The Philadelphia Story

Learning from a Municipal Wireless Pioneer

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NEW AMERICA FOUNDATION

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NEW AMERICA
FOUNDATION
Washington, DC

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Executive Summary

The Philadelphia story told here is an analysis of one city's efforts to build a municipal wireless network. This report examines how Philadelphia's municipal wireless initiative helped shape the national debate regarding the need for public broadband infrastructure and the impact the project's successes and failures had on the local community. The Philadelphia story holds numerous lessons for decision-makers and regulators and is a powerful tool for understanding the interactions between network implementers and the constituencies these networks are supposed to serve.

The Philadelphia case study is presented in chronological order, with recommendations for how to improve community engagement highlighted throughout.

Context

Cities are under pressure to address the "digital divide" in their communities—that is, the gap between those who have Internet access and those who do not—an urgent problem that the federal government and most state governments have not addressed. The notion of "spending no tax dollars" in dealing with this problem was a driving principle behind the Philadelphia wireless initiative and shaped many of the project's outcomes. Philadelphia was a pioneer among large cities in using wireless technology to promote broadband adoption, and its actions have influenced how cities and towns design and pursue their municipal broadband projects.

Key Decision-Makers and Decisions

- Philadelphia's chief information officer, Dianah Neff, initiated the project.
- An executive committee, set up by the mayor's office and tasked to study Philadelphia's options for building a municipal wireless network, assessed the City's situation and solicited input from a wide range of stakeholders. The committee recommended nonprofit ownership of the network as a preferred business model.
- Wireless Philadelphia (WP), the nonprofit formed to own the network, disregarded the executive committee's recommendation by accepting EarthLink's bid to own and operate the network.
- Having given up ownership of the proposed network, WP was in the conflicting position of having to both

promote EarthLink's services and hold the service provider accountable.
- In addition to its marketing and oversight roles, Wireless Philadelphia focused on the project's public interest "digital inclusion" goals. However, WP has no capacity to provide direct services to its constituents, and operating expenses and debt service have eaten up its share of revenues. WP's current strategy to address digital inclusion has been to raise additional funding and establish one-to-one partnerships with nonprofit service providers to fulfill its original mandate.

Outcomes

- Wireless Philadelphia disregarded the recommendations that grew out of the public process and that supported nonprofit ownership of their wireless network. Instead, WP yielded to political pressure when it accepted EarthLink's bid to own and operate the network.
- WP has underperformed because it de-prioritized public input and constituent interests.
- WP would have been more effective if it had assumed ownership of the network.
- In the absence of substantial public control over the decision-making process, arguments in favor of public ownership of municipal and/or nonprofit networks may be disregarded in favor of a "free lunch" corporate ownership model.

Policy Recommendations

For city officials and decision-makers:
- Involve all stakeholders.
- Sustain open participation.
- Promote horizontal relationships among stakeholders.
- Be open with information.
- Go offline.
- Leverage existing assets.
- Seriously consider the benefits of public/nonprofit ownership and open access business models.
- Treat connectivity and digital inclusion as basic public rights.

For community members and local organizers:
- Organize a coalition.
- Get to know the key players and decision-makers.
- Be the media and report on the process.
- Do your own research and disseminate it within your community.
- Start a community wireless project.
- Remain actively involved in all steps of the process.

Introduction

Increasingly, local governments are making decisions that will shape the way we communicate with each other for generations to come. With no national broadband strategy,[1] the United States, which is building its 21st century communications infrastructure slowly and haphazardly, ranked 15th among members of the Organization for Economic Co-operation and Development (OECD) in per capita broadband usage in 2006 and 2007.[2] Prices are far higher and connection speeds far slower in the United States than in many OECD nations.[3] From city to city and neighborhood to neighborhood, we see widely varying levels of access to modern communications technology.

Facing up to this market failure—and recognizing the economic and social potential of a ubiquitous, affordable broadband network—local governments are embracing initiatives aimed at blanketing towns, cities, multi-county regions, and even entire states with wireless broadband networks operating on open, unlicensed frequencies. The communities that meet this challenge—ensuring their local broadband networks serve the public interest—will be able to dramatically narrow the digital divide and boost their local economies.

New wireless technologies (which, combined with wireline technologies, make it cheaper and faster to build wide-area broadband networks) and government participation in the development of new broadband infrastructure make it possible to end the problem of unequal broadband access. However, inadequate planning on the part of governments, and over-reliance on the unverified claims of companies attempting to run municipal networks, can lead to the failure of these initiatives. That is what happened in Philadelphia, which chose to allow a private corporation to build new wireless infrastructure in a manner that supported, rather than challenged, existing inefficient systems.

Anyone wishing to address the inequities and other shortcomings of our digital communications infrastructure would do well to acquire a thorough understanding of the decision-

making involved in the building and running of a municipal network. This report, which is aimed at experts and wireless broadband activists alike, uses Philadelphia as a case study to explain the general process. Community activists wishing to influence the decision-making process will find the "intervention" sidebars that appear throughout this report particularly useful. This report can serve as a basic guide to how any city might develop its own network. It will be of particular use to those interested in the pros and cons of the public-private partnership business model.

Philadelphia hoped to use wireless technology to increase broadband access. The network was to offer connection speeds comparable to digital subscriber line (DSL) at the price of dial-up, and it was hoped that the near-ubiquitous coverage would stimulate economic development. The city initially intended to create a nonprofit entity, Wireless Philadelphia, which would have owned the network and leased wholesale access to competing private Internet service providers (ISPs). Instead, Philadelphia took a different, politically expedient path. It turned over the ownership, control, and future revenues of the network to a single private company. Once it gave up the idea of public ownership, Philadelphia lost its ability to maximize the network's benefits for all of the city's residents. Other cities appear to have learned from Philadelphia's mistakes. Boston, for example, has embraced nonprofit ownership and a wholesale access model similar in key respects to what Philadelphia had originally envisioned. (See appendix A for profiles of cities that have taken approaches different from Philadelphia's.)

In entering this new realm of business, technology, and policy, Philadelphia was a leader among cities seeking to extend Internet access to all of their residents using new wireless technology. An understanding of how the deployment process worked in Philadelphia can provide valuable lessons to other communities.

Keys to Successful Municipal Wireless Network Deployment

The relatively low cost of constructing a wireless network is inspiring municipal governments to consider building broadband infrastructure in order to increase the availability of affordable Internet access, as well as to enhance government efficiency and public safety. When Philadelphia first took action in 2004, private companies—from equipment vendors to network operators to ISPs—were eager to partner with local governments in municipal wireless projects. Since then, however, these companies have grown more circumspect as the costs of build-out have climbed and profits have decreased. With city residents more and more eager to get online and to reduce their telecommunications costs, and with private corporations no longer offering a quick fix, the pressure for municipalities to formulate a comprehensive broadband plan has increased. If cities are to create successful systems, they need to solicit input from diverse constituencies and assess local assets in order to come up with a viable business model that best furthers community goals.

The stakes are high. Communications infrastructure underpins our democracy and our economy. Developing successful networks can have profound positive effects on education, employment, health and safety, and government responsiveness. With forethought, communities can use broadband development to pursue a wide range of public interests.

Digital Inclusion – By making broadband service universally available and more affordable, municipal and community wireless broadband networks can bridge the digital divide and bring the economic, educational, and cultural advantages of Internet access to everyone. However, providing affordable broadband on its own is not enough to bridge the digital divide. At a minimum, individuals also need access to computers, as well as the skills and motivation to use them. Municipal

broadband projects should include funding for digital inclusion initiatives to fulfill these needs.

Network Ownership – The deployment of a new broadband infrastructure is an opportunity for cities to assess the private network ownership model, which is often a duopoly of the telephone and cable companies. However, choosing an alternative is complicated. Cities must weigh the benefits and costs of public investment and grapple with competing political pressures. Although there is ample evidence that broadband connectivity serves the public good (in much the same way as street lights and local roads do), expanding public infrastructure also attracts ardent opposition from incumbent telecommunications providers. Even within the category of public ownership, there exist many variations. A city can offer service as a single utility or it can operate an open access network, with competition at the retail level. The question of ownership is critical and underlies many of the other issues, including the cost and availability of service, customer satisfaction, and funding for digital inclusion.

Community Benefit Obligations – In cities that choose to allow a private company to own the community's wireless broadband network, public officials must insist that the private owners meet concrete and enforceable public interest obligations. While different communities have different needs, all should be concerned with network buildout, service guarantees, pricing, nondiscriminatory open access to competing retail service providers, and funding for digital inclusion programs. As with cable television providers, which often have exclusive franchise rights to operate in their communities, the public interest obligations of private providers must be vigorously enforced. Wireless networks, insofar as they compete with the dominant cable/DSL wireline broadband duopoly and licensed cellular operators, can dramatically lower service pricing and spur cable and telecom incumbents to upgrade their networks and provide enhanced services.

Free and Open Communication (Network Neutrality) – In recent years, regulatory agencies and the courts have allowed incumbent telephone and cable companies that own the network infrastructure to exert greater control over the content and applications that users are able to access over their broadband connections. These regulatory changes have allowed private broadband network operators to engage in discriminatory conduct by, among other things, blocking certain websites, charging content providers for faster access to consumers, and degrading or blocking services they dislike. This threatens the concept of the "level playing field" that has made the Internet a hotbed of innovation and open communication. Public interest and consumer activists are fighting to protect "network neutrality"[4] through state and federal legislation. By providing an alternative communications infrastructure to that owned by the incumbent telephone and cable companies, municipal wireless networks can include protections that ensure network neutrality. When a municipality allows a private company to own its wireless broadband infrastructure, the public interest will be served only if the private carrier is required to remain neutral and allow consumers to access the content and applications of their choosing. Thus, the municipal network will both create a more competitive market and help ensure that the large incumbent providers of wireline broadband services remain neutral as well.

Economic Development and Competitiveness – Businesses large and small need broadband access to operate efficiently. Affordable wireless broadband access can help attract businesses to a region—or prevent them from leaving. Even in large urban areas, such as New York City, thousands of companies lack access to the cable or DSL broadband access that is widely available in resi-

dential neighborhoods.[5] Public wireless access can also attract customers to retail and downtown areas, spurring economic activity.

Pervasive Connectivity, Mobility, and Privacy – Wireless broadband should not only be seen as a competitive substitute for wired broadband. Ubiquitous wireless broadband connectivity can enable the growth of the Internet so as to permit greater mobility and innovative (location-based) applications and business services. For example, wireless broadband networks might enable a community to provide a tourist walking down a street with a localized historic and cultural information, or a resident with information about where to find a specific municipal service. The downside is that wireless broadband can also lead to the invasion of privacy if consumers are unaware or not in control of how location information is used and who has access to it. This could mean being subjected to unsolicited and intrusive location-based advertising, or it could mean others being able to monitor your movement. Community activists must be alert to such potential problems.

Government Services – Pervasive wireless broadband connectivity allows governments to implement a wealth of efficiency-enhancing applications. From automating utility meter reading to equipping building inspectors with wireless handheld devices so they can file reports from the field, the ubiquitous connectivity of wireless broadband networks enable governments to operate more efficiently and cost-effectively. Governments can also be more responsive to citizens by implementing more "e-government" services—everything from providing online forms for voter registration, parking, and building permits, to live chats with officials and two-way video conferencing for constituents who are unable to attend city council meetings. And by providing greater public access to the Internet and undertaking robust digital inclusion efforts, governments can assure that underserved communities are able to take advantage of these services.

Public Safety – A growing number of public safety agencies across the country are utilizing municipal wireless infrastructure operating on unlicensed spectrum (e.g., Wi-Fi and WiMAX) for public safety communications applications. Even where new wireless networks are not specifically designed for this purpose, the mere existence of a redundant, pervasive communications network can be invaluable in emergency situations.[6]

Transparency – Successful broadband projects make network and operational data available to their users. Network usage figures, speeds, user demographics, penetration rates, progress reports, and the like should all be easily accessible. Regular assessments help community members understand the successes and setbacks that a project may face and will greatly aid network implementers in handling community expectations and to set realistic benchmarks.

Families, educators, entrepreneurs, workers, and activists who now live outside the borders of the digital world have much to gain in the deployment of new municipal broadband infrastructure. Will the technologies being deployed today reach them? How will the online world from which they have been excluded change with their participation? What is the future of the Internet and its usefulness for human communication? The decisions we make regarding wireless deployment will determine the answers to these questions.

As we have seen with telephone communications and cable television, early construction and regulation patterns often determine how technologies are applied and develop over time. We are at such a critical juncture with respect to municipal wireless. It is therefore essential for us to understand how the potential benefits of these new technologies may be maximized.

Welcome to Philadelphia

The Philadelphia model of a privately funded, privately owned system became the starting point for the wireless considerations of numerous other major cities. The Philadelphia model was appealing to local politicians because it has been sold as requiring no tax dollars to implement. It also reinforced the political precedent of allowing monopoly cable television franchises with very limited public interest obligations. This model was also more palatable to the incumbent wired broadband duopoly (namely Comcast and Verizon) since it proposed wireless as a supplement to—and not a substitute for—residential DSL and cable Internet service. However, there are many other possible models to consider (as the towns and cities described in appendix A demonstrate), and decision-makers would be wise not to blindly follow in Philadelphia's footsteps. In fact, Philadelphia pursued its private franchise model in contravention of its own task force's recommendations. Based on its careful investigation and extensive public input, the Wireless Philadelphia Executive Committee had recommended a nonprofit ownership model.

The Philadelphia project began in the mayor's office and in the office of his chief information officer and quickly grew to include a large executive committee. This committee spent months studying the state of broadband access in Philadelphia, weighing possible business models, and gathering input from city residents about what they wanted and needed from a wireless network before recommending the formation of a new nonprofit entity as owner of the network to guide the development process. After raising funds to pay for the construction of the citywide wireless network, this nonprofit was to lease wholesale access to the network, in a nondiscriminatory manner, to private ISPs. It would then use revenue generated from these leases to pay for free or low-cost services and equipment for low-income households in the city.

Wireless Philadelphia (WP), the nonprofit the city set up in response to the committee's recommendation, put out a request for bids from companies to build the network. However, after reviewing the bids, WP abandoned the original concept and accepted a bid from EarthLink to pay for, build, own, and operate the network. Instead of a nonprofit owner leasing access to many companies, a single private corporation would own and operate the network, sharing a portion of its revenues with the nonprofit.

The EarthLink proposal came as a surprise to the people of Philadelphia and to others around the country and greatly shifted the terms of the national discussion of municipal wireless. Up to that point—and as the Philadelphia proposal originally outlined—it was assumed that a bond offering, private donations, or funding from the municipality would be required to pay for new construction. Afterward, cities elsewhere began to look to private companies to cover the costs of their proposed networks.[7]

In Philadelphia, the EarthLink proposal was popular among local politicians who were hesitant to allocate any public money to the venture. It was also more palatable to conservative critics and to corporations like Verizon and Comcast who did not think a local government should compete with them to provide broadband access. Verizon had led a successful effort in the Pennsylvania state legislature in November 2004 to restrict municipal broadband projects. While Philadelphia negotiated an exemption for its plan, which was in development at the time, the city came under increasing pressure to limit its direct involvement. Thus, city officials began to look favorably on the EarthLink option.

In sacrificing ownership and control of the network, however, Wireless Philadelphia unilaterally tossed out months of collaborative work with local stakeholders to determine the best solution for the city and handed the bulk of future revenue from the network over to EarthLink. Without retaining ownership of the network, Wireless Philadelphia lost its ability to maximize the network's benefits to

the local community[8] and became dependent on EarthLink instead of the other way around.

About This Report

This report is meant for experts and activists alike. If you are someone who has decided to become engaged in your city's wireless network development process, it will help you become an effective advocate for the public interest. And just as the Philadelphia experience has informed other efforts, the results of your efforts can have an impact far beyond your locality. As you read this report and come to understand the circumstances and decision-making that led to Philadelphia's current state of affairs, you should be able to start imagining how you can influence the development of a wireless network in your own city. For those of you who live in municipalities that have already deployed wireless networks, this report will be a useful resource on how to improve available services and increase the benefits to local residents.

Potential users and community advocates would do well to remember that those who know the players and the stakes early in the development process will be better situated than those who are uninformed about municipal bureaucracy, industry procedures, and the key players to affect the outcome. The Philadelphia experience is a powerful cautionary tale with respect to public awareness and active involvement in municipal wireless decision-making.

Philadelphia: A Case Study

The idea of building a citywide wireless network in Philadelphia came from the Office of the Chief Information Officer. In early 2004, CIO Dianah Neff presented the idea to Mayor John Street. The mayor saw it as a potentially valuable piece of his Neighborhood Transformation Initiative, a plan to invigorate the city and stimulate economic development.

Pilot Project

In the summer of 2004, the mayor and the CIO launched a Wi-Fi hotspot in Love Park, a high-profile square block in Center City, Philadelphia's downtown.[9] Love Park is situated near City Hall and along the Benjamin Franklin Parkway, which connects the park to many of the city's prominent cultural institutions, including the Philadelphia Museum of Art.[10] Users of this pilot area found themselves at a portal page branding the service and conveying related information before being able to surf the Internet for free.

The pilot project served a number of short-term goals: it generated broad interest in wireless broadband access, including among the press; it directly demonstrated some of the benefits of wireless; it gave local decision-makers hands-on experience with an example of wireless broadband access; and it launched a partnership with vendors of wireless technology.

Vendors got involved for two main reasons: to showcase their hardware or software products and to solicit further business with the city. At this early point in the growth of the emerging municipal wireless industry, they all shared an interest in promoting the industry in general.[11]

While the outcome at that point was still to be determined, with this initial step the CIO, on behalf of the mayor, had already made important decisions about the kind of technology that was to be employed, the location of the initial project (the Love Park/Ben Franklin Parkway area), and specific wireless technology vendors (Pronto Networks, Pervasive Services, and Tropos Networks). The network in Philadelphia ultimately included Tropos hardware.

