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“Broadband will be like electricity, as essential as turning on a light. This will be how businesses communicate with the outside world. We're going to get used to sending pictures and text, and small businesses have to do that. They have to be on the Internet.”

NEW YORK'S BROADBAND GAP

Years After the Internet Boom, Businesses in Several of New York City's Largest Commercial Areas Still Can't Access a Reliable Broadband Connection at Prices They Can Afford

HIGH-SPEED, "BROADBAND" INTERNET ACCESS HAS LONG BEEN fundamental to the success of dot-coms, high-tech companies and most large corporations. But in today's digital age, it has become an increasingly critical business tool for businesses of all types and sizes—from architects and animators to freight forwarders and food manufacturers.

Its fast, seamless connection to the Internet enables companies to reach an infinitely larger pool of customers and its "always-on" feature enables them to take full advantage of e-mail, videoconferencing and other Web-based applications that can make them markedly more efficient. At a time when businesses in nearly every industry are facing intense competition from around the block and across the globe, these benefits can't be overstated. Especially for businesses operating in high-cost locations like New York City, broadband can help level the playing field and give firms the competitive edge they need to thrive.

Yet, in New York, a vast number of businesses—particularly small and mid-sized firms located outside of Manhattan's office districts—still rely upon super-slow dial-up connections to access the Internet, and many are not hooked up to the Web at all. Businesses in several commercial districts around the five boroughs have no affordable options for broadband connectivity, and many firms that do have high-speed Internet access still struggle to receive reliable service. The result of all this is a new digital divide in New York, one that could have profound implications for the city's future economic growth.

This report attempts to document how important broadband has become to businesses at every level of New York City's economy, and to illustrate that the roll-out of this vital telecommunications technology has thus far bypassed a significant share of the city's businesses. The culmination of 12 months of research, the report analyzes how this broadband gap could impact the city's economy in the years ahead, and what the private and public sectors can do to address this problem. The study is based primarily on interviews with more than 100 businesses, including many from each borough, and from a cross-section of the city's main industries. It also draws upon interviews with officials from a number of national and New York-based industry associations, government officials based here and in other states and cities, and a variety of economic development and telecommunications experts.

It's important to note that New York City is no broadband backwater. The city's telecom infrastructure

speed Internet connection: a T1 line. T1 lines usually offer faster speeds and greater reliability than DSL or cable modem broadband service, but they typically cost several times as much and are out of the price range of the overwhelming majority of small businesses.

There is no single reason why companies in these neighborhoods do not have more options for broadband service. One problem is that the telecommunications infrastructure in many of the city's older commercial areas is roughly 100 years old, in bad shape and unable to adequately support the high-speed data needs of today's digital age. Verizon, which owns and manages the city's telephone infrastructure, has been slow to upgrade its network in these areas, largely because it has seen little financial benefit to making the significant upfront infrastructure investment and hasn't faced enough real competition from other providers to feel pressure to do so. Cable television companies like Time Warner and Cablevision have been more aggressive in

In large parts of Hunts Point, Sunset Park, Long Island City, Williamsburg, Red Hook, the Brooklyn Navy Yard, East New York and DUMBO, cable modem service still isn't available and DSL either isn't accessible or is of extremely poor quality.

is among the most advanced in the world, and some of the globe's most technology-savvy businesses are based here. The vast majority of businesses located in Manhattan's two central business districts—midtown and downtown—enjoy multiple options for broadband. And in every borough, businesses located in residential neighborhoods or mixed-use districts are now likely to have access to high-speed Internet service that ranges from adequate to outstanding, either through DSL (Digital Subscriber Line) or a cable modem system.

But in many of the industrial parks and other low-density commercial areas around the five boroughs, businesses continue to face extremely limited options for obtaining broadband, and often find it downright impossible to access a reliable high-speed connection. In these areas—including large parts of Hunts Point, Sunset Park, Long Island City, Williamsburg, Red Hook, the Brooklyn Navy Yard, East New York and DUMBO—cable modem service still isn't available and DSL either isn't accessible or is of extremely poor quality. Fiber optics, the technology that delivers the fastest and most reliable broadband service, is not available for all but a few businesses outside of midtown and downtown Manhattan.

While some businesses across the five boroughs continue to be stymied in their attempts to get any form of broadband, in most cases, the problem is that companies can't afford the one option they do have for a high-

speed Internet service to small businesses, but they too say the economics of building out their broadband network to the city's low-scale commercial areas hasn't yet made sense.

It doesn't help that the financial markets, which in the late 1990s provided telecom companies with billions of dollars in funds for capital projects of this kind, are now significantly more cautious.

Another huge problem is the perception that demand for broadband still hasn't reached a critical mass among small businesses and Old Economy firms. Sure enough, some longtime business owners remain "keyboard-impaired," while other executives have yet to see practical applications for the Internet that can translate into immediate dividends for their company, through cost savings or new business opportunities. Until demand reaches that critical mass, firms that are further along on the technology curve are likely to have a hard time getting telecom providers to address their problems. But as this report will discuss, this lag in demand also indicates a failure on the part of telecom providers, the city's business community—including Chambers of Commerce and neighborhood-based business organizations—and city government agencies to educate small businesses about the potential value of this important technology.

As a general rule, the larger a firm is, the more likely it is to have broadband. Virtually every large business

uses a high-speed connection. But for companies with fewer than 100 employees, the picture is mixed. According to a 2002 study by the Yankee Group, one of the nation's leading telecommunications research firms, only 65 percent of businesses in the U.S. with 20 to 99 employees have broadband; for businesses with between 2 and 19 employees, the figure falls to 40 percent.

This trend is potentially ominous for growth prospects, especially in New York City. Small businesses now account for the lion's share of new jobs being created in the U.S. and are likely to be increasingly important to New York in the years ahead, as large corporations continue to shift jobs to the surrounding region and other, less expensive locations.

As it is, 98 percent of all businesses in the city have fewer than 100 employees and 90 percent have less than 20. And like larger companies, small businesses face ever-intense competition in today's global economy. Whether it is a printing company in Long Island City or a recording studio in Williamsburg, businesses in New York that do not have broadband will surely miss out on opportunities for growth and find themselves at a competitive disadvantage.

The good news is that those small businesses that have embraced broadband are greatly benefiting from this technology. According to the Yankee Group, 70 percent of small businesses (firms with between 20 and 99 employees) that have broadband responded that Internet access is "very important to the functioning and productivity of their business."

The broadband gap threatens to diminish the city's economic competitiveness at a time when some of the city's brightest prospects for economic growth lie outside of Manhattan's central business districts.

The broadband gap that exists in the five boroughs, and particularly the structural barriers that help perpetuate it, also threatens to diminish the city's economic competitiveness at a time when some of the city's brightest prospects for economic growth lie outside of Manhattan's central business districts (CBDs). Roughly 48 percent (102,000 firms) of the city's 213,000 businesses are located outside of Manhattan. In addition, many of the sectors with the greatest potential for growth in New York are heavily concentrated outside of the CBDs—including health services, the arts, film and music production, air transportation and food production.

Wider access to broadband could greatly help those sectors realize their growth potential. At the most basic level, broadband allows companies to communicate in a faster and far more efficient way, both internally and also

with outside clients and consultants. It enables printers that used to receive orders in person to download them digitally, allows recording companies to transmit bulky music files over e-mail and lets film production companies in New York edit documents simultaneously with colleagues in Hollywood. It gives some firms the opportunity to market and sell their products and services around the world; a Brooklyn company that makes bagels or tortillas can expand its customer base from New York to the East Coast or the rest of the world.

"It's in the city's interest to have broadband available to all the businesses that need it," says Allan Dobrin, former commissioner of the city's Department of Information Technology and Telecommunications (DoITT). "It's tough to have a thriving business without Internet access."

Up to this point, the city hasn't been aggressive in confronting gaps in the city's telecom infrastructure or exploring how to assist more city businesses in taking advantage of a high-speed Internet connection. The few telecom initiatives supported by the city—like the Digital NYC and Plug 'n' Go programs—have been minor successes, but these limited efforts were almost exclusively focused on a narrow range of high-tech companies. Fortunately, the Bloomberg administration now appears to be taking steps to address larger problems in the city's telecom infrastructure.

Albany has a role to play, too. The state's "wired building" program, which provides grants to make it easier for developers to wire commercial buildings, could help

bridge the broadband gap in parts of the five boroughs. Thus far, however, only one of the 42 grants dispersed through the program—and just \$75,000 of the \$2.5 million committed—has gone to buildings in New York City.

Though our failure thus far to ensure adequate access to high-speed Internet connectivity suggests risk for the city's economy, there's a great opportunity here as well: Broadband can play an important role in New York City's economic growth. "There are opportunities for small businesses to thrive and bring technologies to their businesses that we haven't even tapped into," says Greg Rohde, president of e-Copernicus, a telecom consulting firm, and former administrator of the National Telecommunications and Information Administration (NTIA). "There is a tremendous need to connect businesses into the world so they can grow." ❖

WHAT IS BROADBAND?

Broadband Internet service has several major advantages over traditional dial-up access. For one, broadband is “always-on”—in other words, it doesn’t tie up the phone line—and it’s 10 to 20 times faster than dial-up. More specifically, a broadband connection transmits information at between 256 kilobits per second (kbps) and 10 megabits per second (mbps), depending on the type of service. In contrast, a typical dial-up modem maxes out at speeds of 56 kbps.

The difference in speed is staggering. For instance, it takes about 21 seconds to download a 150 kilobyte Microsoft Word document using a 56 kbps dial-up modem, but less than one second on a 1.5 mbps broadband connection. With a broadband connection, a user can download an 8 Megabyte PowerPoint presentation in 43 seconds; over dial-up, the same file would take about 19 minutes to download.

Broadband is available through a variety of technologies, including a digital subscriber line (DSL), cable, satellite and wireless. In most cities, DSL and cable are the most common.

A big advantage of DSL is that it operates using twisted pairs of copper telephone lines, which most businesses already have. A digital technology that is offered by telephone companies, DSL transmits voice and data on two different frequencies, allowing users to talk on the phone and use the Internet at the same time. DSL is generally the most affordable type of broadband service, and it comes in a variety of speeds, allowing users to select the type of service that suits them best. One drawback to DSL is that the speed of the service is dependent on the distance (measured by the length of cable used) between the user and the telephone company’s central office. In addition, the reliability of this service often suffers if the copper wires are in bad shape.

As with DSL, cable broadband uses existing infrastructure. Cable companies offer high-speed Internet service by using a hybrid fiber coax, a technology that combines fiber optics and coaxial cable. Fiber serves as the backbone of the cable broad-

band network, with strands running out from the companies’ main fiber optic lines and terminating in nodes located in neighborhoods throughout the city—usually in a manhole, a sidewalk vault or on a telephone pole. Each node converts optical signals carrying data, video and other information into electrical signals and redistributes them to homes and businesses on coaxial cable, the same technology that delivers cable television service.

