16 BANDWITHING TOGETHER: Municipalities as Service Providers in a Policy Environment

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Abstract   *In this paper we have highlighted three things. First, that public organizations are engaged in a technologically driven servitization of their traditional service products. Second, that public organizations must approach this servitization differently because of the decision-making role of citizens in the process. Third, it is essential to study the influence citizens have on this process through studying the public policy process around decisions concerning the delivery of technology and technologically driven services. In this paper we provide an overview of four constituencies and their relationships involved in municipal wireless broadband policy. The idea that the growth of information technology-dependent services and activities (education, healthcare, and Web 2.0, for instance) are dependent on wide-scale availability of broadband access, and that local governments are jumping into this market to establish the necessary infrastructures for such services, makes this a very hotly contested space. While national and international political issues are debated on the Internet daily, new avenues for very local, political speech and action on the Internet seem to go hand-in-hand with municipal wireless broadband issues. The creation of public policy, while normally seen as a top-down process, has always drawn varying input from the outside through avenues such as lobbying, town meetings, referendums, and public action. We claim that in the case of municipal wireless broadband policy, policy efforts have been turned upside-down, with the majority of policy making now happens at the local level.*

1   INTRODUCTION

In the past 20 years, the world's economy has moved toward the creation of a service economy in which the service sector has grown in importance, the percentage of service companies is growing in relation to manufacturers, and products have a higher service component. In the management literature, this is referred to as the *servitization of products* (Vandermerwe and Rada 1988).

Information and communication technologies (ICTs) have played a large role in this servitization of products and companies. ICTs have allowed for the converting of products into services and the enhancing of traditional products with information service components. ICTs have also fostered new forms of communication and information exchange between supply chains of intangible services as well as increased communication directly between customers and service providers.

While this change in the private sector has been well studied, similar changes in the public sector have remained virtually untouched. Perhaps this is because the public sector has often been construed as principally a service provider, not having to reinvent from a manufacturing base. The core competencies often associated with local governments are nearly all services, including the provision of arts, recreation, water, sewage, electricity, library, public housing, transportation, police, fire, environment, health, and economic development, to name a few. However, through further development and use of ICTs, the public sector has transformed its traditional offline services into online services, developed new online services, and entered new markets not previously associated with the public sector.

We focus our attention on this last form of public servitization transformation. We are interested in how local governments have come to see themselves as direct providers of telecommunication services. Approximately 400 municipalities in the United States are developing and deploying affordable wireless broadband networks. These cities are deploying their own wireless broadband networks with the intention of meeting the increasing information needs of city employees and citizens and simultaneously increasing the efficiency and effectiveness of the delivery of those services.

ICT-enabled services are human intensive services that are delivered over telecommunication networks, specifically the Internet. The idea that the growth of IT-dependent services and activities are dependent on wide-scale availability of broadband connectivity, and local government officials are affording wireless broadband to establish the infrastructure necessary for such services, makes this a complex and very local telecommunications space. Although the entrance of governments into the telecommunications market is not ahistorical (e.g., they already provide telephones, healthcare, education, and so on.), the strong push-back from the telecommunication incumbents and other for-profits about municipal service providers is something unique to this service area.

Again, perhaps unlike servitization in the private sector, public sector entrance into the telecommunications market has been hotly contested. In 2005, telecommunication incumbents and state legislatures proposed and enacted legislation to restrict, and in some cases prohibit, municipalities from entering into this space. In 2006 and 2007, less than half of the proposed legislation had passed, and none passed without negotiation and compromise between the parties. Simultaneously, five U.S. federal-level bills have been proposed in congress, addressing the municipal broadband issue, none as yet having made it out of committee. A new Telecommunications Act is expected in 2010, making

up for the obsolescence of the Telecommunications Act of 1996, which will significantly alter the political landscape at the state and municipal levels. However, until then, policy making concerning this issue is happening primarily at the local level as municipalities, interest groups, local providers, and state representatives negotiate the best means to provide the most people with the best delivery of broadband and online government services.

