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# Deploying for Deliverance: A Digital Divide Content Analysis in Municipal Wireless Networks Documentation

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## ABSTRACT

Considering the proliferation of information technology (IT), growing IT divides are still proven to exist today. Although some argue the broadband technology could be the platform for universal ubiquity, the benefits are still debatable for municipalities providing access. The authors discuss how public officials have decided to lead, support and usher in an era of rapid IT development by way of wireless broadband networks to address digital divide concerns, and how these claims may or may not meet expectations. The purpose of this paper is two-fold: (1) to propose a fruitful investigative overview of U.S. cities making claims that a municipal wireless network will bridge the so-called 'digital divide;' (2) to examine the digital divide language 21 American cities use by employing a content analysis. Finally, implications for research on MWN are drawn.

## Keywords

Municipal wireless networks, digital divide, content analysis

## INTRODUCTION

Broadband access is commonly believed to be essential for all, yet is not available to all. The skills necessary to use information and communications technologies are not universally prevalent, yet are seen as becoming more centrally necessary to navigate everyday tasks. In order to fill the gap, municipalities are stepping in to offer wireless broadband access, turning the top-down traditional means of supplying telecommunication service and policy on its head. These municipal actions have provoked a flurry of responses from concerned constituents, including fixed line operators, and state legislators and the U.S. Congress. Currently legislation pending exists at both state and federal levels to address this issue. (Tapia, et al., 2005, Stone et al., 2006, Ortiz, et al., 2006). The basic premises upon which this research rests are the following;

- (1) Access to and skilled use of the internet are linked to social, political and economic success in the United States.
- (2) Access to and skilled use of the internet are not evenly distributed across all populations in the United States. A digital divide exists (for various values of digital divide).
- (3) Various levels of government have sought to narrow the gap via policy and programs at all governmental levels.
- (4) A lack of understanding of the digital divide, and the effects of the government actions on this divide motivate the need for research to understand why the divide exists, what factors "cause" or exacerbate the divide (e.g., economic, education), and how government actions affect these factors.
- (5) Recent actions in over 300 American cities to become internet service providers of wireless internet access to their citizens provide a unique opportunity to study the digital divide and observe the effects of government actions.
- (6) The language that many of these cities are using to explain their entrance into the ISP arena is to address both cost and access issues for disenfranchised citizens, attempting to narrow the digital divide.

Information technology has become central to our knowledge economy and thus wedded to wealth, power, and prestige. There is a strong common belief that people who have access to and the skills to use the Internet are (1) more successful economically, with respect to education, jobs, earnings, (2) socially participate more in terms of political and civic

engagement, and (3) receive more government services and other public goods than those who do not. (Katz & Rice, 2002; Kennard, 2001; Oden, 2004; Oden & Strover, 2002; Tufekcioglu, 2003).

Information Technology skills and access can be seen as public goods because, like education and libraries, they are capable of providing positive externalities associated with economic growth and democratic governance (Mossberger, Tolbert, & Stansbury, 2003). Critical technological skills raise the level of human capital in the economy particularly in the context of a knowledge economy. Computer and information technologies are tools for participation in the economy and the political arena (Westen, 2000). This provides a strong case for government intervention to provide access to all citizens, not just those who are already advantaged.

Recently over 300 cities in the United States have announced plans to deploy wireless broadband networks. As a public entity responsible with providing high quality services for citizens, some municipalities feel compelled to act (Tapia, et al., 2005, Stone et al., 2006, Ortiz, et al., 2006). These new wireless technologies, namely Wi-Fi (wireless fidelity or 802.11a/b/g) enable broadband internet access without requiring a spectrum license from the FCC. These technologies enable networks to have a wireless last mile solution and will be especially useful in bringing broadband access to low density areas.