THE PRIME MOVERS—CIO AND PROJECT MANAGER

A new project of this sort usually requires a champion somewhere in city government, one person who stands out as the driving force behind the project. It may be a member of the city council or the mayor. Or, as it was in Philadelphia, the prime mover could be the Chief Information Officer (CIO). The CIO is generally responsible for managing all of the information and communication technology assets in a city. The CIO reviews options for technologies and business models and promotes those that are the most affordable, reliable, durable, and appropriate for local needs. That includes keeping the city updated with the most effective technologies. The explosive growth of wireless broadband has thrust CIOs into the spotlight, but they have also been busy with security concerns since September 11. If your city has a CIO, it will most likely be considering wireless broadband if it has not already done so. The person in this role is highly influential in this process.

THE CIO: DIANAH NEFF

Dianah Neff was appointed by Mayor Street in May 2001 to run the Mayor's Office of Information Services and be a part of his cabinet as CIO. Before Philadelphia, she worked for Palo Alto, CA, helping to make it the first city in the United States to have a website; for Bellevue, WA, on Y2K compliance; and for San Diego, CA, on mapping that city's existing fiber optic infrastructure. She also has an MBA and worked for 14 years with private companies in Silicon Valley. In August 2006, after the deal was approved but before EarthLink had begun construction, she left her job as Philadelphia CIO and joined Civitium, the consulting firm she had awarded two contracts to at the beginning of the wireless venture. Her deputy was named acting CIO.

PROJECT MANAGER: VARINIA ROBINSON

For a large project, like a wireless deployment, the CIO will typically have a project manager, also a city employee, usually in the same department as the CIO. The Project Manager might actually be more directly responsible for the nuts and bolts of the operation, even though the CIO appears more often in the press and at public events.

This was the case in Philadelphia, where Project Manager Varinia Robinson guided the process through its incremental goals while Neff kept the political stars aligned, contributed to the large decisions, continued in her job running the whole department, and evangelized about the project around the world. Like Neff, Robinson has an MBA and experience in both the private and public sectors. Robinson also has direct, hands-on experience managing information technology infrastructure.

The Executive Committee

In August 2004, the mayor formed an executive committee to figure out how to implement a digital infrastructure for Philadelphia, drawing heavily from the city's business community.[12]

According to the committee's subsequent report, "The Mayor's charter to the Committee was to develop a public and private partnership to achieve wireless access throughout the City to enhance economic development in neighborhoods, help overcome the digital divide, and improve quality of life for all Philadelphians."[13] The committee's primary tasks were to develop a business plan for a citywide wireless network, help sell the project, and guide it through any hurdles that might arise.

In presenting the new executive committee, the mayor and the CIO emphasized the potential economic impact of the project. "This will increase visibility and heighten the importance of wireless technology and its benefits in the areas of tourism, economic development, and small businesses and to the residents of the City of Philadelphia," Neff said. "Mayor John F. Street wants Philadelphia to be positioned competitively in the regional and global marketplace."[14]

MEMBERSHIP OF THE EXECUTIVE COMMITTEE

CIO Dianah Neff chaired the Committee that included Project Manager Varinia Robinson; the CIO and CEO of the school district; the President of Philadelphia University; representatives from the African-American Chamber of Commerce, the tourism industry, the Mayor's Office of Neighborhood Transformation, the Philadelphia Commercial Development Corporation and the Philadelphia Industrial Development Corporation (which wound up providing a $1.5 million loan to Wireless Philadelphia); the CEOs of Innovation Philadelphia (a technology-focused nonprofit that would incubate Wireless Philadelphia) and other technology and corporate consultants; and two civic entrepreneurs.

One person of note is Robin Bright, Founder and President of Talson Solutions. He was the only holdover from the EC to the Wireless Philadelphia Board of Directors. He holds an MBA with financial and engineering consulting experience. He is also on the Greater Philadelphia Chamber of Commerce Small Business Board.

The Consultant

A consultant's role is to provide information and options. The consultant can reinforce what project participants already believe, or test assumptions and explain alternatives. Therefore, the selection of a consultant is an important step because it establishes the range of possible outcomes.

Dianah Neff invited Greg Richardson, managing partner of Civitium, a for-profit wireless consulting firm with strong ties to EarthLink, to work with the executive committee, authorizing a $10,000 payment to cover his travel expenses. Neff would subsequently award three separate contracts to Civitium, totaling an additional $453,000.[15]

The Philadelphia project was Civitium's first major contract. It "put us on the map," Richardson has said. There was "a certain amount of luck and being in the right place at the right time."[16] That place and time was a municipal wireless event sponsored by Sprint Communications in the summer of 2004, where Neff and Richardson met.[17] The Philadelphia contract rocketed Civitium to a position as the clear market leader among wireless consultants. In September 2006, after the contracts with Civitium had expired and the plan for the citywide network was complete, but before the project was built, Dianah Neff left her job with the city and took a job with Civitium.[18]

Stakeholder Analysis/ Needs Assessment

While the executive committee went to work on a business plan, the CIO enlisted the help of the Fox School of Business and Management at Temple University to evaluate the technical, economic, and social elements of the potential network.[19] Such an evaluation is often called a stakeholder analysis or needs assessment. At a minimum, it gathers the basic market research required for any large-scale commercial initiative. At best, the stakeholder analysis will gather input from all sectors of the city and serve as a meaningful vehicle for community involvement in developing a municipal wireless network.

In Philadelphia, 110 people from a wide range of constituencies participated in focus group sessions, including representatives of an African American–

INTERVENTION! The initiators Those who lack broadband access are at a disadvantage in trying to initiate a wireless project or other broadband deployment. But you can take other actions to promote your vision for such a project and stimulate its development. If you are not in a position to initiate a citywide or municipally-sponsored network, you might be able to launch a community network or Wi-Fi hotspot that proves the value and popularity of the service. You can also gather input from the community and foster discussion of the topic. Simply contacting your mayor, CIO, or city council representative may be enough to get the ball rolling.

owned business; an Asian American–owned business; other local businesses and nonprofits; high-tech start-ups; civic outreach organizations and social service agencies brought together by a local nonprofit, the Institute for the Study of Civic Values; the local tourism industry; health care professionals; area universities; students from high school through college; and low-income housing residents.[20] Most were long-time computer users, but some reported minimal or no usage. The primary way people became part of a focus group was by invitation from a member of the executive committee.

The focus groups provided a range of input, but overall the groups were very supportive of the project. Responding to questions put to them, about three-quarters said that they thought wireless service would be useful, that the city should build a wireless network, and that they would use it.

Some participants focused on the challenge of expanding participation in the digital/online sphere through computer literacy training and substantial technical support—what would become known as "digital inclusion." Some participants also emphasized the need to keep the technology up to date. Taking into account the focus groups' concerns and responses, the description of the potential Philadelphia network came to include a "continuous process of 'technology refresh' throughout the contract term" that would result in a "complete replacement of the network infrastructure during a period of seven (7) years."[21]

The focus groups also addressed the financing of the project. According to a summary, "Overall consensus was that the City is the only entity capable of initiating this work. It was understood that the private sector would not invest in building a city-wide infrastructure reaching all neighborhoods." However, "no one suggested that this initiative was worthwhile if tax revenues would finance the network's operation." Participants of the focus groups expressed support for involving the private sector wherever possible.[22]

Public Meetings

The executive committee also held a town hall meeting at City Hall in November 2004. As with the focus groups, the overwhelming majority of the participants were supportive, but unlike the focus groups, there was less agreement about the direction of the project. Some participants, concerned about potential costs, favored a revenue-neutral private-ownership solution that would not impact the city budget. Others worried that private ownership would limit free expression and accessibility, and suggested that the quality of the network was a more important concern than the cost. Many expressed a desire to address the digital divide through guaranteed service and training for the city's poorer residents. These publicly expressed concerns and questions were referenced in the business plan produced by the executive committee.[23]

Later in the same month Media Tank, a local nonprofit organization, held its own public forum with experts on the local network and from the field of wireless generally. The goal of this forum was to educate the public "about Wi-Fi technology, how it's used, and its potential to transform our city."[24] Organizers also alerted attendees to pending state legislation that could have blocked the Philadelphia wireless initiative (see below).

The public input process may have suffered from Philadelphia's position as an early adopter of

INTERVENTION! The prime mover Identifying the primary decision-makers over the development of the network will help you understand the motivations driving it forward. City Council Members can also be very influential, though in Philadelphia they did not enter the discussion until late. They made major changes to the contracts, but focused almost exclusively to the oversight and committee structure.

TABLE 1: MUNICIPAL WIRELESS BUSINESS MODELS

The **Civic Wireless** model (which the EC labeled **"public community"**) offers free access paid for by the city or a civic entity, (similar to free public concerts in the summer). Since there are no paying customers, users deal with the civic entity or its partner, but only when accessing the network. This model is frequently used for hotspots in city parks or business districts, including the original Love Park/Benjamin Franklin Parkway pilot project. St. Cloud, FL adopted this model (see Appendix A).	**Paid for by:** civically-minded individuals or businesses or the government. **Owned by:** the same, or by the host of the infrastructure, like a park or other publicly-accessible space. **Cost to the user:** usually free. **Maintained by:** volunteers or original contributors. **Public Interest Obligations:** none. The contribution of Internet access itself is the public benefit.
The **Private Franchise Model** (which the EC labeled a **"private consortium"**) involves a private company or consortium of companies that pays for and owns the network. The city might earn revenue by charging for access to its existing assets or save money by leveraging its purchasing power. It can negotiate other benefits for local residents. Most users would interface with the private company or its resellers. This is essentially of the model ultimately adopted by Philadelphia.	**Paid for by:** private company or consortium. **Owned by:** private company or consortium. **Cost to the user:** at the discretion of the private company or consortium. **Maintained by:** private company or consortium. **Public Interest Obligations:** As negotiated in the contract or franchise agreement.
In a **Publicly-Owned, Privately-Operated** model (Civitium calls this **"Cooperative Wholesale™,"** a term the company has trademarked.) the city pays for the network, though the entire construction and management might be outsourced. The city then achieves savings from using it and earns revenue from selling wholesale access to it to retail ISPs (ISPs). The general public purchases retail Internet access from these ISPs, which also provide customer support and billing. This is the model Boston is in the process of adopting (see Appendix A).	**Paid for by:** the city. **Owned by:** the city. **Cost to the user:** is determined by competition among retailers. **Maintained by:** the city or its subcontractor. **Public Interest Obligations:** for the city to be responsive to local residents.
A **Public Utility**, which could be a new public project or an existing publicly-owned or appropriately-regulated company, would provide broadband access like other basic necessities, such as electricity, gas, or water. This is the model used in St. Cloud, FL (see Appendix A), one of the first cities in the U.S. to implement a municipal wireless broadband network.	**Paid for by:** the utility. **Owned by:** the utility. **Cost to the user:** would be regulated. **Maintained by:** the utility. **Public Interest Obligations:** to provide fair, affordable, reliable service to all.
The **Nonprofit Ownership** model puts the new infrastructure in the hands of a public trust or nonprofit organization. The nonprofit uses money from foundation grants, private donations, or even loans from the city or a bank to pay for network construction. Users may deal directly with the nonprofit or with a private reseller. The nonprofit may focus on programs to promote full-scale community access and bridge the digital divide.	**Paid for by:** the nonprofit, with money raised through donations or loans. **Owned by:** the nonprofit. **Cost to the user:** is low enough to promote universal usage. **Maintained by:** the nonprofit or a subcontractor. **Public Interest Obligations:** to serve people over profits.

wireless technology. There was little public awareness of the issues and barely even an established language for discussing them. Another weakness specific to Philadelphia was a scarcity of community media outlets. At the time, there was no public access television station or community radio station, which could have helped foster a sense of ownership of media outlets.

The public input process should be an opportunity to build relationships among stakeholders in the community, not just a method of gathering information and opinions. The common model for gaining public input is a hub-and-spoke approach, where everything flows into a central body, like Philadelphia's executive committee. The problem is that, once that body ceases to exist, the conversation stops. The best way to ensure that the public's recommendations are acted upon is to keep the people who provided initial input involved in every step along the way and in direct contact with one another throughout this decision-making process.

Business Plan

Philadelphia's executive committee completed its work within 90 days and submitted a business plan to the mayor and the CIO in December 2004.[25] The 72-page document included summaries of all of the data the committee had gathered and an extensive explanation for how it arrived at its recommendations.

The committee considered five candidate business models,[26] as outlined in Table 1.

The committee analyzed each model according to certain weighted characteristics, including:

- Free access in parks and public spaces.
- Low-cost or free service for disadvantaged constituents.
- Ability to control fees/rates.
- Whether it was cost neutral for the city.
- Ability to generate/return profit to the city.
- Universal access/coverage.
- Contribution to the revitalization of poor communities.
- Ability to respond to technology change.
- Service offerings.
- Timeframe for setting up governance structure.

The executive committee scored the public utility model as "average or weak" in meeting these goals. It rejected the civic wireless ("public community") model because of the cost to the city, and it rejected the private franchise ("private consortium") option because it would not serve the city's social impact goals or allow the city to influence retail rates. Instead, the committee focused on the nonprofit ownership and the publicly owned/privately operated ("Cooperative Wholesale™") models, finding pros and cons with each.

In the end, the executive committee recommended a combination of these two models (adopting the "Cooperative Wholesale™" label for the hybrid). The committee proposed that the city form a new nonprofit to solicit grants, private donations, and loans to pay for the construction of

INTERVENTION! **Be the media:** Start a blog to report on the process. This will allow you to distribute the information you think is important without relying on the corporate media. It will also help you keep track of the information you gather and organize your own thoughts. Writing a blog may be enough to establish yourself as an expert in the eyes of reporters or policymakers.

The city officials who attach their names to this project have a strong interest in the way the issue is covered in the press. Keep track of which reporters are covering this project and whether they seem positive, critical, or willing to ask tough questions.

THE BENEFITS OF PUBLIC OWNERSHIP

In January 2007, Becca Vargo Daggett of the Institute for Local Self-Reliance produced a report called "Localizing the Internet: Five Ways Public Ownership Solves the U.S. Broadband Problem."[35] The report argues that cities should invest in broadband infrastructure rather than simply allowing corporations to use city resources to build private, for-profit infrastructure. Daggett's five reasons are:

1. High-speed information networks are essential public infrastructure, like roads and sewers.
2. Public ownership ensures competition. A publicly owned, open access network can be open to all service providers on the same terms, thereby encouraging the entry of new service providers.
3. Publicly owned networks can generate significant revenue and cost savings. Better that the revenue go to the municipality than to a private corporation, and that the local government and residents benefit directly from the savings.
4. Public ownership can ensure universal access. Private companies have incentives to build and upgrade their networks only where it will be the most profitable.
5. Public ownership can ensure non-discriminatory networks. With publicly owned networks, customers can be sure that any traffic management mechanisms are necessary and not simply to improve profitability.

the network. To the committee, which worked on the assumption that a private company would not be willing to make the necessary investment in a citywide network, and with the option of city dollars off the table, this seemed to be the only way to generate the necessary capital. Under the executive committee's scheme, the nonprofit would own the network but would outsource construction, management, and retail service.

The committee thought that this model would serve everyone in the city. At the retail level, such a network would draw customers from among those with no access, dial-up users, and current broadband subscribers who wanted the mobility of wireless or simply a cheaper alternative to their current service.[27] The committee also thought that it would benefit the 430 small ISPs then offering dial-up service in Philadelphia, since it would allow them to resell wireless broadband services.[28] They expected to contract with at least seven resellers by the second year[29] and projected that the competition from the new wireless broadband providers would stir the incumbent cable and telephone companies to expand their services and lower their prices.[30]

The committee set a target retail price for basic residential service at $16–$20 a month (based on a wholesale rate of $9 a month and the prevailing rates for slower access services, such as dial-up or DSL, at $10–$55).[31] It also assumed that service would be offered to businesses and institutional users at higher rates. The city would serve as an "anchor tenant," purchasing its own telecommunication services from the new network. As part of that deal, it would also provide access to light

INTERVENTION! The Executive Committee: The first step after initiation is usually to form an executive committee, alternately referred to as an advisory committee or a task force, and to select a consultant. The committee members are volunteers, so a mayor can pick whomever she or he wants. Aside from being known to the mayor, prominence in the field of technology or general business acumen are common criteria, as is prior involvement in local wireless through research or deployment. To impact the makeup of the executive committee, you can identify and advocate for allies who fit these criteria. This step happens early and quickly and behind closed doors, so intervention at this point often requires taking notable action before the launch. In Minneapolis, for example, concerned citizens organized themselves into a task force and the city later adopted many of its members and recommendations into its official process.

poles where the wireless routers could be mounted and electricity to power the routers.[32]

The committee predicted that the low cost of the service and the ability to access the network from anywhere in the city would lead 22 percent of the city's homes to sign up by the fifth year.[33] Working on that assumption, it declared that the $10 million in construction costs and the $6 million a year needed for maintenance and upgrades would pay off after only four years, by which time the network would be generating $5 million a year of "free cash flow."

The committee envisaged that by outsourcing network operations the nonprofit could focus on economic development and digital divide programs to maximize the social benefit of the new infrastructure. The business plan formulated by the executive committee included a list of "outcomes and measurement criteria" that included targets for the numbers of computers (10,000) to be given away to low-income familes and training classes for small business (25) it expected the nonprofit cooperative wholesale model to yield, thanks to that free cash flow.[34]

Request for Proposals

On April 7, 2005, the mayor announced the results of the executive committee's work, the release of a request for proposals (RFP) to build the wireless network, and the formation of Wireless Philadelphia to fill the nonprofit role outlined in the committee's business plan.

Government agencies are usually required to solicit bids for any large expenditure through an open request for proposals. The RFP is the defining moment of any public-private partnership. A good RFP will present the problem to be solved and the parameters under which it must be solved, leaving the door open to innovative responses.