Furthermore, what makes this issue so interesting is that this is a technological debate being held in a technologically enabled forum. This is compounded by the fact that while all parties involved seem to agree on the goal, very few agree on the means to that end. Additionally, while national and international political issues are debated on the Internet daily, new avenues for very local, political speech and action on the Internet seem to go hand-in-hand with municipal wireless broadband issues. The creation of public policy, while normally seen as a top-down process, has always drawn varying input from the outside through avenues such as lobbying, town meetings, referendums, and public action. We claim that in the case of municipal wireless broadband policy, policy efforts have been turned upside-down, with the majority of policy making now happening at the local level.

Consistent with research approaches in public policy research, in this paper we provide an overview of the different constituencies and their relations surrounding municipal broadband policy in the United States. It is acknowledged from the outset that the perspective adopted, out of necessity, takes an instrumental and narrow view of what is public policy. We are interested in the process of policy, rather than the policy itself. To meet our goals of understanding this complex policy arena, we have developed three research questions that have guided our work.

(1) Who are the constituents that generate broadband policy for municipalities?
(2) What is *unique about their relations* considering the lack of federal policy, the role of the Internet, and bottom-up political action?
(3) What are the mechanisms that facilitate input from these diverse constituencies into a more top-down, traditional policy making setting?

We will provide a general introduction to and highlight the potential role and usefulness of analyzing formal/informal and top-down/bottom-up policy approaches in municipal broadband network research. The paper will provide a brief literature review of public policy process, and will describe recent municipal wireless developments and how these developments are being used to inform policy in the United States. We will then review the evidence on the documentation of these networks, focusing on four archetypes of policy camps driven by different dynamics. The remaining sections of the paper will be devoted to a discussion of municipal constituencies and their relations with regard to public policy.

2 THE CONTEXT: MUNICIPAL WIRELESS BROADBAND NETWORKS

As full participation in civic, commercial, and social life is tied to Internet and computer literacy and access, broadband access is becoming a necessity rather than a

luxury. During the 1990s, this trend was clearly recognized by the U.S. government, which championed the Internet and used the power of the federal government to encourage its growth. However, while the United States has made significant gains in broadband adoption, a first step in closing this gap, it still lags far behind other countries (Bleha 2005). The United States also trails other countries in terms of the average speeds available over their broadband connections. Recent commentary has characterized U.S. broadband among the "slowest, most expensive, and least reliable in the developed world" (Bleha 2005, p. 111).

Recently, cost-saving wireless technologies have unsurprisingly replaced wired technologies. As the demand increases and more users join the wireless community, wireless technologies become faster, more robust, and cheaper (Lehr et al. 2004). As a result, over 400 cities in the United States have announced plans to deploy wireless broadband networks, claiming that these networks would enhance economic development, provide for additional tourism, support city services and personnel, and perhaps decrease the digital divide.

Municipalities enjoy certain advantages in this space. While local governments do not have control over state and federal policies, they do have control over local policies. These local policy efforts can influence communications infrastructure deployment, business and residential demographics that shape demand, and the nature and quality of existing infrastructure, all of which can have a direct impact of the development and deployment of municipal wireless networks (Gillett and Lehr 1999). Given existing municipal assets such as buildings, rights of way, and structures that can house wireless antennas, yet another incentive is that municipalities may enjoy a lower cost of broadband infrastructure deployment.

As municipal wireless broadband deployments have become more high profile, private sector providers have expressed a number of concerns. Private providers express concern that cities providing wireless broadband service have an unlimited base from which to raise capital, act as a regulator for local rights of way and tower permitting, own public infrastructure necessary for network deployments including street lights, and are tax-exempt organizations. In addition, it has been argued that these broadband networks may cost more than the cities anticipate, resulting in money and attention being diverted away from other public interests.   Another fear is that if these networks are allowed to flourish, municipalities will have unfair regulatory and economic advantages (Lenard 2004).