Local municipalities have become involved in the development and deployment of internet services within their boundaries principally as a cost saving effort. Wireless broadband is substantially less expensive to deploy than other broadband solutions. Wireless technology's ability to use ubiquitous airwaves and unlicensed spectrum generates tremendous cost savings compared to wired deployments. Since there is no need to install wired infrastructure, wireless deployments can be deployed more quickly and less expensively in dense, developed, urban areas. In addition to its low cost, other benefits of MWN include: to better promote the growth of local economies, to improve the delivery of municipal services, to improve governmental communications, and to close the digital divide (Gillet, Lehr, & Osorio, 2004; Tapia, et al., 2005, Stone et al., 2006, Ortiz, et al., 2006).

It is common practice to document the objectives of municipal projects; MWN are no exception. For instance, this documentation provides insights in understanding how they intend to address the digital divide. The purpose of this research is to understand and make visible the strands of underlying assumptions made by these officials when it comes to the promises of ubiquitous wireless accessibility.

We are interested in asking (and hopefully providing provisional responses to) the following question in this *prima facie* study:

- 1) What is the digital divide as it emerges in the content of MWN documentation?

In addition, we intend to speculate on the meanings of such documentation in the following ways, leading toward future research.

- 2) What is gained by municipal leaders and/or municipal PR-Marketers-Spokespeople who make such constructions?

Although this research study is introductory in nature, we are hoping to ask these questions as a means to begin constructing a preliminary theory of MWN that takes into consideration the digital divide. Ideally, this line of research will allow us to build a more general model of the digital divide attuned to MWN, social stratification, social informatics, and the link between systems of education and training in the community. In this paper, we focus on preliminary findings from online documentation of twenty-one cities in the process of building or considering MWN in order to narrow the digital gap. The method of research employed in our study is a preliminary content analysis approach and aims to showcase initial trends and findings.

## **A DIGITAL DIVIDE**

The digital divide refers to persistent gaps in access to the internet based on race, ethnicity, education and income. Depending on the source of data, White Americans are 14 to 22.6 percent more likely than African Americans to have access to the Internet and 6 to 22.5 percent more likely than Latinos. Americans with a college degree are 21 to 34.1 percent more likely to have access. Americans that earn more than \$30,000 are more likely to have access than those who earn less. (Mossberger et al., 2003; Pew Internet and American Life Project, 2000; U.S. Department of Commerce, 2000). The digital divide reflects ongoing social inequalities in the US, explained by both the lack of vision as well as entrenched social, economic and political systems (Bagasao, Macias, Jones, & Pachon, 1999). These systems of social inequality not only shape diffusion

rates, but they also shape the use of IT in ways that reinforce existing inequalities rather than mitigate them (DiMaggio, 2001; Kling & Lamb, 2000; Kvasny, 2002). Thus, broad patterns of social inequality in education, work, consumption opportunities, and democratic participation are at the heart of the digital divide and continue to broaden the gap.

Moreover, while more individuals are gaining access to the internet daily, the gap between the haves and have-nots is widening in terms of use, technical competence and information literacy. It is unclear whether this digital divide is caused by economic issues (e.g., cost of basic services), education, or social issues (e.g., perception of the use of the internet). If mere access to information services does not affect the digital divide (or even exacerbates the divide), then new understanding is required to assist policy development and cyber infrastructure implementation and dissemination. Without such an understanding, tax dollars can be wasted and well-intentioned investments in the national cyber infrastructure could actually exacerbate the digital divide.

The discussion as to the nature of the digital divide has two principal voices; those that have conceived it as a technological penetration, or simple access issue (Compaine, 2000; Kolko, 2001; Thierer, 2000), and those that have seen access as only the tip of the iceberg, meaning that the divide is more than digital, it is cultural, educational, and socio-economical (DiMaggio & Hargittai, 2002; Gordo, 2000; Lazarus & Mora, 2000; Oden & Strover, 2002; Servon, 2002; Van Dijk, 2001; Warschauer, 2003). From this point of view government and industry has focused to narrowly on addressing the access issue by providing devices to schools and communities. Since these policy makers have not defined the digital divide in terms of skills and competence, they have not invested in training, teaching and technical assistance that would better address the issues.

