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"Wireless Philadelphia: A Leap Into the Unknown"

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Wireless Philadelphia: A Leap Into the Unknown

By Thomas M. Lenard[*]

I.   Introduction and Summary

The movement toward competition in telecommunications is a worldwide phenomenon.   In most countries where the telecommunications industry has been government owned, this movement has taken the form of privatization of the industry's assets.   In the United States, where the telecommunications industry has been privately owned but subject to economic regulation, competition has been motivated by mounting evidence that regulation is an imperfect mechanism that frequently does not serve the interests of the consumers it is designed to protect.

At the same time that other countries have been privatizing and the U.S. has been moving in a deregulatory direction (at least at the federal level), there has been a growing trend in the opposite direction at the local level, with an increasing number of state and local governments entering the telecommunications market in some form.[1]

Most of these governments have been building fiber-optic networks with the goal of providing their citizens with broadband services that they believe are not being made available by the private sector.   The governments that undertake these projects do so in the hope that they will boost economic development, serve underserved populations, improve city services, and also yield a return to the city treasury.   But, the results thus far have been disappointing.[2]   Municipal entrants typically find themselves in intense competition with private competitors offering essentially the same services.   They

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[1] See Kent Lassman and Randolph J. May, "A Survey of Government -Provided Telecommunications: Disturbing Growth Trend Continues Unabated," Progress on Point 10.17, The Progress & Freedom Foundation, October 2003.

[2] Thomas M. Lenard, "Government Entry Into the Telecom Business: Are the Benefits Commensurate With the Costs?," Progress on Point 11.3, February 2004.

generally have been unable to cover their costs without subsidization and at least one has cut its losses and dropped the project.[3]

Some municipalities are now turning their attention to Wi-Fi and a number of them now have city-wide Wi -Fi projects at various stages of planning. The City of Philadelphia is proposing what appears to be the largest and most ambitious such project. Mayor John Street has appointed a Wireless Philadelphia Executive Committee to, among other things, "act as an advocate of wireless community networking."[4] According to its web site, "[t]he City is singularly obsessed with bringing the benefits of true, affordable broadband data communications anywhere, anytime, to anyone that needs it."[5]

Philadelphia's wireless proposal is motivated by its belief that "for centuries cities have been the early adopters of new technology, and it is by investing in these new technologies that cities became the great creative engines of commerce, culture and society."[6] The City's "goal is to become the number one wireless city in the world…." The purported benefits of this plan are similar to those claimed for municipal fiber optic projects, namely to retain and attract visitors and new businesses, support the delivery of public services and help bridge the digital divide.

The purpose of this paper is to analyze the Wireless Philadelphia project using the data currently available from the Wireless Philadelphia Business Plan as well as other sources.[7] My principal conclusion is that the analysis and financial projections contained in the Business Plan are simply not plausible. The Business Plan projects that Wireless Philadelphia will be able to offer wireless broadband access to everyone , everywhere in Philadelphia, at a cost lower than competitive broadband offerings such as DSL and cable modem. Notwithstanding this rosy scenario, the Business Plan asserts that this service will not be offered by the private sector. But there is no explanation as to why the private sector would pass up such a promising profit opportunity. The Business Plan presents no evidence of a "market failure" in the provision of wireless Internet access that would provide a rationale for the City's involvement . Similarly, the Business Plan provides no evidence that the City would be more efficient and therefore able to provide this service at a lower cost than the private sector.

The most reasonable conclusion is that the Business Plan has dramatically underestimated the costs and risks of this project and overestimated the demand for ubiquitous Wi -Fi service. In addition to the significant risks normally associated with a

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[3] Marietta, Georgia has incurred losses of about $35 million on its Internet company, FiberNet. See Brenden Sager, "Marietta to lose millions in sale of Web service," www.ajc.com (The Atlanta Journal-Constitution), July 29, 2004.

[4] Mayor's Office of Communications, News Release, August 25, 2004.

[5] http://www.phila.gov/wireless/faqs.html

[6] http://www.phila.gov/wireless/briefing.html

[7] "Wireless Philadelphia Business Plan - Wireless Broadband as the Foundation for a Digital City," Presented to the Honorable John F. Street, Mayor, City of Philadelphia, by The Wireless Philadelphia Executive Committee, February 9, 2005.

project like this, Wireless Philadelphia entails risks associated with an untried private - public partnership model based on a largely subjective analysis.