Once inside the home or business, the coaxial cable can be split, with one line connected to the cable TV box and the other hooking up to a modem for high-speed Internet access.

Cable modem service often provides more reliability and higher speeds than DSL, but it is also usually slightly more expensive. And while DSL is generally available to any business or residence in the city that has a telephone, cable modem service still isn’t available in a handful of areas because the fiber backbone hasn’t yet been extended there.

T1 lines and T3 lines are faster and more reliable than a DSL or cable modem connection, and are the broadband mode of choice for most large firms in the city. Unlike DSL or cable modem users, who share a connection with other users in the area and experience slower transmission speeds during times when many people are online, T1 and T3 users enjoy fast service at all times over specially dedicated lines. T lines transmit data and voice service over either copper phone wires or fiber optic cables. A T1 line offers speeds up to 1.5 mbps with high reliability and generally provides quality service over longer distances than DSL while a T3 is equivalent to about 30 T1 lines.

A T1 connection is ideal for companies that employ 20 or more workers who need to be online at once, and for firms that want to put employees from multiple offices on the same network for both voice and data. But the high cost of T1 service means that it’s not an option for many small businesses. One option some co-located businesses pursue is to split up the bandwidth from a T1, and its cost, amongst the group. ❖

WHAT IS BROADBAND?

TYPE	SPEED	METHOD	TYPICAL PRICE PER MONTH	PROBLEMS
Dial-up	Up to 56 kbps	Telephone line	\$20	Slow, unreliable
DSL	256 kbps-1.5 mbps	Paired copper lines	\$40-200	Speed is dependent upon distance from central telephone co. office
Cable	384 kbps-3 mbps	Fiber coax	\$110-\$350	Limited availability
T1	Up to 1.5 mbps	Dedicated copper or fiber lines	\$350-1200	Cost
Wireless	TK	Antenna transmission	TK	Limited Range

CASTING A WIDER NET

From banks to bakeries, Broadband is increasingly important to all New York City businesses.

TODAY, COMPANIES OF ALL SIZES AND TYPES—

even Old Economy stalwarts like manufacturers and freight shippers—are discovering that the Internet offers them competitive advantages in speed, efficiency, and customer service. Ultimately, firms that survive in a global economic landscape where technology is prevalent have no option but to ride the wave. At the same time, it's become crystal clear that in this competitive climate, a super-slow dial-up connection simply won't get the job done.

"Broadband makes businesses more efficient," says Tom Naklicki, operations manager of the Greenpoint Manufacturing & Design Center. "One can purchase online, communicate with accountants and lawyers online, complete banking transactions online, receive and send time- and content-sensitive files online. Once there is an integration of services—such as telephone, Internet, video, and security—additional overhead is reduced and time is saved."

In interviews with more than 100 business owners in New York and leaders of industry associations here and in other parts of the country, we found that most sectors are embracing broadband technologies. And fast.

Printing companies, for instance, are increasingly receiving high-resolution digital files from clients via e-mail, and sending proofs back the same way. With broadband, these often image-heavy files can be downloaded in less than a minute. With slower and less reliable dial-up service, the same transfer could take an hour or more.

Woodworkers, architects and other design-oriented businesses also use fast, reliable broadband connections to receive orders in digital format and to transmit multiple design options to their clients.

Recording studios and audio mastering houses now transmit audio files—from demos to finished recordings—to music companies and others involved in the creative process. Audio recordings are often posted on a secure web site, so clients can listen and comment. And broadband makes it possible for technicians to work with digital editing equipment and other sophisticated software programs that need to be updated regularly.

Animation and film businesses typically need large amounts of bandwidth to upload extensive visual files and edit projects online. "We continually post and update

work online for our clients through a server which they access. These files are large and require a solid broadband connection," said an official at a Manhattan-based animation and film company with 20 employees. "Ninety percent of our editing process is done over the Internet through constant uploads to our hosting server."

Businesses in the health care sector—from hospitals to HMOs—have been streamlining their billing and claims services online. A&J Care, a health care company based in Glendale, Queens, uses a broadband Internet connection to send files, take orders by e-mail, and communicate with its salespeople across the city.

"This business would go right back into the dark ages [without broadband]," says Stanley Yoel, the company's president. "In the world of health care, there have been tremendous cuts in reimbursement. Without this technology, we could never be efficient enough to stay in business. We're totally dependent [on it]," says Yoel.

In the air cargo industry, businesses at JFK Airport and other airports around the country are already using broadband technologies—including wireless, hand-held devices—to track freight shipments and book freight reservations online. High-speed access is also key to implementing the tighter security measures mandated by government in the post-9/11 world: freight forwarders and other cargo officials have to file Customs declarations online, through a Web database.

"A shipment would be loaded onto a Lufthansa plane in Frankfurt, at which point a declaration of the cargo is immediately sent by Internet to the AES (Automated Export System) center in Virginia for processing," explains Jim Larsen, president of New York's Air Cargo Association. "Simultaneously, the database checks the shipper's records and past history. If all goes well, a message is sent to the airline permitting the shipment."

Exporting firms are increasingly taking advantage of videoconferencing and other high-end communications technologies to establish new relationships with international buyers and expand business opportunities. "Broadband has opened up new possibilities, reduced travel costs and made the process of doing business more efficient," says Jon Paone, managing director of goTRADE New York, a pro-trade advocacy group associated with the Business Roundtable. ❖

OUT OF THE LOOP

From Hunts Point to Red Hook, many New York City businesses still can't access a reliable broadband connection at prices they can afford.

IT'S HARD TO BELIEVE THAT NEARLY HALFWAY

through the first decade of the 21st century, thousands of businesses across the city struggle to access a reliable high-speed Internet connection—but this is the sad reality. While a high-speed Internet connection is rapidly becoming a must-have communications tool for businesses of all types and sizes, there are still several key commercial areas around the five boroughs where companies face a paucity of options for broadband, long delays in getting hooked up and, in many cases, routine interruptions in their service.

The gaps in broadband service are by no means widespread throughout the city, or even among businesses outside of Manhattan. Indeed, DSL is now available in many neighborhoods across the city, and cable modem Internet service, which for years was available almost exclusively to residential customers, is an option for an increasing number of businesses.

However, a significant number of businesses located in the city's industrial parks, former manufacturing havens and other low-density commercial areas still cannot access either a DSL or cable modem connection. For many other companies in these areas, DSL is available but is of such poor quality that businesses are unable to access the bandwidth speeds they need and lose service several times a week. While there are no detailed figures available on the number of firms forced to contend with these gaps in broadband service, interviews with local business leaders and telecom experts reveal that the problem is pervasive in large parts of Long Island City, Williamsburg, Hunts Point, Red Hook, Sunset Park, DUMBO, the Brooklyn Navy Yard and a few other commercial areas.

In theory, businesses in these areas have another option: install a T1 line, which generally provides for significantly faster and more reliable broadband service than DSL. But very few firms in these areas have gone this route since T1s typically cost several hundred dollars a month, well out of the price range of most small companies and firms that operate with low profit margins. Additionally, a T1 connection provides far more bandwidth than the average small business needs. Most small firms can get all the bandwidth they need with less powerful DSL or cable modem service,

assuming those types of service are accessible.

"The real gap in service remains between dial-up and T1s," says Phaedra Thomas, director of Red Hook and Gowanus programs for the Southwest Brooklyn Industrial Development Corporation. "Most small businesses don't need and can't afford T1s. But cable is still unavailable for most small businesses [in Red Hook]. And DSL is totally unusable because the existing telecommunications infrastructure [in Red Hook] cannot handle the speed."

DSL

Most of the small businesses interviewed for this report would be more than happy with a basic DSL connection. That's not too surprising, since DSL is usually the most affordable broadband option. Unfortunately, DSL either isn't available or isn't reliable in several commercial districts around the city.

The problem with DSL is that the speed and dependability of this type of service largely hinges on a couple of technical factors: the quality of the local telephone infrastructure and the distance between the user and the telephone company's "central office," (c.o.) which houses switches and other equipment. To qualify for DSL, customers generally have to be located within three miles of a central office, which in New York are owned and run by Verizon. Also, the speeds that data is transmitted are diminished the further away users are from a c.o.

Even in densely populated New York, some communities are too far from a central office to receive a DSL connection—including much of Red Hook, Hunts Point, East New York, the Brooklyn Navy Yard and even parts of up-and-coming areas like Long Island City. "Many buildings in Long Island City are not close enough to a central office to get DSL," acknowledges one Verizon official.

Many firms in industrial neighborhoods that do qualify for DSL are far enough away from a central office that they can only access DSL at a slow bandwidth speed, giving them little more bang for their buck than they might get from dial-up service. In other cases, companies can get DSL only on a few lines, sharply limiting the number of employees that can go

online at once. Businesses in these areas claim that while Verizon has the power to address these technical glitches, the company has been slow to make the needed changes—or hasn't done so at all.

Businesses located in the city's residential neighborhoods, mixed-use areas and dense office districts generally have few complaints about DSL. These areas are usually close enough to a Verizon central office that customers have access to DSL at the highest bandwidth speeds available. Equally important, the copper phone infrastructure tends to be in decent shape in these areas, due to the fact that over the years, the high concentration of customers, increasing competition and regulatory pressure prompted Verizon to modernize its system.

But in many of the city's longtime industrial neighborhoods, the copper phone wires are in bad shape: they're roughly 100 years old and haven't been upgrad-

ed in decades. As a result, numerous companies in these areas report that their DSL service goes down several times a week, a disruption which is not merely annoying, but also costly to businesses that need a reliable connection to effectively take advantage of the Internet, e-mail and other technologies.

"Our DSL line is inherently unstable," says Dennis Sanford, a manager at Legion Lighting, an East New York-based firm that manufactures fluorescent lighting. "I'm bumped off-line several times a week. Bad weather seems to affect it a lot."

Jon Postyn sees the same problem in many neighborhoods throughout Queens. Postyn, president of JLP Computer Enterprises Corp., a firm that provides consulting services to small businesses and non-profits on technology issues, laments that even today some of his clients lose their DSL service a couple of times a week.

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HUNTS POINT

The Bronx experienced stronger economic growth than any other borough in recent years, but local economic development officials say that a significant number of businesses in the borough still have trouble accessing a broadband connection.

"It's difficult in some parts of this borough to get any [broadband] service," says Neil Pariser, senior vice president of the South Bronx Overall Economic Development Corporation (SOBRO). "Right now, we are under-serviced. We've got companies looking for broadband access that are relegated to dial-up, or at best DSL. It's a lost opportunity for businesses."

The gaps in broadband service are particularly acute in and around Hunts Point, a neighborhood in the South Bronx that's grown into one of the city's most important manufacturing and distribution hubs. Though it is home to the largest meat and produce markets on the East Coast, and approximately 20,000 jobs, Hunts Point hasn't received much attention from telecom carriers.