The Philadelphia RFP detailed the type of network the city wanted respondents to build: a wireless network covering 135 square miles, supporting access from desktop PCs, laptop PCs, handheld devices, mobile phones, and other Wi-Fi devices. The RFP specified the speed of the connection—one megabit per second (1 Mbps) upstream and downstream—and its availability—90 percent indoor and 95 percent outdoor, including constant connectivity while moving at up to 60 miles per hour.[36]

INTERVENTION! The consultant: Depending on the power and knowledge in the city administration, the consultants they hire can wind up framing the parameters for the discussion. The consultant may be responsible for presenting all of the possible options for technological and business models, conducting the stakeholder analysis, assessing the local economy and telecommunications infrastructure, and suggesting a particular model or solution. Without officially making any decisions, the consultant can have a determinative impact on the outcome to the point where the choice of consultant often indicates the ultimate choice of solution.

The main things to look for in a consultant, aside from general expertise and a solid reputation, are a specific knowledge of your community and an ability to provide customized answers to your questions and needs. How varied are the solutions that the consultant has helped other communities arrive at? On the other hand, if you have a very clear idea of what you want, you can look for a consultant that shares your biases and assumptions.

A paid consultant requires a contract from the City, which, like the contract to build the network, usually requires a separate request for proposals (RFP). RFPs are supposed to be publicized, so even if you are not in a place to shape the contract, you might at least have a warning that your city will soon be signing one. The problem is they are not publicized very well. Small cities might simply place the RFP document on a website and email it to past contractors. The CIO might be able to put your email on a distribution list. There are also private companies that monitor the issuance of government RFPs as a service to potential bidders. MuniWireless.com is a good resource for tracking RFPs.

THE NONPROFIT: WIRELESS PHILADELPHIA

The Wireless Philadelphia Board of Directors included Philadelphia businesspeople with experience in technology, corporate development, and marketing. Aside from Robin Bright, the other people Mayor Street selected as WP board members were De'Porres Brightful, Director of Technology Solutions and Partner Unit for Microsoft Mid-Atlantic; Leigh Wood, a former executive in the British cable industry and domestic cell phone industry, currently the COO of Real Win Win, a "Philadelphia based, transaction processing company in the energy conservation business;" Carol Baker, CEO of "an investment company that primarily pursues investments in renewable energy and Mid-Atlantic companies" and a former corporate-turnaround consultant; Tonya M. Evans-Walls, an attorney, poet and author; and Chip Finney, who owns a boutique travel agency specializing in vacation packages to Brazil. The CIO is an ex-officio member of the board.

The interim CEO of WP was Derek Pew. In that role, he became the chief negotiator with EarthLink, the private company whose proposal won the "request for proposals" (RFP) review. He is a lawyer and former investment banker who participated in the merger of Bell Atlantic and NYNEX that created Verizon. He is the Chairman of Boathouse Communications Partners, which invests in smaller telecommunications companies. He is also involved as an advisor or director in several civic organizations, including the Metropolitan AIDS Neighborhood Nutrition Alliance (MANNA).

Derek Pew stepped down from the CEO position after the contract with EarthLink was approved by the City Council. The WP Board of Directors hired Greg Goldman, who formerly ran MANNA and worked at the Philadelphia Foundation. His role is to oversee the development and implementation of a digital inclusion program and to fundraise in support of the program. WP is also responsible for monitoring the quality of the EarthLink network and keeping the City informed.

The RFP also explained the criteria and timeline the city would use to evaluate and select proposals. The Philadelphia RFP announced a pre-proposal meeting at which interested parties could ask questions of city officials, as well as other mechanisms for requesting additional information.

Responding to an RFP such as the one Philadelphia issued is an arduous task, beyond the capacity of all but the largest companies. A respondent needs to describe precisely how the proposed system will work, what equipment it will use, when it will become operational, the process for managing and overseeing the work, and a detailed budget for all of the above, as well as detailed information on the company's qualifications to do the work as described. For this RFP, the respondent also needed to explain in detail how it would provide customer service, support other service providers wishing to purchase wholesale access to the network, and provide security for both network traffic and the physical infrastructure. The RFP also required a $100,000 "proposal security," which Wireless Philadelphia would use to hold any respondent to the plan it proposed.

Notably, while the Philadelphia RFP referred to the plan outlined by the executive committee as the default model, it specifically allowed for "counter proposals"—responses with different business models or technological approaches.

Incumbent Pressure

The Philadelphia decision-making process did not take place in a vacuum. Existing broadband providers had much to lose from a new, low-cost wireless alternative. The telephone and cable television providers had invested heavily in securing contracts with municipalities to dig up the streets and lay cables in the ground even before they began offering Internet access. By minimizing competition, these incumbents could maintain the high cost of broadband Internet access for homes and businesses. In a May 2005 interview, Dianah Neff said that "the political challenge mounted by the telecommunications industry" had been the largest obstacle to achieving the city's original vision.[37]

In Philadelphia, the incumbents were Verizon, which offered digital subscriber line (DSL) service, and Comcast, which offered cable broadband service. While both corporations were influential in Harrisburg, the state capital, Comcast, based in

EARTHLINK, THE SOLUTION PROVIDER

The EarthLink bid to pay for the construction of the network was the most significant factor in shaping the outcome of the process. Why was EarthLink in a position to make that kind of offer when no one else would?

EarthLink built its business on dial-up access and then expanded to reselling DSL. Being a reseller meant EarthLink did not own the telephone lines it used to provide Internet service. It had to buy access wholesale and then use its service and reputation to gain and keep customers. The telephone networks were an "open access" system, which means the network owners are required to sell access to other service providers. Because dial-up and DSL use the phone lines, the same rules applied.

On August 5, 2005, the Federal Communications Commission reclassified DSL broadband as an information service rather than a telecommunications service, a move the Supreme Court had just approved in June with its decision in the landmark *Brand X* case.[44] *Brand X* ended the "open access" requirements and established a sunset for "net neutrality," which meant the owners of a wire or cable infrastructure would soon have the legal right to decide what went over their wires and cables—including which websites customers could have access to, and whether competing ISPs could offer retail services over the network. This decision effectively shut competitive ISPs like EarthLink out of the business of broadband service provision.

The Philadelphia RFP was announced on August 7 in the wake of the FCC's reclassification. If EarthLink wanted to stay in business as an ISP, it would need to find a way to own its own infrastructure so it could reach customers directly. That direct connection to the customer is called the last-mile and wireless was the last-mile solution for Earthlink. Other bidders did not have the same pressure on their company's core business model. Moreover, the Philadelphia contract was a huge prize in the burgeoning municipal wireless industry. Whichever company won that contract would be well-positioned to win other contracts and reap even bigger profits.

Philadelphia, also held great sway among local politicians. Comcast also had a functional monopoly on cable television service throughout the region, which it leveraged to bundle and sell residential cable television and Internet access.

The incumbents strongly resisted the Philadelphia wireless development. They applied pressure in as many ways as they could, from the beginning of the city's process through the City Council's review of the eventual plans. Once the network partners were established, incumbents responded by offering new lower-priced deals. Verizon offered a $15-a-month introductory offer, undercutting Wireless Philadelphia's $16–$20 target price before

INTERVENTION! The Researcher: In the stakeholder analysis, who asks the questions will shape who gets heard and what the answers are. While many community advocates only ask for a seat at the table, you can have a much bigger impact by making the table in the first place. Community groups and coalitions can offer to conduct or help shape the research process.

When looking for help from scholars, whether you or the city asks business school professors, or sociologists, or economists will determine the presumptions and methodology of the research. Whether the researcher's orientation is towards free markets or economic justice will have a profound effect on their results.

Most importantly, however, if the methodology of the research is flawed and the results indefensible, the entire project will lose legitimacy or the research will simply be tossed out. If you conduct research into what people want from a wireless network, using a rigorous survey methodology and sampling from a diverse range of stakeholders will strengthen the impact of the final results.

WHAT IS DIGITAL INCLUSION?

Digital Inclusion is a strategy for addressing the digital divide. It includes a variety of tactics directed at the economic and social barriers to Internet usage: lowering the cost of a computer and an Internet connection, and building the knowledge and motivation to use both. It is a demand-side subsidy directed at consumers who have not obtained their own hardware and skills.

After all but branding the term to describe their package of programs, Wireless Philadelphia would offer this definition:

Digital Inclusion is the initiative that helps people who are not online gain access with affordable hardware, software, tech support/information, and broadband Internet service, so they can begin to use this technology to improve their lives.[45]

Digital Inclusion addresses disparities in technological access, literacy, and usage. It does not address disparities in who owns and operates the network. So, while Digital Inclusion brings new people into the online world, it does not consider how the Internet will change as a result of that new participation.[46]

it was even available. Comcast launched its "triple play" package of television, broadband, and telephone service for $99 a month.

Comcast advised City Council members throughout the process, offering critiques and technical assessments. And at one executive committee hearing, a consultant for Comcast distributed articles that described struggling wireless projects in other cities.

The incumbents, particularly Verizon, were intent on scuttling the building momentum toward municipal broadband in more overt ways as well. In 2004, as Philadelphia was embarking on the research phase of the project, Verizon successfully pushed a bill through the state legislature severely restricting any Pennsylvania municipality's ability to launch a municipal broadband network. House Bill 30 gave incumbents, which in most instances would be Verizon, the right of first refusal to participate in any municipally funded broadband construction in the Commonwealth.[38]

Verizon argued that it should not have to compete with government-owned wireless networks, especially while it was investing in upgrading its infrastructure. But Philadelphia had already made headlines with its proposal, and the governor, a former mayor of Philadelphia, seemed hesitant to sign into law a bill that would undermine its efforts. Supporters of the initiative pressured the governor for a veto. In the end, Philadelphia and Verizon agreed that the city would drop its opposition to the bill if Verizon would not invoke its privilege with respect to the city's network. However, other cities in the Commonwealth considering such an initiative would be shut out if they did not implement their concepts

INTERVENTION! The Stakeholders: A good, potentially useful stakeholder analysis will be transparent and designed to maximize input. If you live in the city, you are a stakeholder. If you want to be heard in this process, you should be heard in this process.

If the process is not as open as you want it to be, you can identify better methods employed by other cities (see the Resource Guide in Appendix B below for more information on the process in other cities) and hold them up for comparison. This is especially effective if the rhetoric around your city's network or process has emphasized openness or community benefit. In truth, the network will be better off the more widespread the participation in its development, especially if participants in the process go on to become advocates and customers.

How you choose to function in that role is a different question. You might have to answer questions as an individual, but you may also be called on to speak on behalf of people like yourself or for the constituents of your organization.

before the law went into effect on January 1, 2006.

HB 30, which became Act 183, was one of many similar bills incumbents around the country pushed in numerous state legislatures. In Nebraska, incumbents lobbied legislators to pass an all-out ban on networks funded by municipalities.[39] However, a strong coalition of providers, municipalities, and public interest advocates lined up to oppose the incumbents' efforts. Companies like Intel, Dell, Tropos, and EarthLink, which stood to profit from municipal networks, representatives from the cities and public agencies whose authority to construct such networks was being challenged, national public interest and consumer advocacy groups like Free Press, New America Foundation, and the Baller Herbst Law Group, and local media activists worked together to confront lobbyists from Verizon, AT&T, Comcast, and other incumbents. The high-profile confrontation in Pennsylvania, along with strong resistance in some other states and the steady expansion of wireless networks nationally, helped sap support for the incumbents. Pro-municipal forces won key victories in Texas, Indiana, Iowa, and Florida before Congress began to move forward on bipartisan legislation to preempt the state-level bans. The Community Broadband Act of 2005, introduced by Senators John McCain (R-AZ) and Frank Lautenberg (D-NJ), did not reach a full floor vote in the Senate, but it sent a signal that the congressional committee overseeing telecommunications policy viewed municipal wireless networks as a local prerogative and as serving the public interest.[40]

Despite the exemption for Wireless Philadelphia, the heat from the debate engendered by

MAIN POINTS OF THE AGREEMENT:[52]

- EarthLink pays for the network.
- EarthLink owns the network.
- Term of contract is 10 years, with mutual option for 5-year renewal.
- Exclusive agreement between WP and Earthlink.
- WP receives the greater of 5 percent of subscriber fee or $1 per subscriber.
- WP can purchase wholesale accounts at $11-$8, depending on volume.
- EarthLink sets wholesale and retail rates except for the rates for WP's wholesale purchases.
- EarthLink must provide non-discriminatory access to other retail service providers.
- Cost for wholesale access is $5,000, plus $10,000 in up-front purchase of service.
- WP receives 25,000 $9.95/month accounts to distribute as it sees fit, with the potential number of these "EarthLink Assisted" accounts rising as the overall user base grows.
- Base service speed is 1 Mbps symmetrical with availability through out 95 percent of the city outdoors.
- Nearly two dozen free areas in city parks and community centers.
- WP pays half of Earthlink's electricity bill up to half of its share of the gross revenue from the network.
- EarthLink pays $74 per year per light pole for 4-5000 light poles for 10 years, with two-thirds of the total payments ($2 million) coming in the first year to provide startup funding for Wireless Philadelphia.
- Detailed provisions for service level requirements, including customer service.
- Free or discounted accounts for municipal use.

INTERVENTION! Town Hall Meetings: You can supplement any official public meetings by organizing your own events. Hold them in places and times that complement other meetings. Or you can record the statements of people who cannot make the official hearings and deliver them on their behalf.

incumbent opposition shaped the local process. In the end, Philadelphia decided against using public money to develop its wireless network. Other cities followed Philadelphia's lead because they wanted to move forward without having to fight drawn-out political battles against incumbents.[41] Thus, while the pro-municipal forces may have been victorious in the legislative realm, the incumbents ultimately succeeded in their goal of limiting government involvement in the construction of new broadband infrastructure. With Philadelphia's defection, the private franchise model became the standard.

The Proposals

Wireless Philadelphia received 12 proposals.[42] It worked with a number of the bidders to set up pilot projects, pairing potential solution providers with neighborhood organizations. After narrowing the field to AT&T, Hewlett-Packard, and EarthLink, WP entered into initial negotiations with Hewlett-Packard and EarthLink. Then, on October 3, 2006, WP announced it had entered into final contract negotiations with EarthLink.

In contrast to both the original Wireless Philadelphia business plan and to all of the other bidders, EarthLink proposed to build and maintain the network at its own expense. In exchange, the Atlanta-based service provider would own the network outright, offering both wholesale and retail access. It would offer qualifying Philadelphia residents Internet access at a discounted rate of approximately $10 a month and would share a portion of its revenue with Wireless Philadelphia.

By all reports Earthlink's proposal came as a surprise. Not only did it satisfy the requirement that the project be cost neutral to the city, it removed the financial burden altogether so that Wireless Philadelphia would not have to raise funds or issue a bond.

In exchange for taking on the financial risk, EarthLink would get the benefits if the risk paid off. The company estimated it would spend around $10 million to build the network and another $10 million to maintain it for the first 10 years. It expected to sign up at least 50,000 customers at $20 or so a month, which would yield gross revenues of $12 million a year.

Earthlink's proposal meant that the city would not have to spend any of its tax revenue on the network. This satisfied the incumbents' objections and made the deal a lot more palatable to local politicians. It also meant the nonprofit would not have to raise the estimated $10–$20 million needed to construct the network. On the other hand, it meant that the network owner would be a private corporation with profit as its primary motive, not a nonprofit corporation with a mission of digital inclusion.

The Selection

Thus, after having arrived at a proposed business plan through an extensive process with considerable public input—and after specifically rejecting

INTERVENTION! The Request for Proposals: Some information may be restricted to vendors that will be responding to the RFP, but there is almost always a "pre-bid meeting" that should only require your registration. That meeting is intended for the potential respondents, especially for the small or relatively less experienced vendors, so the best thing to do is listen. You will get to know which companies are considering a bid and what some of the stakes are. You will also often wind up on an email list for updates by attending. Otherwise, all of the relevant documents and information should be posted on the City's or agency's website.

The bids are usually considered by a selection committee. Before you lobby anyone on a selection committee for the RFP, check what your local law says about trying to influence the award of a municipal contract. On the other hand, if you witness improper influence from others, you can blow the whistle.

the private franchise option for not serving the city's social impact goals or allowing the city to influence retail rates—Wireless Philadelphia accepted a proposal for a private franchise. What factors, other than incumbent pressures, played a role?

Derek Pew, who as interim CEO of Wireless Philadelphia negotiated the deal with Earthlink, saw this as a liberating decision: "In the end, I think we felt that if we could raise money, we would rather raise it for education, computer distribution, motivation and community outreach rather than to build the network if someone else was willing to do that."[43]

While press coverage of the Philadelphia project had been overwhelmingly positive, the notion of a publicly accessible wireless network on the scale proposed in Philadelphia was still financially and technologically unproven. Pushing the risk onto EarthLink minimized the fallout from possible failure for those people who had pushed the process forward.

The new business model meant that if Wireless Philadelphia was going to achieve its goals of controlling retail rates and closing the digital divide, it would have to write them into the contract with Earthlink. WP entered into final negotiations with EarthLink aiming to secure network performance guarantees, affordable subscription rates, and funding for digital inclusion.

Negotiating the Network Services Agreement

Wireless Philadelphia, the city solicitor (essentially the city's lawyer, working under the mayor), and EarthLink negotiated for nearly five months. They worked through an array of clauses regarding service level agreements, wholesale access, revenue sharing, electricity bills, discounted access for low-income households, fees for light-pole usage, payment schedules, and oversight mechanisms (see the "Main Points of the Agreement" sidebar). The same group simultaneously negotiated a separate agreement between EarthLink and the Philadelphia Authority for Industrial Development (PAID), which controlled access to the city's light poles on which EarthLink planned to mount the wireless routers that would make up the wireless network.

Among its negotiating goals, Wireless Philadelphia sought multiple measures, both direct and indirect, to control the retail rate of the service. The direct measures included reduced-rate accounts for low-income households and the designation of free service areas throughout the city. The indirect measures, including requiring EarthLink to sell wholesale access to network capacity to Wireless Philadelphia and competing ISPs, were intended to promote competition in the retail Internet services market.

Wireless Philadelphia also sought specific measures under a "digital inclusion" heading to ensure that the network would be useful and affordable for

INTERVENTION! Pilot Projects: Pilot projects are a way for you to learn about new technologies and software applications. Make sure the pilot projects serve constituencies that are representative of the city, demographically and topographically. The results from any tests should be made public, but do not rely on city officials, the press, or the vendors themselves to review them. You can conduct tests and report your findings to the city, the public and the press. If that sounds intimidating, keep in mind that these pilots, like the finished network, should be inviting and accessible. They should allow you to use the Internet the way you normally would.