There is no absence of private sector activity in the intensely competitive marketplace for broadband and wireless broadband . Indeed, the private sector is investing billions of dollars in a number of wireless technologies designed to bring mobile, high-speed Internet connectivity to consumers. The private sector is, however, not investing heavily in city-wide Wi -Fi networks, because Wi-Fi is a technology that seems best suited for local applications.

If Wireless Philadelphia is allowed to proceed, the likelihood is that the City will be stuck with a network that will not achieve its advertised benefits and may well be technologically obsolete . Moreover, contrary to the City's claim, its taxpayers will likely have to foot the bill.

II.   Decision to Launch Wireless Philadelphia

The Executive Committee based its decision to launch Wireless Philadelphia on several pieces of research—analyses conducted by Temple and Drexel Universities; focus group surveys of stakeholders; and a Philadelphia School District survey.

A. Temple and Drexel University Analyses

The Business Plan relies on analyses from Philadelphia-area universities to support its conclusion that the proposed project is needed and will be successful. The following conclusions are presented (although it is unclear how they were reached):[8]

1. There is a need for low-cost broadband beyond what is now available and making it available requires a comprehensive plan.

2. The private sector cannot be counted on to provide such services.

3. In the majority of cases, local government has acted as the catalyst for projects to provide broadband access to citizens.

4. Wireless technology is the most cost-effective way of implementing broadband access—more cost-effective than other technologies, including cable or DSL.

5. The risks of implementing a project that is not a core competence suggest that private industry should play a major role in the funding, implementation and on-going operation.

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[8] Business Plan, 11-12.

B. Stakeholder Analysis [9]

The Executive Committee relied on focus groups and a town hall meeting to analyze the interests and needs of a diverse group of stakeholders. The following interest groups were represented: government representatives, residents, tourists, business travelers, foundations/funders, non-profits, universities, schools, businesses, agencies/utilities, vendors and healthcare agencies. To elicit input from these stakeholders, the Committee held 13 focus groups organized by a variety of civic organizations, including the African American Chamber of Commerce, the Asian American Chamber of Commerce, the Community Network, the Greater Philadelphia Tourism Marketing Corporation, the Health Care Group , various area educational institutions , the Hispanic Chamber of Commerce, Innovation Philadelphia, the Philadelphia Chamber of Commerce, and Universal Companies.

In total, 110 individuals participated in the focus group discussions. The results were:

1. Most stakeholders supported the wireless initiative.

2. Most thought the City was the only entity capable of undertaking this initiative — that the private sector wouldn't do it.

3. The stakeholders did not want tax revenues to finance the project.

4. They wanted a sliding price scale geared to individuals' ability to pay, with a top price below the current DSL price.

There are several problems with this procedure. First, if you ask people if they would like to have a service—in this case, broadband service—at a lower price than it is currently available , with no increase in taxes , obviously, they are going to say yes. This is the choice that apparently was presented to the focus group participants . But, as this paper shows, it is not a realistic representation of the choices available .

Second, the focus -group methodology is not a scientific way of gauging stakeholder sentiment or estimating the value of this new service to the City's citizens. There appears to have been no effort to undertake a scientific survey, which would entail a random (or at least a representative) sample of citizens with a standardized questionnaire. There is no way of knowing whether the focus groups are representative of Philadelphia's population. Moreover, the focus group process does not lend itself to asking standardized questions or reporting results in a way that can be evaluated objectively by the user. The number of participants also was much smaller than would be the case in a more scientific survey. In sum, there is no reason to believe that it accurately reflects the views of a majority of Philadelphia's citizens.

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[9] Business Plan, 19-24.

Finally, and perhaps most importantly, in the absence of any serious market failure (discussed below), the market will be a much more efficient aggregator of information concerning demand and supply conditions than even the best consumer survey.

C. Philadelphia School District Survey

A survey of school parents provides data on ownership and usage of computers and access to the Internet. It suggests a correlation between computer usage and Internet access, on the one hand, and income on the other, which is not surprising . It does not seem to provide any data that are directly relevant to the decision to go forward with Wireless Philadelphia.

