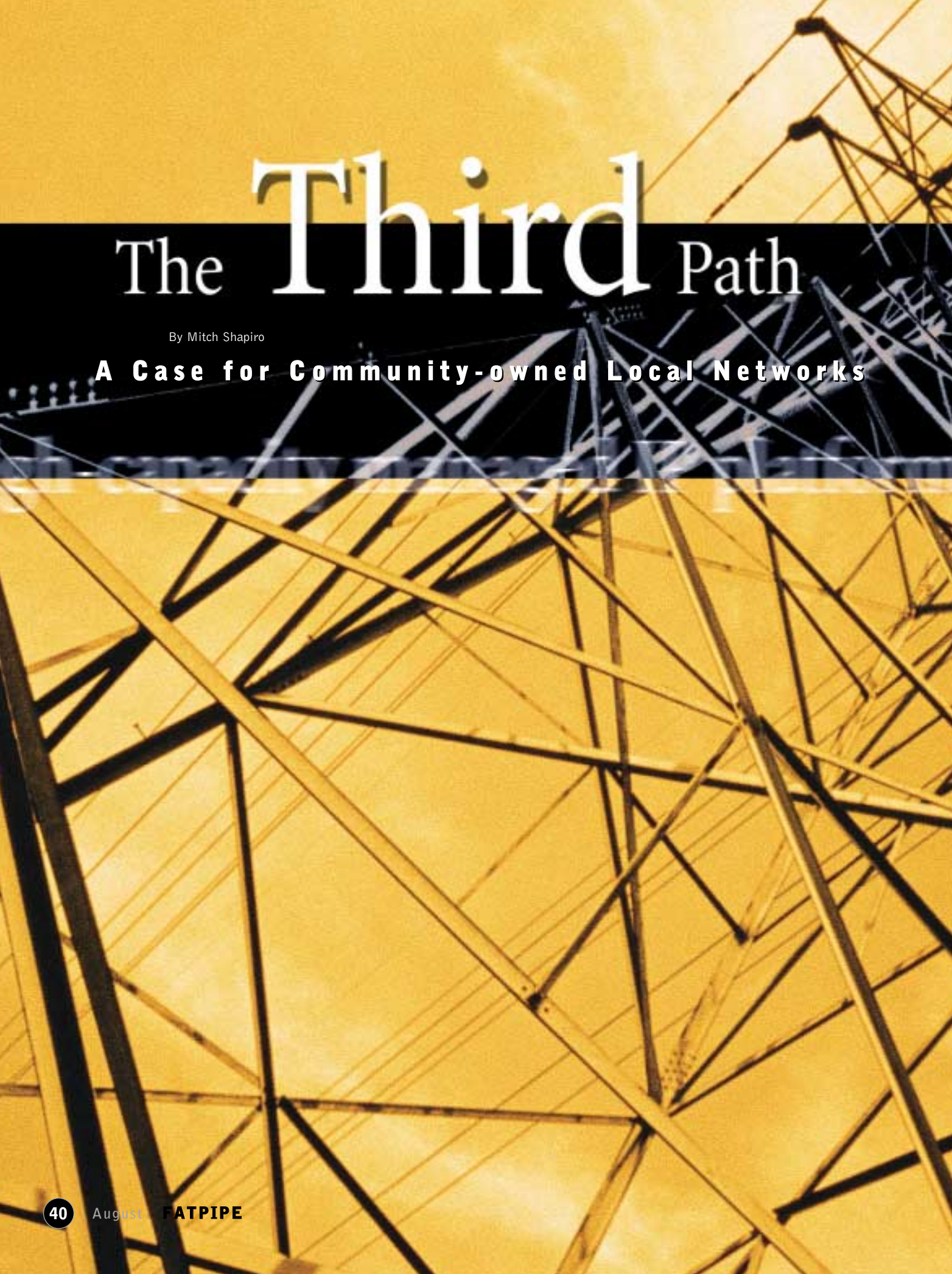

The Third Path

By Mitch Shapiro

A Case for Community-owned Local Networks

Meet Mike Bookey, who argues that publicly owned optical networks are a third path to mass market broadband. Community local area networks (C-LANs) –gigabit-speed optical LANs owned and controlled by local communities–are wholesale "IP-utilities" that provide local high-capacity managed IP platforms designed to support a wide range of competitive retail service providers.

To help make that new model a reality, Bookey has founded two companies dedicated to designing, building and managing optical C-LANs. The first, ViaLight, already has an optical C-LAN operational at Issaquah Highlands, a 3,350-home residential development 15 miles east of Seattle that is the future home of Microsoft's second major business campus. The goal of his most recent startup, FTTX Systems, is to develop C-LANs in new housing developments and through alliances with public utilities.

Many argue that the local broadband market is regressing to a private monopoly/duopoly mode of operation and that this trend calls for regulation to compensate for the resulting distortions in market function.