Many, if not most, of the businesses in the produce and meat markets are too far from a Verizon central office to qualify for DSL. At the same time, business leaders say that Cablevision, the cable company that serves the area, has wired only a handful of buildings in the area. "There's basically no availability of cable access or DSL in Hunts Point," says Brian Kenny, operations manager for the Hunts Point Cooperative Market, which includes approximately 50 meat wholesale companies.

Kenny has tried for years to get telecom providers to make infrastructure investments so that companies in the meat market could access broadband. But to date, the providers have only

gone the extra mile for a small group of companies with deep pockets and political clout, like the New York Post printing plant in nearby Port Morris and the construction company now developing the plot of land in Hunts Point that is slated to become the new home of the Fulton Fish Market.

Myra Gordon, executive administrative director for the Hunts Terminal Produce Cooperative Association, says that while large businesses have the tools to bring in a T1 line, many small businesses cannot do so. Most of the companies in the produce market, she says, only need something as basic—and affordable—as a DSL connection. But that isn't an option. "Our problem here is predominantly Verizon," says Gordon. "We still have copper cabling in here. They're probably five years away from wiring the whole Hunts Point area [with fiber optics]."

To its credit, Verizon did recently make a significant investment to bring fiber optics to the Hunts Point area. Local economic development officials say that while Verizon still maintains that it isn't capable of using this fiber to offer DSL service to local companies, a handful of businesses have been able to tap into the fiber to get a T1 line.

Few businesses in the area can afford a T1 line, and connecting the fiber over the last mile into individual buildings remains a giant hurdle for most small firms, but some companies have found creative ways to overcome these obstacles. For instance, a few entrepreneurially minded companies in the meat market have taken the step of purchasing a T1 and splitting up the bandwidth—and the cost—with two or three or other companies. ❖

“DSL is still spotty in Queens,” he says.

Neither the city nor the state collects data from Verizon and other telecom providers that would detail the extent of the service problems with DSL. However, data from the state’s Public Service Commission reveal that the highest “customer trouble rates” were found in Williamsburg, the area around JFK airport, the Brooklyn Navy Yard, parts of the Bronx and other neighborhoods on the city’s periphery. (See chart, page 13)

CABLE MODEM

Instead of transmitting data over copper phone lines, cable companies use a combination of fiber optics and coaxial cable—the same wires used to deliver cable television service. Fiber provides the backbone for their network and coaxial cables bring the Internet over the “last mile”—the distance between major avenues in the boroughs and other streets—to businesses and residences. Time Warner, Cablevision and RCN have made some inroads by aggressively courting small business customers for their cable modem broadband service, giving many firms an alternative to DSL.

The number of businesses subscribing to Time Warner’s high-speed Internet service, Road Runner, has nearly tripled over the past two years. And the bulk of Road Runner’s new business subscribers are based outside of Manhattan, says Howard Szarfarc, senior vice president and general manager for Time Warner Cable of NYC. According to Szarfarc, Time Warner now has the infrastructure in place to service almost 57 percent of the 64,000 businesses located in their designated service areas, which includes all of Manhattan and Queens and the western half of Brooklyn.

Meanwhile, Lightpath, the business telecommunications division of Cablevision, added 120 more buildings (an 8 percent increase) to its broadband network between June 2003 and June 2004.

But gaps remain. For instance, despite Time Warner’s significant expansion, Szarfarc admits that Road Runner still doesn’t reach into several industrial neighborhoods, including much of Williamsburg, DUMBO and Red Hook. In the Brooklyn Navy Yard, Time Warner is just now wiring two buildings in the complex. But the company currently has no plans to provide service to any of the other 38 buildings in the Navy Yard, even though the complex has an occupancy rate of around 97 percent.

Time Warner officials argue that these other buildings in the Navy Yard don’t yet have enough companies interested in subscribing to their broadband service to justify the costs they would incur in a build-out. It’s easy to understand the company’s rationale for this policy, but it leaves the more tech-savvy businesses in

these buildings out in the cold.

The same scenario is playing out in other commercial areas. Just ask Roberto Gil. The owner of Casa Collection, a furniture design company in Red Hook, Gil has been trying to get Road Runner service for months. But Time Warner told him it won’t run cable to his facility until he gets three or four other businesses in his building to sign up for Road Runner as well. In addition, Time Warner says he’ll have to sign a two-year contract up front, something most customers aren’t asked to do.

Gil doesn’t like these conditions, but Time Warner is the only cable company serving his neighborhood and he’s too far away from a Verizon central office to qualify for DSL. “I have to agree [to the conditions], because I have to have broadband and it’s the only option,” said Gil. As of September 2004, Gil noted that he was close to lining up enough firms in his building to fulfill Time Warner’s demands.

In general, businesses located in or near residential neighborhoods have a much greater likelihood of qualifying for cable modem Internet service than firms operating in more isolated commercial districts. Sunset Park is a good case in point. Time Warner’s cable modem service is widely available to businesses located east of Third Avenue, in the residential portions of this Brooklyn neighborhood. But cable modem service remains elusive for most of the several hundred businesses located west of Third Avenue, in Sunset Park’s extensive industrial park. “Nobody down here can get cable,” says Leah Archibald, former executive director of the Southwest Brooklyn Industrial Development Corporation, an organization that represents businesses in Sunset Park, Red Hook and Gowanus. “Because there’s no residential [population] down here, you just can’t get it. Some businesses have tried.”

A final problem with cable modem Internet service is that it’s often too expensive for many small businesses. Cable modem service in New York typically costs businesses around \$110 a month. While this is a reasonable amount for many companies, it is twice as much as the most basic DSL package and a difficult cost to justify for many small businesses that operate on low profit margins. Some firms, for instance, only have a few employees who need to tap into a high-speed connection. Plus, many companies complain that they’re charged over \$100 for a broadband package that’s no different than a residential cable modem package that’s half the price.

FIBER OPTICS

Ordinary copper telephone wires are increasingly being replaced with fiber optics in telecommunications networks in New York and across the world. The bene-

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BROOKLYN NAVY YARD

The Brooklyn Navy Yard is one of the city's greatest assets for small businesses. The massive 3.6 million square foot complex houses roughly 220 businesses, is one of the only places in the five boroughs to witness new industrial development in recent years and has the capacity to accommodate growing companies in the decade ahead. Yet, despite its economic importance, the geographically isolated Navy Yard for years has been plagued with an antiquated telecom infrastructure, and many companies based there have been unable to access a reliable broadband connection.

The situation has improved within the past year, as a handful of telecom providers, finally sensing unmet demand in the Navy Yard, have begun to make needed infrastructure investments. However, even today, a significant share of the tenants in the Navy Yard still cannot access or afford a broadband connection.

Bernard Dushman of the Brooklyn Navy Yard Development Corporation (BNYDC), the non-profit that manages the complex, reports that slightly more than half of the businesses in the Navy

“More and more of our tenants need broadband, and more of the tenants coming in over the next generation will need it.”

Yard “have access to reasonably priced broadband today.” The senior vice president for technology at BNYDC, the non-profit that manages the complex, Dushman says that’s a significant improvement over the past year, and credits the arrival of several alternative telecom providers that are now offering T1 lines and fractional T1 service. But even with these advancements, Dushman says that the overwhelming majority of companies in the complex still can’t access DSL. “For people who want the least expensive form of broadband—Verizon DSL—it’s still not available to them [in the Navy Yard],” says Dushman.

Marc Agger, the owner of Agger Fish Corporation, a 35-employee business in the Navy Yard that imports and distributes fish, has tried just about everything over the past five years in attempting to get a reliable broadband connection. Verizon consistently told him he couldn’t get DSL because he was too far away from one of their central offices, and Time Warner wasn’t offering their Road Runner broadband service to businesses there. He subscribed to satellite Internet service a few years ago, but the service often went down when poor weather interfered with the satellite connection. Last December, he broke down and got Verizon to install a T1 line, which costs much more than he wanted to pay for a level of bandwidth he says he doesn’t need.

“I pay an extravagant amount of money, just so I can have friggin’ broadband,” says Agger, who pays \$6,000 a month for the T1 connection. “It’s not like I’m a graphic design firm with 30 people here all sending digital files all the time. I’d be happy with standard, home DSL. But you can’t get it here.”

The kicker is that his premium broadband service still has

reliability problems. “[T1 lines] need extremely clean copper wires, and the copper infrastructure of Brooklyn is not so perfect, especially in the Navy Yard,” adds Agger.

Many other small businesses in the Navy Yard simply can’t afford anything more than a basic DSL connection. Yet, small companies say Verizon has been slow to make the needed changes to make DSL a reality—if it does so at all.

Just ask Dan Chase. The owner of Chase Office Supply, located in the Brooklyn Navy Yard, Chase has spent more than two years trying to get DSL service from Verizon. Finally, in mid-September, Verizon told him that his company now has the technical capacity to receive DSL. Verizon wouldn’t, however, guarantee that it will work. “They’re saying it’s a 50-50 chance that it will work,” says Chase, who had yet to install the necessary equipment by the time this report went to press.

Chase needs the service badly, since his business does all its ordering online. But he’s had too many bad experiences with Verizon to get excited prematurely. “We’ve been trying to get

[DSL] for a long time. They just say ‘It’s not available. It’s not available.’ Now they say it might be, but it’s a 50-50 chance. I don’t know why they can’t tell us if it is or not.”

Whether or not Verizon will finally be able to make DSL a reality, the good news is that businesses in much of the Navy Yard are at least beginning to have real options for getting a high-speed Internet connection. Time Warner is now in the process of wiring two buildings in the Yard, giving at least a few dozen companies the opportunity to get cable modem broadband service. Other companies like Intellispace are offering fractional T1 connections to businesses by installing a T1 line in one building and splitting up the bandwidth among several companies.

The infrastructure to support T1 lines or cable modem services hasn’t yet been installed in many of the 40 buildings in the Yard. In some cases, BNYDC is attempting to erect conduits that would allow them to pull fiber, cable or copper wiring from buildings that have the proper broadband infrastructure to nearby buildings that do not. While this is an important step, and a model for other commercial landlords around the city, there is still a long way to go before affordable broadband service is widely available throughout the Navy Yard, something that BNYDC’s Dushman says is becoming increasingly critical. “It’s important to the Yard because more and more of our tenants need broadband, and more of the tenants coming in over the next generation will need it,” he says. “Broadband will be like electricity, as essential to businesses as turning on an a light. This will be how businesses communicate with the outside world. We’re going to get used to sending pictures and text, and small businesses have to do that. They have to be on the Internet.” ❖

DRUMMING UP DEMAND

More and more small businesses are going online, but in many commercial areas demand for broadband still hasn't reached a critical mass.

IT WOULD BE EASY TO BLAME THE GAP IN BROAD-band deployment solely on the failure of Verizon and other telecom carriers to target small business customers and develop a modern telecommunications infrastructure in neighborhoods outside of Manhattan's central business districts. But while supply issues are clearly an important part of the equation, a big part of New York's broadband gap comes back to a real or perceived lack of demand. The critical mass of business customers demanding better broadband access vociferously enough to prompt a change in policy from telecom providers hasn't yet arrived.