III.   Wireless Philadelphia

A. Organizational Structure

The outlines of Philadelphia's plan are as follows:[10]

1. The City will create a non-profit corporation—Wireless Philadelphia—to implement the project.

2. Wireless Philadelphia will receive start-up funding from foundation grants, bank loans and/or other non-City sources.

3. Wireless Philadelphia will outsource the design and construction of a wireless mesh serving the entire city based on Wi -Fi 802.11b standards . Individual Wi -Fi cells will be deployed on street lights and other traffic control devices. The city will provide access to these city-owned assets. Eight to 16 units per square mile will be needed.

4. Wireless Philadelphia will provide access to ISPs and telecommunications companies at low wholesale fees.

5. Wireless Philadelphia will provide some level of free wireless Internet access to everyone living, working or visiting in the city. The retail providers will also make discounted pricing available to low-income and disadvantaged subscribers.

6. Higher levels of service will be available for a fee through retail providers.

7. The non-profit will use its free cash flow to fund economic development and digital divide programs.

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[10]   Information at http://www.phila.gov/wireless/briefing.html; http://www.phila.gov/wireless/faqs.html; and Business Plan, 12- 13.

8. The City will act as an "anchor tenant," purchasing some of its broadband services from Wireless Philadelphia.

B. Financial Projections[11]

The financial projections for the project are extremely optimistic.   The salient features are as follows:

1. Capital costs will be $10 million over five years (a capital cost of less than $19 per home passed).

2. A wholesale residential price of $9.00/month will allow retailers to offer the service—which is competitive with cable modem and DSL service—for $16-$20/month.

3. The service will have about 85 ,000 subscribers after year 1 and 151,000 after year 5.

4. The service will have positive EBITDA   (earnings before interest, taxes, depreciation and amortization) in year 1, positive free cash flow in year 2, and break even in year 4.

5. At the end of year 5, it will have accumulated a working capital reserve of $4.2 million and free cash flow of $ 5.0 million to spend on digital divide projects.

IV.   Issues Raised by Wireless Philadelphia's Analysis

There are serious contradictions in the Wireless Philadelphia analysis that shed doubt on its validity. The authors of the Report are telling us that:

- Wireless Philadelphia will be able to offer ubiquitous broadband service at a significant discount compared to existing services.

- Virtually from the outset, Wireless Philadelphia will be a profitable enterprise.

- Wireless Philadelphia will be so profitable that it will not require any subsidy from the city and it will accumulate a surplus that can be applied to economic development and digital-divide programs.

- Despite these favorable economics, the private sector won't do it.

This is not a plausible story.   The private sector is looking at the same technologies and the same market conditions as Wireless Philadelphia. Private -sector

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[11] Business Plan, 37-41.

firms are at least as competent as the Business Plan's authors at evaluating the relative merits of alternative technologies and business strategies and projecting revenues and costs. Moreover, they have a stronger incentive to get it right because they are playing with their own money. Finally, assuming the economic assumptions above were correct, a City-wide Wi-Fi network would be even more profitable for a private profitmaking firm because it wouldn't necessarily be under the same obligation to fund public programs or provide free service in public spaces.

The Business Plan did consider a "Private Consortium" model in its analysis of alternative business models.[12] In this model, the City provides access to light poles and other city assets (potentially for a fee), much as it does already for other telecommunications providers. This model was rejected because it was deemed inferior at providing services for disadvantaged citizens. However, if the economics are as favorable as the City projects, a private contractor would be willing to build out the Wi-Fi network, even if also required to provide some social services.[13]

So, the obvious question is: "Why aren't private firms chomping at the bit to do what Philadelphia is proposing?" Either the private sector is missing a great opportunity or there is something wrong with the Wireless Philadelphia projections. The latter seems to be the more reasonable explanation.