In Philadelphia, the pilot projects were formed as partnerships between a vendor and a neighborhood organization. You can seek to influence the selection of either. The neighborhood organization is most likely to be one that already works with technology. Many such organizations are members of the Community Technology Center Network (CTCnet), which has a database of its 1,100+ members on its website, www.ctcnet.org.

WHAT COULD THE DEAL HAVE LOOKED LIKE?

Other cities deploying new broadband infrastructure have deviated from Philadelphia's model in key ways. While not exhaustive of the possible characteristics of a municipal broadband network, the following set of examples demonstrate a range of possible priorities for a city. (*See* Appendix A for further descriptions of key cities' municipal wireless models and the political process that led to the formation of these various models.)

the people who have so far been excluded from broadband Internet service.

Free and Low-Cost Access – The centerpiece of Wireless Philadelphia's digital inclusion plan was a package of "EarthLink Assisted" accounts capped at $9.95 a month. Wireless Philadelphia secured 25,000 of these accounts (with provisions for that number to rise), which WP would distribute to households with income up to 130 percent (later raised to 150 percent) of the federal poverty level.[47] It is worth noting that the executive committee estimated the wholesale cost of serving an individual on the network to be $9 a month, so EarthLink could be expected to turn a profit even on the accounts that Wireless Philadelphia would market to the city's poor.

Wireless Philadelphia also made sure that there would be a location in each district of the city from which individuals could access the Internet at no charge.[48] Some of these were to be in public areas like parks or community centers. For the rest, City Council members were to be able to areas in their districts.[49]

Revenue and Cost Sharing – Having sacrificed the revenue that would come from ownership of the network, Wireless Philadelphia negotiated revenue and cost sharing terms with EarthLink. Under their contract, EarthLink will pay WP 5 percent or $1/month for every account, whichever is greater. For accounts costing billed at $20 or less, including wholesale accounts, WP receives $1; for accounts billed at more than $20, WP receives 5 percent. This amount is not broken out and listed separately on subscribers' bills, so customers are unlikely to realize that they are paying a surcharge. In testimony before the City Council, Wireless Philadelphia estimated this revenue would equal $750,000 to $1 million annually.

In its turn, EarthLink negotiated a key provision obligating WP to pay a portion of the electricity bill for operating the network. Wireless Philadelphia agreed to pay for these costs up to half of its income from revenue sharing. Earthlink's goal was to enlist WP in negotiating a better deal on electricity rates from PECO, the private electricity company.[50] PECO wanted each router to be treated as a separate account, greatly inflating the startup costs. This, plus the normal volatility in the energy market, posed a potential risk for Earthlink. The arrangement with WP mitigated this risk, but it would potentially cut the net revenue stream for WP by half.

Given its share of the electricity bill, payments on a $1.4 million startup loan from the Philadelphia Industrial Development Corporation (PIDC), and operational expenses, none of the revenue from the network will go providing equipment or training programs to close the digital divide. Wireless Philadelphia has told the City Council that it expects to raise additional funds to support its digital inclusion programs.

However, Wireless Philadelphia did make arrangements to ensure that it would have startup funding. It deferred payments on its share of the electricity bills for the first two years and on its loan from PIDC for the first year. EarthLink also agreed to pay for two-thirds of its light-pole attachment fees—totaling $2 million—up front and then asked the City Council to direct those funds to Wireless Philadelphia.[51]

Promoting Competition – Individuals or families who do not qualify for a low-cost account will have to pay the prevailing rate. Rather than trying to mandate a specific retail price, Wireless Philadel-

TABLE 2: MUNICIPAL WIRELESS MODELS

City: Model:	**Minneapolis** Private Franchise	Key difference: Shared revenue flows not to a new nonprofit organization but to a fund at the Minneapolis Foundation that is overseen by a community advisory board, minimizing administrative costs. Contract includes "Community Benefits Agreement" outlining specific public interest obligations to be fulfilled by franchise partner.
City: Model:	**Boston** Nonprofit Ownership (proposed)	Key difference: Emphasis on "open access" wholesale market with very low barriers to entry to allow ISPs and even small community groups to participate as service providers.
City: Model:	**Seattle** Publicly-Owned, Privately-Operated (proposed)	Key difference: Planning a "fiber to the premises" network, which would deliver much higher speeds and enhanced services throughout the city.
City: Model:	**Washington, DC** Private/Nonprofit Franchise (proposed)	Key difference: Focused on serving lower-income neighborhoods, called "greenlining" to contrast with the traditional redlining of those neighborhoods in financial and technological services. RFP imagines a partnership between private company and nonprofit organization.
City: Model:	**San Francisco** Private Franchise (proposed)	Key difference: Tier of low-speed service funded through advertising, available at no fee throughout the city.

phia sought to use market-based mechanisms to influence the price. WP tried to negotiate conditions that would encourage multiple ISPs to enter the market, believing that this would keep retail costs down to between $16 and $20 a month.

The principle means through which WP sought to introduce competition into the wireless broadband market was by requiring the network to be "open access," but they ultimately arrived at a very weak definition of the term. An open access regime is one in which the owner of the physical network must sell subscriber accounts on a wholesale basis to various ISPs, who in turn resell those accounts and compete for retail customers on the basis of price and service. These could be large existing providers like America Online or Comcast, or they could be locally owned new or existing ISPs. Open access eliminates the need for each ISP to build its own network. It can ensure vigorous retail service competition even where one company controls the physical network infrastructure.

Open access regimes are most successful when it can be guaranteed that the network owner treats all possible service providers in a nondiscriminatory manner. The WP/EarthLink contract contains an Open Access Commitment that requires EarthLink to show good faith in allowing third-party resellers onto the network and to treat all resellers in a nondiscriminatory fashion, however it falls short in important ways. Notably, the contract contains no guidelines for EarthLink on the wholesale price it is allowed to charge to other service providers.

Furthermore, the contract makes no requirement that there actually be additional service providers using the system.[53]

In order to enter the market as a competing service provider, the main requirements are a $5,000 fee and a $10,000 upfront purchase of access, plus the cost of setting up the business. EarthLink and WP split the $5,000 fee.

As part of the WP/EarthLink contract, WP is also entitled to purchase subscriber accounts to the network at a negotiated wholesale rate in order to move into the market as a service provider, if it feels the existing retail price is too high.[54] WP and EarthLink negotiated a wholesale rate of $11 per account per month for up to 10,000 accounts, dropping to $8 per account per month for higher volume (over 50,000 accounts). In order to provide retail service, WP is allowed to subcontract with one, and only one, reseller. That company must in turn operate under the "Wireless Philadelphia" logo. These restrictions ensure that WP cannot become its own wholesale provider and undercut EarthLink in the wholesale market.

Technically, since the light-pole mounting agreement with the city is not exclusive, another company could launch a separate, competing network in Philadelphia. However, the contract between WP and EarthLink includes an exclusive marketing provision, tying the two together and establishing a nearly insurmountable barrier to entry at the physical network level.[55]

Aside from the EarthLink Assisted accounts, WP was able to achieve its target retail rate of $16–$20 per month. EarthLink initially announced a base rate of $21.95 a month.[56] Since then, EarthLink has lowered the rate for its 1 mbps service to $19.95, with an introductory rate of $6.95 for six months.[57] It should be noted, however, that the final cost to consumers after fees, taxes, etc. may end up being well over the $16-$20/month goal.

The City Council

After EarthLink, WP, and the city solicitor's office negotiated the network services agreement between WP and Earthlink, the management services contract between WP and the city, and the light-pole attachment agreement between the city and Earthlink, they brought the contracts to the City Council for approval.

In Philadelphia, the project changed consider ably on its way through the City Council. The Committee on Technology and Information Services and the Committee on Public Property and Public Works held multiple hearings on the measure, hearing from witnesses representing EarthLink, Wireless Philadelphia, and the city solicitor's office. City Council members expressed special concern about the level of subcontracting to

INTERVENTION! The Solution Provider: The party that will ultimately determine the quality of the network is the one who builds it. This role requires considerable capital and expertise so it will be hard for you to fill this role yourself, but it is not impossible. There are cities like Austin, Texas, and Urbana, Illinois, where local initiatives grew into municipal options.

The selection of a particular bid from a particular vendor is the most volatile part of the process, so it is important to gather as much information as you can. You can try to use press coverage to impact the decision, though most outlets will wait until a decision is actually made to run the story. Do not rely on the press for your own information, since there will be many parts of the process that they do not watch or will not run a story on. You have to stay on top of the process.

If you know of good solutions in other cities, you can forward the RFP to vendor companies and offer your assistance. Even if the RFP is very specific, respondents can make an argument for an alternate approach. The Earthlink bid was outside the boundaries of the Philadelphia RFP and wound up defining the outcome of the entire process.

local and female- and minority-owned firms and sought clarity on the community benefits of the agreement.

Council member Blondell Reynolds Brown arranged for a public hearing. While this public hearing generated some attention, it did not ultimately impact the direction of the process. Most of the public testimony was solicited by proponents of the project and spoke not to the specific proposal for a wireless network, but to the benefits of broadband access more broadly.[58] A few critics testified, but community advocates by and large supported the project.[59] Many had been involved at earlier stages and had already decided it would benefit their constituents or their organization.[60] No one criticized Wireless Philadelphia for moving away from the original vision.

The executive committee did make significant changes to the contract. It approved amendments to give council members a role in overseeing the network. It created an oversight committee to monitor subcontracting to minority- and female-owned businesses.[61] The hearings also brought many financial issues to light, though the City Council approved the deal without electricity rates being finalized.

Proof of Concept

After the City Council approved the deal and the parties signed all of the contracts, the next step was for EarthLink to build out a 15-square-mile "proof of concept" (POC) area. This was a stretch of North Philadelphia that included a range of demographics and topography. EarthLink finished construction on January 16, 2007, and Wireless Philadelphia approved the POC four months later on May 23.[63]

Implementation

While EarthLink began building the physical network, Wireless Philadelphia was staffing up and getting ready for business. The board of directors hired Greg Goldman as the new CEO along with a chief operating officer, a director of communications, a director of community relations, and an operations manager. The organization filled multiple committees, including a Steering Committee of six, with three representatives from WP and three from Earthlink; an Advisory Committee of a dozen people, each selected by a different City Council member or other elected officials; a Diversity Oversight Committee to monitor Earthlink's compliance with minority- and female-owned subcontracting requirements, and a Technical Advisory Board, with an equal number of WP and EarthLink appointees to oversee the actual operation of the system. Wireless Philadelphia also held a series of fundraisers[64] and added new people to its board of directors.

In October 2006, Wireless Philadelphia accepted a bid from Ninth Wave Media, based in Toledo, Ohio, to build a citywide portal for users of the new wireless network.[65] The general portal will include "six links" to specialized portals developed for groups such as parents, teens and 'tweens, seniors, visitors, and small businesses. The portals will allow citizens to "access content related to education, employment, health, recreation, nightlife and more," and will allow community groups to "post and exchange information about neighborhood issues and events."[66]

INTERVENTION! The Service Provider: If the network is an open access network, an independent service provider will be able to enter the market as a reseller. Depending on the barriers to entry of your system, a neighborhood association or a small partnership might be able to enter the market in this fashion. As an Internet service provider (ISP), you would have direct influence over pricing. If small or local ISPs formed a cooperative, this would give them access to bulk rates or other purchasing leverage with the network owner.

In its February 2007 newsletter, WP announced its first community Wireless Internet Partnerships (WIPs) with People for People and Impact Services Corporation. The goal of the partnerships is to distribute WP's digital inclusion package of computers, training, and Internet access through existing agencies using preexisting neighborhood relationships. WP is also partnering with Employment Advancement Retention Network (EARN) Centers, one-stop-shops where people can access a full range of social services.

The Role of Wireless Philadelphia

Wireless Philadelphia now has three functions: implement a plan for digital inclusion, fundraise for and promote the project, and oversee the EarthLink network.

Digital Inclusion – Sensibly, the city's digital inclusion plan builds on existing local capacity through the WIPs, which "will be a diverse group of community based organizations, corporations, educational institutions and religious organizations that have the ability to identify, qualify, sign up for service, train and provide support for all Digital Inclusion customers."[67] Wireless Philadelphia brings its EarthLink Assisted accounts and its high profile to the partnerships. Unfortunately, as described above, these facets of its work use up all of its revenue from the network before any of it goes into direct services.

This problem is being avoided by other cities, like Minneapolis for example. Much like Philadelphia, Minneapolis will receive a funding stream of 5 percent of network revenues from its privately owned and operated network. However, Minneapolis and its Digital Inclusion Task Force sought to ensure that this revenue was not diminished by administrative costs as it is in Philadelphia. They agreed to funnel the revenue to an existing foundation, after which a community advisory board allocates the funds to existing social services and digital inclusion organizations. Nearly all of the revenue winds up in the budgets of those service providers, and thus has a fairly direct impact on end users in Minneapolis.

Unlike in Philadelphia, Minneapolis did not negotiate for discounted Internet service accounts. "It seems to me like a marketing ploy to get new users, turning us all into a sales force to market

INTERVENTION! Corporate Accountability: Once the network is up and running, you can approach your engagement with it like a regular corporate campaign. Just as your community might organize to hold a local employer, industry or program accountable by collecting information about the impact on customers, workers and community members and taking action when problems arise. Whether it is a privately-owned network or a city-owned network using subcontractors, it is only as good as the users' experience.

Here are some things to look for when holding your wireless ISP accountable:

- Keep reminding the public, the provider, and the press of the original promises of what the network would provide. Hold the provider to a high standard. If your city or planning committee published specific goals for the network in the RFP or the business plan, as Philadelphia did, see if they are being met.
- The contract should have specific service level agreements (SLAs) for network performance. The Philadelphia contract even specifies the maximum hold time for customer service calls. Gathering this kind of data is difficult, but a good contract will specify penalties for violations.
- Is the City meeting its community benefit goals? The stakeholder analysis can be repeated periodically to measure the impact of the network. Regular town meetings and active work by a community advisory or oversight board can foster the sense of shared ownership that usually accompanies the launch of new municipal infrastructure.

these low-cost accounts to people, and then those people become full paying customers in the future," said Catherine Settanni, who coordinated Minneapolis's Digital Inclusion Task Force. "We looked at the idea of free accounts, but when we realized how much it would cost to manage a sales force, that's not a game we wanted to be in. We don't want to create another bureaucracy."[68]

Structurally, Wireless Philadelphia's Digital Inclusion/partnerships strategy emphasizes the centrality of Wireless Philadelphia. The nonprofit became the hub, connected to multiple organizations without the other organizations necessarily being connected to each other. This mirrors the hub-and-spoke model of the earlier process, during which many people provided the Philadelphia's executive committee with their input without building a sustainable human network around the project.

In June 2007, Wireless Philadelphia delivered its first computers to Digital Inclusion Participants.[69] It labeled its bundle for training, education, access, content and hardware services "the T.E.A.C.H. continuum." WP announced an aggressive plan to reach 2,800 recipients in its first year, 6,000 over three years.

Fundraising – WP intends to compensate for its consumption of network revenues by raising additional funds. To that end, fundraising has become a core ongoing mission of the nonprofit. Fundraising appears to be a key strength of CEO Greg Goldman.

There is the danger that Wireless Philadelphia, because of its high profile, will suck in the funding streams that existing social service IT organizations have relied on. Greg Goldman rejects that thinking, insisting that the people in and around Philadelphia have the capacity to give more. Furthermore, he projects that WP will quite easily be able to raise what it needs to fully fund its digital inclusion programs. "We're not talking major dollars here.… This two million is a very small drop in the bucket."[70] One way to measure the future success of Wireless Philadelphia would be to compare funding for community technology before and after its inception, since the clear aim is to increase funding overall.

Oversight – Wireless Philadelphia's roles promoting buy-in from community organizations, soliciting donations from the wealthy, and marketing subscriptions to lower-income households are at odds with its role overseeing the network and EarthLink's operation of it, because to fulfill those requirements, Wireless Philadelphia has to be an advocate for Earthlink.

Wireless Philadelphia's Technical Advisory Board and Steering Committee are evenly divided between members from Wireless Philadelphia and from EarthLink. This suggests that the management process is intended to be collaborative, not adversarial.

The presence of a Diversity Oversight Committee, while adding to the bureaucracy, is helpful. Philadelphia has a track record of not enforcing the provisions in its franchise agreements that set minimum levels of subcontracting to minority- and female-owned businesses.[71]

The role of advocating for the people of Philadelphia and the users of the network falls to the Advisory Committee, which reviews the WP

INTERVENTION! Testify to City Council: If there is no public hearing, submit written comments. You can also gather other people's comments. The City Council hearings are also a good place to meet decision makers, other passionate advocates, and local journalists.

Your comments should be brief, approximately 2–5 minutes. It is best if you read from a written statement and make copies beforehand to distribute at the hearing.

budget annually and "meets quarterly with the CEO of WP to discuss community concerns and possible solutions."[72] Some members of City Council were fairly aggressive in their questioning of Wireless Philadelphia, Earthlink, and the mayor's representatives, so the assumption is that their chosen representative on the Advisory Committee will be similarly vigilant. But participation on such committees cuts both ways.

Greg Goldman explained his approach to the Advisory Committee: "As I head into the first [meeting], I'm going to look to those people to help me. Help me raise money, help me reach out to the community, help become ambassadors for this program and for this mission of digital inclusion. [Yes, there are] a lot of committees. But it also means that there's a hell of a lot of buy-in for the project." That kind of buy-in will undoubtedly be helpful for the digital inclusion and fundraising missions of Wireless Philadelphia, but it might confuse the oversight function of the Advisory Committee.

Ultimately, oversight should be Wireless Philadelphia's most important task. WP can prove its worth by growing the city's funding base for technological access and capacity, but those goals depend on EarthLink upholding its end of the bargain. The contract between WP and EarthLink includes many provisions giving WP leverage to make sure the people of Philadelphia receive the wireless network they were promised. Time will tell how WP chooses to use this leverage.