Even as more and more firms across the city are awakening to the benefits of broadband, many small businesses and Old Economy companies remain way behind the technology curve. The CEOs of some of the city's industrial businesses, for instance, don't even use a computer or have e-mail. Many other business owners realize the value of the Internet, but aren't yet able to justify the additional cost of making the leap from dial-up to broadband service.

And though every corner of the city is now home to at least a smattering of businesses that take advantage of a high-speed Internet connection, in many areas the demand is not yet great enough for broadband providers to feel confident that they can recoup the high cost of building out a more modern infrastructure.

"There are profound reasons for small companies to have advanced communications, but I'm not sure where

"When I see what networks can do in terms of training and content and product launches, opportunities to establish networks and meet face to face with colleagues [over videoconferencing], and opportunities to do marketing . . . I think of it as fairly remarkable. But I'm not sure it reaches the radar of most folks in the small business community," says Piller. "There isn't a significant consciousness of how much value and opportunity those technologies provide. The cost of these technologies have come down, but you have very limited deployment."

"You've got specific isolated companies who see the need to be on the Internet and do business online, and who have a need to access appropriate technology," adds Sara Garretson, executive director of the Industrial Technology Assistance Corporation (ITAC), a New York City-based organization that helps manufacturers and other companies throughout the five boroughs adapt technologies to become more productive and competitive. "But in many cases, companies are led by executives who don't understand the technology and don't easily use it on their own. This has a great impact on the degree to which the company utilizes technology."

Economic development experts say that many small firms around the city simply aren't aware of what a high-speed Internet connection can do to improve their efficiency, sales and profits. It hasn't helped that telecommunications and cable companies have been slow in rolling out broadband and marketing the serv-

"You've got specific isolated companies who see the need to be on the Internet and do business online, and who have a need to access appropriate technology. But in many cases, companies are led by executives who don't understand the technology and don't easily use it on their own. This has a great impact on the degree to which the company utilizes technology."

the consciousness lies, even today," says Bob Piller, a technology consultant who served as vice chair of the committee overseeing the state's Diffusion Fund, a project aimed at bringing advanced telecommunications to economically disadvantaged areas in New York State.

ice to small businesses, and have not yet lowered prices to a level at which firms with low profit margins could justify the additional expense. But it's also true that small businesses are often preoccupied with other, more pressing concerns—from simply running their

business and fending off competition to dealing with issues like rising real estate and health insurance costs. And unlike larger businesses, few small businesses have anyone on staff with expertise on technology and telecom issues.

“Most small businesses don’t have an IT professional on staff,” says Brian McCue, a senior account manager for Sprint in Queens. “I can’t tell you how many times I’ve talked to a business owner’s high school son or daughter. That’s their IT person.”

Meanwhile, few Chambers of Commerce and local development corporations have spent time educating businesses about technology issues. One problem is that many of these organizations have had their already meager budgets cut by city, state and federal agencies in recent years, limiting their ability to dedicate staff to these issues. More importantly, these intermediaries rarely hear from businesses about telecom issues. In fact, most of the officials at LDCs around the city that were interviewed for this report say they receive few calls from businesses about broadband—and those are generally from the tech-savvy businesses that already decided to get the service but have experienced problems getting hooked up.

“I think a lot of our companies are blissfully free of [broadband],” says Leah Archibald, former executive director of the Southwest Brooklyn Industrial Development Corporation. Companies like printers and T-shirt manufacturers need high-speed connectivity because their operations involve transferring artwork and other very large files. But Archibald adds, “It’s so hard for these little firms to think about marketing. I think they don’t realize that it would be yeast that could grow their business.”

There’s some evidence to suggest that New York businesses have been slower to seize upon the new technology than their competitors elsewhere. While manufacturers, distribution companies and other Old Economy firms across the country are increasingly plugging in to broadband, there is evidence that smaller firms in these sectors are less likely to have taken the plunge. And in New York, the bulk of manufacturing and distribution companies are small or mid-sized. According to a 2000 report by the Progressive Policy Institute, New York ranked 47th out of 50 states in the percentage of manufacturers that were online.

David Hochman, an economic development expert who has worked with clients in the government and non-profit sectors nationwide through the Technology Partnership Practice at Battelle Memorial Institute, says that today’s broadband gap

reminds him of the rollout of the personal computer in the 1980s. Back then, he says, economic development officials were trying to figure out how they could educate manufacturing companies about what the PC could do for them—something that was extremely difficult to do.

“Broadband is the same problem lagged 10 or 15 years. Many of the companies just have no clue what it’s about,” says Hochman, who worked as deputy director of the New Jersey Commission on Science and Technology in the mid-1990s. “It’s extremely difficult to reach out to companies one-on-one and they are very suspicious of government programs trying to help them.”

He and others like ITAC’s Garretson say that businesses will ramp up to broadband only when their customers begin demanding that they interact online or otherwise become convinced of the financial value of having a high-speed connection. But they add that government and local business assistance organizations can play a role in raising the level of awareness about the value of broadband, and the costs associated with not being online.

Hochman says that one of the conclusions they came to in New Jersey was that it is far easier, and more cost-effective, for government to provide educational and technical assistance of this sort to clusters of businesses that have common characteristics rather than to individual firms. In other words, instead of trying to educate one business at a time—an extremely impractical approach in New York—the city’s economic development agency could work with industry associations or local business groups that are trying to connect a number of like-minded businesses.

One such effort is already in the planning stages in the Bronx. The Bronx Small Business Development Center has sought funding from the federal government and foundations to create a “virtual incubator” that would provide an array of important business services to the very small businesses it works with across the borough. Clarence Stanley, the center’s director, notes that businesses he works with frequently need bookkeeping assistance, legal advice, marketing help and countless other services. By creating an online incubator, he says that the center could more easily provide these services while at the same time giving company owners greater awareness of what the Internet can do to make them more productive.

Similarly, the city could have an impact by delivering more of its services online and making it easier for companies to apply for city licenses and contracts online. ❖

DISCONNECTED

An antiquated telecom infrastructure and the high cost of upgrading the network keep businesses in many neighborhoods offline.

WHEN DEMAND REACHES A TIPPING POINT, IT'S

likely that broadband providers will become more aggressive in serving the high-speed telecommunications needs of small businesses around the city. But inadequate demand accounts for only a part of the explanation as to why affordable and reliable broadband service remains scarce throughout the five boroughs. The broadband gaps New York faces today can also be traced to a host of infrastructure and service delivery problems, from the city's century-old telecommunications infrastructure and the high cost of upgrading this network to a lack of competitive broadband providers in most business areas outside of Manhattan's central business districts.

A big part of the problem is that the copper wires that formed the backbone of the city's original telephone network more than 100 years ago remain the primary type of wiring used to reach businesses and homes in many parts of the five boroughs today. The same lines over which Langston Hughes, Robert Moses and other towering figures of New York's past once shared their thoughts are now called upon to transmit bulk amounts of data over high speeds. It shouldn't be surprising that they aren't always up to the task.

"It's very expensive to build a fiber network. Five years ago you could get a lot of people to lend you money to do it. You can't get anybody to lend you the money now."

Verizon, which owns most of the city's telephone infrastructure, could repair aging phone lines or install newer copper wires. This would at least guarantee that most businesses could tap into a reliable DSL connection. But making these upgrades isn't cheap, and experts say Verizon is reluctant to spend significant sums when they believe—perhaps understandably—that within a few years' time, fiber optic technology will soon render all copper wiring obsolete.

Telecom companies have already replaced old copper wires with more suitable fiber optic cables throughout Manhattan's two central business districts and in specific pockets of the other boroughs, like the Metrotech office complex in downtown Brooklyn—

places where there was abundant demand and many corporations willing to pay top dollar for modern telecommunications services. But the companies have not invested in this type of infrastructure upgrade in many other areas of the five boroughs.

In terms of modernizing the infrastructure, the bottom line is the bottom line: in much of the city, it's just not profitable for telecom companies to do it. While fiber optic trunks lay under the main streets and avenues of every borough, it's expensive to connect fiber over the last few hundred yards from under the street to a firm's office or an individual's apartment building, and it's often even more costly for companies to extend cables into neighborhoods that don't already have a fiber backbone. Either way, it involves tearing up the streets and digging underground, something that's both expensive and time-consuming. Unless there is a significant number of potential customers—or the prospect of losing business to competitors that are making infrastructure upgrades there—telecom companies have shied away from these capital projects.

"The capital cost of build-out is the biggest hurdle of any company, whether it's Verizon or us," says Bhupender Kaul, Vice President of Sales & Marketing

and Business Services at Time Warner Cable of NYC. "It's so expensive. In New York, everything is underground, so you are digging up the street to connect the manhole and then you're building infrastructure inside the building. There are also environmental issues that we need to take care of. It all adds up."

Kaul says that it's often most expensive to dig underground in neighborhoods where the physical infrastructure is old or in bad shape. For instance, he says Time Warner will pay a premium to wire parts of the Brooklyn Navy Yard since the streets there are lined with cobblestone.

In today's deregulated telecom environment, telecom carriers will put their capital dollars into areas where

they see they can get the biggest bang for their buck. “The providers go for low-hanging fruit,” says David Bronston, a New York-based attorney who specializes in telecom issues and chairs the Telecommunications Law Committee of the Association of the Bar of the City of New York. “The original copper network is being replaced in core business districts, but I don’t know where else.”

To a large extent, the economics of wiring business areas outside of Manhattan just doesn’t add up for telecom companies. Outside of midtown and downtown Manhattan, there are few high-rise office buildings, and few of the large corporations that make telecom providers salivate. And even though businesses in other parts of the city are often clustered in industrial parks or retail strips, firms in these areas tend to be spread out over larger distances and are mostly housed in small buildings that rarely have more than a few tenants. In many cases, companies are in one- or two-story factories and warehouses by themselves.

Con Ed Communications president Peter Rust acknowledges that small businesses often lose out because of these economic realities. A competitive local telecommunications provider, Con Ed Communications

has been building its own fiber optic network around the city and now delivers T1 service to more than 125 buildings around the region, mostly in Manhattan. But while the company has wired a handful of buildings in Brooklyn, Rust concedes that they’ve largely chosen to avoid the small business market.

“The issue in Brooklyn is finding buildings with enough businesses to justify [the investment],” Rust says. “When you’re investing in infrastructure, you need a certain return on your investment. It takes about six small- to medium-sized businesses in a building to break even.”

This cautious approach represents a big change from the speculative wiring during the boom years of the late 1990s, when it looked as if fiber optic technology would be available widely throughout the city. This was a period of unbridled optimism with the financial markets about the growth of new technologies like broadband: flush with investors’ money, telecom companies were eager to build out fiber optic networks in the confidence that within a short time, demand would arise to justify the expense. Nationally, the industry spent hundreds of billions of dollars doing so.

