

Get Wired or Get Left Behind

Telecommunications planning is the key to economic health.

By Kathleen McMahon, AICP, and Andrew Cohill

The Terabyte Triangle in Spokane, Washington, sounds like a hot new high-tech company. But in fact the triangle is a district that merges technology with downtown redevelopment to promote smart growth.



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fficials in Spokane realize the city can only stay competitive with other communities by investing in telecommunications. Spokane isn't alone. From Virginia to Idaho, places large and small are making telecommunications a focus of their infrastructure planning.

Photos this spread courtesy the Avista Corporation

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Delivering the goods

In the 20th century, the key to economic development and community development was manufactured goods. All were rooted in physical places. The Internet has created a different economy, in which goods and services have no weight, and are not tied to a particular place. Today telecommunications has become essential public infrastructure in the same way that roads are essential public infrastructure. Both are transport systems that help deliver a wide variety of public and private services.

Communities without good roads were not viable in the manufacturing economy. Likewise, communities without an affordable broadband transport system are going to struggle as the knowledge economy matures.

Think ahead. Our communities need a robust telecommunications infrastructure so that when voice, television, radio, and other information media move to a broadband and Internet-based transport system, our residents and businesses will have what they need to compete in the global economy.

There is an emerging consensus that the target capacity for a robust broadband network is 25 to 40 megabits per second for homes and small businesses, with a three times burst capacity to handle surges in traffic (like downloading a video or conducting a business videoconference). Is your community anywhere near that now?

It's in the public interest

Often public officials view telecommunications as a set of unrelated issues such as cable franchises, right-of-way permits, or cell tower regulations. But some communities now recognize that this increasingly important infrastructure can promote economic development and smart growth principles. If you aren't on board yet, here is a brief summary of activities in other nations:

- Ireland. The national government is installing 30,000 miles of fiber rings around 123 towns and cities (virtually the entire country).
- England. London's Westminster district government is installing a WiFi (wireless Internet) "blanket" throughout the entire community.
- Japan. Two-thirds of Japanese homes have access to fiber, and fiber Internet access costs

At far left, Steamplant Square, in the Terabyte Triangle in Spokane, Washington. Left, the entry to Steamplant Square, an historic structure that has been renovated to offices connected to a high-speed data center.

Regional project sets a new standard

The Lenowisco planning district in southwest Virginia (encompassing Lee, Wise, and Scott counties, and the city of Norton) is getting national attention for the innovative duct and fiber backbone it is installing as part of a water system upgrade.

When a major water line connecting the communities of Big Stone Gap and Duffield, Virginia, was funded, Skip Skinner, president of Lenowisco, saw the opportunity to place telecom duct alongside the water line. Lenowisco has set a goal of getting high-capacity broadband to every home and business in the next 10 years, and this project fit well with that goal.

After some research, Lenowisco decided to use a microduct product from the Emtelle Company. The Emtelle fibreflow® duct is about an inch and a quarter in diameter, but has 24 small tubes inside. Each tube can carry a bundle of four, eight, or 12 fibers. The duct is easy to install using conventional techniques, but the real advantage to Lenowisco was the ability to blow fiber into the individual small tubes on an as-needed basis as customers for fiber connections signed up for the service.

For more information: Lenowisco Planning District (www.lenowisco.org) and Emtelle Corporation (www.emtelle.com).

Emtelle's ultra-lightweight fibreflow® being blown into their microducts. Below, the microducts.



about \$50 a month per household.

- Korea. The national government has begun a fiber-to-the-home (FTTH) initiative in select communities to provide 155 megabit fiber service to every home and business.

How does your community and region compare to the rest of the world?

Bandwidth and amenities

At one time, companies made location decisions based on access to transportation routes. But in a service economy, information technology becomes the primary means to transport digital products. Quality-of-life issues and broadband are becoming two driving forces in business relocation decisions. Communities with adequate, affordable bandwidth can more easily attract companies that want to relocate in order to offer their employees a better quality of life (and lower cost of living).

“We need to create a place where people who want to use that technology want to be,” says Phil Kushlan of the Capitol City Development Corporation in Boise, Idaho. In 1994, Boise’s Smart City Initiative started off as a 260-acre urban renewal project that would provide connectivity to high-tech businesses. As the planning for the project progressed, says Kuslan, local officials realized that urban design and amenities had to be inherent in the development.

In 2002, the Smart City steering committee issued a report with recommendations for continued development of the area. Among the urban design strategies suggested are these:

- Fix the zoning codes to encourage a true mix of uses.
- Create policies and incentives for rehabilitation of historic buildings.
- Choose designs that promote a sense of place, are human in scale, and are pedestrian friendly.
- Provide a true variety of housing choices.

Telecommunications investment can also advance redevelopment in center cities. Downtowns that have fared poorly against outlying



Top, the Boise district map; above, the linked Central District map, where further mouse clicks on the yellow circles will bring up photos of individual projects, such as those opposite.