A. Is There a Market Failure?

Most goods and services in our economy are provided by the private sector, not the government. This generally works well because privately owned firms usually have the right incentives to provide consumers with the goods and services they want when consumers are willing to pay the costs of producing those goods and services. Wireless Philadelphia is premised on the assumption that the private market is failing —i.e., that there is a demand for ubiquitous Wi-Fi that is not being met, even though consumers are willing to pay for it.[14] There is, however, no evidence that such a market failure exists. Indeed, the market for Internet access, including broadband, seems to be thriving:

- Overall Internet penetration in Philadelphia is estimated at 45 percent, including about 92,000 households with broadband and 173,000 households with dial-up.[15]

- Major broadband providers include Verizon, Roadrunner and Comcast.[16] •

There are over 400 operating dial-up Internet service providers.[17]

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[12] See Business Plan, 30- 31 and discussion below in Section IV.B.
[13] Although I am not suggesting this model, there is a precedent for it in cable franchise agreements. [14] Business Plan, 12.
[15] Business Plan, 21.
[16] Theconsumerbridge.com. Providers found by searching several phone numbers in the 215 area code. [17] Business Plan, 9.

- The major universities in Philadelphia—Drexel, Temple and the University of Pennsylvania—all have wireless broadband networks covering their campuses for the use of their students and employees.

- There are over 90 Wi -Fi hotspots operated by 13 different companies (see table).[18]

Provider	No. of Hotspots	Provider	No. of Hotspots
Ipass	47	AT&T	6
Wayport	30	Airpath	5
T-Mobile	26	STSN	5
Boingo	20	SBC	3
Independent	11	AirRover	2
Surf and Sip	7	Starwood	1
Trustive	7		

B. The Hybrid Non-Profit, Cooperative-Wholesale Business Model

In developing its Business Plan, the City evaluated five different business models according to 10 different criteria, such as ability to provide low-cost or free services for the disadvantaged, ability to generate a return to the City, and ability to respond to technology change.[19] Each business model was rated using a five -point scale on its ability to satisfy each of the 10 criteria.   In addition, each criterion was given an explicit numerical weighting (with all the weights adding to 100) and a separate , non-numerical weighting —"must" or "want".   The two highest -ranking models, "Non-profit" and "Cooperative Wholesale" form the basis for the public-private cooperative model the Business Plan recommends.

This methodology with its combination of subjective weights and subjective ratings is highly arbitrary and can easily be manipulated to produce any desired result. It also does not seem to be internally consistent.   For example, "ability to generate a return to the city" is a "must", but has only a 5-percent weight.   In contrast, "ability to respond to technology change" is a "want", but receives a 10-percent weight.   As another example, the private consortium model is only marginally better than the non-profit model at yielding cost neutrality for the City (5 versus 4) or responding to technology change (4 versus 3).   One could make a strong argument that the difference between these two models with respect to these two criteria is much larger.

While the proposed "public-private partnership" model that the City has arrived at may sound good, it is not a model with a proven track record.   In fact, it may be difficult for the City to get private -sector ISP partners to agree to its target retail prices, given that these partners will responsible for customer care, billing, technical support, content and other high-cost activities.   The Business Plan's principal example of the cooperative

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[18] www.jiwire.com hotspot directory for Philadelphia, PA; and Business Plan, 9.
[19] Business Plan, 30-36.

wholesale model is UTOPIA, the consortium of 14 Utah cities engaged in deploying a broadband network, which thus far apparently has not advanced significantly beyond the borrowing stage.[20]

C. The Wi-Fi Technology

Wi-Fi is a short-range technology   with a range of about 300 feet primarily designed for local area networks.   Millions of individuals have Wi -Fi networks in their homes to enable family members to access a single Internet connection—a cable modem or DSL connection—from anywhere in the house.   Even under these localized conditions, coverage is frequently incomplete.   Wi-Fi is well suited for localized hot spots—e.g., in Starbucks or McDonalds—and, as the table above indicates, a number of companies are providing that service.

According to Derek Kerton (a wireless consultant), Wi-Fi works well for these small local applications , but will not   work well for larger applications such as city-wide networks , in part because it will be subject to interference from other Wi -Fi networks, cordless phones, microwaves and other devices that use the same unlicensed frequencies. [21]

The area's topography and buildings also affect the signal speed and quality. Reception in buildings will be spotty to non-existent unless indoor repeaters are installed to reflect outdoor signals into homes and other buildings.   The Wireless Philadelphia projections do not appear to include these costs.   As telecommunications analyst Thomas Hazlett has written, "[j]ust as your cordless phone augments, rather than replaces, your phone line, Wi -Fi signals enable PC mobility only when a fixed grid is within shouting distance.   Hence, municipal Wi -Fi coverage will be spotty if cheap, very expensive if ubiquitous." [22]

Consultant Kerton also questions the ability of municipalities to provide adequate service: "The access point that covers your house is down - how long will it take the city to get out there and fix it?   Or will they complain they don't have the budget to fix it?"[23]

Similarly, an article in the MIT Technology Review contains this warning:

The scenario is similar to that of the late   1980s, when municipalities considered offering cable TV services, recalls William Frezza, a general partner with Adams Capital Management in Cambridge, MA.   Cable couldn't survive as a low-cost public service, he says, and he finds public

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[20] Business Plan, 33.