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OUT OF ORDER

DSL works by transmitting data over standard phone lines. In many areas, businesses complain of poor service and frequent service interruptions, problems usually associated with an aging telephone infrastructure. While local government agencies don’t compile statistics that measure the quality of DSL service by neighborhood, they do closely monitor the quality of telephone service. This chart shows that the Verizon central offices in New York City with the highest “customer trouble rates” are in the Williamsburg section of Brooklyn, the area around JFK airport in Queens, the Brooklyn Navy Yard, parts of the Bronx and other neighborhoods on the city’s periphery. The central offices with the lowest “customer trouble rates” are in midtown and downtown Manhattan.

WORST PHONE SERVICE		BEST PHONE SERVICE	
Customer trouble rate (per 100 customers)	Location of Verizon Central Office	Customer trouble rate (per 100 customers)	Location of Verizon Central Office
3.77	Williamsburg	0.18	104 Broad Street
3.57	JFK Airport	0.42	104 Broad Street
3.38	Tratman Avenue (Throgs Neck)	0.81	104 Broad Street
3.30	Bridge St. (DUMBO, Brooklyn Navy Yard)	0.91	West 42nd Street
3.25	Fairview Avenue (Ridgewood, Cypress Hills)	1.10	World Trade Center
3.15	East 150th Street (Port Morris, Mott Haven)	1.11	East 37th Street
3.14	14th Street (Sunset Park, Gowanus)	1.12	East 37th Street
3.12	14th Ave. (Borough Park)	1.21	West 42nd Street
3.11	71st Street (Dyker Heights, New Utrecht)	1.22	104 Broad Street
3.06	Bushwick Avenue (Bushwick)	1.32	East 30th Street
2.90	Avenue R (Marine Park)	1.39	104 Broad Street
2.89	Astoria	1.44	East 37th Street
2.83	Albemarle Rd. (Prospect Park South)		
2.81	Avenue Y (Sheepshead Bay)		
2.80	Hoe Avenue (Hunts Point)		

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New York was seen as a potential goldmine because of its sheer number of potential customers, and at one point more than two dozen telecom companies were heatedly vying for a piece of the market, laying fiber around the city and, in some cases, wiring buildings speculatively. Not surprisingly, the bulk of the fiber deployment occurred in the densest parts of the city, but some of the companies looking for niches in the market specifically targeted small businesses and underserved parts of the city.

A considerable amount of fiber was laid underground outside of Manhattan's central business districts. But before most of this fiber was connected over the last mile to customers' offices and homes, the money stopped flowing. When the stock market bubble burst, the telecom industry was among the hardest hit.

After this extended shakeout in the industry, a number of telecom providers here and across the country declared bankruptcy. The handful of firms in New York that survived have been considerably more cau-

tious with their capital investments.

Take RCN, for example. The Princeton, NJ-based broadband provider is one of a few companies looking to fill some of the gaps in New York's broadband market. It built out its own fiber-optic network in several neighborhoods in Queens, and has been trying to compete with existing telecom providers in several neighborhoods across the borough by selling high-speed Internet, cable TV and telephone service in a single package. But from the beginning, economic realities dictated that RCN target residential customers—not businesses. And even though RCN officials now see significant potential in Queens' small business market, the company doesn't currently have the funds to extend its fiber network into commercial areas it doesn't already cover.

"It's very expensive to build a fiber network," says Gary Lindemann, RCN's director of alternate sales channel development. "Five years ago you could get a lot of people to lend you money to do it. You can't get anybody to lend you the money now." ❖

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fits are clear: fiber allows data, voice and video to be transmitted significantly faster and more reliably than over copper wires. Unfortunately, fiber isn't an option for the lion's share of firms based outside of the city's two main business districts.

According to a 2003 study by the City Council, of the roughly 3,400 "fiber lit" buildings across the city, only 54 are in Queens (1.6 percent of the total), 205 in Brooklyn (6.1 percent), 140 in the Bronx (4.1 percent) and 40 in Staten Island (1.2 percent). The rest—nearly 3,000 (87 percent)—are in Manhattan.

Chris Havens, director of leasing for Two Trees Management Co., a real estate management firm based in DUMBO, says that the gaps in fiber deployment even extend to downtown Brooklyn, the city's third largest business district and an area with enormous growth potential. While the area's sprawling Metrotech office complex has state-of-the-art fiber-optic connectivity, Havens estimates that as many as 40 of the 50 commercial properties in the area that he keeps up with are not wired.

"The vast majority of office buildings in Brooklyn aren't wired [with fiber optics]. I bet it is still just three or four percent that are wired," says Havens. "In terms of all [commercial] buildings in Brooklyn, I bet it couldn't even be one percent. Very few buildings have fiber connections."

The problem is that while fiber optic cables do run under main streets throughout all five boroughs, it typically costs between \$50,000 and \$200,000 to dig under the street and extend fiber over the "last mile," the distance between the fiber backbone that runs between the main thoroughfares and the side streets where businesses might be located. In midtown and downtown Manhattan, telecom companies and building owners usually end up swallowing this cost, because most of the buildings have scores of potential customers. An up-front investment in wiring a building can be recouped relatively easily. But outside of these CBDs, businesses tend to be more spread out, located by themselves in owner-occupied units or in properties with only a small number of tenants. As a result, outside of new commercial development and most Class A office properties, most of the fiber in the other boroughs remain "dark," or not yet wired.

While most small businesses today would be content to settle for one of the other, more affordable types of broadband service, like DSL or cable modem, the speed and reliability of fiber optic technology will only become more crucial in the years ahead, as companies begin to use broadband for Voice over Internet Protocol (VoIP) service and other new money-saving technologies. ❖

MARKET FAILURE

Multiple broadband providers compete to offer high-speed internet service in the city's central business districts, but in other commercial areas Verizon remains the only viable option.

THE DAYS WHEN TELECOM COMPANIES HAD A

nearly endless stream of funds to spend on infrastructure improvements are long gone, but many business leaders and telecom experts agree that there is one thing that would likely prompt upgrades to the telecom infrastructure in the city's underserved areas: more competition.

Today, several telephone and cable companies compete to provide broadband services in high-density areas like midtown Manhattan. But in many other commercial areas across the city, businesses face extremely limited choices. In some places, the only viable option for broadband is DSL from Verizon, the company that long enjoyed a monopoly over local telephone service in New York and still controls much of the telecom infrastructure.

Verizon thus faces little pressure from competitors to improve their DSL service or upgrade their copper phone infrastructure. With minimal competition, some say that Verizon and other Baby Bell phone companies across the U.S. have focused less on improving their lower-margin DSL service and more on their lucrative T1 services.

Businesses across the city claim that the absence of competition has had other negative consequences. They say Verizon was slow to roll out DSL service to small companies and still hasn't adequately marketed the service to businesses. Verizon also has been accused of long delays in installing DSL and responding to service complaints.

"Theoretically [Verizon] can serve everybody, but they're not going to do anything to improve their DSL service and they haven't marketed themselves real well to small businesses," says an official with another broadband provider in New York. "Other companies are looking to fill in the niches, but it's difficult. We have to open up the streets and it's expensive."

The gaps in New York's small business market offer an opportunity for other providers, but alternative carriers face barriers that often put them at a competitive disadvantage to Verizon and, in some cases, discourage them from entering the market. For instance, every broadband provider but Verizon must pay the city a franchise fee—roughly 5 percent of their gross revenues or a minimum of \$200,000 per year—to gain permission to open up city streets to install cable, wire or fiber lines. In addition, Verizon's legacy as the city's local telephone carrier means that it already has the equipment to support

broadband networks installed in most commercial buildings across the city. Other providers typically have to pay building owners—sometimes in excess of \$100,000—for the right to enter the property and set up infrastructure needed to deliver broadband to customers in the building.

Other companies offering DSL service also have to lease the phone lines that Verizon owns—an arrangement that makes it difficult for them to offer competitive rates and gives them little leverage over whether Verizon makes necessary improvements to its phone infrastructure. Dependent upon Verizon's copper phone network, other providers often struggle to deliver reliable service. "The net effect is a competitor to Verizon has much higher costs to put fiber in the ground than Verizon does," says Marc Josephson. "Verizon is operating on a much lower cost basis than everyone else. A [telecom] company or investor can't afford to go into the neighborhoods."

"We had a really hard time getting good service and just even decent support from anyone other than Verizon, only because [the other providers] were so dependent on Verizon," says Steve Mendelsohn, executive director of Manhattan Neighborhood Network. "That lack of competition really hurts us. We were never able to get a good price from any of Verizon's competitors. And now we have to go with Verizon's pricing, because it's the only way to get reliable service. It's reliable, but it comes at a premium."

Verizon officials refused repeated attempts to comment on the findings of this report. But for years, Verizon and other Baby Bell carriers around the country have maintained that it's unreasonable to expect them to invest significant funds to improve the local telecom infrastructure when the 1996 Telecom Act requires them to essentially hand over access to their facilities to competitors. Verizon has long argued that it would be free to make a significant investment in the telecom infrastructure if it could charge competitors more for their facilities. In fact, a recent court ruling sided with Verizon and other incumbent telecom providers on this question. The decision will clearly make it more difficult for other companies to offer certain broadband services at competitive rates, but it is not yet apparent whether Verizon will make a new commitment to overhaul its infrastructure. ❖

BUILDING BLOCKS

Some commercial landlords put unreasonable demands on telecom companies looking to wire their buildings.

ONE OF THE MORE UNLIKELY BARRIERS STANDING in the way of a more competitive landscape for broadband service, particularly the expansion of top-end broadband over fiber optic cable, is the reluctance of commercial building owners to help facilitate the wiring of their buildings.

Commercial landlords have a crucial role to play in the expansion of high-speed Internet services and the creation of a more competitive environment for broadband. After all, every telecom company wishing to offer high-speed service needs to connect their fiber optic cables into buildings and to the tenants' offices. To do this, they need to make arrangements with building owners and typically pay a fee to gain access to phone closets in which they can store switches, wires and other necessary equipment to run fiber to individual offices.

None of this is out of the ordinary. The problem is, some landlords drag out the negotiation process for months and even years, and in some cases, demand unreasonably high fees. Telecom experts claim that many landlords started demanding exorbitant access fees during the late 1990s, when telecom companies were flush with money and often willing to pay any price to get into office buildings, at least in Manhattan.

Ideally, building owners around the five boroughs will increasingly view broadband access as a part of the standard package they offer tenants, along with air conditioning and other necessary items, rather than as an extra amenity.

All of this slows down the installation of broadband and often makes it more difficult for telecom companies to offer competitive prices. In some instances, telecom companies have walked away from buildings because of what they see as shakedown tactics.

"It's slowed down the deployment [of fiber into buildings]," says Peter Rust, president of Con Edison Communications. "Some landlords are greedy and some are difficult. Twenty-five percent of the time you can't make a reasonable deal [with the building owner]."