Evaluation

In August 2007, Wireless Philadelphia issued an RFP for evaluation services.[73] The two-year project will measure the impact of its T.E.A.C.H. program on the Wireless Internet Partnerships and the EarthLink Assisted account recipients. The eventual evaluator will be faced with a lack of solid baseline data from before Wireless Philadelphia began, especially since it has been three years since Philadelphia's executive committee completed its assessment.

For its part, EarthLink is not pleased with how the project has gone. Among other things, it has had to nearly double the "node density" in order to provide the service speeds and reliability it promised. The number of wireless routers EarthLink is installing in each square mile has increased from 20–25 to 42–47, and costs have risen accordingly.[74] EarthLink has also had trouble attracting subscribers to its wireless networks.[75] In the summer of 2007, the CEO of the company died unexpectedly. His replacement, Rolla Huff, immediately announced plans to revisit EarthLink's approach to municipal wireless contracts and pulled the company out of its pending deals with San Francisco and Houston. He cut 900 out of 1,900 jobs, hastened outsourcing of customer and technical services, and gutted the company's municipal division, including the team of Don Berryman and Cole Reinwand who had negotiated the Wireless Philadelphia contract. While promising to keep its commitment to Philadelphia, Huff has made it clear that he wants to negotiate for more involve-

INTERVENTION! Intervention! – The Digital Includer: If the city or nonprofit organization has established a source of revenue from the network for digital inclusion, it will need to spend that money in some fashion, hopefully in partnerships with existing community technology centers and programs. If there are organizations or programs in your city or models in other cities that you think are particularly effective, you can promote those options.

Additionally, you can also advocate for your city, nonprofit and/or private partners to develop special, open and accessible web portals to serve the needs of particular communities and/or constituencies. Philadelphia has developed portals for parents, teens/tweens, seniors, visitors, small businesses, etc. In Minneapolis, the city's private partner has agreed to develop localized community portals for different neighborhoods.

ment from the host governments. The irony of this is that, while the private ownership model has protected the city and Wireless Philadelphia from the direct expenses associated with having to increase node density, EarthLink may still pull in tax dollars by convincing the city to purchase services as an anchor tenant. This may be a tough sell in Philadelphia, where EarthLink agreed to provide discounted wireless and fiber broadband accounts to the local government, and where EarthLink competitor, Comcast, holds considerable sway.

Initial reports from non-EarthLink Assisted users have been mixed. One journalist who sought out early adopters of the network concluded that the project was off to a "shaky start."[76] Another found his outdoor experience around the downtown area satisfactory, but described a lack of reliability.[77] However, such anecdotal evidence does not tell us much, either about the true quality of the service or the impact it is having on people's lives or on the city as a whole. Looking at the early reviews, it seems likely that Philadelphians will ultimately gravitate toward the wireless network once it is fully built if they are interested in saving money, are satisfied with modest speeds, and perceive some benefit from the mobility it permits. However, given the substantial history of telecom incumbents not delivering what they promised, residents remain understandably skeptical of private providers.[78]

Conclusion

Wireless Philadelphia was a major undertaking that helped shape the national discussion around municipal wireless. In the coming years, we could see the transformation of the city of Philadelphia. We need to learn all we can from this experience to guide and strengthen the broader impact of this transformation.

The idea of a company like EarthLink paying for and owning the network in Philadelphia was considered and originally rejected because it was thought that this would limit WP's ability to deliver on its social impact goals and to ensure an affordable retail rate that would permit the entire city to be connected. The people who shaped WP were acting under difficult circumstances. The incumbent broadband providers, who exercise considerable leverage in Philadelphia, fought the project. There was a widespread aversion to spending city funds, which narrowed the range of possibilities. And the municipal wireless industry was in its infancy. Even so, the executive committee arrived at nonprofit ownership model as the right solution for Philadelphia. However, in the end, this was not the model Philadelphia adopted.

In hindsight we can see a number of missed opportunities where the project could have been made stronger. Most of these were instances where decision-makers rejected or neglected public input. This suggests that the key to a successful municipal wireless deployment is strong and consistent public engagement.

There were frequent, lengthy lulls in public engagement, especially during the period of negotiation with Earthlink, which took place for the most part behind closed doors. After the City Council approved the contract with Earthlink, Dianah Neff and Derek Pew left their positions as

INTERVENTION! A Users Union: Use online forums to connect with other Earthlink users. Share practical information, like tips for getting the best signal or for getting results from customer service. Issue an annual report card or conduct more precise reviews of connection speeds. Arrange occasional in-person meet-ups.

The important thing about measures like this is that, without having to issue any requests, complaints, or demands, the very existence of such a forum is a point of leverage, since potential customers will look there for advice and journalists will look there for quotes and anecdotes.

chief information officer of Philadelphia and interim-CEO of Wireless Philadelphia, respectively, leading to a months-long transition period while their successors were being identified and settling in. The proof-of-concept phase also took longer than predicted, without explanation.

Each lull raised doubts in the minds of some observers. More importantly, it caused the momentum from previous moments of public engagement to fade. As EarthLink and Wireless Philadelphia now seek to attract customers, clients, and donors, they face an uphill battle that leaves the fate of the project in question.

From the beginning, Philadelphia treated the process of instituting a municipal wireless network as a business venture. The mayor and the CIO selected primarily business executives for the executive committee. They partnered with business school researchers to conduct market research for the endeavor. Then, they veered toward a solution built on private investment.

This shielded the project from political and financial risk and made the project more palatable to the incumbents and easier to pass through City Council. And it meant that Wireless Philadelphia was not liable for the rising construction costs when EarthLink determined it would need to install additional hardware to achieve the service levels to which it had agreed.

However, the move toward private ownership left the nonprofit component of the project on uncertain ground. Wireless Philadelphia was founded to own the network. When EarthLink assumed that role, Wireless Philadelphia was transformed from a public agent overseeing the project into a nonprofit partner, providing marketing, training, and other services to underserved Philadelphians on behalf of a for-profit company.

This placed Wireless Philadelphia in a role for which it had not prepared and that it had not considered nearly as carefully as it had its original ownership mission. However, by emphasizing fundraising within the region and one-on-one relationships with existing community technology organizations, WP has established itself as indispensable in the attempt to narrow the digital divide. Whether this represents a significant benefit for Philadelphia in comparison to the goals of the original mission remains to be seen.

The move toward private ownership also meant a lost opportunity for using wireless technology to explore new and innovative business models for delivering communications services. The nonprofit ownership model would potentially have made Philadelphia a standout among municipal wireless networks, not only with respect to the technology it proposed to employ (i.e., non-proprietary) and the scale of the proposed deployment, but also in its business model. It would have offered an alternative not just to the incumbent duopoly of cable and DSL wireline broadband, but to the way we think about communication in the digital era (i.e., as a critical infrastructure). That was the vision of the people who contributed to the original business plan for Wireless Philadelphia. Wireless Philadelphia sacrificed that ambition when it selected the proposal from Earthlink.

The following recommendations are intended to provide overall guidance to current and would-be municipal wireless activists.

Recommendations for a Successful Municipal Broadband Development Process

City officials overseeing the development of new infrastructure who want a constructive, successful process can follow these guidelines for promoting healthy participation from all stakeholders:

Involve all stakeholders in a comprehensive assessment of the local challenges and in the development of a solution. The range of stakeholders and their needs are quite broad. Plus, there are social, political, economic, physical and technological barriers to Internet access. The successful investigation will be multifaceted and interdisciplinary.

Wireless Philadelphia did an adequate, though not exemplary, job in this regard. It undertook a methodical assessment of the condition of broadband access

in Philadelphia. There were many different modes of input. However, the research team was exclusively from the business community. The executive committee also lacked sufficient representation from the potential users of the proposed system.

Sustain open participation beyond the initial "focus group" stage, through the entire development process, and continuing even after the network is built. The people you talk to are potential champions of your cause and future customers of a commercial network. Once you get their buy-in, it is a simple matter to maintain it. But if you alienate potential participants, it will be hard to get them back. One simple, practical measure you can take is to hold follow-up town hall meetings periodically to share updates and issue new requests for help.

After Wireless Philadelphia held its town hall meeting in November 2004, it was not until April 2006 that it solicited support from a few people for the City Council hearing. It offered practically no information to the public until it sent out an e-newsletter in September 2006. Once EarthLink finally launched the network and Wireless Philadelphia began its digital inclusion programs, both faced an uphill climb to sign people up.

Promote horizontal relationships among stakeholders rather than hub-and-spoke relationships that connect stakeholders to one person or organization, but not to one another. This will help you establish strong social bonds around the project. Plus, keeping the communication process centralized limits your ability to engage with others to those with whom you have the time to maintain direct contact. The problems you are trying to solve will require much broader participation and serious collaboration. A network structure empowers your community to grow and innovate. What you give up in control you will gain in strength.

In planning the network and passing the agreement through the City Council, Wireless Philadelphia solicited input and testimony from a variety of nonprofit organizations. All of those organizations care about the issue of Internet usage and all work with overlapping constituencies. Yet Wireless Philadelphia did not take any steps to foster relationships among them that would encourage synergistic collaborations. Instead, WP is forming Wireless Internet Partnerships, a series of one-on-one relationships between Wireless Philadelphia and individual organizations

Be open with information. Publish documents, test results, and updates both on an accessible website and in offline formats. The more that happens behind closed doors, the less people will trust the end result. Plus, you want your website to be the first place people go to for information. This is important to do from the very beginning when search engines are getting used to the new terms of your work.

After a slow start, Wireless Philadelphia has improved considerably in this area. The Wireless Philadelphia website is updated regularly, with the staff blog featured prominently on the front page. The website was distressingly quiet during the long proof-of-concept phase, but important documents and committee assignments are easy to find.

Go offline. Common sense should tell you that e-mail is an ineffective way to communicate with people who lack Internet access, and yet it remains the primary method of publicizing new broadband initiatives in the early stages. Distributing information on paper takes time and money, but it is absolutely necessary. Radio—whether through participating in community affairs programs or by producing public service announcements—is a cost-effective way to reach people who lack Internet access. You can also connect through community organizations or events.

Wireless Philadelphia connected with leaders from a number of community organizations in the course of its work, though few of them engaged their members in a substantive way. WP did not develop printed materials until the later stages of the project, when it was launching its digital inclusion programs.

Incorporate existing service providers. Involve community technology institutions early on. The existing executive committee or task force should assess these human assets along with its examination of existing physical infrastructure and economic conditions. This approach helps build on and strengthen existing relationships and limits redundancy.

Wireless Philadelphia has identified partnerships with existing organizations as a core strategy for delivering its services. The problem is that Wireless Philadelphia may itself be redundant, adding an intensive layer of bureaucracy to the work of digital inclusion. Going forward, WP will need to demonstrate that it has invigorated the community technology sector in Philadelphia and added significant value to existing programs. WP will naturally evaluate its impact relative to the situation when it began its work, but other observers should compare it to the other paths Philadelphia could have followed or that other cities have chosen.

Recommendations for Community Engagement

The first thing to do is decide what you want from a wireless network. Then determine how closely your desires match the stated desires of the project being proposed. Where there is divergence, you can do two things: you seek leverage to oppose what you do not like or you can seek out other stakeholders and try to reach a compromise.

However your city's process is designed and whether you are an individual or a member of an organization, you can take steps to strengthen your position, encourage public participation, and make a positive outcome more likely.

Organize a coalition. Build relationships with your neighbors, with stakeholders, and with others who are interested in the process. If you speak together, your voice will have greater impact. The best way to begin organizing is by including many people in a discussion about how your community wants to benefit from the project.

Get to know the players. By attending public hearings and events, you will learn who has influence over the process and what they believe. You can also develop personal relationships that may prove useful.

Be the media. Simply by keeping a regular weblog of the process as it proceeds, you can establish yourself as an expert. You can also garner significant web traffic, giving you a platform for your views. Request interviews with key people for your blog or podcast. Aside from launching your own outlet, you can pitch articles or op-eds to your local newspaper.

Do your own research. Do not rely solely on city government or its consultants to decide what you and your neighbors should know. This could involve forming a partnership with researchers at a local university, conducting a survey on the street, or forming your own focus groups. The more you engage people in the research process, the more invested they will be in the ultimate outcome. The more sound your methodologies, the more compelling your results will be. Be sure to conclude and present your research in time for it to matter.

Start a community wireless project. If you demonstrate that the technology is accessible and useful, you can get more people engaged in the issue. The more you can get people to actively participate in designing their own communications infrastructure, the harder it will be for a private company or a city agency to impose a solution on them.

Appendix A: Selected Profiles of Other Municipal Wireless Networks

Boston

In February 2006, Boston Mayor Thomas M. Menino created a Wireless Task Force to recommend an approach for the implementation of a citywide broadband wireless network. Menino envisioned such a network to promote three principal goals: (1) promoting economic development and stimulating innovation, (2) ameliorating the digital divide, and (3) improving the quality and efficiency of city services.[79]

The Boston Wireless Task Force consisted of 22 representatives from business, academia, technology-oriented nonprofits, and city government. On July 31, the Task Force released its recommendations, developed in cooperation with a telecommunications consulting company. The Task Force's critical observation was that a major bottleneck currently exists in the Internet access value chain in the city. The group pictured that value chain as consisting of four distinct layers: (1) backhaul, or the connection from/to the Internet backbone; (2) metro transport, or connections between neighborhood "first mile" networks into regional networks; (3) "first mile" access, broadband infrastructure into neighborhoods and homes; and (4) "last mile" applications and services, such as ISPs and other online retail service offerings. The group noted that while several companies compete in the provision of Internet backhaul, resulting in low prices at that layer, only three companies—Verizon, Comcast, and RCN—compete at the metro transport, first mile, and services/applications layers. Of the $40 average monthly broadband costs paid by customers in Boston, only $3 goes to backhaul, while a whopping $37 goes to the other layers. Competing service providers are unable to enter the market due to the concentration at the middle layers (and the fact that broadband's legal status as an "information service" means that broadband network operators are not required to allow access to competing retail service providers).

Building on this analysis, Boston's Task Force adopted an innovative model of nonprofit ownership of physical infrastructure (i.e., metro transport and first mile layers) creating extremely cheap wholesale access (i.e., very low barriers to entry) to ISPs, as well as existing community wireless networks and local nonprofits, to buy capacity on the network. The nonprofit will fund the $16–20 million construction of the network through donations, equity, and debt. The Task Force envisions that such low barriers to entry will not only create a competitive retail market with low prices (1.5 Mbps for $7–$15), but will also allow existing community groups and digital divide programs (of which there are several, the most prominent of which is the Boston Digital Bridge Foundation) to focus their efforts on training and support rather than building their own networks to provide Internet access. Wholesale profits will go back to funding/expanding existing digital divide programs in Boston and launching several new ones.

The Boston Wireless Task Force identified six major components to the digital divide, and expects Boston's network to address all of them:

- Awareness of the benefits of broadband
- Motivation to take advantage of technology and existing programs
- Affordability of Internet Access
- Affordability of Equipment
- Training
- Technical Support

Most cities focus solely on the access component, but Boston's approach will tackle all of them, by supporting existing community initiatives and

implementing new ones. Examples of digital divide programs that will be instituted/expanded include:

- Expanding Technology Goes Home, an initiative by Mayor Menino and the Boston Digital Bridge Foundation that provides training and access to computer equipment to 800 families directly each year and 5,000 families through Boston public schools and community based organizations.
- Making the Boston Public Library and Public Schools resources available to every resident at home through a MyBPS web portal.

The Task Force also envisions the network to provide alternative wireless services for municipal government use, to allow the City to utilize the network to reduce the cost of existing wireless applications and implement new ones, such as broadband access for public safety applications and mobile workforce applications for City workers.

As of early June 2007, a number of companies were competing to play a role in the pilot Wi-Fi project in the square-mile Grove Hall neighborhood. Boston is on track for citywide Wi-Fi by the end of 2008, Pamela Reeve the chief executive of OpenAirBoston, the nonprofit created by the city to manage the wireless project, said at the time.[80]

Corpus Christi, Texas

Corpus Christi is one of the first municipalities with a truly mixed-use wireless broadband network. Corpus Christi originally deployed a Wi-Fi network for a single application—an Automated Meter Reading (AMR) system for use by the city-owned water and gas utilities. Analyzing the potential benefits of such a system, the city found that not only could it realize significant labor cost savings by eliminating the need for utility personnel to visit each meter, but it could also more quickly and accurately provide up-to-date billing information to customers. An AMR system could give customers immediate, real-time usage data through a Web-based billing and information system. With this application alone, Corpus Christi's wireless broadband network would result in significant cost savings and increased productivity for the city.[81] After an initial pilot project covering 24 square miles and over 3,000 automated gas and water meters, the city decided to invest $26 million to expand the system to the remaining 123 square miles of the city, a project that was completed in August 2006.

Investment in the AMR system gave Corpus Christi a Wi-Fi network with far more capacity than is needed for the AMR system alone. Consequently, the city embarked on an ambitious project to make the most of the network to promote the goals of government effectiveness, educational excellence, economic vitality, improved quality of life, improved public safety and homeland security, and universal public access to broadband. The city created the Corpus Christi Digital Community Development Corporation to explore and coordinate uses for its Wi-Fi and optical fiber based networks.

In addition to the utility applications, public works employees now have in-field access to geographical information systems and work management applications. Building and code enforcement inspectors can access and update databases on-the-go, reducing the time needed for building and problem correction. In education, the city and the school district are working on a system that will allow increased online parental involvement. The City's Wi-Fi network fosters economic development and local/regional businesses through a local "marketplace portal" that provides local businesses with competitive online store services and advanced marketplace services that empower local small businesses with online shopping features traditionally limited to national name brand businesses.