A better approach, says Bookey, is for direct public control of the network. Local digital networks, he says, need to be controlled by the community for the same reason local roads are: they are too important to the community to have decision-making in the hands of remote executives and shareholders.

Bookey's arguments rely on the premise that ubiquitous optical last-mile networks, like roads, are natural monopolies (or, at most, duopolies). If so, it makes the most sense economically and logistically for a community to build just one high-capacity open-access network. He challenges critics of public ownership to present convincing evidence that private monopolies provide better overall value than publicly run monopolies.

Importantly, Bookey argues that the network ought to be open to the general public on a fair and equal access basis and achieve beneficial "network effects" by interconnecting every location within a community.

And just as a combination of public funding and usage fees (e.g., gasoline taxes and tolls) have financed road construction and maintenance, Bookey believes a similar financial model makes sense for C-LANs.

Optical C-LAN Revenue Requirements

Total passings	100,000	100,000	100,000
Residential	93,000	93,000	93,000
Business	7,000	7,000	7,000
Fixed infrastructure cost per passing, $	900	900	900
Connection penetration of passings	100%	50%	25%
Total connections	100,000	50,000	25,000
Residential	93,000	46,500	23,250
Business	7,000	3,500	1,750
Variable cost per connection, $	1,400	1,400	1,400
Total cost per passing, $	2,300	1,600	1,250
Total cost per connection, $	2,300	3,200	5,000
Total fixed capital cost, $	90,000,000	90,000,000	90,000,000
Total variable capital cost, $	140,000,000	70,000,000	35,000,000
Total capital cost	230,000,000	160,000,000	125,000,000
Discount rate	6%	6%	6%
Fixed cost payback period	25	25	25
Annual operating cash flow required to pay back fixed cost, $	7,040,405	7,040,405	7,040,405
Variable cost payback period	6	6	6
Annual operating cash flow required to pay back variable cost, $	28,470,768	14,235,384	7,117,692
Annual operating cash flow required to pay back all capital cost, $	35,511,173	21,275,789	14,158,097
Operating margin	60%	60%	60%
Required wholesale revenue per year, $	59,185,288	35,459,648	23,596,828
Required monthly wholesale revenue per connection	49	59	79
Residential share of revenue	75%	75%	75%
Required monthly wholesale revenue per residential connect, $	40	48	63
Required monthly wholesale revenue per business connect, $	176	211	281
Wholesale transport as percent of average retail service price	60%	60%	60%
Required monthly retail revenue per residential connect	66	79	106
Required monthly retail revenue per business connect	294	352	468

Source: Broadband Markets estimate

A wholesale optical network connecting every home and business in a community might break even at $40 monthly per residential connection and $176 per business connection, assuming capital costs and depreciation schedules typical of public utilities. If customers were connected to the network only when they subscribed to one or more service, the revenue hurdle would rise to $48 to $63 per home and $211 to $281 per business at penetrations ranging from 50 to 25 percent.

These wholesale figures imply retail revenue of between $66 and $106 a month for a residential customer and business retail revenue of between $294 and $468.

Though the "ubiquitous connection" model has the lowest per-connection hurdle rates, it bears the risk of paying for connections regardless of actual subscription levels. On the other hand it promises the most benefits in terms of "network effects" and public service applications like automatic meter reading.

The model seems workable at a 6 percent discount rate and 25- and six-year payback periods on outside plant and variable capital, respectively. If one assumes a 10 percent cost of capital and 12- and four-year paybacks on outside plant and variable capital, it's hard to make the model work.

Benefits of an Open Platform

Among those likely to benefit from the proliferation of C-LANs, says Bookey, are competitive local exchange carriers (CLECs) and IP service providers that would have access to a high-capacity optical network on a fair and equitable basis.

Bookey also foresees major benefits to a community if every one of its government, utility, public service, education and health care facilities had a symmetrical gigabit-per-second link to each other and to every home and business in that community.

Critics of public ownership argue that, in addition to being poorly equipped to manage a telecom business, "public" entities would have unfair competitive advantages relative to private-sector incumbents, including access to lower-cost capital, close ties to local governments and, in some cases, tax-related advantages.

Bookey counters that incumbents also could benefit by exploiting the vast capacity of optical C-LANs. As incumbents, he says, they would be well positioned to retain existing customers, especially if they use C-LANs to deliver new services not readily supported on their existing networks. C-LANs also would allow them to compete for customers outside of their network footprint, focus investments on high-margin services and free themselves from costly upgrades and maintenance of legacy copper and coax networks.

And, since the transition from telephone and cable last-mile infras-

tructures to C-LANs would be gradual, says Bookey, incumbents would have ample time to transition their business services and investments. And, to the extent they use C-LANs to deliver services, incumbents would benefit from the public's access to low-cost capital.