## RESEARCH DESIGN

What we present here is research at its midpoint, in which some data has been collected, interim analyses have been completed, which have spurred us on the collect more data and ask new questions. This work is built upon research into the state and federal level policies that have enabled or restricted MWN development in 2004 and 2005 in the US (Tapia, et al., 2005, Stone et al., 2006) as well as research attempting to understand the role of MWN in addressing the digital divide (Ortiz et al., 2006). Currently, we have developed a database repository of approximately 300 municipalities in the United States at various stages in their development of MWN. We are following the development and deployment of MWN in each of these municipalities in terms of the following topical areas; business model, partner/relationships, network form, development process, response to state restrictions, municipal policy, and public participation. While this repository has been and will be invaluable to understand the nature of MWN development in the United States, it is clearly not enough to understand the digital divide issue in any detailed sense. This question demands further study.

To assess the arguments made by the cities deploying MWN, the initial goal of this research was to conduct a content analysis of public text distributed by twenty-one cities. We proposed to analyze the MWN texts in terms of the code “digital divide” and related constructs. By content analysis, we mean the investigation of the content of a selected text, and the ideas it comprises. These are then understood, both in terms of their antecedents, and as part of a logical sequence. It is a method of understanding how the use of language has social effects; how language is used, why it is used, by whom, and in which circumstances (Holsti, 1969). Content analysis enables access to the ontological and epistemological statements behind a text, to reveal the hidden motivations or assumptions (Krippendorff, 1980; Berelson, 1952). The objective here is to discover the main structure of the (underlying) digital divide message.

The text of analysis included City Mayors’ statements, official governmental City websites and newspaper articles for these 21 cities. We understand that the majority of these documents were official press releases and governmental statements, and thus carefully word-smithed by governmental public relations officials. Because of our core interest in policy, we selected these statements because of their official nature. While the MWN deployments do not form a complete picture as they are specific in time in the experiences of that city, they were read literally in terms of discursive event. The deployment sites assessed are listed below.

- |                      |                         |
|----------------------|-------------------------|
| 1. Scottsdale, AZ    | 9. Muskegon, MI         |
| 2. Long Beach, CA    | 10. Grand Rapids, MI    |
| 3. San Diego, CA     | 11. St. Louis Park, MN  |
| 4. San Francisco, CA | 12. St. Paul, MN        |
| 5. Miami, FL         | 13. Sandoval County, NM |
| 6. Chicago, IL       | 14. Buffalo, NY         |
| 7. Cambridge, MA     | 15. Suffolk County, NY  |
| 8. Cabin John, MD    | 16. Akron, OH           |

- |                      |                   |
|----------------------|-------------------|
| 17. Portland, OR     | 20. Seattle, WA   |
| 18. Philadelphia, PA | 21. Milwaukee, WI |
| 19. Houston, TX      |                   |

The municipalities in this study represent those cities that are considering a MWN or in the process of building one. We chose these cities because they met the following criteria:

- Actively engaged in developing, and/or deploying a MWN (not completed)
- Publicly use text/language that links this development/deployment to alleviating the digital divide.

One of our future goals is to extend the analysis to all 300 cities in our repository.

The data collection of these cities was a three-fold process. First, we searched annual Mayors’ statements, official governmental City websites and newspaper articles for any mention of the aforementioned codes. Second, if a code was present then the data source was marked and reviewed. Lastly, the type of discussion was noted and stored to be compared with all other instances found.

Our coding framework was established a priori based on our review of the literature on the digital divide discussed earlier in this paper. Initial article coding was done by one of the authors. This was compared to the coding of one co-author and one undergraduate research assistant. As is typical in dual coding efforts, differences in the coding of an article were resolved through discussion. Twelve key codes were developed through this negotiation of understanding.

- |                                    |                              |
|------------------------------------|------------------------------|
| 1. Digital Divide                  | 7. Information Rich and Poor |
| 2. Digital Inequality              | 8. Low-Income                |
| 3. Digital Gap                     | 9. Disenfranchised           |
| 4. Social Inclusion                | 10. Underrepresented         |
| 5. Social Exclusion                | 11. Disadvantaged            |
| 6. Information Haves and Have-Nots | 12. Underprivileged          |

**A LIMITED TYPOLOGY FOR DIGITAL DIVIDE IN MWN DOCUMENTATION**

Based on the municipalities that mentioned the digital divide, we have developed a typology to better discuss our results. A typology allows us to develop a schema in order to identify themes which form an applicable foundation on which to assign individual examples to different categories. Specifically, it allows us to clarify the range of digital divide terminology; it is an attempt to create a common language about what presently is in place across all these MWN. This typology should only be seen as a means to simplify the presentation of our findings.

