

# Public Works, Public Networks

## *Community-Centric Telecommunications Planning*

By Greta Byrum and Benjamin Lennett

**T**HE MOST comprehensive cross-country public works project of the twenty-first century is not a build-out of roads, tunnels, bridges, train lines, waterfronts or sewer lines. Rather, it's the development of an essential infrastructure that is generally ignored by those who understand public works the best. Planners and communities need to remember that although the internet and wireless networks are thought of as invisible and virtual, they rely on very real physical land uses, social and institutional networks and development processes.

There are two main reasons planners cite for not getting involved in communications infrastructure build-out. First, as discussed at the 2011 American Planning Association Conference at a panel on “Integrating Information and Communications Infrastructure in Planning,” planners feel that they lack the technical knowledge needed for network design. But the process of network planning is not just technical, it is also social—community needs and existing relationships are very much a part of the process.

Second, public agencies are broke. Public works projects that have high sunk costs are more and more

frequently being turned over to private industry, or to public-private partnerships. The process and expense of building a new and massive infrastructure system seems daunting. Planners and city officials concerned with unsafe bridges and overwhelmed sewer systems feel constrained by dwindling resources. Yet an initial investment in communications infrastructure would yield a huge benefit to any community.

Meanwhile, a consequence of the abdication of public responsibility for communications infrastructure is that the private industry entities which are developing it do not have a mandate to serve the public interest. Rather, these entities (especially large publicly traded firms) have a nearly singular interest in maximizing profits for their shareholders, not in maximizing the benefits of connectivity for a community. And this results in the loss of not only the chance for local and community participatory design of networks, but also the opportunity cost of not building capital assets to promote economic development and better city services.

With a primarily market-driven model of infrastructure development, inequities emerge between levels of broadband access available in rich and poor communities. Fiber-optic “backbones” may even run right through communities with fewer resources on the way to wealthier areas, like private highways without on- or off-ramps for local residents. According to a March 2011 report by the Joint Center for Political and Economic Studies on the National Broadband Map, broadband speeds offered in minority communities (particularly those with low incomes) are often significantly lower than those found in higher income areas. Though not exactly equivalent to red-lining, such disparities reinforce societal and economic inequities—the very inequities,



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it was hoped, that broadband and the internet would help to level. In addition, government and community institutions such as libraries, schools and hospitals need access to high-capacity data connections that may not be offered by commercial providers in their communities (especially in low-income areas), or may be prohibitively expensive.

A number of local governments have built their own municipal fiber networks, which now provide connections to meet the needs of institutions and agencies while saving significant amounts of money. Among these, the city of Santa Monica provides a useful model. Santa Monica's municipal network build-out started in 2006, when Chief Information Officer Jory Wolf realized that the city's twelve departments and sixty-six divisions were paying incumbent service provider Verizon upwards of \$1.3 million per year. Since Verizon had a chokehold on DSL service, and cable companies were not offering internet service in the area, the city could not simply turn to a different service provider.

Rather than accepting the limitations imposed by Verizon's monopoly on the local market, Wolf



Mobile telecommunications tower.

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decided to study the city's resources and think creatively. He found that if the city pooled its IT resources with the school district and the local college, together they would have \$1.4 million to invest in lighting and expanding the dark fiber (passive network infrastructure that allows users to connect their own network equipment) that Adelphia Cable had already installed in much of the city. As a result, the city renegotiated its franchise agreement with Adelphia, and within a few years it had a revenue-producing capital asset and had laid the groundwork for inviting new investment to the city as well as for building smart infrastructure systems.

Since the initial investment, the city has continually expanded the network, installing conduits and fiber whenever road construction or other infrastructure improvements are made. As the number of internet providers in the area has increased from one (Verizon) to 200, new media and entertainment companies have moved to the area, drawn by reduced telecom costs and the developing density of businesses and activity. The city not only has one less annual bill for \$1.3 million, it now has yearly revenues of \$300,000 from its business customers. In addition, the city can leverage the network to improve city services and smart infrastructure planning. The fiber network enables wireless municipal systems, including smart parking meters and traffic signaling (which could allow for signal prioritization of BRT and other mass transit), smart grids and Wi-Fi in parks and other public spaces. Wolf says: "There's nothing unique about

Santa Monica. Any municipality can do this." That may be more or less true—not every city has dark fiber waiting for its community network—but many municipalities do have the capacity to pool their IT resources to invest in communications infrastructure as a capital asset, even in these uncertain financial times.