Incumbent telecom companies across the country—like Verizon in New York—usually don't have to

pay a fee or spend time negotiating access agreements. After years of supplying standard telephone service, they already have storage space for their equipment in most buildings.

"It creates an economic imbalance between incumbent [telecom providers] and competitors," says Rust.

Four years after the shakeout in the telecom industry, however, it appears that most landlords have belatedly come to realize that the providers don't have cash to burn as they did in the late '90s and have changed their tune accordingly. Indeed, there's widespread agreement today among executives at telecom companies and real estate industry officials that the situation has gotten much better. Most commercial landlords today understand that a building that offers several options for high-speed Internet service is more likely to attract tenants.

Different parties have sharply different impressions as to the seriousness of this problem. Marilyn Davenport, senior vice president of the Real Estate Board of New York, concedes that there are instances where building owners are blocking access. But she argues that the vast majority of owners are now supportive of efforts to wire buildings. "There are very few buildings that will refuse

access if they have the space. There's a misconception that tenants' telecom needs aren't being met. If tenants are asking for it, then it gets put in."

Yet, even if they are less common, problems persist. Bhupender Kaul of Time Warner Cable said he just finished negotiating an access agreement with one Manhattan landlord that took four years to complete.

Ideally, building owners around the five boroughs will increasingly view broadband access as a part of the standard package they offer tenants, along with air conditioning and other necessary items, rather than as an extra amenity. ❖

CAN CITIES PLAY A ROLE?

Despite limitations of the 1996 Telecommunications Act, local government can take action to help close broadband service gaps.

THERE IS NO LONGER MUCH DOUBT THAT CITIES

today have an economic stake in making sure broadband service is widely available and affordable. Unfortunately for New York and other urban centers, the federal Telecommunications Act of 1996 makes it difficult for mayors and other key city officials to play a significant role in telecom issues. The Act took almost all regulatory power out of the hands of municipal governments, removing any chance that New York City

But despite the limitations of federal law, telecom experts say that cities can play a role in ensuring that broadband is widely available. “The Telecom Act says cities cannot enact barriers to entry, but the city can look at what they can do to stimulate a market,” says Greg Rohde, president of e-Copernicus, a telecom consulting firm, and former administrator of the National Telecommunications and Information Administration (NTIA). “There’s a big untapped market in many parts

One telecom expert says it would be foolish and counterproductive for the city to force telecom companies to wire areas where there is no demand. But he says local policymakers could offer financial incentives and other carrots—such as leasing its light poles at a discounted rate—to broadband providers and building owners that agree to wire underserved areas. One way or another, local government should look for creative ways to have an impact.

could impose the same kind of universal service requirement on broadband providers that the city used to pressure companies providing cable TV service in the 1980s and 1990s.

Designed to prevent cities from enacting barriers to competition in the telecom industry, the law broadly restricts municipal officials from placing demands upon broadband providers. For instance, when telecom companies first expressed interest in laying fiber optic cables around the five boroughs in the early 1990s, New York City officials looked into the idea of requiring those firms to make a commitment to wire areas beyond the central business districts. Now only the Federal Communications Commission can impose such requirements, and in light of the deference to the telecom industry shown by the FCC since the passage of the Act, it seems unlikely it would choose to do so.

Some have advocated that municipal governments take on the ambitious role of building out a fiber optic infrastructure to areas neglected by telecom companies. But most telecom experts dismiss this idea, noting the extremely high costs involved in laying fiber and the distinct possibility that this technology could be obsolete by the time construction was completed.

of New York. Serving these areas doesn’t have to be a charity case; it can be a successful business. City governments have an enormous amount of power to stimulate a market.”

Robert Atkinson, director of policy research and special projects at the Columbia Institute for Tele-Information, says it would be unwise and counterproductive for the city to force telecom companies to wire areas where there is no demand. But he says local policymakers could offer financial incentives and other carrots—such as leasing its light poles at a discounted rate—to broadband providers and building owners that agree to wire underserved areas. One way or another, he says, local government should look for creative ways to have an impact.

“If the lack of broadband in certain areas is because of market failure, government has a proper role to inject itself,” says Atkinson. “The correct role for government is to act as a catalyst. It would be foolish for government to force companies to do unnatural acts...like forcing them to provide fiber to a garbage dump. But it could nudge [private telecom carriers] to do something in the Brooklyn Navy Yard or Red Hook.” ❖

WHAT NYC IS DOING

New York City has been slow to confront gaps in broadband service, but the Bloomberg administration appears to be moving in the right direction.

UP TO THIS POINT, NEW YORK CITY'S APPROACH TO

telecom issues has consisted of a few high-profile but limited initiatives focused at companies on the leading edge of the technology curve. While these projects were at least partially successful, they helped obscure a larger issue: the missed opportunity to truly prepare the city's business community for the wired world of the new century. Fortunately, there are signs that the Bloomberg administration is now preparing to tackle some of these difficult issues head-on.

In 1997, the city's Economic Development Corporation (EDC) teamed with the Lower Manhattan-based Alliance for Downtown New York to create the Plug 'n' Go program. The initiative, which used city tax breaks to spur the creation of pre-wired, Internet-ready office buildings in lower Manhattan, helped transform many obsolete office buildings in lower Manhattan into attractive homes for hundreds of dot-coms and other technology firms looking for wired office space at affordable prices.

Two years later, EDC created "Digital NYC: Wired to the World," a program intended to attract high-tech companies to seven designated business districts outside of midtown and downtown Manhattan. Only a couple of the districts—DUMBO and Long Island City—attracted a significant number of high-tech firms, but the initiative led to at least some investment in telecom infrastructure in all of these areas.

Unfortunately, both of these programs were narrowly targeted at technology companies and the Giuliani administration made little effort to promote the development of a modern telecommunications infrastructure that could support the telecom needs of the larger business community. In addition, the Giuliani administration largely failed to address the widespread service problems and installation delays that tech companies and other small businesses were experiencing with Verizon's broadband services.

Mayor Bloomberg at least seems to understand the new dynamics of today's economy, noting in a speech late last year that "businesses need an environment that gives them the tools to be competitive in an ever more competitive world." He also stressed that it was important to ensure that businesses have "a modern infrastructure

that enables them to be successful." But while he has championed projects like the development of new housing and parks and the expansion of subway lines, Bloomberg thus far has been mostly silent on the state of the city's telecommunications infrastructure.

There are indications that this is about to change. In May 2004, EDC assembled a task force of telecom experts and business leaders to advise the city on how to identify and address some of the five boroughs' key telecom infrastructure challenges. The agency subsequently hired a consulting team to examine the issue more closely and make recommendations that ensure the city "will be capable of maintaining and attracting new businesses and residents... and of providing cost-effective broadband telecommunications infrastructure to the greatest number of people in New York City." The consultant expects to deliver its report to the mayor in December or January.

The project, which is being conducted in coordination with the Department of Small Business Services (SBS) and the Department of Information Technology and Telecommunications (DoITT), could end up being the city's most ambitious effort thus far to integrate telecommunications into its economic development strategy. Still, it's not yet clear how closely the report will focus on persistent gaps in the city's broadband infrastructure. And the project's success will largely depend on how vigorously the administration chooses to respond to its recommendations.

Several telecom experts and business leaders hope this project will signal the beginning of a more assertive role for DoITT on broadband infrastructure issues. They acknowledge that DoITT has played an important role in coordinating city agencies' websites and rolling out 311, the city hotline for government services launched in early 2003. But critics claim the agency hasn't shown significant interest in addressing gaps in broadband deployment, and some believe DoITT hasn't even been interested in acknowledging these gaps exist.

"It's too bad that DoITT has seen its mission in such narrow terms," says Nick Noe, a former technology policy analyst for the New York City Council. "They're focused almost exclusively on agency needs

and disaster response. The result is that our supposedly tech-rich city has virtually no public leadership when it comes to the broader needs of many communities who increasingly need affordable, reliable access.”

Agostino Cangemi, DoITT’s deputy commissioner, acknowledges that there are pockets within the city where businesses still don’t have access to affordable broadband service. “We shouldn’t have industrial parks in Brooklyn or the Bronx with no connectivity at all,” he admits.

But Cangemi says it wouldn’t be wise for the city to be overly aggressive in pushing telecom companies to provide service. “We view our role as getting out of the way, creating a climate for businesses to thrive with as few government impediments as possible,” says Cangemi. “It would never be a good thing for a city to compete with the private sector. Cities can’t do this well, and it will be a disincentive for the private sector to build out their own infrastructure.”

Cangemi agrees that DoITT can play a role in promoting a more extensive rollout of broadband services, but believes it should be done carefully, by tapping city assets—like light poles and rooftops of municipal

buildings—and inducing telecom companies to make needed changes themselves. He also believes the agency can have a greater impact encouraging a wireless build-out in underserved areas than getting telecom companies to do the more costly work of expanding their wire-based infrastructure. In fact, DoITT’s recently announced initiative to lease 18,000 city light poles to wireless companies includes incentives that could prompt those companies to make high-speed Internet services available to underserved areas. (See “Unwiring the City,” page 20)

DoITT has also issued a Request for Proposals (RFP) for carrier neutral laterals that would connect individual buildings with fiber optic cable running under city streets. If implemented, the proposal could significantly lower costs for carriers to connect fiber over the “last mile” into commercial buildings. The project is intended to make it more feasible for competitive telecom carriers to enter commercial buildings, giving businesses options for redundancy and presumably leading to lower prices. It is a good example of what the city can do, but even the plan’s biggest proponents doubt that carrier neutral laterals will be erected

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STATE OF DENIAL

New York State’s “Wired Building” program provides grants to encourage the wiring of non-Class “A” commercial buildings and business incubators in parts of the state “where such advanced telecommunications initiatives have not kept pace with the larger metropolitan areas.” While the program could help bridge the broadband gap in underserved business areas in the five boroughs, thus far only 1 of the 42 grant recipients is located in New York City.

	ROUND 1 # GRANTS	ROUND 1 AMOUNT	ROUND 2 # GRANTS	ROUND 2 AMOUNT	TOTAL # GRANTS	TOTAL AMOUNT
NYC	0	0	1	\$75,000	1	\$75,000
Mid-Hudson	3	\$214,500	4	\$300,000	7	\$514,500
Capital Region	2	\$1,102,388	5	\$159,663	7	\$262,051
North Country	2	\$143,000	4	\$230,005	6	\$373,005
Central NY	0	\$0	1	\$31,000	1	\$31,000
Southern Tier	2	\$143,000	3	\$134,350	5	\$277,350
Finger Lakes	2	\$137,678	4	\$234,550	6	\$372,228
Western NY	3	\$214,500	5	\$350,000	8	\$564,500
Mohawk Valley	1	\$44,508	0	\$0	1	\$44,508
Total	15	\$1 million	27	\$1.52 million	42	\$2.52 million

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anywhere but in midtown and downtown Manhattan.