Many telecommunications companies have sought legislative relief at the state level to regulate or restrict a municipality's ability to provide wireless broadband services to the public. With no guidance from the Telecommunications Act of 1996, the Supreme Court sided with the Federal Communications Commission and various ILEC (incumbent local exchange carrier) lobbyists in its decision in *Nixon v Missouri Municipal League*, to allow states to bar their subdivisions from providing telecommunications services. The opinion gave states the authority to determine when and where municipalities can deploy communications services.

Currently most states have legislation proposed, pending or passed that prohibits municipalities from providing telecommunication services directly or indirectly. In some cases state legislatures have prevented municipalities from expanding existing networks. In other cases, state legislatures have not out-right prohibited the development and deployment of municipal broadband networks, but they have created organizational and bureaucratic barriers causing these networks to be curtailed, reconfigured, or resized.

Thus the current setting is that most municipalities are caught between citizens, local businesses, and their own employees who are demanding high quality, affordable, universal broadband Internet service and their state legislators and incumbent telecommunications companies who seek to keep the offering of telecommunications services out of public hands, yet cannot, or will not, comply with local citizen and business demands. In some cases, municipalities have entered into public–private partnerships in which they do not offer broadband service directly, but instead offer rights of way or government employee contracts, among other things, to either an outside nonprofit or local Internet service provider to offer the service on their behalf. These negotiations usually result in hybrid organizations offering service to consumers at reduced prices, covering more square miles, and reaching underserved populations, as well as complying with some of the more restrictive state policies.

3 DIMENSIONS OF THE PUBLIC POLICY PROCESS

The perspective of this paper is a public policy one. This is in contrast to other social research perspectives, which are often based on a narrow disciplinary focus. A public policy focus acknowledges the complexity of the policy decision-making process. For our purposes, we examine the process of creating broadband policy as a series of choices, rather than a study of costs and benefits (March and Olsen 1989). Our working definition of public policy is "an action which employs governmental authority to commit resources in support of a preferred value" (Considine 1994, p. 3). Federal, state, and local governments usually set the rules of the political arena and, consequently, determine the outcome of public policies. It is in this light that public policy is a reflection of a government's political agenda, encompassing both specific policies (i.e., universal access policy) or those wider in scope (i.e., economic policy).

During the past decade, the role of governments in public policy has been steadily changing. Increasing emphasis (often implicit) is being placed on setting overall direction through policy and planning, on engaging stakeholders and citizens, and on empowering stakeholders or partners to deliver programs and services (Dunn 1994; Fischer 1995; Patton and Sawicki 1993). At the same time, the environment for policy and planning has increased in complexity (Demsetz 1999). The ownership of issues is often unclear, especially when more than one department and often more than one level of government are involved. Local governments and grassroots communities also increasingly claim ownership of policy issues and processes. In this complex environment, the demand for good public policy development steadily increases, as must the capacity of managers, policy analysts, planners, and others involved in the design and delivery of policies and programs.

An array of definitions regarding public policy exist (Brooks 1989; 1978; Dye 1972; Frederich 1963) and there appears to be a lack of consensus about what constitutes public policy. Nonetheless, most definitions recognize policy as an action, which employs governmental authority to use resources in support of a preferred value. Briefly stated, public policy is a choice or decision made by federal, state, and local governments that guides subsequent actions. It is outcome-oriented and operates on the basis of general criteria, namely, mission statements, organizational values, political priorities, and so on.

Public policy issues can be separated into two main categories: those that are on the public policy agenda, and those that are not. If an issue is on the public policy agenda, it has a high profile, and a formal process is likely to be in place. If an issue is not on the public policy agenda, the job of the stakeholders/community is to provide information and education, and to take other steps to raise awareness and get it on the agenda. According to Gerston (1997), an issue will appear, materialize, and continue on the public policy agenda when it meets one or more of three criteria. Gerston argues that the issue must have sufficient intensity (the magnitude of the impact is high), scope (a significant number of people or communities are affected), and/or time (it has been an issue over a long period).