[21]   Amy Cox,   "Cities   find   Wi-Fi   future,"   CNN.com,   October   18,2004. (http://www.cnn.com/2004/TECH/internet/10/18/wireless.city/)

[22]   Thomas Hazlett,   "In the clouds over municipal Wi-Fi," FT.com, January   13, 2005. (http://news.ft.com/cms/s/6261de60-6576- 11d9- 8ff0-00000e2511c8.html)
[23] Cox, op.cit.

Wi-Fi equally misguided. He has read several dozen business plans from entrepreneurs looking to make money from public Wi -Fi. No model can succeed because the annual maintenance costs are likely to be exorbitant, he says. Moreover, he argues, performance will degrade as more users log on, which won't necessarily stop municipalities from casting themselves as Wi -Fi service providers. "A town can make any argument it wants," says Frezza. "It has as much money as it can pull out of its taxpayers."[24]

It is noteworthy that only a few private sector-companies are attempting to market the same Wi -Fi service as Philadelphia. Ricochet (owned by YD I Wireless), which is probably the company with the most ambitious projects, has about 15,000 subscribers in Denver and 12,000 in San Diego.[25]   A company called Spot On Networks offers Wi -Fi service in Connecticut and has plans to offer it in Florida and New York.[26]   Financial data on these ventures are not available. Most private -sector companies are investing in other wireless technologies.

D. Other Wireless Technologies

Private entrants are not rushing to build Wi-Fi networks because there are a number of technologies either already   available or on the horizon   that appear to be better. At a minimum , there is a great deal of technological uncertainty in this area.

For example , WiMax (sometimes described as Wi -Fi on steroids) has a range as far as 30 miles and could potentially provide coverage over an area the size of an entire city.   WiMAX can operate on the same unlicensed bands as Wi-Fi , but in a large market with crowded airwaves, licensed spectrum may be needed.   In addition to its greater range and speed capabilities, WiMax offers the possibility of a bundled offering of broadband and Internet phone service, which, according to some, would be far cheaper than bundles of phone and broadband by current providers. [27]   WiMax is considered a prime candidate to be the third commercial broadband pipe (after cable modem and DSL) into the home.

In addition, after years of promises, a whole new generation of wireless broadband services—sometimes referred to as third-generation (3G) services—now appears to be close to realization.[28]   These mobile wireless broadband services allow high-speed access to the Internet and other data services from a cell phone, a PDA

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[24] Deborah Asbrand, "Who Pays for Wireless Cities?," TechnologyReview.com, September 21, 2004. (http://www.technologyreview.com/articles/04/09/wo_asbrand092104.asp)
[25] Number estimates obtained by calling the Customer Service Center of Ricochet Networks. [26] Information obtained by speaking with Spot On customer service representative.

[27] Paul Davidson, "Inventive Wireless Providers go Rural," USA Today.com. July   14, 2004. (http://www.usatoday.com/tech/news/2004-0 7- 14 -wireless_x.htm)
[28] See, for example, Seth Schiesel, "For Wireless, The Beginnings of a Breakout," The New York Times, January 13, 2005, E1.

(personal digital assistant) or a wireless-equipped laptop.   A laptop equipped with the appropriate laptop card can get broadband without having to be near a Wi -Fi hotspot.