Telecom experts applaud DoITT for taking these steps, but some still believe the agency should be more aggressive in pushing telecom companies to make broadband service available in underserved areas. For instance, City Council Member Gale Brewer and others have long suggested that DoITT do more to leverage the city's own substantial telecom spending to get carriers to upgrade existing infrastructure in underserved communities. The city currently spends more than \$130 million a year on its telecom bill, the vast majority of which goes to Verizon. Brewer, who chairs the Council's Committee on Technology in Government, argues that by competitively bidding out these services, the city could mandate that winning vendors make broadband available to underserved areas or at least use a portion of the anticipated savings from the new contract on grassroots projects, such as the installation of a wireless infrastructure in targeted communities.

DoITT did put the city's telecom services out to bid earlier this year, and it is now reviewing competitive proposals from several companies. The agency plans to have new contracts in place by early next year that could save the city tens of millions of dollars, but there is no indication that DoITT plans to use part of those funds for targeted infrastructure projects.

As EDC and DoITT have begun to tackle some of the

issues around the rollout of broadband throughout the city, SBS over the past year has been taking a number of simple but important steps that could lead to greater use of the Internet by small businesses and, ultimately, an increase in demand for high-speed Internet services. Under the radar of the media and most economic development observers, SBS has been steadily making more of its small business services available online and making it easier for companies to learn about procurement opportunities by e-mail or over the Web.

Jean Hamerman, a deputy commissioner at SBS, says that more than 50 different business resource documents are now available on the agency's website, including information about how to develop a business plan, register with the state and manage cash flow. In addition, the agency signed up scores of local companies in a software program it licensed that combs through city, state and federal procurement opportunities and sends nightly e-mails alerting firms about possible matches. "None of this existed prior to the last year," says Hamerman.

There's certainly room for making more services to the Web. For instance, it's still not possible for companies to apply online for licenses and permits that are required by various City agencies. And SBS needs to step up its efforts to get the word out about these programs and to promote the benefits to firms of being able to tap into these services online. ❖

UNWIRING THE CITY

New wireless technology offers a cheaper, more practical way to deliver broadband to underserved parts of the city.

THE STEEP COST OF INSTALLING FIBER AND THE current economic realities of the telecom industry all make it unlikely that telecommunications companies will move on their own to close NYC's broadband gap by wiring the whole city with fiber optics—much less that they'll suddenly drop prices to a point at which every small business could afford broadband. The city and its business community will have to find another answer. The good news is that an emerging new technology has the long-term potential to deliver broadband service to underserved areas, with literally no strings attached: wireless.

Wireless Internet connectivity allows users to connect to the Web, send e-mail and download files—all at broadband speeds—without having to hook up their computers to a telephone jack, cable line or local net-

work. Like a cellular phone, it sends and receives information over a radio frequency. To make it work, users simply need to buy a wireless card for their computer and be in proper range to transmit a wireless signal to and from a fixed broadband "hotspot".

What makes wireless so attractive is that it has the potential to provide small businesses with a high-speed broadband connection while circumventing some of the most formidable physical and economic barriers to expanding broadband through fiber connectivity. Wireless is considerably cheaper to install than fiber wires, and it's free from many limitations of the 1996 Telecommunications Act. An infrastructure for establishing wireless networks can draw upon existing city assets, such as lampposts and the rooftops of municipal buildings. In addition, wireless doesn't rely

as intensely on the existing telecom infrastructure, and can thus be brought more easily to areas of the city that are currently underserved by major telecom providers.

“It is a really obvious way to fill in these gaps of the wireline technologies,” says Michael Oh, president and founder of Tech Superpowers, a Boston based wireless company that created that city’s largest free wireless project. “It’s not going to be the end-all, be-all. But it’s something that’s attainable and tangible.”

Thus far, wireless deployment in New York has largely been limited to private initiatives to (un)wire city parks, coffee shops and other public spaces, predominantly in Manhattan. One reason for this limited rollout is that WiFi, the current generation of wireless technology, is vulnerable to hackers, viruses and other security threats. In addition, WiFi has a limited reach; it can transmit data only within a range of a few feet to a few blocks.

But advances in wireless are beginning to address security concerns. For instance, new encryption technology and firewall software are making WiFi networks increasingly secure. Meanwhile, next generation wireless technologies like WiMAX and MobileFi offer connectivity over distances up to 10 miles. They also have the advantage of being able to penetrate indoors, eliminating the need for antennas on the roof of every building.

Some wireless experts say that as these breakthroughs continue, public sector leaders in New York should push for the broadest possible deployment of wireless technologies. “WiMAX, more than any other technology, including WiFi, has huge potential to enable the service of all sorts of under-served areas to get real Internet connectivity,” says Dana Spiegel, a technology consultant and member of the board of directors at NYCWireless, a non-profit group that seeks to expand wireless technology throughout the city. “There’s no reason why you couldn’t take the same model and beam service from a central office in Brooklyn 10 miles out, which should cover just about every part of the borough.”

Shivendra Panwar, director of the New York State Center for Advanced Technology in Telecommunications (CATT) at Brooklyn’s Polytechnic University, says that the best thing about wireless is its low infrastructure costs. He says that instead of spending tens of thousands—or even hundreds of thousands—of dollars to bring fiber into a building, wireless providers can install the necessary equipment with an upfront cost of around \$1000. After that, businesses should initially be able to subscribe to WiMAX service for about \$100 a month, with rates declining over time.

“The problem with fiber is digging in the ground,” says Panwar. “That’s 80 percent of the costs. Wireless

doesn’t have that cost. All you need is fiber close by, which you have in New York.”

Even though the upfront infrastructure costs aren’t huge, some industry leaders say that major telecom companies will have little incentive to take on these expenses until there is sufficient demand for this service.

Ultimately, it will probably require a strong push from business leaders and non-profit organizations like NYCWireless to ensure a broad-based deployment of wireless. But a recent city initiative gives some reason to believe that the Bloomberg administration would be responsive to such an effort: In August, the city’s Department of Information Technology and Telecommunications (DoITT) announced an agreement to lease 18,000 city lampposts—one out of every ten lampposts in the city—to six cellular phone companies planning to use them to improve cell phone coverage. The plan includes an incentive for the cellular companies to expand phone coverage in underserved parts of the five boroughs: the city will lower the costs of renting lampposts in wealthier areas coveted by cellular companies if the firms agree to offer inexpensive WiFi telephone service to neighborhoods where less than 95 percent of residents have a land-line phone in their home. It would not be difficult to leverage this smart and practical strategy to provide phone service to underserved parts of the city into greater expansion of wireless capacity; indeed, it’s unfortunate that this project doesn’t include incentives for wireless broadband coverage.

Other cities have put forth more ambitious plans to take advantage of wireless technologies. For instance, in August, Philadelphia Mayor John Street announced a strategy to optimize the entire city for wireless Internet services. The plan, which involves installing wireless transmitters on lampposts across Philadelphia, aims to bring extremely low-cost Internet access to all parts of the city (See “Hot Spots,” page 22). Though some telecom experts remain skeptical whether Philadelphia will be able to implement the plan effectively, most agree that it could serve as a model for how cities like New York can use public infrastructure to expand access to affordable broadband service.

Several other cities—including Milwaukee, St. Louis, Tallahassee, FL and Long Beach, CA—have developed complex wireless networks to spur economic development and increase the availability of high-speed telecom to all businesses and residents. The city governments have been assertive in getting these efforts off the ground and procuring significant donations from vendors and service providers. ❖

HOT SPOTS

While NYC makes slow progress, other cities and states have taken creative and ambitious action to expand access to broadband.

WHEN IT COMES TO EXPANDING THE AVAILABILITY

of broadband service, New York City certainly has a difficult task ahead. It's stuck with an archaic copper telephone infrastructure, aging commercial buildings, and a market environment in which most private telecom companies still don't see enough potential business to justify spending the millions of dollars it would take to develop the necessary broadband infrastructure in underserved commercial areas. But other cities and states that faced many of the same challenges have made the issue a top economic development priority and, in many cases, aggressively pursued creative solutions.

Some of the broadband initiatives pushed by various mayors and governors, like Chicago's CivicNet initiative, have failed to get off the drawing board. But several others have at least had a modest impact and promise to strongly support business development and individual usage in years to come.

In terms of specific programs, the initiatives run the gamut. Some states and cities, like Utah, are aggregating their substantial purchasing power to create a fiber network that is affordable for small businesses. A number of others, such as Philadelphia, have turned to wireless technologies to help small businesses access broadband, while San Francisco and Omaha have looked to their unglamorous sewer systems as possible fiber conduits. In most cases, public officials are working closely with the private sector to achieve their goals.

The following are just a sampling of the initiatives that cities and states have been trying to implement across the nation. Though not all of them may be practical for New York, officials here would be wise to take a close look at these efforts.

PHILADELPHIA – Wireless Philadelphia

Philadelphians may always debate whether Pat's or Geno's makes a better cheesesteak, but the value of a widespread wireless infrastructure has garnered extensive support, culminating in the recent announcement that the city plans to become the first major American city to provide wireless services to all residents for free or at low cost. Thanks largely to tech-savvy Mayor John Street, Philadelphia hopes to create a comprehensive wireless network that would cover the city's 135 square miles.

First announced in August, the plan calls for the city to spend \$7 to \$10 million to erect a comprehensive wireless infrastructure. Thousands of small transmitters will be mounted on streetlights and other fixtures across the city. Once installed, the transmitters would be able to communicate with any computer equipped with a wireless networking card and deliver high-speed WiFi access to anyone within its purview. Planners have not yet determined whether residents would be able to access the network at no cost, or if they would have to pay a small fee. After the network is built, the city will pay another \$1.5 million in annual maintenance costs. Philadelphia officials anticipate that significant revenue from grants and licensing fees should be sufficient to finance the project.

The project has garnered significant attention nationwide, and some local businesses leaders hope the positive publicity will help transform the city's image and help it attract more technologically oriented companies. "This certainly sets a framework for the city as a more technology-friendly city," says Ed Schwartz, president of the Philadelphia-based Institute for the Study of Civic Values and member of a 14-member committee appointed by Mayor Street to oversee the wireless project.

MICHIGAN – Broadband Development Authority

The home of the Motor City has been cruising ahead when it comes to rollout of broadband. The state easily ranks first in every category within TechNet's State Broadband Index, while New York doesn't even crack the top 25.

But Michigan's success should give hope to New York, in that it shows just how quickly smart policy choices can produce a turnaround. A February 2002 *Detroit News* article highlighted the problems businesses there faced in getting high-speed telecom connections: one business owner memorably complained of being stuck in "the broadband black hole of Michigan."