The literature divides public policy into two basic types: vertical policy and horizontal policy (Chung 2001; Guiraudon 2000; Lafferty and Hovden 2003; Williams and Griffin 1996). Vertical policy is developed within an organization that has authority and resources for implementation. Vertical policy is what we think of as the normal or traditional way in which policy decisions are made. Vertical policy is developed within a single organizational structure and generally starts with broad overarching policy. Horizontal policy is developed by two or more organizations, each of which has the authority or ability to deal with only a part of the situation. The distinction reflects how clearly a mandate rests with one department, unit, or agency, and its capacity to address the root cause of the issue with existing resources. Horizontal policy, often referred to as integrated policy, is developed between parts of an organization, or among organizational components that are in similar hierarchical positions. There is a great deal of discussion today about horizontal policy issues (sometimes referred to as *crosscutting issues*) and the challenges that organizations face in dealing effectively with them (Kubler et al. 2003).

The first dimension in our discussion of the process of policy decision making is rational versus political models (Grindle and Thomas 1990; Majone 1989; Stokey and Zeckhauser 1978). The rational model explicates policy making as a problem-solving process, which is balanced, objective, rational, and very analytical. In this model, decisions are made in sequential steps, starting with identifying the issue, and ending with a list of actions to address it. Because policy is categorized by objective analysis of choices and separation of the policy from the implementation, some argue that a linear model is inaccurate (Clay and Schaffer 1986). This split between decision making and implementation is generally "attributed to decision-makers sense that politics surrounds decision-making activities while implementation is an administrative activity" (Grindle and Thomas 1990, p. 1170). As a result, policy making and policy implementation are best appreciated as a chaos of purposes and accidents; a combination of concepts and tools from different disciplines can be used to put order into the chaos (Sutton 1999). This contrasting model is termed the *political model* and is the most prevalent view of the policy process (Majone 1989; Stone 1997). The main rationale behind the political model is the influence on political decisions through the passing of laws, regulations, and legislation. In short, this model is instrumental and tactful in achieving quickly the objectives of the government.

In yet another dimension, the policy-making process can be viewed as either top-down or bottom-up (Chrispeels 1997; Christman and Rhodes 2002). Top-down approaches to public policy are authoritarian and coercive in nature; bottom-up approaches are viewed as grassroots movements and in objection to existing (or pending) policy.

The *bureaucratic process model* starts with the policy message at the top and sees implementation as occurring in a chain (Dunsire 1978). The policy is seen as a paramount and resistance to it tends to be seen as irrational, and as a barrier to implementation. The bottom-up approach, in contrast, involves the citizenry in decision-making processes considered for adoption at the top at different stages of development. The depth and breath of the latter framework is to involve citizens in the governance process and, by so doing, regenerate, reinforce, or retract laws and regulations that affect practices impacting on their lives. It reflects the ways in which local people understand their situation, strategize, and formalize a plan to implement new laws. Nevertheless, the policy-making process remains essentially a top-down process involving political figures (e.g., elected officials, political appointees, advisors, etc.) (Majone 1989). This said, however, some scholars argue public policy is more accurately understood to be produced at the intersection of top-down and bottom-up forces (Baumgartner and Jones 1993; Goggin et al. 1990; Sundquist and Davis 1969).

Our third dimension of the policy process is formal versus informal. Formal policy is written, either as rules or ordinances and typically represents the policy goals of most governments. Formal policy is published as a distinct policy document that is publicly available. On the other hand, informal policy is unwritten and is conceived as a set of "understood" practices that individuals must follow. Informal policy is unpublished and there is little assurance that government officials will adhere to it, as well as tremendous potential for variations in understandings about how the policy should apply.

From this brief review of the dimensions of public policy, we can draw several conceptual tools to apply to the municipal broadband sphere. The policy process can be seen as having both vertical and horizontal action and action that is both rational and politically motivated and construed. For our purposes, we see these actions in terms of their origins, top-down versus bottom-up, and in terms of the form, formal versus informal. There is a great deal of overlap between each of these aspects of policy. For instance, vertical policy can be viewed as a political and top-down approach for implementing both formal and informal policy. As we will see in this paper, broadband policy for municipalities is no exception.