**Table 1: Limited Typology of Emergent Themes**

<i>Theme</i>	<i>Municipality</i>	<i>Evidence</i>
<b>1) Internet access is seen as a utility and thus the City’s responsibility towards citizens.</b>	Chicago, IL	“[The City] needs to compete for jobs, to improve education, to train the Internet work force, and to eliminate digital divide...To compete in the Internet age, a whole new infrastructure is needed - one that can carry high speed communications.” <a href="http://www.cityofchicago.org/civicnet/RFOInformation.html">http://www.cityofchicago.org/civicnet/RFOInformation.html</a>
	St. Louis Park, MN	“The City adds wireless as another service on utility bills (just as water, sewer, and solid waste are other utility services.” <a href="http://www.stlouispark.org">http://www.stlouispark.org</a>
<b>2) Ubiquitous wireless broadband will increase accessibility and usage.</b>	St. Paul, MN	“[The City] recognizes the importance of broadband accessibility to the future of our city and...has a study underway to help officials chart a course of action. ...One of the goals of the study is to better understand how residents, businesses, and visitors may benefit from having access to broadband technology at any time and any place within Saint Paul.” <a href="http://www.ci.stpaul.mn.us">http://www.ci.stpaul.mn.us</a>
		“We will be announcing a partnership with the MicroSoft Foundation who will donate 100