Skeptics will ask why C-LANs would perform any better than the institutional networks built by cable operators since the early franchising days? Bookey contends that community-wide IP-based optical C-LANs operating in an increasingly IP-based world would be a far cry from these early I-Nets. These pre-Internet local networks lacked strong long-term planning, management and maintenance. Nor were they well integrated with the residential cable network.

Public network supporters, citing the industry's current rash of business failures, challenge their critics to prove that the private sector has had a significantly better record of success.

Bookey argues that the real issue is not whether early failures occur, but whether or not lessons are learned and whether a business model is fundamentally sound and–if given a chance to take root in reality–can achieve desired results faster, better and cheaper than the alternatives.

Rural Markets

Though Bookey believes C-LANs have a place in metro markets, he sees the nation's smaller towns–especially those served by publicly owned utilities–as the natural place to start. Often suffering economically and lacking broadband services from incumbents, many of these communities feel a growing urgency about their need for broadband. At the same time, some have local utilities that are able to contribute key resources needed to support a C-LAN, such as access to low-cost, patient capital.

Some optical vendors also are targeting smaller communities. Bernard Daines, CEO of World Wide Packets, for example, sees public power companies as "first movers" in the deployment of his company's gigabit Ethernet technology. Among the key reasons he cites are their longer financial time horizons, community-service orientation and experience with utility-related telecom.

The Grant County Public Utility District (GCPUD) in Washington state is one of WWPs first customers and one of the first public utilities to deploy an optical C-LAN. Under a Washington state law passed in March 2000, GCPUD is limited to providing wholesale service, a restriction that does not conflict with the C-LAN business model.

According to Jonathan Moore, senior telecommunications engineer at GCPUD, the utility is spending $3,500 per customer location today as it begins to deploy its optical gigabit network, dubbed "Zipp." He expects this cost to fall to $3,000 by yearend and $2,500 to $2,600 by early 2002. Roughly 85 percent of the network will consist of aerial plant.

Though these prices would not be well received by private investors evaluating a largely residential broadband network–especially in today's tight capital markets–Moore says GCPUD, "as a government agency" is "less time constrained." He says the utility's business plan includes a 15-year capital recovery period, with network electronics amortized over five years and the system expected to go cash positive in six to seven years. This assumes that take rates rise from an initial 5 percent to 40 percent, which Moore suggests could prove conservative.

GCPUD's approach to the C-LAN wholesale model is an interesting one. It charges $4 per terabit of data flowing into the network with a minimum monthly access charge of $40, which covers up to 10 terabits of traffic.

GCPUD does not charge customers for downstream traffic they receive from the network, though retail service providers may. There also is a one-time installation fee of $300. This fee structure applies to both consumers and businesses, including Internet service providers (ISPs) and other service providers.

Moore says initial ISP retail prices started in the $35 to $40 range but have since come down to $9 to $25 as competition has taken hold. Northwest Telephone, based in Wenatchee, Wash., has begun offering voice-over-IP service for $15 a month. Northwest Broadband is charging $40 a month for a package of roughly 70 video channels. Moore predicts this price will decline as additional video providers enter the market, a process already in the works.

GCPUD is hoping that the combination of its low wholesale fee structure for retail service providers coupled with competitive price cutting will allow county residents to receive a much higher level of service using Zipp for roughly the same price (including its minimum $40 per month access fee) they might otherwise pay for voice, video and data services using alternatives. It also is using the network for internal utility functions, including electronic meter reading and, later on, more sophisticated customer-controlled energy management functions.

Zipp's link to the outside world is NoaNet (Northwest Open Access Network), which operates a fiber backbone with 24 points of presence in the region. NoaNet is a non-profit corporation formed last year by 18 PUDs in the region, including GCPUD.

To make fiber transport more affordable in the state's low-density areas, NoaNet charges distance-insensitive "postage stamp" rates. This improves the economics of linking remote communities to centralized "master headend" facilities by allowing the equipment to be more economically shared among a larger but geographically dispersed user base. Other public utilities linked to NoaNet are watching Grant County closely and considering whether and how to pursue a similar model in their own communities.

Though needs and resources are different than in small towns, Bookey believes a strong argument also can be made for building C-LANs in the nation's major markets.

One potential spawning ground for the C-LAN model are low-income urban areas that have been a low priority for incumbents' broadband investments. The city of Chicago, for example, is in the process of soliciting proposals to build and operate CivicNet, an optical network reaching government offices, non-profit agencies –and eventually private businesses and homes–in underserved parts of the city. With its $32 million in annual telecom expenditures, the city will be an anchor tenant on the network. It also is contributing resources to the project, including rights of way, conduit and fiber.

In the search for ways to break the "last mile" bandwidth bottleneck, optical C-LANs may offer a third path. **FAT**

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