4 METHODOLOGICAL APPROACH

In June 2005, we created a dynamic and evolving database of all municipal/community wireless initiatives in the United States. As of June 2007, the database contains more than 400 entries. The data that we have collected spans multiple categories including information on the shape, form, uses, and technologies of the municipal/community network itself; the business plan and/or service delivery plan; the status of the development/deployment of the network; the social impacts of the network; and the marketing language used by the owners and users of the network.

This database has been populated through a variety of methodologies. In most cases, information was obtained through the use of the Internet, using crawling techniques via municipal/community sponsored websites, press releases, public documents, and online news and web logs. In addition, when information proved scarce or dubious, the municipality or community was called, and information was supplemented and verified

via phone. Drawing from one subsection of fields from the database, we have compiled all texts from these cities. While the documents analyzed do not form a complete picture of the intentions of the city or its representatives, as they are specific in time and space in the experiences of that city, they were read literally in terms of discursive event. (For a complete presentation and analysis of these data, see Ortiz and Tapia 2008.)

Building on the these public policy documents, theoretical underpinnings, and our evolving database, we develop a conceptual framework. In this paper, we attempt to provide an overview of the different public policy constituencies and their relations that generate municipal broadband cities in the United States. We do not attempt to summarize academic, industry, or public policy literature. We strive to categorize (not summarize) the current types of public policies by way of a conceptual framework. This framework describes four constituencies involved in municipal wireless broadband policy and not necessarily the process of policy making.

Figure 1, with the various actors/intermediaries (websites, policy documents, etc.), informs our analysis. It presents a matrix of the sources of input to policy making and implementation. The cell entries are incomplete and only illustrative. The arrow represents the path traveled from the Type 4/Broadcast Interaction to the Type 1/Law Building quadrants. In other words, grassroots, bottom-up driven policy efforts aim to inform and influence formal, top-down policy. The lines between each quadrant are not solid as there is a great deal of overlap between each type. Each quadrant is explained below.

4.1   Type 1: Law Building (Top-Down + Formal Quadrant)

This approach is distinguished from other approaches in that it is embedded within a hierarchical structure initiated and executed by an organization's top leadership by way of laws, statutes, ordinances, and policy legislation. It is the ideal goal desired in policy implementation as it is needed at times for instituting major changes in direction. The Telecommunications Act of 1996 is an example of a top-down, formal approach. The Act was the first major overhaul of telecommunications law in over 60 years.

4.2   Type 2: Rhetorical Inscription (Top-Down + Informal Quadrant)

In contrast to the top-down, formal approach, this quadrant is composed of formal policy that comes in the form of the spoken and written word; it is rhetoric that appears in governmental addresses (president and mayor speeches, for instance), government press releases, and commentaries. For example, the State Corporation Commission, the Federal Trade Commission, the Federal Communications Commission, and the Federal Reserve Board follow standards of policy. Standards of policy are informal rules and practices that are part of their governing documents and thus a part of the rules of the rights and obligations governing their members. Members of these organizations envisage a gradual transition from informal standards of policy to a more organized, formal standard. The transition is a systemic process to ensure consistently high standards of policy development.
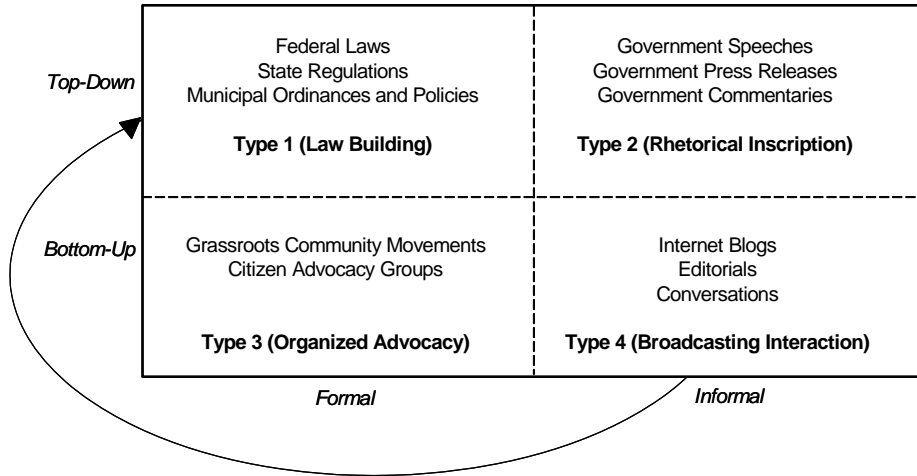
Figure 1. **Public Policy Conceptual Framework**