	<p>Miami, FL</p> <p>Sandoval County, NM</p> <p>San Diego, CA</p> <p>Muskegon, MI</p>	<p><i>new computers for our parks in an effort to bridge the digital divide. Our E-Parks program will build computer labs in all of our major [hot spots].</i>  <a href="http://ci.miami.fl.us/cms/mayor/1284.htm">http://ci.miami.fl.us/cms/mayor/1284.htm</a></p> <p><i>“One of the main reasons for building the county system is to bring rural residents high-speed Internet access. Many people in the state’s rural areas do not have access to high-speed Internet service, which is particularly helpful for students and business owners.”</i>  <a href="http://www.freenevmexican.com/news/34454.html">http://www.freenevmexican.com/news/34454.html</a></p> <p><i>“In an ongoing effort to remove inequities in our society and promote technology inclusion, [the City of San Diego] is launching a public awareness campaign to promote community technology centers. They provide residents with access to computers and high-speed Internet connections...along with technical support and training ...”</i>  <a href="http://www.waittfoundation.org/news/digital.html">http://www.waittfoundation.org/news/digital.html</a></p> <p><i>"[The City] intends to mobilize broadband investment in geographic regions where high-speed Internet service may not be available or where service is unaffordable for the average low to medium income (LMI) household. Lowering...costs will increase broadband adoption rates in LMI communities. Increasing broadband adoption rates in LMI communities is the ultimate goal of the [The City]."</i>  <a href="http://www.co.muskegon.mi.us/digitaldivide/digital_divide_rfp.pdf">http://www.co.muskegon.mi.us/digitaldivide/digital_divide_rfp.pdf</a></p>
<p><b>3) Providing low-cost access to low-income areas translates into increased social benefits.</b></p>	<p>Philadelphia, PA</p> <p>San Francisco, CA</p> <p>Houston, TX</p> <p>Long Beach, CA</p> <p>Portland, OR</p> <p>Grand Rapids, MI</p> <p>Milwaukee, WI</p> <p>Buffalo, NY</p>	<p><i>“A wireless city...will...assist in bridging the digital divide that now exists and prevents many individuals and families from obtaining the full measure of the opportunities generated by the Internet because they can’t afford the cost of wired broadband Internet access. This limits educational opportunities, job opportunities, and participation in many dimensions of modern society. Eventually it results in segments of the population forever lagging behind their peers...One goal of the project [Wireless Philadelphia] is to overcome the digital divide, to train small businesses and disadvantaged people.”</i>  <a href="http://www.govtech.net/digitalcommunities/story.php?id=96864">http://www.govtech.net/digitalcommunities/story.php?id=96864</a></p> <p><i>"San Francisco understands that universal, affordable, wireless broadband access is essential to boost our economic, social and educational opportunities. Providing universal, affordable, wireless broadband ...will bring the promise of technology to low income and disadvantaged citizens."</i> <a href="http://www.govtech.net/digitalcommunities/story.php?id=96864">http://www.govtech.net/digitalcommunities/story.php?id=96864</a></p> <p><i>“[The City intends] to make wireless broadband Internet access available ... This includes universally-available and affordably-priced Internet access for residents, businesses and visitors to the City, helping to promote economic development and digital inclusion.”</i>  <a href="http://www.houstontx.gov/it/wirelessrfp.pdf">http://www.houstontx.gov/it/wirelessrfp.pdf</a></p> <p><i>“The City believes that the deployment of a Wi-Fi network will allow residents and businesses to experience significant economic and social benefits through increased options for broadband Internet connectivity.”</i>  <a href="http://www.muniwireless.com/reports/docs/LongBeachRFP.pdf">http://www.muniwireless.com/reports/docs/LongBeachRFP.pdf</a></p> <p><i>“[The City] is collaborating to sponsor the development of a wireless network to promote economic and public benefits for community, business and government use.”</i>  <a href="http://www.portlandonline.com/omf/index.cfm?c=26586&amp;">http://www.portlandonline.com/omf/index.cfm?c=26586&amp;</a></p> <p><i>“... a ubiquitous community wireless broadband network will provide an economic development tool to attract and retain business, reduce the digital divide with affordable high-speed broadband service, improve service delivery to residents, facilitate wireless technology use for citizens and visitors, and create a seamless wireless infrastructure to attract and retain young professionals, making Grand Rapids a cool city.”</i>  <a href="http://www.ci.grand-rapids.mi.us/index.pl?binobjid=1678">http://www.ci.grand-rapids.mi.us/index.pl?binobjid=1678</a></p> <p><i>"It will create tremendous growth for a locally-owned company and will open the door to new jobs, job training and other social and educational opportunities...a big step toward bridging the digital divide and for the promise it brings to low-income citizens and neighborhoods in critical need of access to online information and opportunities."</i>  <a href="http://badgerherald.com/news/2006/02/03/milwaukee_plans_wire.php">http://badgerherald.com/news/2006/02/03/milwaukee_plans_wire.php</a></p> <p><i>“Buffalo wants to raise its technology profile and attract businesses, as well as try to bridge the digital divide between poor neighborhoods and wealthier ones.”</i>  <a href="http://www.muniwireless.com">http://www.muniwireless.com</a></p>

<b>4) Ubiquitous connectivity creates an identity and revitalizes the community.</b>	Suffolk County, NY	<i>"Being wireless of course would make us state of the art and provide for greater flexibility for businesses and residents,"</i> <a href="http://www.newsday.com/news/printedition/longisland/ny-liwifi104620864feb10.0.3957594.story">http://www.newsday.com/news/printedition/longisland/ny-liwifi104620864feb10.0.3957594.story</a>
	Cambridge, MA	<i>"The main goal of the project is to provide internet access to Cantabrigians who live in public housing. The city's partnership with MIT will affect town-gown relations positively"</i> <a href="http://www-tech.mit.edu/V125/N65/wirelesscambridge.html">http://www-tech.mit.edu/V125/N65/wirelesscambridge.html</a>
	Seattle, WA	<i>"Using technology as a tool to help businesses in our communities attract more customers is another the way the City is working to strengthen our neighborhoods."</i> <a href="http://www.ci.seattle.wa.us">http://www.ci.seattle.wa.us</a>
	Cabin John, MD	<i>"The Cabin John Citizens Association is an organization of concerned citizens dedicated to addressing the concerns of the Cabin John community. [Its] fundamental goal is to preserve and promote the identity of Cabin John as a community."</i> <a href="http://www.muniwireless.com/reports/docs/CabinJohnRFI.pdf">http://www.muniwireless.com/reports/docs/CabinJohnRFI.pdf</a>
	Scottsdale, AZ	<i>"[The wireless project] would make downtown more inviting to those who are mobile data users. The network could attract technology workers who would live and work in the city's core, helping revitalization efforts there."</i> <a href="http://www.azcentral.com/community/scottsdale/articles/1118sr-wifi18Z8.html">http://www.azcentral.com/community/scottsdale/articles/1118sr-wifi18Z8.html</a>
	Akron, OH	<i>"The city of Akron's wireless initiative will help bring us into the forefront when it comes to technological advantage and creativeness. It should also help in slowing the exit tide of young technicians moving away and keep them right here in Akron."</i> <a href="http://www.ci.akron.oh.us">http://www.ci.akron.oh.us</a>