The Wi-Fi network has also significantly reduced the cost to the city of implementing key public safety and homeland security applications. The public safety agencies, with more than 315 police, fire, and EMS vehicles in their collective fleet, will have mobile access to all of the applications currently available only in their offices. Previously, the city would have had to implement an

expensive trunked data network for secure police applications. But Wi-Fi enables authenticated access to the police VPN (virtual private network), eliminating the need for this expensive system. Now members of the Corpus Christi police force are able to access full-color photos of crime scenes and mug shots from their squad cars. Soon, they will be able to view streaming video of disaster sites (this application is currently in the proof-of-concept phase). The city also plans to operate GPS-based asset and vehicle tracking applications over the Wi-Fi network, increasing both officer and community safety. On the homeland security front, the network will improve cooperative enforcement and video surveillance efforts between the City and the Port of Corpus Christi, the fifth largest port in the United States. It will also enable cooperative applications with the nearby oil refining community, one of the nation's largest petroleum areas.

Naturally, Corpus Christi sees its Wi-Fi network as a critical asset to increase residential broadband access. In June 2006, the city announced a partnership with EarthLink to provide business and residential retail Internet access. March 2007, the city—which had, until that point, owned the network—sold the network to EarthLink outright and established a franchise agreement with the company, in order to relieve the city of its debt from network construction and ongoing costs of operation. Subsequently, EarthLink added nodes throughout the city to heighten network performance. In June 2007, EarthLink launched residential Wi-Fi services. Residential access will be provided for about $20 per month ($7 per month for the first six months of service). A free wireless bridge, enabling better in-home Wi-Fi coverage, will be provided to customers who make an initial one-year commitment. EarthLink, professing a commitment to "open access," has stated that it will allow competing service providers, including PeoplePC, to offer services over the network—though EarthLink itself will get to set the terms of such an agreement. Whether turning over network ownership to a private service provider in a franchise agreement will, on balance and in the long term, be a positive development for the city from a digital inclusion perspective remains to be seen.

Minneapolis

In April 2005, Minneapolis issued a conceptual RFP for a citywide Wi-Fi and fiber network to be built and run by the private sector, with the city serving as an anchor tenant for the network. Unlike Philadelphia's initial business plan, in which a city-chartered nonprofit would serve as a wholesaler to ISPs, Minneapolis expected its network to be built and run by a private service provider.

The city received nine bids in July 2005, by companies including US Internet (a local ISP), Sprint, Cellnet Technology, EarthLink, and EchoStar Broadband. The costs outlined in the bids ranged from $15–$30 million, which would be borne entirely by the winning contractor, not the city. Most bidders proposed networks relying heavily on Wi-Fi mesh technology.

In August 2006, the city chose US Internet to build and run the citywide Wi-Fi network. According to the terms of the agreement, the city will pay US Internet $2.2 million up front for services to the city government (at 1 to 3 Mbps) to be purchased over 10 years. The city agreed to purchase at least $1.25 million from US Internet annually, which will be discounted by a portion of the up front payment over the 10 years. Additionally, the city will provide US Internet access to its municipal fiber infrastructure as backhaul for the wireless network. The company will provide 95 percent outdoor coverage and 90 percent indoor coverage, selling $75 wireless bridges to customers who wish to boost their signal indoors. The monthly access fee for a residential connection at 1 Mbps will be $20 per month. Business connections will cost $30 per month.

While local digital inclusion activists came up short from their goal of persuading the city to own its network outright, the Minneapolis plan is unique and remarkable in the highly progressive

slate of "community benefits" the city and local activists negotiated with US Internet. In November 2005, in response to the city's original RFP, two local nonprofit organizations, The Community Computer Access Network (C-CAN) and the Alliance for Metropolitan Stability (AMS) banded together to work on an education and outreach effort to secure a "Community Benefits Agreement" (CBA) in conjunction with the citywide wireless contract. C-CAN, a longtime supporter of community technology efforts in the area, hoped to leverage AMS's experience working with local community-based organizations to develop and enact community benefits agreements in other contexts. In response to the groups' initial organizing efforts and testimony from community technology advocates on behalf of low-income constituents, the Minneapolis City Council voted in February 2006 to amend the RFP to *require* vendor support for digital inclusion efforts, rather than merely encourage it. Catherine Settanni, Director of C-CAN, was tapped by the city to head a cross-sector Digital Inclusion Task Force to set forth a Digital Inclusion vision for Minneapolis. The Task Force solicited recommendations from a diverse slate of community groups and developed a legally-binding slate of community benefits for the city to include in its final contract with the winning bidder.[82] Highlights of the CBA included in the Minneapolis/US Internet contract were:

Service Packages: Residential services of 1 Mbps at $19.95 per month, business services of 1 to 3 Mbps at $29.95 per month, and laptop connections of 1 to 3 Mbps for the City of Minneapolis for $12 per month.

Monetary Contributions to Digital Inclusion: US Internet will contribute an advance of $500,000 to the city's Digital Inclusion Fund (DIF), and additional $200,000 upon contract execution and $300,000 upon network signoff by the City. In the future, it will pay a minimum of five percent of net pretax income and 100 percent of all community portal revenues (explained below) that are sold by the Digital Inclusion fund agency. US Internet will also host an annual Digital Inclusion fundraising event and commit its employees to volunteering in support of community benefits.

Free Access in Public Spaces: US Internet will provide a "walled garden" as a free level of service, and offer time-limited free service with 1 Mbps broadband access in defined public locations such as parks and plazas.

Community Portals: US Internet will develop up to 90 location-based community log-in sites for various Minneapolis neighborhoods that will allow access to selected government sites, community services, community technology centers, and other local civic and cultural information. These log-in sites will include multi-lingual functionality and will offer a platform for local advertising. US Internet will provide support services to local advertisers.

Network Neutrality: US Internet will ensure net neutrality defined as not limiting bandwidth, content or otherwise implementing any limitation on use or access to bandwidth in order to create or provide any advantage to itself or any wholesaler, application or network lawfully accessing the network, with the exception of harmful or malicious traffic. US Internet is authorized to manage traffic for the purpose of maximizing the speed and efficiency of the network to provide the highest standard of service to the largest number of customers on the network.

911 Services: US Internet commits that any VOIP services offered over the network provide location information for 911 callers.

Free Network Access Services for Community Technology Centers: Free connectivity to participating CTCNet member organizations.

With the establishment of the Community Benefits Agreement, Minneapolis is positioning itself at the vanguard of public-interest-minded municipalities pursuing citywide wireless broadband access. As stated in the Final Report of the City's Digital Inclusion Task Force, "No other municipality has created a similar model that includes a Community Benefits Agreement as part of a Wireless/Broadband contract; Minneapolis is creating a new model for equity and inclusion with this approach."

The Community Benefits Agreement model has become attractive to digital divide activists in other cities that are pursuing contracts with private partners for ownership and operation of city wireless networks. In Chicago, where city officials have stated an intention to pursue a citywide wireless network financed and owned by a private sector partner, local community technology activists have formed the Chicago Digital Access Alliance to conduct a campaign for a Community Benefits Agreement for Chicago. The group has defined a set of key principles for "Digital Excellence" which they are pressing the City to embed in its final contract. But as of Fall 2007 Chicago's Wi-Fi initiative is in peril after corporate partners pulled out of the endeavor.

In proposing upfront not to control or own the physical layer of the network, Minneapolis hoped to avoid some of the corporate pushback initially faced by Philadelphia and other cities with regards to government involvement in broadband provision, seen in the form of aggressive lobbying at the state and federal level (with success in Pennsylvania and several other states) for the pre-emption of municipal efforts. In Minneapolis, officials asserted that the city would not subsidize the operator, and that the government was simply using its position as a potential anchor tenant to demand low-cost broadband services for the city's residents, thus bridging the digital divide. But the reluctance of the city to play a role in the ownership of citywide broadband networks drew extensive criticism as well.

Local consumer groups expressed frustration at the city's lack of transparency in decisions about how to pursue its wireless goals. These groups, like the Institute for Local Self-Reliance, asserted that public ownership of broadband infrastructure was not nearly as risky an investment as opponents claimed, and that cities are more inclined to upgrade infrastructure to keep pace with technological change than private companies that try to maximize profit from existing infrastructure. The city could avoid dealing with day-to-day operation of the network by outsourcing operation and service provision to the private sector. Municipal ownership of the physical layer, they further argued, would enable the city to exert greater leverage over private partners with respect to enforcing service standards and ensuring adequate revenues to fund network upgrades, digital inclusion efforts, and other community benefits, and would allow the city to renegotiate contracts with private partners if problems occurred.

In mid-2007, the wireless network became a reality in many parts of downtown Minneapolis. As of the end of June, the Wi-Fi service covered 75 percent of the downtown area. Citywide completion is slated for November 2007, according to James Farstad, a Wi-Fi consultant to the city.[83]

San Francisco

In August 2005, Mayor Gavin Newsom launched the TechConnect initiative to bring affordable wireless broadband access to the entire city of San Francisco. The city first issued a Request for Proposals, inviting parties from the public, nonprofit and private sectors to weigh in with ideas on how the city can provide free or low cost wireless broadband access for residents and businesses in a way that is cost-effective for the city.[84] Other goals of the project are to improve the efficiency of government service delivery and government response to constituent needs, to promote job creation, business growth and economic development, and to enhance education by improving the interaction between teachers, students and parents.[85]

The main technical and service goals of the network, outlined in the subsequent RFP, mirror the initial business plan of Wireless Philadelphia. San Francisco's plan also puts emphasis on ensuring users can achieve seamless, mobile connectivity throughout the city using Wi-Fi technology. Additionally, as originally specified in Philadelphia, the city has specified that the network must provide open access to competing service providers.

Six groups, including MetroFi, SF Metro Connect (a collaboration of SeaKay, Cisco, and IBM), and a partnership between EarthLink and Google filed formal bids, each premised on different business models. In April 2006, the Google/EarthLink pairing was selected. EarthLink and Google proposed a two-tier service: consumers can choose between Google's free, ad-supported service running at a slow 300 kbps (about half the speed of DSL), or pay $20 per month for an EarthLink connection with a speed of 1 Mbps.[86]

While negotiating a contract with EarthLink, the City Council was hit with a wave of negative feedback about its proposed plans. Critics accused the city of rushing through the RFP process without significant public participation and input. Specifically, critics accused the city of not giving enough consideration to implementing a municipal *fiber* network, which would ensure high-capacity wired backhaul and last-mile connections throughout the city. Additionally, critics accused the city of not giving enough consideration to a *municipally-owned* broadband network, instead allowing corporate interests to sell an inferior franchise-like model that would not serve public needs as effectively. Responding to mounting pressure, the Board of Supervisors in February 2007 decided to delay a vote on the final contract with EarthLink in order to conduct a feasibility study on a municipally-owned fiber and Wi-Fi network.

In the summer of 2007, after new CEO Rolla Huff announced a review of the EarthLink's municipal broadband strategy, the company officially pulled out of the stalled negotiations.

Silicon Valley, CA

In November 2005, Wireless Silicon Valley, a project supported by the nonprofit group Joint Venture Silicon Valley, released a plan to make a fully functioning wireless network that will stretch the length and breadth (1,500 square miles) of the valley and serve 2.4 million people. To date, 41 city governments, county governments and other entities, spanning four counties, are signed on to participate in the venture.

In September 2006, the Wireless Silicon Valley Contract was awarded to Silicon Valley Metro Connect, a consortium consisting of IBM, Cisco, Azulstar, and SeaKay. As of June 2007, the consortium was operating one square-mile proof of concept networks in two participating cities, Palo Alto and San Carlos. The pilot networks will test both wireless equipment and potential applications, and will be in operation for 120 days, before the network will be expanded to the entire region.

Silicon Valley Metro Connect will build the network based on the latest Cisco Systems wireless mesh technology. Systems integration and network design will be provided by IBM. IBM will also coordinate technology applications for public agencies and local utilities including intelligent traffic solutions and wireless utility meter reading. Azulstar Networks will be the retail service provider. SeaKay, a nonprofit organization, will work with municipal agencies and local nonprofits to develop outreach and digital inclusion programs to meet the economic development and social benefit objectives of the network.

Silicon Valley Metro Connect's network will be privately owned and operated, and supported by sponsorship from the region's technology and other industries.

The network will offer a 1 Mbps service as a free base service. A fee-based premium service is also being developed. As conceived in the Wireless Silicon Valley Business Plan and RFP, the network will allow outdoor users of wireless-enabled laptops, PDAs and other devices free or low-cost basic serv-

ice. Outdoor users will have seamless and portable coverage anywhere in the network's expansive coverage area. The network will also provide guaranteed indoor service for residences and businesses, plus secure, private and mobile data networking for governments and public safety agencies from around the region, supporting mobile data access by government, and public safety workers, and a variety of public works applications as well. The network will have a minimum bandwidth of 1 Mbps for basic outdoor use, 36 Mbps for indoor use, and 24 Mbps for government and public safety.

Although wireline broadband providers reach most parts of this high-tech hotbed, some still do not have access to affordable broadband services, and many do not have wireless access. Wireless Silicon Valley will play an invaluable role filling in coverage gaps that exist in underserved areas and will add an additional competitive offering to those areas already served. Organizers hope that in addition to bridging the digital divide, the regional network will provide a platform for innovation by the region's many wireless technology companies.[87]

One complication—the existing wireless program in Mountain View provided by Google—is in the process of being resolved. The Wireless Silicon Valley Task Force is in talks with Google to set up interoperability with Mountain View's citywide network.

St. Cloud, Florida

St. Cloud, an Orlando suburb, is the first town in America to provide free wireless broadband connectivity citywide as a public service. The town—whose population is expected to balloon from 28,000 to 74,000 by 2012—views investment in a wireless broadband network as critical to making the town attractive to 21st century high-tech businesses. With that goal in mind, the city first launched a pilot Wi-Fi "Cyber Spot" in July 2004, covering a 12-square-block area of its historic downtown. The pilot was so successful that the City Council voted unanimously in May 2005 to approve the expansion of the Cyber Spot to blanket the entire city, a 15-square-mile area.

The decision to deploy (and then expand) the city's Wi-Fi network came down to a very simple calculus. According to former Mayor Glenn Sangiovanni, small businesses in the city's downtown were initially the biggest boosters of the Cyber Spot project, as many had no access to broadband connections. Furthermore, surveys of St. Cloud residents had revealed that while over 70 percent of households had computers linked to the Internet, most were connected through dial-up connections. The average cost of these connections, approximately $450 per year, constituted more than the average household paid yearly in municipal taxes (approximately $300). Thus, the city government figured that by providing free wireless broadband access to all, residents would save more than they paid in taxes and ensure that whatever public funds were spent on Wi-Fi would recycle back into the community in the form of increased economic activity and efficiency gains (as opposed to paying an Internet bill to a private service provider or telecommunications provider located outside the city). The city estimates that the citywide wireless network will generate 1,000 new jobs and $190 million in economic activity.

The citywide Cyber Spot, launched in March 2006, provides symmetrical connectivity at up to 1 Mbps. The network, constructed and managed by HP and MRI, Inc., uses approximately 300 Wi-Fi mesh nodes operating on the 2.4 GHz unlicensed band. The mesh nodes are connected in turn to backhaul at City Hall using a WiMAX configuration.

While operations are outsourced, the network is owned by the city. The network is costing the city $2.5 million in initial capital costs, which include both deployment of the network as well as the first year of operations. These funds will be taken from the city's economic development fund. After the first year, the network's ongoing yearly operational costs, estimated to be about $340,000, are expected to be paid for by productivity efficiencies in city operations.

By March 2007, after only one year in operation, 8,492 households (approximately 77 percent of households in the city) had subscribed to the Cyber Spot. Many of the subscribing households have dropped their wireline broadband connections entirely. The estimated annual savings to St. Cloud residents is $3,724,754.[88]

The network allows outdoor connectivity for both residents and visitors of St. Cloud. Although the city cannot guarantee that connectivity will extend inside all homes and businesses, it does encourage potential business and residential users to install an inexpensive wireless bridge device to bring the signal indoors if a strong signal is not already present. If more lower-frequency spectrum is opened up for wireless broadband use, building penetration could be achieved more easily and without the need for extra equipment on the customer premise.

In addition to economic benefits to businesses in the area, the network is creating an immediate payoff in education and quality of life. The Cyber Spot provides instant wireless connectivity to all schools in the area, and ensures that even low-income children (who are provided laptops at school) have access to the Internet at home as well. Sangiovanni expects that the network will allow more parents to telecommute and spend more time with their children, and may even allow parents to keep an eye on their children while they are playing at the park through wireless video cameras connected to the Internet.

The Cyber Spot infrastructure will also provide connectivity over a secure network for government and public safety agencies. All city departments are actively experimenting with ways of integrating the wireless network into daily tasks in order to improve efficiency. The city's building inspectors, for example, are using tablet PC's schedule inspections and file reports remotely, increasing the number of inspections they are able to perform and reports they are able to file and all but eliminating their need to report into the city office. Across all city departments, these efficiencies are expected to add up and save the city up to 6 FTE's (full-time employees) in the first year alone. These efficiencies will help pay for the ongoing costs of the network.

Appendix B: Recommended Resource Guide

Helpful Organizations, Links, and Books for Those Interested in Municipal Wireless Advocacy

New America Foundation Wireless Future Program

About: The New America Foundation's Wireless Future Program develops and advocates proposals to make wireless broadband access universal and affordable. The Wireless Future Program works to increase unlicensed public access to the airwaves (i.e. electromagnetic spectrum) to allow municipal and regional governments, community groups, and small commercial service providers to cost-effectively deploy wireless broadband networks. New America also researches policies and practices to help ensure that municipal and regional wireless broadband efforts best serve the public interest.

URL: www.spectrumpolicy.org

Sample Resources from New America:

Stakeholder Strategy Committee Report: Wireless Broadband and Public Needs

Report from the first convening of New America's Stakeholder Strategy Committee, a 12-member group representing community technology groups and advocates for a broad array of underrepresented constituencies, including low-income, rural, Native, disabled, and people of color.

Download for free, or request printed copy at: http://www.newamerica.net/publications/policy/building_constituencies_for_spectrum_policy_change_first_report

The Citizen's Guide to the Airwaves

A graphical description of the radiofrequency spectrum, its value, and its uses (and misuses).