4.3   Type 3: Organized Advocacy (Bottom-Up + Formal Quadrant)

This quadrant represents organized and established public interest groups, referred to as advocacy groups here. They can be grassroots groups or professional lobbyists; the only requirement is that they are organized, established, and comprised of citizens not employed, elected, or serving the current government. Public interest groups bring together and speak for individuals, groups, and organizations who have common interests, views, and concerns (Pross 1986). Advocacy groups represent the general public by educating and influencing public policy decision makers. Advocacy groups' methodologies encompass lobbying efforts, writing, or voicing concerns to public officials. For example, in early spring 2006, the FCC opened an investigation that studies a significant number of U.S. television stations; it is believed they were broadcasting pro-Bush propaganda and airing it as bona fide, normal news (Buncombe 2006). The FCC began their probe after a report produced by an advocacy group, the Center for Media and Democracy. Without the existence of such a group, perhaps the FCC would have never opened the investigation.

4.4   Type 4: Broadcast Interaction (Bottom-Up + Informal Quadrant)

The participants in this quadrant are often solitary individuals or small, unorganized groups or newly forming efforts comprised of citizens unaffiliated with the government or other, more-formalized organizations. Often these participants serve a watchdog function. While these participants have always been present (e.g., Ben Franklin's Widow Silence Dogood) information and communication technologies like the Internet have produced or enabled an explosion of online, individualized, personal, political activity. Nielsen reports that

> Web surfers are more politically active than the general population…more than 50 percent reported to have signed a petition on a political issue. Thirty-seven percent of the online audience reported to have written a letter to an elected official and 28 percent of the online audience has donated money to a political campaign or party (Nielsen/NetRatings Enumeration Study 2004).

An average of 8 percent of Internet users actually publish Internet blogs (Pew Internet 2006). Citizens also rely on editorials and message boards to express their view. Political groups and other public interest groups also use the Internet (in general) to communicate and disseminate information to a much wider, even worldwide, public.

Perhaps most interesting in this space is the advent of the political blog. Although blogs are the classic example of how citizens are voicing their approval (or not) of policy, they are far from being the only mechanism used by the public. Blogs appear to be consciousness and awareness raising tools not held to journalistic standards (Gillmor 2004). In their *Time* article, Groosman and Hamilton (2004) state that "you can't blog your way into the White House, at least not yet, but blogs are America thinking out loud, talking to itself, and heaven help the candidate who isn't listening." A particular case in point is the recent popularity of news and opinion web logs or blogs from a liberal perspective that serve as an alternative to the discussions of talk radio, which tends to be primarily for a conservative audience. As a result, such blogs will set the agenda for their readership on certain topics since other media did not assume that role (Morris 2001).

5   ANALYSIS OF THE MUNICIPAL WIRELESS BROADBAND POLICY MATRIX

Using the types identified in the model described above, we present the following analysis of the current position of the municipal wireless broadband policy constituencies and their relations. The matrix presented in Figure 2 operates with four dimensions.

5.1   Type 1: Law Building

Congress passed the Telecommunications Act of 1996 with the intention of promoting competition by further deregulating the industry. Despite the effort by forward-thinking leaders in 1996, they were in actuality wholly unprepared for the exponential advancement of high-speed, affordable Internet technologies, and perhaps even more unprepared for the revolutionary changes its adoption into society would create. The 1996 act did not address broadband or municipal entry into providing such services, and, therefore, the act was toothless in regulating the issue on a federal level: in essence, it left regulation to the state governments. States, however, were also unprepared and began passing legislation in reference to municipal entry.