The typology analysis described above was grouped into four themes and shows how the digital divide language used by municipalities are related to one another. According to Table 1, it would seem that Theme #3 has the most entries (8 cities); this makes sense as most of these cities are bigger, metropolitan towns with higher rates of poverty, racial and income heterogeneity, and a more complex infrastructure. In several instances, one quote may be placed in one or more themes. This is noted after quote [Themes 3 and 4 for example].

**INTERPRETATION OF RESULTS**

The results of the study were interpreted from an interpretative standpoint which is based on a four-tier typology. The typologies described above must be considered a beginning effort in pursuit of a more rigorous categorization plan; it is an introductory effort in creating a common language. Simply put, it is a beginning towards understanding that while all MWN deal with similar digital divide issues, they put different emphasis on the digital divide concept and related genres. Certainly, there is a great deal of overlap between and among each category. This distinction is explained by how much emphasis the cities typically place on the digital divide and related types

The typology analysis of the digital divide language provides additional perspectives in understanding its meanings and its use as it emerges in MWN literature. The large number of actual "digital divide" terms that appear in MWN documentation indicates a close relationship between the wireless technology and social benefits, suggesting that access promises to provide a gateway for eliminating digital inequality.

It is important to highlight that the text we unearthed is crafter by marketing personnel who are looking to employ buzzwords they think are crucial for convincing the general public. The texts are written with the intent of persuading someone about something. Who is that someone? What is that something? These are the questions we ask as content analysis researchers.

Drawing from the Social Shaping of Technology and Actor Network Theory, we see a MWN as a socio-technical ensemble, in which technology and organizations cannot be treated as separate entities. There exists a complex web of mutual dependency between all relevant social groups, devices, expertise and information. Bijker uses the term socio-technical ensemble to denote this network of objects, infrastructures, and humans and the roles they play (Bijker, 1995). These elements of the ensemble, whether human or technical, must work together to produce a functioning whole. The development and deployment of MWN is a complex and interdependent set of relations among people, their organizational rules and roles, and various computing resources (Orlikowski and Iacono, 2001).

We see the concept of "inscription" as a useful theoretical tool to help analyze the digital divide content as used by these municipalities in describing the potential for their MWN. Inscription is a process by which various stakeholders who have political, social and economic interest in a socio-technical artifact attempt to protect and ensure their own interests regarding

the artifact. Often this is done through the process of defining the artifact through the use of language. (Latour, 1992; Latour and Woolgar, 1986; Callon, Law, and Rip, 1986; Akrich 1992; Akrich and Latour 1992). It is obvious that these MWN are being defined differently to different relevant social groups. The municipal governments, internet service providers, state and federal legislators, device designers, and potential users all represent relevant social groups who have political interest in shaping the MWN. These relevant social groups can also be seen as communities of practice who share a technological device in common, yet who interpret that device very differently.