### **Community-Centric Network Planning**

The success of Santa Monica's network planning underscores the need for local communities and planners to view communications networks as basic public infrastructure. This will allow them to focus on leveraging digital technologies to benefit their local communities, not just by providing access to the internet, but by strengthening community ties and local economic development. Indeed, many of the local services and applications that Santa Monica is leveraging are discouraged by commercial networks, which are designed with the primary purpose of delivering media and information from the internet and outside content-providers to users.

By contrast, many community-owned networks have taken a different approach, focusing not only on connecting their residents, businesses and institutions to the internet, but also on connecting them to each other. A fiber network built and operated by a local, publicly owned utility in Lafayette, Louisiana, provides connections as fast as 100 Mbps to the internet, yet also allows all users to send and receive data with other users on the network at speeds of 1 Gbps (ten times faster).

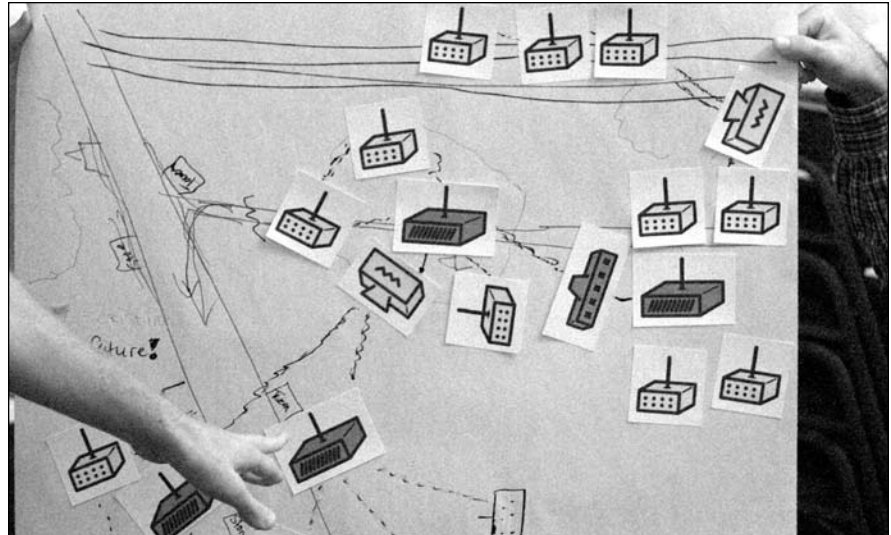
In a similar fashion, our organization, the Open Technology Initiative (OTI), is also developing low-cost wireless technologies and network models to encourage local communications in order to strengthen community ties. For example, our work with wireless multi-hop mesh networking allows local communities to build area networks that integrate off-the-shelf Wi-Fi routers, Wi-Fi-enabled computers and other personal devices (like smartphones). In this way, a neighborhood can work together to build a neighborhood or metro-scale peer-to-peer sharing network, where community members do not just "get connected," but rather each user and his or her device serves as part of the infrastructure itself.

Our method of deployment and build-out is driven by a process of collaboration with community members, including residents, community institutions and local businesses. Work is already underway on building such a network in Detroit, where OTI is working with the Detroit Digital Justice Coalition and residents of the city's 48127 zip code. That network started taking shape when organizers linked up with a community resident—a retired teacher who had long been running an informal lending library from her living room—who came to understand and support the new community internet project as another kind of local resource-sharing. Networks designed to meet local community needs are richer, more sustainable and more suited to their environments the more that residents and stakeholders are involved in planning them.

## Protecting the Role of Local Planners and Citizens in Communications Infrastructure

Rather than encourage community participation and planning, a number of policies both at the state and federal level are making it more difficult for communities to build their own networks, or even to require public approval or input. Most recently, North Carolina passed an anti-municipal broadband bill, adding to a total of nineteen states that have blocked or put up significant barriers to the ability of local communities to build high-speed broadband networks, even in cases when commercial carriers are unwilling to serve the community.

In April of this year, the Federal Communication Commission—despite calling for an end to state bans on community networks in its National Broadband Plan—announced its intention to review right-of-way regulations and processes, including proposals to preempt local regulations or require that they be standardized at the federal level. For these purposes, *right-of-way* refers to easements or spot developments in parks, transportation corridors or other public lands for the installation of infrastructure such as electrical cable and telephone wiring—and increasingly, fiber optics for the provision of broadband. Currently, municipalities control use and development of rights-of-way through permitting processes, zoning ordinances and environmental impact review processes, all tools of participatory local governance designed to ensure