Since the existing federal laws were not applicable, state legislatures began considering how to respond to the objections of private sector providers. The legislative initiatives made use and continue to make use of a variety of tools that ostensibly aim to ensure that
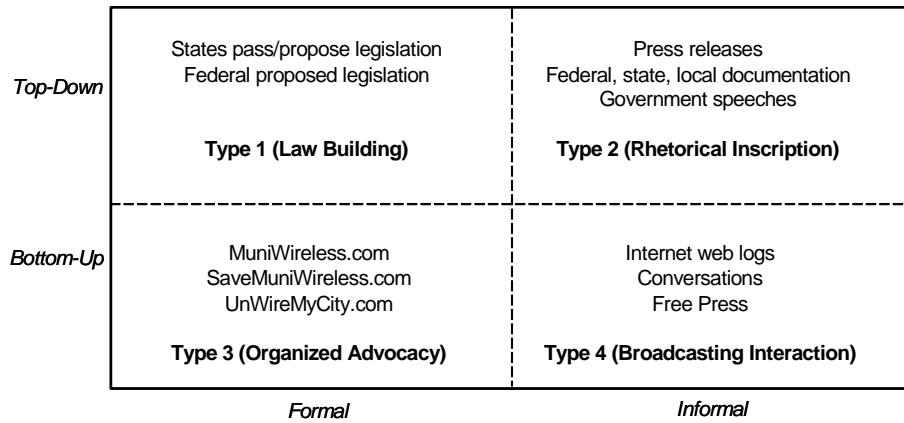
	Formal	Informal
Top-Down	States pass/propose legislation Federal proposed legislation **Type 1 (Law Building)**	Press releases Federal, state, local documentation Government speeches **Type 2 (Rhetorical Inscription)**
Bottom-Up	MuniWireless.com SaveMuniWireless.com UnWireMyCity.com **Type 3 (Organized Advocacy)**	Internet web logs Conversations Free Press **Type 4 (Broadcasting Interaction)**

Figure 2. Mobile and Wireless Network Policy Constituencies Matrix Mapped to Types

(1) a majority of local residents are behind the initiative
(2) the broadband project will not negatively affect a city's finances
(3) the broadband deployment does not compete or competes on a level playing field with private carriers

Several tools have been used to achieve these objectives. First, to ensure that a majority of the residents support the initiative, several states included a requirement that municipalities hold hearings and/or referenda about the broadband deployment. These activities also went some way to answering the second concern, that the project did not negatively affect finances. In addition to reporting to the public, some states have also required plans be submitted for approval to a state entity or agency. Tools used to achieve the third objective included a variety of stipulations ranging from providing the local exchange carrier (LEC) the right of first refusal to outright prohibition of competing with LECs (Tapia et al. 2005, 2006). Currently, there are approximately 35 state laws governing or affecting municipal broadband. As states have considered legislation, so has the U.S. Congress. Congressional leaders have agreed for some time that the Telecommunications Act of 1996 needs to be rewritten to reflect the many developments in telecommunications that have occurred during the last decade. As of June 2006, there were more than a dozen bills relating to Internet and broadband adoption.

5.2 Type 2: Rhetorical Inscription

A key principle of rhetoric is that words can have power or force over listeners. Some stipulate that rational manipulation of the economy through rhetoric requires that the tone of presidential remarks be optimistic, constructive, positive, and a practical assessment of the current and future state (Lewis 1997; Ragsdale 1984).

In the case of municipal wireless broadband policy, little research has been conducted which actually examines the role of public statements made by government

representatives regarding these networks. We see the public discourse initiated by the press corps of governments as shaping public perception of these networks as well as in a recursive process—informing the more traditional top-down policy process.

   Table 1 presents some examples that illustrate how and when rhetoric is used by elected officials. The table not only shows the sample text but also the implicit message conveyed by the text.