Photo by Sean Oliver/CDC

Diners in a Boise cafe located in an area that connects central downtown to the Grove, the cultural epicenter of downtown. Left, Boise's Idanha Hotel, rehabbed for retail and apartments.



big box retailers and malls now have a competitive advantage because they are centrally located. Telephone companies' switching offices, historically located in central business districts, offer easy access to high-speed fiber routes. Co-location facilities (places to locate network equipment and servers) and Internet-ready offices can become the cornerstones and anchor tenants of redevelopment projects.

Kim Pearman-Gillman, Economic Development Advisor to the city of Spokane, says, "We are clearly linking historic preservation and technology. The Steam Plant Square is a historic structure in the Teragyte Triangle. The building, which won an award from the National Trust for Historic Preservation, has been renovated to offices with a high-speed data center. Other buildings in the Triangle are being marketed to take advantage of the fiber infrastructure already downtown."

Telecommunications also affects the built environment because it enables more and more people to work at home. In fact, the 2000 census counted four million work-at-home business people. The work-at-home phenomenon has grown to such an extent that, for the first time, the 2002 economic census collected data on home businesses.

Home-based small and micro-businesses (a microbusiness is typically a single, self-em-

ployed professional) can support the neighborhood commercial centers that so many communities are trying to encourage. But there is a road block. More and more home-based businesses need affordable broadband Internet access. It goes without saying that this feature should be incorporated into the design of residential developments.

What can cities do?

Contrary to popular belief, towns and cities can use a variety of low-cost and no-cost strategies to greatly accelerate the development of affordable broadband.

For local government, telecommunications infrastructure is as much about land use and zoning as it is about burying fiber cable. In a competitive marketplace (which we've had since the 1996 Federal Telecommunications Deregulation Act), public rights-of-way are or will be in greater demand, and in some places poor right-of-way management is already choking future development.

For the past 75 years, just three utilities have been burying cable in rights-of-way (electric, cable, telephone). Cable laying traditionally was done by employees of the company who lived and worked in the community. In many cases, a relatively small number of employees from these utility companies, who knew each other well, informally managed the public right-of-way, and local governments had little to do.

As more companies enter the telecommunications marketplace, some communities are adopting a first come-first serve approach to right-of-way management, granting easements as they are requested, without the guidance of a master plan or any understanding of the capacity of the rights-of-way. Rights-of-way are narrow, and the capacity can be used quickly. Many communities do not require the companies to provide complete cable route information, which makes the problem worse. And some communities do not have accurate cable route information in their geographical information system, or do not use a GIS at all.

One of the key roles of government is to manage scarce resources, so it is appropriate for local governments to play a more active role in this area. It is also an economic development issue. If right-of-way is used up before the community has an adequate duct and fiber backbone, it may be more difficult to attract and retain businesses that need broadband (and these days, that is virtually all businesses).

One simple option to begin funding a modest duct and fiber backbone is to reallo-

cate five to 10 percent of street maintenance and repaving funds for duct installation. The work is best done just before repaving anyway, so communities can make duct installation a routine activity of the public works department (have a duct overlay plan in place first).

In new developments, the community could require developers to install a duct and fiber system in new neighborhoods that is then turned over to the community, just as the developer turns over water and sewer infrastructure. Structured cabling could be required in all new residential and commercial construction. These two simple steps add only fractional costs to a building. The community incurs no direct costs, and it has very limited future maintenance costs because the duct and fiber systems can be leased out to private service providers.

Another simple step is to require developers in new neighborhoods to set aside small plots of land (for example, 15 feet by 15 feet) for telecommunications equipment and fiber/duct head ends. One of the biggest problems in rewiring old neighborhoods is the lack of space to put equipment and terminate duct and fiber runs. However, a small plot is needed for every 50 to 200 homes. That is a tiny incremental cost. All new developments should take this step. Even if no telecom infrastructure is installed immediately, at least the neighborhood is ready for a retrofit later.

With the rise in home-based businesses, neighborhoods are becoming the new business districts. Communities that encourage traditional neighborhood design will get a bonus in the form of an increased tax base because the higher densities in TND developments will make it easier for neighborhoods to support service businesses such as coffee shops, quick copy centers, and professional offices. But local zoning must be adapted to allow these new uses.

Downtown revitalization projects need telecommunications planning as well. It is a shame to see a community replace downtown sidewalks without installing revenue-producing telecom duct beneath them. Light poles are often replaced during such projects, and there are now light poles available with integrated mountpoints for WiFi (802.11 wireless broadband) equipment and antennas. Wireless hotspots may bring more foot traffic into downtown areas, and project an image of a "connected" community.

Many communities that do undertake investments in telecommunications infrastructure often discount the importance of local content and services, which are typically coordinated through a community information

system project. Community information systems encourage the development of rich local content and provide services like email and web hosting to local government, civic groups, and nonprofits.

