

to be made in the second year. After the second year, Earthlink would pay 5 percent of its revenues to Wireless Philadelphia, in addition to a per-pole usage fee.

- Wireless Philadelphia would use the funds paid by Earthlink to serve the needs of low-income residents by providing personal computers to both low-income residents and nonprofit organizations, conducting training programs, providing Web site development and online marketing assistance to small businesses, and raising awareness.

These arrangements required no investment from the city (contrary to the earlier assumption) and, on the surface, seemed like a win-win for all. The city created an entity—Wireless Philadelphia—to lead the social consciousness elements of its vision—and with the Earthlink agreement provided Wireless Philadelphia with the continuing funding and authority to have a chance at realizing this vision. By outsourcing all of the key technical, service, and management elements of the project, the city stayed away from activities that are typically outside its scope of expertise. Essentially, what the city government did was to monetize its passive assets such as lamp-posts and other rights-of-way properties. It had created a new source of income without investing anything.

The agreement generated considerable goodwill in various quarters, including the media. Nevertheless, the agreement still needed to be approved by the Philadelphia City Council. After considerable debate, and—according to media reports—pressure on both sides of the fence, the Philadelphia City Council eventually approved the Earthlink deal in March 2006. Work on building the network started immediately afterward. Wireless Philadelphia hired key staff during the spring and summer of 2006, including Greg Goldman, the first permanent chief executive officer. Goldman's background included experience with both the private and nonprofit sectors. Goldman's initial focus was to oversee the deployment of the 15 square mile proof of concept, which was completed by March 2007. In the summer and fall of 2006, Goldman also worked on creating the relationships and infrastructure needed to market the \$9.95 "digital inclusion" accounts. One key element was establishing relationships with existing community and nonprofit groups that could both market the accounts and handle payments. As of May 2007, the proof-of-concept deployment was completed and rolled out to subscribers. Citywide implementation was expected by October 2007.

Lessons Learned

The Philadelphia initiative is one of the largest and most ambitious wireless projects in the world, and the city was one of the first to announce and start working on an MWN. The city government of Philadelphia intervened to accelerate the availability of low-cost, reliable wireless Internet access throughout the city. This may be considered a low-level goal, a means to an end. But there was also a much higher-level goal. The city government's intervention can be framed as the use of technology by government to promote social change and reduce disparity. To achieve this goal, the city played the role of a catalyst by taking on a variety of roles, such as champion, facilitators, steering committee, policy maker, partner, coordinator, consultant, project manager, referee, regulator, and capacity builder. It removed barriers to resources and provided incentives and a legislative framework to give stability to the new infrastructure. The key lessons of the Philadelphia wireless project are discussed further here.

First, a strong champion is required. From 2004 to about the middle of 2006, the original champion of the project was Dianah Neff, chief information officer in Philadelphia. Since the summer of 2006, Greg Goldman, chief executive officer of Wireless Philadelphia, has taken on a leadership role. Both Neff and Goldman championed the MWN in the media and in the community, and when necessary, they mounted a vigorous defense of the project. They had to work extremely hard to rationalize competing visions and maintain public interest while simultaneously staying current with technological developments. The champion of a project of this nature is subject to a large number of external and internal forces and competing claims; he or she must handle pressure from different constituents while remaining conscious of the socio-political context and complexity.

Second, diverse stakeholder interests must be managed. The city government had to manage the demands and challenges of different stakeholders, including telecommunications companies, civic leaders, community groups, the media, state government, city politicians, and the public. For instance, when both Verizon and state legislators appeared to be against the creation of MWNs, the city government coordinated a solution whereby Philadelphia could be excluded from anti-MWN legislation. To put pressure on legislators to exclude Philadelphia, the city government facilitated communications by activist groups and nongovernmental organizations to communicate the message that

the digital divide in Philadelphia could not be addressed solely through private sector efforts.

From a different perspective, to unite Philadelphians around the project, the city tapped into their civic pride and nostalgia about the city's past greatness. It told stakeholder groups what they wanted and needed to hear. When dealing with corporate leaders, the city emphasized how the MWN would enhance the city's image, whereas it emphasized to community groups how the network would address the digital divide. To further increase community support, the project leaders started discussions with the powerful Philadelphia school district about how the network could address problems facing the district. The leaders of future projects will need to play different roles and wear multiple hats to respond to the demands and challenges from extremely diverse and often powerful stakeholders. These pressures led to some difficult compromises. The time taken for approval was very long, and there were some stipulations that may prove difficult to implement. For example, according to the agreement with the city, Wireless Philadelphia should also "improve parental involvement in student education."

Third, private and public interests need to be balanced. With planning and creative thinking, it is possible to create structures that can optimize the interests of both the public and private sectors. In Philadelphia, a nonprofit organization, Wireless Philadelphia, led the social consciousness goals of the project, while a large, well-known for-profit organization, Earthlink, led the technical and management aspects of the project. By creating a nonprofit organization with a mission to lead the digital divide elements of the city's vision—and by providing the nonprofit with the authority and sustainable funding to take action—Philadelphia seems, at least in the short term, to have created a viable structure for realizing its social consciousness goals. By partnering with Earthlink to build the network, the city avoided involvement in activities in which it had little experience and credibility. It also made moot, to some extent, the philosophical and political challenges to the role of government in building MWNs. In addition, by actively working with local small businesses to deliver other services such as training and Web site development to the community, the city created a sense of opportunity for the private sector.

However, it is still too early to say whether the optimization of public and private interests in Philadelphia will be sustainable. For example, if the expected higher-paying retail customers do not materialize in the long term, it would not be unusual for a for-profit firm such

as Earthlink to try to restructure the agreement or back out completely.

Fourth, the "application" of the MWN must be identified. A question that has been asked of MWNs is, "If you build them, will they come?" Setting up the infrastructure will not guarantee success, and enabling access is not synonymous with adoption or with an effective application. In Philadelphia, a decision was made to focus on Internet access as the main "application"; other cities have focused on more tangible applications, such as wireless meter reading. Yet even with simple Internet access, Philadelphia will face challenges in ensuring adoption and effective use. The current efforts of Wireless Philadelphia to connect with and use existing community groups to distribute the \$9.95 digital inclusion accounts are a positive first step to ensure adoption. However, MWNs may be unadvisable when a community has preexisting Internet access options and there are no specific compelling applications. As Internet access becomes more and more easily available, newer MWN projects will likely face a higher bar for success and will need to include formal social programs, such as training, or tangible cost-effective applications, such as wireless meter reading, to ensure adoption and eventual success.

The digital divide is a tenable justification over the short term but faces long-term challenges. The principal method by which Philadelphia was able to draw concessions from opponents of the MWN project was to call attention to Philadelphia's considerable digital divide. This indicates that government involvement with MWNs may not be advisable in the absence of a compelling social rationale, such as the existence of a persistent digital divide. The existence of such a rationale gives government the moral confidence to pursue radical measures and encourages stakeholders to support these measures. However, the danger is that projects based on a digital divide may not be able to deliver measurable success. The digital divide cannot be resolved overnight. Digital divides arise from deep-seated socioeconomic causes that are related to education, income, culture, and attitudes toward technology. Simply providing low-cost access to the Internet is not going to make much of a difference in the short term. However, this is a "chicken and egg" argument. Take the case of a village in the third world that has no access to electricity. Providing this village with access to electricity will not transform its economy overnight. However, it will lay the basic foundation to enable it exploit this resource in the future. Moreover, without electricity, it has no hope of competing and participating in the