The most prevalent 3G solution is EV-DO (Evolution-Data Only).   Verizon is already offering EV-DO 3G service in several metropolitan   areas (including Philadelphia) and has indicated it will offer service in 30 metropolitan areas covering over 70 million people on February 1 of this year.[29]   EV-DO delivers data at speeds between 300Kbps and 500Kbps, with peak throughput of more than 2Mbps.   These speeds are fast enough to run business applications.   Verizon sells EV-DO data cards for notebook PCs that are similar to Wi-Fi cards, except that they run on the cellular infrastructure rather than on the limited range of a hotspot.   Sprint has announced the rollout of EV-DO technology and plans to offer it nationwide by late 2005 or early 2006.[30]

Smaller companies are also investing in 3G technologies to offer broadband connectivity.   Before it suspended service due to bankruptcy, Monet Mobile Networks offered an EV-DO-based service in the upper Midwest (Minnesota and the Dakotas). [31] Clearwire, a company operating in Minnesota, Texas and Florida, uses an alternative 3G transmission protocol—OFDM (orthogonal frequency division multiplexing). [32]   The company operates in the 2.5GHz (licensed) band, which enables it to offer a level of security unattainable with unlicensed Wi -Fi.   In October 2004, Clearwire announced it was teaming with Intel to plan WiMax networks.   Finally, a company operating on Maryland's eastern shore, Bay Broadband, is using the Motorola Canopy solution. [33] When configured as a point-to-multipoint system, this platform supports subscribers for distances of up to 15 miles.   Configured as a point -to-point system, its delivery range is up to 80 miles.

The wireless carriers as well as other entrants are spending billions of dollars to upgrade their systems to provide these advanced services. Eastern Research estimates that for U.S. wireless carriers to upgrade to 2.5G and 3G systems may cost in excess of $100 billion.[34]   These companies would not be making these investments if they thought municipal (or, for that matter, private) Wi-Fi, with a cost as estimated by the City of Philadelphia of $19 per home passed, was a viable service.

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[29] *Ibid.*

[30] Stephen Lawson,   "EV-DO Lights Up Mobile Data," IDG News Service. August   2, 2004. (http://www.infoworld.com/article/04/08/02/HNevdo_1.html).

[31] Monetmobile.com   (http://www.monetmobile.com/Assets/usingmbb.pdf).

[32] Clearwire.com (http://www.clearwire.com/support/faqs.html).

[33] Information provided by Bay Broadband customer service representative, www.baybroadband.net, and www.motorola.com/canopy.

[34] Eastern Research, "Cost Optimization in Radio Access Networks as Mobile Carriers Migrate to 3G" (http: //www.erinc.com/products/access_gateways/white_paper_dnx1u/pdfs/dnx1u.pdf).

V.   Experience of Other Municipal Telecom Entrants

Because Philadelphia is one of the first cities to propose a Wi -Fi mesh network, there are virtually no data available from other cities on similar projects.   There is, however, a growing literature on the experience of municipalities that have undertaken wireline telecommunications and cable television of various sorts .   These ventures have generally   not   been successful in covering costs or returning the taxpayers' investments.[35] The comments of Ashland, Oregon's director of electric and telecommunications   mirror   the   experience   of   many   municipal   entrants   into telecommunications.   When the City's Ashland Fiber Network ran into trouble, he said he thought they made three major mistakes: they underestimated how   much it would cost to build it; they underestimated how   long it would take to build it; and, they underestimated the competitive response of the incumbent provider. [36]   Similarly, the mayor of Kutztown, Pennsylvania said the municipally owned cable and Internet company there—Hometown Utilicom—was hemorrhaging money, with profits nowhere in sight and taxpayers subsidizing the system for too few paying customers.[37] He also complained that he was having difficulty getting access to reliable data on the venture's finances. (The town's director of information technology, on the other hand, described its telecom venture as a grand experiment playing out according to plan.)   Finally, as referred to at the beginning of this paper, Marietta, Georgia lost more than $35 million operating the city's "FiberNet". [38]

VI.   Risks for Philadelphia Taxpayers

All of this suggests that proceeding with Wireless Philadelphia entails significant risks for Philadelphia taxpayers.   The City's plan assumes that the project will receive all of its funding from non-City sources.   Given the technological uncertainties, the lack of a track record for comparable projects, and the problems encountered by other municipal telecom ventures, it is doubtful that Wireless Philadelphia would be able to borrow money without the City's backing.   The City would then be on the hook for these loans if the project did not generate sufficient revenue to pay them off.

