For Smart Growth Network’s National Conversation

Broadband Networks and Network Access Centers: Technology and New Practices for Sustainable Communities

Walter Siembab
Siembab Corporation

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IN 2010, Google issued a national call for communities of all sizes and locations to apply to be the demonstration site of its high speed (gig/sec) Metropolitan Area Network (MAN). In a visionary move, the Los Angeles County Metropolitan Transportation Authority (Metro) and the Department of Water and Power of the City of Los Angeles jointly submitted an application to become the demonstration site of the Google MAN. Why?

The answer involves understanding the potential relationship between broadband networks and sustainable metropolitan form and function. That will lead to the relationship of the Google MAN and the national conversation on new ideas in Smart Growth.

The story begins in the early 1990s. Driven by deregulation of telecommunications markets, private firms were developing wide area broadband fiber networks, primarily to carry large volumes of data at high speeds among data centers and for connections to long distance carriers. These were originally called “by-pass” networks because they avoided the entrenched public switched network.

Metro owned about 80 miles of continuous rights of way in Los Angeles County which were attractive for the purposes of network development. Having discovered that an old asset had new value, Metro contracted with me to develop a strategy for using their ROW for fiber networks. The results was METRO NET Fiber Optics and Metro Rail: Strategies for Deployment, Los Angeles County Transportation Commission (Now the MTA), 1992.

Metro Net envisioned three fiber bundles – one for internal use (for train coordination), one for commercial use (to generate revenue), and one for the public interest. Today that would be characterized as for sustainability and equity.

The heart of the third option was not the raw data transmission capabilities of the fiber network, but the potential to create and connect together public network access centers at each of its rail stations.

One of the limitations of rail systems is that the urban era -- with its dominant downtowns containing 80-90% of all destinations -- is dead. Most regions are now polycentric and mostly dispersed. Destinations are all over, not just in one place.

The idea of public network access centers at rail stations was for Metro to use its public interest fiber network to connect a range of facilities that represent destinations not near the rail to a system of access centers located at rail stations. In this way, destinations remote from the rail network could be made to appear virtually on the rail network. This is a form of transit oriented development (TOD) but without extensive construction. The rail system would become a destination as well as a conveyance.
The Metro Net strategy treated the Metro Rail network as the first phase of what would become a region-wide backbone that would eventually connect over 100 (and eventually thousands of) access centers, initially at Metro Rail stations, then along Metro Link stations (commuter rail system), then into civic centers and regional malls, and finally into neighborhood schools and libraries. The idea was to develop a network access center within walking distance of every home in the region. Each facility would also become a small economic engine in the middle of every neighborhood and village.

The design was well articulated with levels of organization and democratic participation processes. There was a plan for financing operations, although the capital would cost less than ¼ mile of underground rail construction.

The idea presented the opportunity to combine access to public transportation with access to public telecommunications and eventually extend telecommunications access to every neighborhood. The whole package would become a System of Public Transit for the Information Superhighway (published in A Compilation of Best Practices to Implement the Telecommunications Act of 1996, the National Regulatory Research Institute, April, 1999).

But what would a public network access center look like? In the 1994 “Call for Projects,” Metro staff funded a demonstration of a prototype network access center. This project completed in 1997 was developed in about 2,500 square feet in the Martin Luther King Transit Center across from the Compton stop about midpoint along the Metro Blue Line that connects downtown Los Angeles with downtown Long Beach. The project was formally titled the “Blue Line TeleVillage Demonstration Project” (BLTV).

The BLTV had 5 components:

- **Computer center** – 800 square foot room equipped with 12 computers, local area network and Internet access.
- **Video conference center** – 1200 square foot room equipped with a dual monitor video conference system and seating for up to 25 participants.
- **Telework center** – two semi-private work stations equipped with computers, telephones, printer and Internet access.
- **Kiosks** – in the building foyer, there were ATMS from Wells Fargo Bank and from Bank of America plus kiosks from Metro/Caltrans and the City of Los Angeles Housing Authority.
- **Community meeting room** – a large space that could seat up to several hundred.

One of the objectives was to demonstrate the feasibility of importing “destinations” to a low income community. It did that.