Download for free, or order a printed copy at: http://www.newamerica.net/publications/policy/citizens_guide_to_the_airwaves

Contact:
New America Foundation - Wireless Future Program
1630 Connecticut Avenue, NW, 7th Floor
Washington, DC 20009
Phone: (202) 986-2700

The Ethos Group

About: The Ethos Group is a telecommunications consulting firm focusing on the community benefits of wireless technology. Ethos follows three core principles: **accessibility**, **accountability**, and **affordability**. Ethos prioritizes the needs of the community in its assessments and works directly with municipal representatives as well as local residents to deliver proposals and networking options tailored to each community's particular needs. Ethos's founders, associates, and advisors leaders in the fields of municipal wireless, community technology, and telecommunications policy.

URL: www.ethoswireless.com

Sample Consulting Services from Ethos Wireless:

Broadband Business Planning
Develop the broadband network that maximizes the financial and social benefits for your community.

Community Needs Assessments
Ethos conducts Community Needs Assessments (CNAs) that go beyond statistics and surveys to understand the human relationships that make your community unique and vibrant, using both quantitative and qualitative measures.

RFP Development and Issuance
After assessing community assets and goals, Ethos works with clients to formulate a Request for Proposals (RFP) meeting the client's needs and priorities.

Technical & Engineering Expertise
Ethos's broad technical expertise allows it to approach each municipality as an opportunity for merging the best available technologies to meet community needs. Ethos surveys and troubleshoots existing infrastructure, analyzes geography and topography, and assesses community needs in devising the best solutions.

Wireless and Community Broadband Training
Ethos offers educational presentations and materials to communities seeking to understand wireless and community broadband technologies and how to take full advantage of existing and future networks.

Sample Resources from Ethos Wireless:

Better Broadband Toolkit
A free, comprehensive, annotated library of municipal broadband resources.
http://ethostoolkit.net

Contact:
P.O. Box 938
Urbana, IL 61803
Phone: (202) 470-5257

Free Press Community Internet Campaign

About: Free Press is a national nonpartisan organization working to increase informed public participation in crucial media policy debates, and to generate policies that will produce a more competitive and public interest-oriented media system with a strong nonprofit and noncommercial sector.

Free Press's Community Internet Campaign page provides the basics on municipal broadband—what it is, its history, updates on what is going on in various municipalities nationwide, policy analysis, and how to act.

URL: www.freepress.net/communityinternet

Sample Resources:

Community Internet 101

A tutorial on how community broadband networks can improve access to information, provide education and job training, enhance public safety, foster technological innovation, and bolster local economic development.

Community Internet Policy
The basics on federal, state, and FCC regulations affecting community broadband.

Community Internet Map
An interactive online map showing community, municipal, and WISP broadband networks across the country—including their development status (i.e., RFP, operational, etc.) and type of technology (i.e., wireless on unlicensed spectrum, fiber optic, etc.).

Contact:
Free Press
501 Third Street, NW
Suite 875
Washington, DC 20001
Phone: (202) 265-1490

Baller Herbst Law Group

About: The Baller Herbst Law Group, P.C. has a national law practice based in Washington, DC, and Minneapolis, MN. The Firm represents the American Public Power Association, regional and state municipal electric associations, state municipal leagues, local governments and public power systems across the United States on a broad range of regulatory, administrative, legislative and judicial matters involving telecommunications, cable services, Internet access and other communications services.

URL: www.baller.com

Sample Services:

Comprehensive telecommunications planning and implementation

Establishment and optimal utilization of advanced telecommunications systems

Identification and evaluation of potential strategic partners and negotiation of cooperative relationships

Contact:
Baller Herbst Law Group, P.C.
2014 P Street, NW
Suite 200
Washington, DC 20036
Phone: (202) 833-5300

Media Access Project

About: Media Access Project (MAP) is a 35 year-old nonprofit tax exempt public interest media and telecommunications law firm which promotes the public's First Amendment right to hear and be heard on the electronic media of today and tomorrow.

URL: www.mediaaccess.org

Contact:
Media Access Project
1625 K Street, NW, Suite 1000
Washington, DC 20006

Institute for Local Self Reliance New Rules Project: Telecommunications as a Commons Initiative

About: The Institute for Local Self Reliance (ILSR) is an organization dedicated to promoting sustainable communities through *localized public ownership* of essential infrastructure. ILSR believes that only public ownership of a city's information infrastructure can guarantee citizens a controlling voice in the design and operation of those systems. Information networks can operate like road networks: a common carrier, open to all users and suppliers, small and large, at similar rates. We're working with key officials in a half dozen cities to foster publicly-owned information networks.

URL: www.newrules.org

Sample Resources:

Localizing the Internet: Five Ways Public Ownership Solves the U.S. Broadband Problem

Download for free at:
www.newrules.org/info/5ways.pdf

Contact:
New Rules Project
Institute for Local Self-Reliance
1313 Fifth Street, SE
Minneapolis, MN 55414
Phone: (612) 379-3815
Email: info@ilsr.org

Consumers Union HearUsNow.org

About: Consumers Union, publisher of Consumer Reports, is an independent, nonprofit testing and information organization serving only consumers. HearUsNow.org follows Consumers Union's long tradition of promoting a fair and just marketplace by empowering consumers to fight for better and more affordable telephone, cable and Internet services or equipment.

URL: www.hearusnow.org/internet/190/ and www.hearusnow.org/internet/18/

Contact:
1101 17th Street NW,
Suite 500
Washington, DC 20036
Phone: (202) 462-6262

Local Metropolitan Groups Organizing Around Municipal Wireless

NEW YORK

People's Production House Digital Expansion Initiative

About: People's Production House is a comprehensive media justice organization serving New York City and Washington DC. The Digital Expansion Initiative develops new experts in Internet policy and technology and promotes meaningful Internet access for all New Yorkers through participatory research, public education, and community organizing.

URL: digitalexpansion.net

Contact:
265 Canal Street, Suite 410
New York, NY 10013
Phone: (212) 334-7433
Email: info@peoplesproductionhouse.org

CALIFORNIA/BAY AREA

Media Alliance Internet 4 Everyone Campaign

About: Media Alliance is a 30 year-old media resource and advocacy center for media workers, nonprofit organizations, and social justice activists. Our mission is excellence, ethics, diversity, and accountability in all aspects of the media in the interests of peace, justice, and social responsibility.

Why is there still a digital divide in California? Why doesn't everyone have access to the Internet? Comcast and SBC monopolize our access to the Net. Join us in securing viable alternatives. We want Internet 4 Everyone!

URL: action.media-alliance.org/article.php?list=type&type=3

Contact:
1904 Franklin Street
Suite 500
Oakland, CA 94612
Phone: (510) 832-9000
Email: information@media-alliance.org

PHILADELPHIA

Media Mobilizing Project

About: Media Mobilizing Project builds community media infrastructure that results in concrete gains for groups organizing locally, regionally, and nationally in areas of housing and equitable development, worker rights, and education. It also produces media for use in organizing campaigns. It is currently implementing a project to distribute audio and video reports from Philadelphia's immigrant communities via the city's new wireless network.

URL: mediamobilizing.org

Contact:
Philly IMC Media Mobilizing Project
LAVA
4134 Lancaster Avenue
Philadelphia, PA 19143
Email: mmp@phillyimc.org

MuniWireless

About: MuniWireless.com is devoted to municipal broadband projects worldwide that are funded or supported by cities and towns, especially those projects that incorporate wireless technologies. These range from downtown hot-zones & city- and county-wide wireless broadband networks, to country-wide deployments. Although the site often refers to cities, rural municipalities receive equal coverage, because they are leading the fight for affordable, fast, universal access to the Internet. The site also covers the products, technologies, and standards that comprise public broadband networks, and the organizations that design, install, and maintain them. MuniWireless is now a full-fledged media producer, producing a magazine, as well as ongoing conferences and seminars on municipal wireless throughout the world.

URL: www.muniwireless.com

Wi-Fi Net News

About: Daily reporting on wireless data networking. Includes reporting on municipal wireless.

URL: www.wifinetnews.com

Broadband Reports

About: Provides news, information, and reports on broadband networking and municipal wireless.

URL: www.broadbandreports.com

A Civil Defense Blog by Josh Breitbart

About: Media policy activist Josh Brietbart, co-founder of Ethos Wireless and Policy Director at New York City's People's Production House, keeps a periodic blog with thoughts and analysis on municipal broadband.

URL: josh.fm/tag/internet

Public Ponderings Sascha Meinrath's Blog

About: Community wireless pioneer Sascha Meinrath, founder of the Champaign-Urbana Community Wireless (CUWiN) network and Principal of Ethos Wireless, analyzes telecommunications and Internet policy with an emphasis on broadband and municipal wireless.

URL: www.saschameinrath.com

Conferences & Conventions

International Summit for Community Wireless Networking

About: This yearly summit is the largest gathering of wireless network developers, technology and policy experts, and community organizers working to build universal, low-cost broadband networks around the world. "The International Summit for Community Wireless Networks explores the opportunities and challenges facing the growing movement to build nonprofit, open-source, community and municipal broadband networks," said Sascha Meinrath, co-founder and Executive Director of CUWiN.

URL: www.WirelessSummit.org

MuniWireless Conferences

About: These periodic conferences organized by MuniWireless.com and Microcast bring together municipal officials, policy activists, vendors and many others.

URL: www.muniwireless.com/events

Wireless Internet Institute (W2i) Digital Cities Convention

About: Founded in 2002, the Wireless Internet Institute, LLC, is an independent forum bringing together stakeholders around the world to accelerate the adoption of wireless Internet in support of social and economic development and better managed cities, communities and regions.

Held annually in three to four regions of the world, the W2i Digital Cities Convention is a thought-leadership conference exploring the planning and deployment of broadband-wireless infrastructure, applications and services at the metropolitan scale, and a professional development seminar for local-government IT professionals.

URL: w2i.com/
w2i.com/about/digital_cities_convention

Books

Fighting the Good Fight For Municipal Wireless
By Craig Settles

ISBN: 1-58776-836-4
Soft Cover
288 Pages

From Successful.com:

"This is one book you need to read now if you want to use municipal wireless and mobile workforce applications to improve your government's efficiency, responsiveness and fiscal strength.

Using a combination of narrative and directive, business strategist Craig Settles tells how Philadelphia launched its citywide broadband wireless initiative, and gives you a foundation for planning your own wide-scale wireless project. Fighting the Good Fight doesn't give you all the right answers. It poses questions you need to ask to determine what answers are right for you.

Craig Settles helps organizations develop strategies for using Internet, mobile and wireless technology to increase revenues, reduce costs and operate more efficiently. As president of Successful.com, he started writing the book about municipal wireless when he worked at Metricom, which marketed the Ricochet wireless Internet access service."

URL: www.successful.com/fgfsummary.html

Critical Materials from Cities for Public Interest Activists

Boston

Task Force Site: www.cityofboston.gov/wireless/

Task Force Final Report:
www.cityofboston.gov/wireless/Boston%20Wireless%20Task%20Force%20Report%20-%20Final.pdf

Minneapolis

Digital Inclusion Task Force Report: www.digitalaccess.org/documents/MDITF%20complete.pdf

Final Wireless Minneapolis Community Benefits Agreement:
www.digitalaccess.org/daecResources.htm

Chicago

Chicago Digital Access Alliance:
www.digitalaccessalliance.org

Digital Access Alliance Ten Principles for Digital Excellence:
www.digitalaccessalliance.org/principles-for-digital-excellence

Appendix C: Glossary of Key Terms

Anchor tenant – A big customer who makes a big commitment to purchase from a specific provider, establishing some financial stability. For a citywide wireless network, the city itself or specific agencies are the most common and sensible anchor tenants.

Broadband - A vague and politically-charged catchall term for Internet connections that are faster than dial-up, including digital subscriber line (DSL), cable, fiber optic, and most wireless and satellite services. The FCC defines broadband as 200 kbps in one direction, which means there is significantly more variation within the broadband category of connections than between broadband and not-broadband.

Business Model - The plan for how to sustain the project financially, specifying sources for capital construction costs and ongoing revenue. A chart listing the most common business models for municipal wireless networks can be found on page 24.

CIO - Chief Information Officer, the person in charge of a city's (or an agency's or a corporation's) technology assets.

Community Needs Assessment - A common practice to determine the locally-appropriate solution, usually undertaken before issuing an RFP for network construction. A city may conduct its own CNA, form a volunteer committee for this purpose, or issue an RFP for an outside company to perform the assessment. A community can also conduct its own needs assessment.

Hotspot - The area surrounding a single point of wireless Internet access. As contrasted with a "mesh network," a hotspot has a hub-and-spoke architecture, with every device connecting to a single, central point. The advantage of a hotspot is its simplicity.

Incumbent - An existing service provider that, having already expended capital to establish itself in a market, has a competitive advantage over new entrants to the marketplace. With phone service, the incumbent is sometimes called an ILEC, or Incumbent Local Exchange Carrier, but there can also be an incumbent cable company or even wireless Internet provider. One way to address the power of incumbents is by having an "open access" network, which means multiple service providers can use the same infrastructure.

ISP - Internet Service Provider, the company from which one purchases Internet service.

Mesh Network - A network architecture with multiple paths of connection. As contrasted with a hotspot, each node in a mesh network can be a beginning, middle, or end. The advantages of a mesh network are the capacity to route around damage and grow organically.

Node density – The number of wireless routers in a given area, usually a square mile. Higher node density will usually mean better performance and higher cost.

Proof of Concept - An initial phase of a project intended to demonstrate that the overall project will do what its designers say it will do.

RFP - Request for Proposals, a formal solicitation from a corporation or government agency. Issuing a public request is intended to ensure a competitive, open process for selecting a company for an important contract.

Service level agreement (SLA) – A contract provision that sets performance standards. For a municipal wireless network, it might require a specific amount of bandwidth be available at all times everywhere in the city, and set penalties for downtime.

Unlicensed Spectrum - A portion of the publicly-owned airwaves available for use by the general public. Other sections require a license for broadcast on a specific frequency, while unlicensed spectrum usually only requires that the device be certified. Cordless telephones, garage door openers, TV remote controls, and Wi-Fi routers all use unlicensed spectrum.

Acknowledgements

New America Foundation: The New America Foundation is a nonprofit, post-partisan, public policy institute that was established through the collaborative work of a diverse and intergenerational group of public intellectuals, civic leaders, and business executives. New America seeks to preserve, update, and expand the public interest obligations of our nation's communications infrastructure for the digital age through its Wireless Future Program.

Ethos Group: The Ethos Group is committed to refocusing the debate over municipal broadband to prioritize local needs and empower communities to get the broadband service that benefits them. Ethos provides tools, research, and strategic consulting services to communities worldwide.

CIMA: Center for International Media Action is dedicated to a vision of a media and communications system that serves social justice and human rights. CIMA aims to strengthen the voice and power of communities in shaping media and communications policy, infrastructure and activism through programs that help groups build their alliances, knowledge, and strategies. Based in Brooklyn, NY, CIMA collaborates with advocates, organizers, educators, and funders across the US and around the world. We help groups work together, share and access knowledge. For more about CIMA and a broad library of resources for media & communications activism, see: www.mediaactioncenter.org.

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Naveen Lakshmipathy: As Senior Program Associate of the Wireless Future Program, Naveen Lakshmipathy contributed broadly to the program's efforts to broaden public access to the airwaves through research, writing, and outreach. He also managed the program's web content and print publications. Mr. Lakshmipathy holds a Master's degree in Public Policy and Administration from the London School of Economics, and a Bachelor's degree in Political Economy from University of California, Berkeley. He left New America in the summer of 2007 for an Indicorps service fellowship.

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ment Technology's Digital Communities, the online portal and comprehensive information resource for the public sector. Sascha has also worked with Free Press, the the Cooperative Association for Internet Data Analysis (CAIDA), the Acorn Active Media Foundation, the Ethos Group, and the CUWiN Foundation.

The following gave their time and expertise in reading earlier drafts of this report. Their input was critical, though they may not necessarily agree with every one of the conclusions.

Sue Beckwith, Community Network Consultant and Organic Farmer
Richard Chabrán, California Community Technology Policy Group
Becca Vargo Daggett, Institute for Local Self-Reliance
Dharma Dailey, The Ethos Group
Cecille Isidro, Acorn Active Media
Nicol Turner Lee, Neighborhood Technology Resource Center and OneEconomy
Antwuan Wallace, Science and Technology Policy Fellow at The National Academies

We would like to acknowledge the generous support of the Otto Haas Charitable Trust of Philadelphia for making this report and related research possible.

Endnotes

[1] *See* Jim Baller and Casey Lide, "America Needs a Fiber-Based National Broadband Policy Now, if Not Sooner," *FTTH Prism*, Vol. 3, No. 2, October 2006.

[2] OECD Broadband Statistics, December 2006 and June 2007. Available online at: www.oecd.org/sti/ict/broadband.

[3] S. Derek Turner, "Broadband Reality Check II," Free Press, August 2006, available at: www.freepress.net/docs/bbrc2-final.pdf.

[4] For more information on net neutrality, *see* www.SaveTheInternet.com.

[5] Jonathan Bowles, Center for an Urban Future, "New York's Broadband Gap" (December 2004).

[6] For example, following the collapse of the I-35 bridge in Minneapolis on August 1, 2007, cell phone networks were overloaded, but US Internet was able to make its partially-complete wireless network freely available to rescue workers and stranded commuters. *See* James Farstad, "Minneapolis Bridge Collapse Provides Early Test of Wi-Fi Network" (08/06/2007) http://w2i.com/resource_center/the_w2i_report__weekly_newsletter/news/p/newsletterId_/id_122.

[7] This expectation may be unrealistic. Some communities lack the density, affluence or other ingredients that might entice a reliable network operator to risk its own capital. Other communities—including, perhaps, Philadelphia—would need to give up too many of the potential public benefits to ensure the investment will be highly profitable to a private owner/operator. By the second half of 2007, even EarthLink was expressing hesitation to front the cost of new deployments. *See* Stephen Lawson, IDG News Service, "EarthLink's Caution Reflects Shift in Muni Wi-Fi" (August 01, 2007) http://www.pcworld.com/article/id,135335-c,wireless/article.html.

[8] See Becca Vargo Daggett, "Localizing the Internet: Five Ways Municipal Ownership Solves the U.S. Broadband Problem," Institute for Local Self-Reliance, January 2007, available at: http://www.newrules.org/info/5ways.pdf.