Blacksburg, Virginia, has one of the best known community information system efforts. Both the town government and the local library system pay the Blacksburg Electronic Village (BEV) to host their web sites because it is less expensive than operating an independent site. The library also uses the BEV for electronic mail, and thereby avoids paying for a full-time technical staff person.

It's all in the plan

What should a telecommunications master plan focus on? For starters, such a plan should address technology issues like land use, rights-of-way management, zoning, and economic development. Training and seminars may be needed to help staff people develop a better understanding of the needs and possibilities. Or a consultant who specializes in technology planning and development can assist with the plan.

Some tips for technology master planning include:

Courtesy of Housing Partnership, Louisville



Top: a new home in Louisville, Kentucky, was pre-wired for high speed Internet access during construction. Students and adults in Blacksburg, Virginia, work at computers in the local library, which participates in the Blacksburg Electronic Village (BEV).

- Start now. Technology planning is a critical economic development issue, just as water, sewer, and transportation projects were 40 years ago. The longer this work is put off, the more a community will fall behind other communities that are actively engaged in this area. Some planning, however incomplete, is better than no planning.

- Do not use equipment vendors and service providers as “free” sources of expertise. Equipment vendors are only going to recommend what they sell, regardless of whether or not it meets community needs. Local service providers will often try to encourage projects that give them a competitive advantage over rivals. If you hire a consultant, make sure the firm has no hidden marketing agreements with equipment vendors (some do).

- Avoid too heavy a focus on infrastructure projects. Some communities believe nothing can be done until every home and business is wired. As this article has discussed, a variety of efforts, planned and executed as parallel processes (each with its own timeline), is more likely to create measurable results quickly.

- Don’t depend on grants. Grants are useful to help jump start projects, but too many communities make grant development the

go on to create the critical mass to support small neighborhood service businesses. Traditional neighborhood design, live/work units, and relaxed rules on locating small service businesses in or near neighborhoods can help promote the quality of life that highly paid work-at-home professionals desire.

Places to know about

The Kentucky Housing Corporation (KHC) recognizes the value of designing housing for the future. “We look at Internet access the same as the telephone. It will be one of the basic necessities in the not-so-distance future,” says Kim Lyon, KHC’s director of communications.

In January, the agency adopted a universal design policy that requires wiring for Internet access in all new construction and reconstruction on housing units with more than 50 percent KHC financing. The new requirement results in about a \$50 per unit cost and has been well received by developers of new projects, according to information provided by Lyon.

KHC has also partnered with One Economy, a nonprofit, to develop a web portal that will provide access to information and resources for low-income residents. The rationale is that while housing can help break the cycle of poverty, it has to be coupled with other services. Because the Internet is becoming a more common way to access those services, KHC has decided it is essential to build these services into new housing.

Wiring houses is only a first step. Connecting these houses to high-speed Internet service is still an issue in many areas. Zoomyco, a technology start-up in Glenwood Springs, Colorado, is developing models to address this issue. The firm has created Ethernet technology that can be placed inexpensively in new subdivisions to close the loop between the user and an Internet service provider.

Diane Kruse of Zoomyco explains that the most efficient method is to bury the cable directly in the trench when installing other utilities. Another option is to install empty conduit and pull the cable through at a later date. The firm has worked with engineering firms to develop design standards for this procedure. It plans to work with developers to explore ways to recapture the costs for these improvements. Zoomyco is now partnering with several developers in the Glenwood Springs area.

What we’ve learned

Smaller cities and low-income areas with less demand are being left behind because private providers don’t want to pay the enormous

upfront costs of creating infrastructure in there. Cities must be proactive and make modest investments in telecommunications to attract the needed private investment to finish the job and make the knowledge economy an integral part of economic development and sustainable growth.

Planners can promote this approach by integrating telecommunications planning and standards as part of the vision and codes that they routinely address. Some examples:

- Include a telecommunications component in the comprehensive plan as part of essential infrastructure.

- Fund a professionally developed technology master plan for the community.

- Collaborate regionally with other local governments and authorities to develop the necessary regional infrastructure to connect local projects and reduce costs for all participants.

- Revise subdivision codes to include design standards for structured cable that can be used by residents to deliver broadband access throughout homes.

- Revise zoning codes to provide incentives to develop more traditional neighborhood design, more live/work developments, and less segregation of residential and small commercial use.

- Adopt a telecommunications policy that promotes development of information infrastructure and encompasses right-of-way management, cable franchises, wireless facilities, and new developments.

- Develop community information systems to build content and demand for services.

- Provide workshops and hire speakers to speak with education planners, municipal officials, civic leaders, and economic development officials on telecommunication and information infrastructure benefits.

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Resources

On the web. www.terabytetriangle.com; www.steamplantsquare.com; www.ccdcoise.com.



tail wagging the dog. Begin making modest budget allocations for technology from local sources (economic development funds, local government sources), develop a vision and plan, and only then look for grants that support the vision.

- Revise zoning codes to recognize the growing trend of home-based, professional businesses. These businesses reduce commuting and road congestion, reduce the amount of land needed for commercial office spaces, but