This prototype was popular (620 paying members from 91 zip codes but with 52% located in the 3 adjacent zip codes); successful in making distant physical places appear locally (including a library, college campus, bookstore, training center, small business development center, and more); and successful in reducing dependence on auto travel with somewhere between 1/3 and ½ of the visitors accessing the facility through transit or by walking.
This project proved to be a dead-end as development of the prototype stalled once the original design and demonstration phase ended. A subsequent attempt to develop a second facility proved insincere and failed.

The next step was a feasibility study entitled “Using Fiber Networks to Stimulate TOD: Prospects, Barriers and Best Practices” funded by the Mineta Transportation Institute for Surface Transportation Policy Studies (MTI Report 01-16). The research found that a sampling of the TOD community active in California including developers and bankers found that access to a fiber network and to a network access center would provide significant incentives to their intention to build or finance building at rail adjacent facilities.

The next attempt at developing a network access center was the Riverdale e-Village project set in a transit village located a few miles outside of the southern boundary of Chicago adjacent to the Metra Electric Line. The design of the facility was published in April, 2003 as part of a plan for a transit oriented development that would remake the commercial core adjacent to the rail stop. Neither the network access center nor the TOD plan proceeded as designed, largely because of financial limitations.

The Riverdale design described a network access center (aka network station) as a non-profit, shared-use, mixed-function facility. Its functions are programmable rather than fixed like in a school, bank or post office.

Mixed function means that the facility will provide access to a variety of digital technologies and the virtual presence of a variety of functions, such as education, health care, business meetings, small business counseling, vocational training, government services, etc. The mix of functions leads to transportation benefits.

Shared use means that the facility will accommodate different communities of users. They include:

- Service providers outside of the village.
- Local consumers of the imported services.
- Local producers of services and other types of content

Shared-use leads to economic benefits.

Flash forward to the 2010-2011 effort by DWP-Metro to attract the Google demonstration network. The combined resources of the two organizations provided over 300 miles of ROW where literally hundreds of organizations could be seamlessly connected to one another in order to share programs, information and work sites. This proposal captured the essence of the original Metro Net with fingers of the high speed network running everywhere. Network applications included distance education, telemedicine, telework, e-government, e-retailing and just plain community communications.

One distance education example is based on the location adjacent to the Metro Orange Line in the San Fernando Valley of LA Pierce Community College and Los Angeles Valley College – the dominant two-year college options available to residents of the San Fernando Valley. It
seems likely that some form of curriculum sharing or arts synergies could be developed using a high speed network. There are also a number of elementary and middle schools near the stations which offer access of these younger students to higher educational resources in some form and, perhaps as importantly, access by college students and faculty interested in teacher development to public school class rooms.

The proposal to Google contains many other examples. Google eventually selected Kansas City as the site for its demonstration network. The idea has once again become dormant at Metro.

Today, a network access center would include wi-fi access, a low power radio station to broadcast information to the neighborhood, and an electricity generator to provide backup power in case a natural disaster or civic disruption brings down the grid and a face-to-face meeting place connected to the outside world would help summon resources and restore order.

The original Metro Net plan with its access centers connected by a high speed broadband network would support many of the goals of Smart Growth. It would stimulate TOD, contribute to place making, reduce motorized travel, help shorten trips, encourage walking, reduce GHG emissions and criteria pollutants, stimulate local innovation, and support participation in the cyber economy.

My colleague Marlon Boarnet and I submitted another paper to the national conversation. That paper proposes a vision of sustainable suburbs based on neighborhood oriented development, new local modes of zero emission mobility, and new business practices. This paper provides a vision of how to use new telecommunications technologies to implement that strategy for sustainability.

Much more detail is known and can be described. Many reservations such as the impact of the mobile telecommunications revolution should be addressed. This paper simply outlines the basic idea and its potential. I am responding to the SGN’s call for innovation.

Although not a “new” idea, the potential of using broadband networks and network access stations to advance sustainability remains great. Proof of concept has been established but the initiative has so far failed to gain traction. It appears that the idea may have been too far ahead of its time. Perhaps the national conversation will bring that future into the present.