[9] A hot spot was also launched at the Reading Terminal Market, an indoor farmers and gourmet food emporium tailored to serve visitors from the Pennsylvania Convention Center.

[10] For more information on the pilot project, *see* http://www.prontonetworks.com/PR_1stJoint_WiFi_Hotzone.htm and http://www.phila.gov/wireless/pdfs/Love%20Park%20v3.pdf.

[11] Within a couple of years, this sense of cooperation would start to change. *See* http://www.govtech.net/digitalcommunities/story.php?id=102873.

[12] According to the press release announcing the EC, "The talents and areas of interest represented by the Committee will help identify funding sources and partnerships as part of the business plan." Mayor's Office of Communications, "Mayor John F. Street Announces Appointment of Wireless Philadelphia™ Executive Committee," August 25, 2004.

[13] "Wireless Philadelphia™ Business Plan," The Wireless Philadelphia™ Executive Committee. (February 9, 2005), p. 7.

[14] *Supra* note 11.

[15] Philadelphia Board of Ethics, *In Re: Dianah Neff*, (September 20, 2006), pp. 2–4, available at: http://www.phila.gov/ethicsboard/pdfs/Neff_Report.pdf.

[16] David Ho, "Small Georgia Firm Has Big Role In Municipal Wireless Internet," *Cox News Service*, (January 8, 2007) available at: http://www.coxwashington.com/news/content/reporters/stories/2007/01/08/BC_CIVITIUM_NY_ADV03_COX.html?cxtype=rss&cxsvc=7&cxcat=0.

[17] Philadelphia Board of Ethics, *In Re: Dianah Neff*, (September 20, 2006), p. 2,. Available at: http://www.phila.gov/ethicsborad/ pdfs/Neff_Report.pdf.

[18] Following the announcement from Civitium that Neff would be joining the firm as a Senior Partner, Mayor John Street initiated an Ethics Board investigation to determine whether she violated any laws or otherwise acted improperly. The investigation found that because Neff awarded the contracts before reform measures took effect on February 1, 2006, she was not required to open the contracts to competitive bidding. But it also said she should have consulted the Ethics Board or Law Department once she began discussing employment with Civitium. *See Ibid.*

[19] See Julie Fesenmaier, et al, "The Wireless Philadelphia Initiative: Final Report to the City" (December 2004) http://ibit.temple.edu/programs/wirelessphila/ (accessed August 26, 2007).

[20] "Wireless Philadelphia™ Business Plan," The Wireless Philadelphia™ Executive Committee, (February 9, 2005), p. 20.

[21] "Request For Proposals For A Citywide Wireless Network," Wireless Philadelphia, pp. 1718.

[22] "Wireless Philadelphia™ Business Plan," The Wireless Philadelphia™ Executive Committee, (February 9, 2005), p. 23.

[23] *Ibid.*, p. 24.

[24] "Why Wi-Fi," Media Tank program brochure (November 17, 2004).

[25] "Wireless Philadelphia™ Business Plan," The Wireless Philadelphia™ Executive Committee (February 9, 2006).

[26] The Boston Wireless Task Force also divided the models into a different set of five categories, explaining that any one could include participation from for-profit or

nonprofit entities. They offered the following options:

1 Community hotspot model – public/private decentralized model in which residents with broadband connections open their access points to each other's connections using a sharing model.

2 EarthLink model – private, exclusive model in which a single company builds, operates and sells retail monthly and one-time services to consumers, businesses and the city.

3 Google/MetroFi model – private, exclusive model in which a single company builds, operates and sells paid access and ad-supported free access.

4 Venue hotspots model – private, open model in which several companies build hotspot areas and sell access on a one-time or monthly basis.

5 Municipal build – public, exclusive model in which a city builds, operates and sells or gives access to its residents and visitors using taxpayer dollars.

For Boston, they proposed a nonprofit ownership model emphasizing open access. *See* "Wireless in Boston: Wireless Task Force Report," Boston Wireless Task Force, (July 31, 2006).

[27] "Wireless Philadelphia™ Business Plan," The Wireless Philadelphia™ Executive Committee (February 9, 2005), p. 39.

[28] *Ibid.*, p. 33. The Executive Committee cited www.findanisp.com, an Internet directory of ISPs. For at least some of those companies, this prediction has not come to pass as a similar search yielded only 355 dial-up ISPs in March 2007.

[29] *Ibid.*, p. 38.

[30] *Ibid.*, p. 34 (citing research from Mark Cooper of the Consumer Federation of America).

[31] *Ibid.*, p 38.

[32] *Ibid.*, p. 33. The provision of electricity would ultimately become a major sticking point in negotiations involving the private energy utility PECO. This is explained in more detail further in this report.

[33] *Ibid.*, p. 39.

[34] *Ibid.*, p. 42.

[35] Becca Vargo Daggett, "Localizing the Internet: Five Ways Municipal Ownership Solves the U.S. Broadband Problem," Institute for Local Self-Reliance, January 2007, available at: http://www.newrules.org/info/5ways.html.

[36] One Megabit per second (Mbps, representing one million data bits per second) is a measure of the data transfer speed of a network connection. Speed is specified as either *downstream* (from the Internet to a computer), *upstream* (from a computer to the Internet), or *symmetrical* (the same speed in both directions). The FCC defines a "broadband" connection as providing 200 kbps (kilobits per second, one kilobit represents one thousand data bits per second) of speed in at least one direction. As a point of reference, 200 kbps downstream is the minimum speed necessary to receive very low-quality streaming video. Currently, prevailing broadband offerings in the U.S. offer downstream speeds of up to 5 Mbps (cable) and 3 Mbps (DSL). U.S. customers pay approximately $12 per Mbps of speed. In contrast, in Japan, where broadband offerings of 100 Mbps or faster are common, customers pay approximately $1 per Mbps. In other words, U.S. customers pay nearly twice as much for a connection that is at least 20 times as slow. (*See* S. Derek Turner, "Broadband Reality Check II," Free Press (August 2006), available at: www.freepress.net/docs/bbrc2-final.pdf.)

[37] Philly Future, "YOUR Interview with the CIO of Philadelphia - Dianah Neff" (May 22, 2005) http://www.phillyfuture.org/node/809. See specifically http://www.phillyfuture.org/node/809#comment-482.

[38] Full text of Act 183 available at http://www.legis.state.pa.us/WU01/LI/BI/BH/2003/0/HB0030.HTM.

[39] For a comprehensive view of state legislation on municipal broadband, see the map at Free Press, "Community Internet," available at: http://www.freepress.net/communityinternet/=munibroad.

[40] This bill was reintroduced in 2007 and with a vote pending at the time of this writing. Recently in Pennsylvania, legislators have begun rethinking the wisdom of HB 30. It now looks increasingly likely that HB 30 will be amended or rescinded.

[41] For a discussion of how this trend dominated the municipal wireless industry for a year, *see* Joshua Breitbart, "The End of the Philadelphia Model?" *Digital Communities*, September 20, 2006, available at: http://www.govtech.net//digitalcommunities/story.php?id=101091.

[42] The proposals all involved partnerships among multiple companies. For example, AT&T worked with BelAir and Lucent; HP with Alvarion, Aptilo, Tropos and Business Information Group; and EarthLink with Tropos and Motorola Canopy.

[43] Quoted in Joshua Breitbart, "The End of the Philadelphia Model?" *Digital Communities*, September 20, 2006, available at: http://www.govtech.net//digitalcommunities/story.php?id=101091.

[44] National Cable & Telecommunications Association *et al.* v. Brand X Internet Services *et al.*, Decided June 27, 2005, available at: http://www.law.cornell.edu/supct/html/04-277.ZS.html. That decision applied to cable providers. The FCC move came on August 5: http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-260433A1.pdf.

[45] *See* http://www.wirelessphiladelphia.org/digital_inclusion.cfm.

[46] For further critique of Digital Inclusion, see Sascha Meinrath, "Beyond Digital Inclusion," Government Technology's Digital Communities Magazine (June 2007) http://www.govtech.com/dc/articles/125514 and Joshua

Breitbart, "Digital Inclusion or Digital Expansion?" Civil Defense blog http://josh.fm/2006/06/21/digital-inclusion-or-digital-expansion/.

[47] Compare September 2006 newsletter "Introducing Wireless Philadelphia" with Wireless Philadelphia website (March 2007), available at: http://www.wirelessphiladelphia.org/digital_inclusion.cfm.

[48] Those areas include Love Park, Benjamin Franklin Parkway, Belmont Parkway, The Historic Square Mile, Penn's Landing, Cobbs Creek Environmental Center, Hunting Park, Wissahickon Environmental Center, Pennypack Environmental Center, Mouth of the Pennypack, Bartram's Garden, FDR Park, and Penn Treaty Park. *See* http://www.wirelessphiladelphia.org/wireless_areas_free_access.cfm.

[49] The City Council-selected areas are Capitolo Playground, Murphy Recreational Center, Malcolm X Park, Carroll Park, Martin Luther King Center, Pennypack Park on the River, Norris Square, Vernon Park, Dorothy Emanuel Center, and the Fox Chase Playground.

[50] Despite this approach, the electricity rates still had not been finalized by the end of 2006, but Greg Goldman was still negotiating: "How much money should we really have to pay PECO when there are people out there who don't have the access? So for every $100,000 I don't have to pay to PECO and can provide those direct services to individuals, that's only going to improve our city... So are we going to pay PECO more or are we going to try to uplift our community? And I fully intend to make that distinction quite clear to everybody—including PECO." (from interview with the author that appeared in the December 2006 issue of *Government Technology's Digital Communities Magazine*.)

[51] As Becca Vargo Daggett summarizes, the payments would arrive as follows: $250,000 20 days after agreement is signed; $750,000 20 days after the feasibility of the project is verified through the successful completion of the proof of concept area; and $1 million one year after the successful completion of the proof of concept. The remaining $24 per year per light pole equals $97,200 annually if 4,050 light poles are used. see Becca Vargo Daggett, "Wireless Philadelphia-EarthLink Contract: Highlights" (April 14, 2006), *Revised April 24.* http://www.newrules.org/info/philly-earthlink-contract.html

[52] For a detailed analysis of the EarthLink -WP contract, *see* Becca Vargo Daggett, "Wireless Philadelphia-EarthLink Contract: Highlights," April 14, 2006, *Revised April 24.* http://www.newrules.org/info/philly-earthlink-contract.html.

[53] p. I-1 Wireless Philadelphia-EarthLink Network Agreement Exhibits.

[54] Derek Pew described WP's indirect, market-based influences to the first author as "Like the Fed," at one City Council hearing, comparing WP's power in the Philadelphia ISP market to the Federal Reserve Bank's influence over US lending rates.

[55] Wireless Philadelphia-EarthLink Network Agreement, p. 23.

[56] "Introducing Wireless Philadelphia," Wireless Philadelphia newsletter (September 2006) available at http://josh.fm/2006/09/13/wireless-philadelphia%E2%80%93earthlink-access-to-cost-2195/.

[57] http://www.earthlink.net/wifi/ as of August 2007. It should also be noted that the "assisted" rate is $6.95 for three months, and then $9.95, while the regular promotion rate is $6.95 for *six* months, and then $19.95 thereafter.

[58] Witnesses came from the Korean Community Development Center, the Mt. Airy CDC, Uptown Entertainment and Development Corporation, Greater Philadelphia Cares, the Caring People Alliance, TechAccess PA, Computers for Youth, the Philadelphia School District, and the Fronteras Norteñas web radio station, according to the Joint Council Committees on Technology & Information Services and Public Property and Public Works (Wireless Philadelphia).

[59] One person complained about the health effects of radio transmissions and was disregarded. The owner of Closed Networks, a local wireless competitor, criticized the lack of required upgrades to the system. He was also dismissed after a Council Member asked if it was better to have some access or no access. The author of this report, who was there in his former capacity as Communications Director of Media Tank, questioned the oversight and governance procedures (*see* Joshua Breitbart, "Written comments of Joshua Breitbart, Communications Director of Media Tank, before the Philadelphia City Council regarding the Wireless Philadelphia-EarthLink agreement," (March 30, 2006) available at: http://www.mediatank.org/Issues/wireless/033006testimony.html. At the next hearing, Council Member Brown asked questions of the EarthLink representative based on that testimony.

[60] With at least one organization, People's Emergency Center, the partnership was strong enough that Clifton Roscoe, Earthlink's General Manager for Philadelphia, wound up on the organization's Board of Directors. *See* http://pec-cares.org/pecbrd.htm.

[61] *See* Hannah Sassaman, "Amendments to Wireless Philadelphia Ordinance: A Dissection!" http://hannahjs.wordpress.com/2006/05/04/amendments-to-wireless-philadelphia-ordinance-a-dissection/.

[62] Joshua Breitbart, "What Will the Wireless Philadelphia Budget Look Like?" *Civil Defense*, (April 27, 2006) available at: http://breitbart.wordpress.com/2006/04/27/what-will-the-wireless-philadelphia-budget-look-like/. .

[63] For a map of the proof of concept area, see http://wirelessphiladelphia.org/wireless_areas.cfm.

[64] Specifically, a happy hour on October 26, a $200-a-ticket soiree at the city's "ultimate penthouse" on November 30 (http://www.wirelessphiladelphia.org/pdfs/wp_invitation_web.pdf) and a "techno-flirt dance party" on

February 8 (http://www.wirelessphiladelphia.org/in_the_media.cfm/news/48.htm) It named the first "Wireless Angels"—donors who contributed $25,000 or more (http://www.wirelessphiladelphia.org/newsletter_feb_07.htm)

[65] *See* http://ninthwavemedia.com/index.php?fuseaction=home.pressroom.

[66] For more information on WP's plan for the "six links" see http://www.wirelessphiladelphia.org/about_wireless.cfm. Wireless Philadelphia also went through the process of redesigning its own website with Philadelphia-based firm O3 World.

[67] "Wireless Philadelphia-Digital Inclusion Program: How Does it Work?" *See* http://wirelessphiladelphia.org/pdfs/digital_inclusion.pdf.

[68] Quoted in Joshua Breitbart, "Digital Inclusion: Wireless Initiatives," *Government Technology*, (Dec 20, 2006), available at: http://www.govtech.net/digitalcommunities/story.php?id=102997.

[69] For profiles of the women who received the first bundles of Internet service and a laptop, see Dan Geringer, "Wi-fi Philly's laptop leap," *Daily News* (June 14, 2007) http://www.philly.com/dailynews/local/20070614_Wi-fi_Phillys_laptop_leap.html.

[70] Interview with the author, October 2006.

[71] See Bruce Schimmel's "On Demanded" column, on Comcast's routine disregard for those requirements in its franchise. http://www.citypaper.net/articles/2006/12/07/On-Demanded.

[72] See http://www.wirelessphiladelphia.org/about_committees.cfm.

[73] The full RFP is available at http://www.wirelessphiladelphia.org/documents/Evaluation%20RFP-FINAL.pdf.

[74] Eric Bangeman, "Philadelphia WiFi network gets more expensive as city-wide launch nears," ars tecnica (June 18, 2007) http://arstechnica.com/news.ars/post/20070618-philadelphia-wifi-network-gets-more-expensive-as-city-wide-launch-nears.html. Unrealistically low node density estimates have plagued many of Earthlink's projects. It is unclear why EarthLink systematically underprovisioned their networks in their initial estimates.

[75] On a July 26, 2007, conference call, new CEO Rolla Huff said, "Against some of the guidance that we have given in the past, we really expected wi-fi subscribers to be ramping up and, let's face it, we haven't seen that in the results." *See* http://ir.earthlink.net/eventdetail.cfm?eventid=42491.

[76] Meir Rinde, "Ill Communication," *Philadelphia Weekly* (July 25, 2007). http://www.philadelphiaweekly.com/articles/15100.

[77] Keith Shaw, "WirelessPhiladelphia? Most of the time," Network World (August 2, 2007) http://www/networkworld.com/columnists/2007/080207-cool-tools.html. See the comments at http://www.networkworld.com/community/Philadelphia.

[78] *See* Bruce Kushnick's, "The $200 Billion Broadband Scandal." http://www.newnetworks.com/broadbandscandals.htm.

[79] *See* Boston Wireless Task Force, available at: http://www.cityofboston.gov/wireless/ and Task Force Final Report, available at: http://www.cityofboston.gov/wireless/Boston%20Wireless%20Task%20Force%20Report%20-%20Final.pdf.

[80] "Hub's WiFi rollout starts in Grove Hall this month," Boston Globe, June 9, 2007. http://www.boston.com/business/globe/articles/2007/06/09/hubs_wifi_rollout_starts_in_grove_hall_this_month/.

[81] Adapted from "Corpus Christi, Texas Gets Citywide Wi-Fi," July 29, 2004, www.muniwireless.com. Additional information provided by Leonard Scott, Project Director, City of Corpus Christi Wireless Network.

[82] *See* Minneapolis Digital Inclusion Task Force Report, available at: http://www.digitalaccess.org/documents/MDITF%20complete.pdf; Final Wireless Minneapolis Community Benefits Agreement, available at: http://www.digitalaccess.org/daecResources.htm.

[83] "Minneapolis Wi-Fi system hits parts of downtown," *Minneapolis Star-Tribune*, June 29, 2007, http://www.startribune.com/154/story/1277552.html.

[84] "Request for Information and Comment (RFI/C): San Francisco TechConnect Community Wireless Broadband Initiative," issued by the City and County of San Francisco on August 16, 2005, pp. 7-9, available at: http://www.sfgov.org/site/uploadedfiles/dtis/tech_connect/BroadbandFinalRFIC.pdf.

[85] www.sfgov.org/techconnect.

[86] "Detailed Analysis of EarthLink-San Francisco Contract," *MuniWireless*, January 27, 2007, http://www.muniwireless.com/article/articleview/5513.

[87] http://www.jointventure.org/programs-initiatives/wirelesssiliconvalley/wireless.html.

[88] "One Year Later, St. Cloud Citywide WiFi Network Shows Impressive Results," *MuniWireless*, March 7, 2007, http://www.muniwireless.com/article/view/5762/.

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