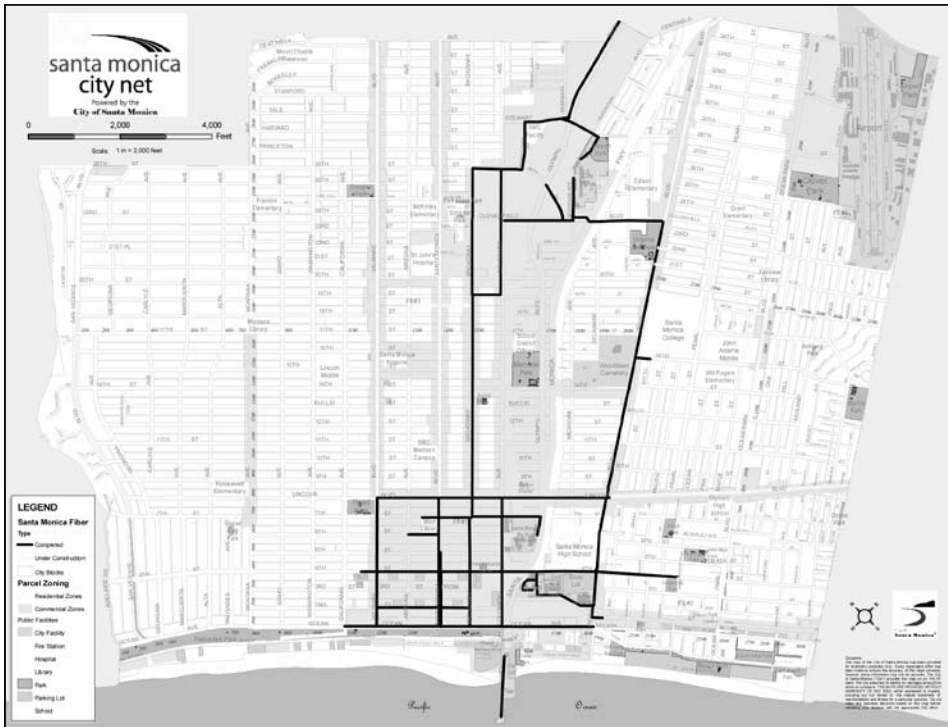
Workshop participants tell a story about the development of a community network at the 2011 Allied Media Conference in Detroit.

land is used wisely and sustainably.

Those who support federal oversight—for the most part, large communications companies—argue that it would ease difficulties and reduce expenses experienced by broadband providers in their efforts to build out and expand service to underserved areas. But there have been no empirical studies presented thus far that demonstrate any strong correlation between a locality or state's right-of-way regulatory practices and levels of broadband deployment. Beyond this lack of evidence, local right-of-way practices have developed over time in response to the particular needs of each community. Local governments have a mandate to protect the health, safety and well-being of citizens—a mandate that may necessarily at times conflict with build-out processes designed for maximum convenience and expediency at minimum cost. Commercial developers whose decisions are guided by those same principles are subject to local or-

dinances and land use regulations precisely *because* convenience and expediency may compromise safety or well-being, or may conflict with measures taken by communities to guide responsible development.

Furthermore, since many rights-of-way cut through transit corridors such as roads and highways, these must be ripped up and re-laid for utility installation. If the installation of broadband infrastructure is planned, scheduled and sited separately from that of other utility systems, there is not only greater likelihood of damage to existing systems, but also hassles with detours, traffic management and other problems which, in the end, must be managed by (and at the expense of) local municipalities. Finally, not only would the preemption of local zoning and land use regulations be unwarranted, it actually represents an abuse of the participatory process that underlies local decision-making. Local taxpayers own rights-of-way and should have a say



Santa Monica network maps. Reproduced with permission from the City of Santa Monica.

as to what happens in them. Federal regulation of local rights-of-way would amount to a subsidy for an industry that, unlike cash-strapped municipal governments, is showing sizable profits. Accountability to local communities can't be scaled up efficiently and tends to get forgotten on the national stage.

### Information Networks are Public Infrastructure

The role of local planners and communities in determining where, what and how networks get built cannot be limited or circumscribed, especially as the importance of data communications and the internet increase. Local communities and planners need to take charge of their communication futures, and to stop worrying that a lack of technical knowledge is prohibitive for designing community-based networks. As with any other systems design, technocratic processes function sustainably only when informed by the local knowledge and input of stakeholders.

Decisions about public infrastructure are essentially decisions about the equitable allocation of resources. It is time to add network design and build-out into planning school curricula and into any master planning process—and to consider the repercussions of private build-out and control of networks. As all infrastructure, including transportation and other public utilities, gets smarter and relies more on data and communications for efficient service provision, the more unwise it becomes to abdicate public oversight of these networks.