The City believes Wireless Philadelphia will be a boost to economic development.   There is no evidence to support that assertion.   At best, Wireless Philadelphia will provide a subsidized, marginal broadband service purchased by consumers whose valuation of broadband is relatively low.   Individuals who place a

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[35] Thomas M. Lenard, "Government Entry into the Telecom Business: Are the Benefits Commensurate with the Costs?" Progress on Point 11.3,   The Progress & Freedom Foundation.   February 2004.
Ronald J. Rizzuto and Michael O. Wirth, "Costs, Benefits, and Long-Term Sustainability of Municipal Cable Television Overbuilds," GSA Press, 1998.
David G. Tuerck, John Barrett, "Municipal Broadband in Concord: An In -Depth Analysis," Beacon Hill Institute, March 2004.

[36] Minutes, Citizen's Budget Committee Meeting, April 25, 2002.

[37]   Akweli Parker, Bucolic Kutztown Split Over High -Tech Gamble.   June   18,   2004. (http://www.philly.com/mld/inquirer/8950615.htm).

[38] Brenden Sager, "Marietta to lose millions in sale of Web service," www.ajc.com (The Atlanta Journal - Constitution), July 29, 2004.

higher value on broadband will go to other services, such as DSL and cable modem and others coming to the market. Individuals who place a high value on mobility will gravitate to the new advanced services that are coming from the wireless carriers and perhaps other companies.

Rather than being helpful to economic development, the Wireless Philadelphia project may well be harmful for a couple of reasons. Notwithstanding its claims, Wireless Philadelphia is likely to be a drain on the city's budget. This is the experience of virtually all the municipal telecom entrants for which we have data. This added tax burden is not conducive to attracting businesses to the city. To the extent that Wireless Philadelphia enjoys any success, it will be competitive with private firms. Spending tax revenues to compete with the private sector would also not seem to be the best way to create an attractive business environment .

Finally, there is a good chance the City will spend a lot of money and not achieve its social objectives. If the City is serious about helping bridge the digital divide, there are probably better ways of doing it. For example, with $10 million, the city could buy 20,000 desktop computers (assuming a price of $500).

VII.   Conclusion

For the City of Philadelphia, the Wireless Philadelphia project is a major leap into the unknown. While Philadelphia and other cities have provided isolated Wi -Fi hot spots, Philadelphia would be the first major city to attempt to provide wireless broadband throughout the entire city. As with other municipal telecom projects, Wireless Philadelphia raises the issue of the appropriate boundary between the government and the private sector.

It is only in exceptional cases, when there is compelling evidence that the private sector can't do the job, that a government entity should enter the market. In general, governments should be very cautious about entering markets where private -sector firms are active.[39] The private sector is clearly active in the market for broadband and wireless broadband.

The fact that a good is not produced by the private sector does not mean that there is a market failure. In most cases, it means that the good shouldn't be produced because it is not worth its cost to consumers. Private -sector firms are required to pass a market test. If a firm makes a mistake and produces a product that consumers don't value , the owners of that firm will bear the costs. This provides a powerful incentive to avoid mistakes.

This discipline is absent when the government enters a market. When government managers make a mistake—by producing a product for which consumers

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[39] See Joseph E. Stiglitz, Peter R. Orszag and Jonathan M. Orszag, "The Role of Government in a Digital Age," Computer & Communications Industry Association, October 2000.

are not willing to pay—they do not bear the costs in the same way as a private firm's owners.   Rather these costs are borne by the public in general through the taxes they pay.

Wireless Philadelphia is based on a number of premises that are likely to prove false.   First, it assumes that Wi-Fi is a superior technology for a city-wide network.   In fact, Wi -Fi is a local technology that is unproven in large-scale applications . There are a number of wireless technologies that may have much more attractive features.   Second, Wireless Philadelphia assumes that a public-private cooperative business model will best meet the City's objectives.   The analysis on which this conclusion is based is flawed and subjective.   Third, Wireless Philadelphia assumes that no City funds will be required.   This is a dubious assumption.   The City will likely be liable for the costs if the project is unsuccessful.   Fourth, Wireless Philadelphia assumes that its Wi-Fi network will boost economic development .   However, investing City resources in a questionable technology is not a good away to generate a business-friendly environment.   Finally, Wireless Philadelphia assumes that its Wi -Fi network will help bridge the digital divide. But, the City has not analyzed other alternatives to determine the most cost -effective ways of providing computers and Internet access to underserved populations .

In sum, Wireless Philadelphia is not a good deal for the citizens of Philadelphia.