Our data point to the fact that MWN are socio-technical objects that are being textually defined in the public sphere as a solution to the complex problem of the digital divide. In the case of these twenty-one cities city officials have made a direct, causal link between the deployment of municipal broadband systems and narrowing the digital gap. These city officials have made textual efforts to “inscribe” the MWN with concepts of social inclusion, utility status, social revitalization and equality. We are driven to ask, considering the paucity of data making a clear link between MWN and narrowing this gap, what governmental officials seek to gain by making these perhaps unfounded claims.

From our earlier literature review, we also know that delivering broadband internet access to impoverished and disenfranchised neighborhoods or institutions does not, in fact, narrow the gap. It is possible that these municipal labeling efforts reflect a need to sway taxpayers toward a more favorable stance concerning the development of MWN, especially in the light of continued state and federal legislation that threatens continued municipal deployment. While we do not believe that merely adding low-cost broadband internet access to impoverished neighborhoods, without additional educational programs and low-cost devices, will indeed narrow the gap, we concede that the growing use of such language has brought the digital divide issue to the forefront of many large municipalities, demanding much needed political attention.

As an example of this, the city of Philadelphia, Pennsylvania, USA has encoded addressing the digital divide into their MWN business plan. The intentions of the Philadelphia wireless plan are to get creative about designing public-private partnerships that involve as many private enterprises as possible and that lower the cost of communications for businesses and residents. Philadelphia also has decided not to become an Internet Service Provider (ISP) itself, rather the city will create a non-profit organization (Wireless Philadelphia) whose task is to build the network by contracting out to private parties. The non-profit will get its funding through foundation grants and bank loans; earning revenue by selling access to private ISPs at wholesale prices. The city will be an anchor tenant by purchasing business class DSL, T-1 service and other basic access needs from the non-profit. In turn, the city will provide the non-profit with rights of way to city-owned property and electric poles for the installation of wireless equipment. The non-profit will use the revenues to help the city meet its social goals: with the free cash flow, they plan to give 10,000 computers and 8-10 hours of training to low-income individuals, increase the number of families that have access to broadband and partner with other non-profits in neighborhoods. They hope to create 6000 new jobs in low-income neighborhoods (Wireless Philadelphia Business Plan, 2005). In the future we will take what is offered in the Wireless Philadelphia business plan and use that as a starting point from which to build a more complete case study of Philadelphia’s process toward the development and deployment of a MWN and addressing the digital divide.

## CONCLUDING REMARKS

Further research, both conceptual and empirical, is needed. First, a complete review of content analysis in context would help to clarify our position and define the acceptable extent of civic obligation and municipal power in addressing the digital divide. Second, it is clear that studying multiple case studies in the Information Society requires in-depth and intrinsic insights into the process, operation and dynamics of each MWN. Further work is required to examine how the points identified relate to specific cities and thus, gauge the development plans of each city. This was only a first phase of research. In a succeeding paper, for instance, we will examine the city of Philadelphia, PA in order to develop a complete case study.

In many ways this is a new frontier for research in this social-political-technological realm. The questions are immense, the current research is meager, and the implications are far-ranging. Although there is research that suggests MWN in-fact enhance economic development activity (Lehr, et al 2005), there is no academic research supporting the claim that they also address the digital divide. Little research has been conducted which actually examines content analysis, such as digital divide context, in planning and implementing MWN initiatives in the U.S. Recent research by Dimaggio, et al. 2005 and Kvasny, 2002 suggests that the success of digital divide projects depends on a variety of factors such as training, education, user perceptions of IT, and the organization’s past experience with using IT. All of these factors impact in some way the perceived approval and success of MWN. Additionally, as noted in the academic literature, the ongoing effort to narrow the gap between the information rich and information poor continues to be a problematic issue (Oden, 2004; Hoffman & Thomas, 1998). We see issues with language and the dynamics of wireless ubiquity (and the concerns with universal access) as potentially important forces that shape MWN discourse. Finally, writing this paper allows us to explore an example of cities attempting to move toward proving a service traditionally offered by incumbents. Again, the academic literature



illustrates that municipal interventions are important (Thomas, 2004) but there are relatively few instances of how IT can be used on a broad scale to improve municipal social issues, like the digital divide.

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