With that in mind, state officials undertook a comprehensive strategy for improving broadband delivery. The crux of the state's efforts was the creation of the Michigan Broadband Development Authority (MBDA). Signed into law in March 2002, the agency provides low-cost financing to businesses looking to expand their

telecom capacity, by providing capital for projects like the expansion of fiber networks and development of e-commerce initiatives. MBDA also offers low-cost loans to telecom companies as an incentive for investing in broadband. Michigan also has passed legislation to facilitate competitive access to public and private rights of way. “We are nearing the point where affordable broadband access is an ‘expected’ service for a region — much like electric, gas, water or other infrastructure services are thought of today,” says former MBDA chairman and president William Rosenberg.

ATLANTA – WiFi Network

Telecom advances in Atlanta are largely the result of a thriving relationship between city government and the business community, namely their current partnership on a citywide WiFi wireless network. Officials hope to begin the initiative this year, culminating in a seamless network of hotspots and infrastructure throughout the city. “No city the size of Atlanta has attempted to do this on a city-wide basis,” says Jabari Simama, Executive Director of the Atlanta Mayor’s Office of Community Technology. “There have been some cities that have done certain districts. The goal in Atlanta is to have this citywide in a five year period.”

This subscription-based, city-owned network, will combine new infrastructure with existing hotspots and footprints. Simama stressed that “the city sees WiFi as being the next great public technology,” evidenced by an RFP also in the works for a WiFi network at the Atlanta airport.

UTAH – UTOPIA

Formed in March 2002, the Utah Telecommunications Open Infrastructure Agency, or UTOPIA, is hard at work on creating a publicly owned open service provider fiber network. Fourteen Utah cities, including the capital, Salt Lake City, have bought into the project. In total, these cities represent 440,000 people, with a potential subscriber base of 140,000 homes and businesses.

UTOPIA bears a cost of about \$330 million, with the initial \$85 million tapped for construction of a portion of the in the first six of the state’s 14 member cities. Use of sales tax pledges from 11 of the 14 cities was a key factor in maximizing fiber availability for Utah government, consumers and businesses. “Banding together makes sense to get economies of scale and clout with potential service providers,” says Paul Morris, UTOPIA’s Executive Director. “We believe we’ve achieved critical mass of size. I’ve been told that our proposed fiber business build is the largest in the United States and one of the largest in the world.”

OHIO – Ohio Broadband Initiative

Under the auspices of his \$1.6 billion “Third Frontier” program, Ohio Governor Bob Taft created the Ohio Broadband Initiative, which is focused on providing businesses with widespread, affordable access to broadband. When he outlined this plan last fall, Taft emphasized that high-speed telecom is not an option, but rather a necessity for Ohio’s businesses, and argued that Ohio’s telecommunications network should be given as much priority as the state’s transportation infrastructure.

A central component of this plan is the Ohio Broadband Link (OBL), a statewide program run by the Department of Development. Under OBL, Ohio businesses aggregate their purchasing power to obtain more affordable rates for high-speed telecom. In conjunction with the state’s Small Business Development Center network, another initiative trains small businesses in how to use e-commerce, lower telecom costs and formulate a strategic technology plan.

CHICAGO – CivicNet

Sometimes the boldest ideas are a little too bold. Several years ago the city of Chicago launched its ambitious CivicNet initiative, an effort to provide broadband access to businesses and residents in far-flung neighborhoods without spending new public money.

The city government—with key support from the business and civic communities—sought to hire a single telecommunications company to install fiber-optic lines to meet the needs of its various agencies, on the understanding that the infrastructure built for the city’s own use would also be available to businesses, organizations and residents who wished to purchase broadband service from the company. To help finance the rollout, CivicNet would aggregate all the money local government agencies had been spending on telecommunications services into one pool, amounting to more than \$30 million.

But earlier this year, CivicNet fell victim to budget cuts, and the program has been suspended indefinitely. It had been the highest-profile effort by a city government to build a broadband infrastructure on a large scale.

The demise of CivicNet was striking for a project Chicago Mayor Richard Daley had compared to the creation of railroads in the 19th century. Mayor Daley’s influential Council of Technology Advisers had championed the effort, and Daley himself had been outspoken on the importance of technology and telecom in making Chicago businesses competitive in the global economy.

Policymakers in Chicago are now working on more modest initiatives to expand broadband access, with a focus on expanding high-speed wireless networks. ❖

RECOMMENDATIONS

Since the market alone isn't taking care of many businesses' technology infrastructure needs, policymakers in New York must find a way to fill the gap. Fortunately, despite constraints like the federal Telecommunications Act of 1996 and the exorbitant costs associated with building out broadband networks, local officials can have an impact. To do so, they will have to be creative, work closely with the private sector, and take advantage of new technologies.

CITY AND STATE OFFICIALS MUST MAKE TELECOM INFRASTRUCTURE A PRIORITY

More important than anything else, Mayor Bloomberg and Governor Pataki need to recognize two things: telecommunications and technology will be critical to the city's future economic growth, and telecom providers aren't doing enough to address many businesses' technology infrastructure needs. Despite obvious challenges ahead, city and state officials must make it a priority to ensure that all five boroughs have a better, more modern telecommunications infrastructure and the widest possible deployment of broadband.

EDUCATE BUSINESSES ON HOW WIRELESS CAN FILL A GAP

Policymakers in New York would be wise to embrace wireless technologies that have the potential to serve as a much less expensive option for delivering reliable broadband service to underserved areas. Key city agencies like DoITT, SBS and EDC should work with telecom companies, business leaders, Chambers of Commerce, LDCs, the state Public Service Commission and non-profits like NYCWireless to develop an action plan for rolling out wireless broadband service to businesses across the five boroughs. Wireless Internet service is likely to spread on its own, based on a growing market for this product, but city and state officials should attempt to ensure broad coverage throughout the city by establishing a workable mix of regulations and incentives, and by encouraging the use of city-owned resources like lampposts and rooftops of municipal buildings.

OFFER INCENTIVES TO BRING BROADBAND TO UNDERSERVED AREAS

City officials should create a package of financial

incentives designed to encourage the wiring of commercial buildings in underserved areas throughout the five boroughs. The incentive program could easily expand upon previous initiatives, like the successful Plug'n'Go program. However, it's important that in addition to merely creating sweeteners for building owners, the program include incentives that make it easier for broadband providers to justify infrastructure investments to small commercial facilities.

SUPPORT THE DEVELOPMENT OF MULTI-TENANT CLUSTER BUILDINGS

Cluster buildings allow several small businesses working out of the same building to share resources, from a boardroom and photocopier to loading docks and a receptionist. In today's digital world, cluster buildings may also be a good way for small businesses to share the cost of a T1 line, the expensive-but-reliable form of broadband that few small firms can afford on their own.

In the past, the city has supported the development of cluster buildings like the Greenpoint Manufacturing and Design Center and the non-profit center at 120 Wall Street. Today, the city should work with developers and industry leaders to spur the creation of new cluster buildings throughout the five boroughs. Moreover, the city should push for measures that require all new and existing cluster buildings to be wired with fiber optic cables.

WORK CLOSELY WITH INDUSTRY ASSOCIATIONS, CHAMBERS OF COMMERCE, BIDS AND LDCS IN EDUCATING BUSINESSES

One of the most important things city officials can do is to educate small business owners about how broadband can help them realize new opportunities and become significantly more efficient. Since many firms are suspicious of government efforts to tell them what to do, policymakers in New York might have the most success by working with industry associations, Chambers of Commerce, local development corporations, business improvement districts and other business intermediaries to get the message out. These organizations can play an important role because few small business executives have the time to educate themselves about broadband and, unlike government,

these organizations usually have the trust of member firms. City and state officials should work with them to insert technology initiatives into their agenda.

These intermediary organizations should begin by disseminating basic information to their member firms about the different types of broadband service available and how much it costs. But, beyond that, there are a number of ways they can demonstrate the value of having a high-speed Internet connection. For instance, they can use their newsletters to publicize how local businesses are taking advantage of the Internet and promote opportunities for firms to use the Web to access government services and apply for contracts, incentive programs and licenses.

MAKE IT EASIER FOR BUSINESSES TO ACCESS CITY SERVICES ONLINE

The Bloomberg administration should seek changes through various city agencies to enable businesses to apply for all licenses and contracts, pay fines and receive city services online. The Department of Small Business Services has already made great strides in making this possible, but other city agencies still have a long way to go.

AGGREGATE CITY TELECOM SPENDING

New York should take a cue from other cities and municipalities around the nation and develop a plan to aggregate the telecom spending of all city agencies. When combined, the city's annual telecom expenditures total more than \$130 million, making the city the largest municipal telecom purchaser in the U.S. But under the current fractured system, city agencies do not coordinate their telecom spending, resulting in duplicative—and less cost-effective—strategies for securing telecom services. If aggregated, the city's massive purchasing power could serve as a major bargaining chip in negotiating improvements in telecom service for businesses and residents throughout the five boroughs.

GIVE CITIES AUTHORITY TO WRITE UNIVERSAL SERVICE REQUIREMENT INTO FRANCHISE AGREEMENTS

Federal officials should revisit the 1996 Telecommunications Act and cede authority to local governments on the issue of requiring some form of universal service. After all, local governments—not the FCC—are in the best position to know whether telecom companies are, in fact, making fiber widely available. And only cities are in a position to under-

stand the economic consequences of having a limited fiber rollout. Mayor Bloomberg and officials from the National League of Cities should aggressively push for these changes.

HOLD VERIZON TO THEIR COMMITMENT TO UPGRADE THE LOCAL TELEPHONE INFRASTRUCTURE

Verizon has long argued that it would be free to make a significant investment in upgrading their telecom infrastructure if they could charge competitors a fair price for the use of their facilities. Now that a series of court decisions and FCC rulings appear to be giving Verizon what it wanted, federal and state regulators should hold the company accountable to its assurances. The New York State Public Service Commission and the FCC should immediately make it clear to Verizon that the company must fulfill its pledge to make needed improvements to the local telecom infrastructure.

BUILDING OWNERS NEED TO PLAY A ROLE

More commercial property owners around the city—especially those outside of the city's largest office districts—should realize that offering multiple telecom options is increasingly crucial to attracting tenants in today's digital age. They must make it as easy as possible for several broadband providers to offer service to firms in their building, and when possible, offer pre-wired space to prospective tenants. Real estate industry associations, LDCs and BIDs can help educate property owners by holding seminars for local property owners.

MARKET AVAILABLE BROADBAND SERVICE MORE AGGRESSIVELY TO SMALL FIRMS

Even now, many small businesses around the five boroughs do not sign up for a high-speed Internet connection because they do not know service is available or that there are new options that have recently become open to them. Other firms simply can't figure out what type of service and what amount of bandwidth they need. They need someone to walk them through their options—and, considering that they stand to gain the most by doing so, that someone should be the telecom providers themselves. The bottom line is that there is ample room for broadband providers to more aggressively market this product to the small business market. As a representative from one of the city's broadband carriers conceded in an interview this summer: "Up until three months ago, we didn't have a sales force in the boroughs [outside of Manhattan]. Now we realize it's an area with vast potential." ♦

CREDITS

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