Table 1. Government Sample Texts

Source Type	Source Example	Source Text and Message
Presidential Speech	U.S. President George Bush, speech delivered at the U.S. Department of Commerce in Washington, DC, on June 24, 2004 Source: http://www.whitehouse.gov	**Sample Text**: "Broadband saves costs throughout the economy. The quality of life of our citizens is going to improve dramatically through this technology." **Implicit Message**: We should promote broadband access as a way to help U.S. workers become more productive and improve the economy.
Municipal Document	Request for proposals document issued by the City of Long Beach, CA, on January 27, 2006 Source: http://www.muniwireless.com/reports/docs/LongBeachRFP.pdf	**Sample Text**: "The City believes that the advancement of WiFi technologies has presented significant opportunities for local jurisdictions. The City believes that the deployment of a city-wide WiFi network will allow residents and businesses to experience significant economic and social benefits through increased options for broadband Internet connectivity." **Implicit Message**: Broadband is good for their citizenry and new technology will promote social inclusion.
Press releases	Mayor Sam Teresi's statement, press release issued by the City of Jamestown, NY, on January 12, 2005 Source: http://www.tropos.com/pdf/jamestown.pdf	**Sample Text**: "Today, we have effectively unwired our downtown area using Tropos Wi-Fi equipment. We plan to use the newly-formed Wi-Fi network to improve public safety, increase the productivity of our city workers out in the field. [Our city] is the first municipality in New York State to utilize this newest technology known as Wi-Fi for public safety communications." **Implicit Message:** Wi-Fi enhances public safety tools for all.
Commentary	Texas Agriculture Commissioner Susan Combs, commentary on http://www.statesman.com/search/content/auto/epaper/editions/today/business_245237edf10221dd0093.html (printed on March 2, 2005)	**Sample Text**: "For economic development, it is a death blow in the 21st century if you don't have broadband. If I wanted to encourage some company to move to small-town Texas, they will ask about education and housing. And then they will ask about broadband." **Implicit Message**: Without broadband, cities will not survive in the new digital global economy.

5.3 Type 3: Organized Advocacy

We can assess the potential for public interest groups to participate in the policy development process by looking at the case of Texas House Bill 789. In partnership with local incumbents, Texas introduced state legislation that considered prohibition of Municipal Wireless Broadband Networks but the legislation, as written, failed. The failure of this legislation is often attributed to the organized activities of several public interest groups. Citizen activists formed organized and established groups that interacted on their behalf. The following are simple descriptions intended to provide an overview of these organizations:

• SaveMuniWireless.com is a coalition of Texas organizations and citizens concerned about legislation that would outlaw any municipal involvement in networks or information services. They seek to ensure any legislation supports competition and innovation and helps Texans, not just the incumbent communication providers. Their action is intimately linked with a mailing list called TxMuni-Action, which was instrumental in the defeat of anti-municipal wireless provisions in Texas HB 789.

• Muniwireless.com reports on municipal wireless and broadband projects. The site is maintained by Esme Vos, a consultant from Amsterdam. The bipartisan repository is consulted by vendors (e.g., Tropos, Red Line Communications, NextPhase Wireless), think tanks, public officials, academics, and consultants. Aside from fee-based request for proposal alerts, the site also includes recent press releases, magazine articles, reports, and international documents.

• UnWireMyCity.com keeps a repertoire of the MWN debate; the site is operated by John Cooper, a technology consultant from Texas. The site is tailored to municipal chief information officers, city and borough managers, and mayors considering community Wi-Fi. With white papers and resources, the web forum aims to provide information for discouraging the use, design, and deployment of community Wi-Fi.

5.4 Type 4: Broadcasting Interaction

The Internet serves as both an interactive and a broadcast medium at the same time. This unique aspect of the medium has allowed those with political opinions to express them so that they can be widely read and responded to. Despite a lack of being formally trained, vetted, and published, multitudes of political voices are sounding out on topics. Municipal wireless broadband initiatives are no different.

• http://roisforyou.blogspot.com. Craig Settles, a technology consultant, created this website in order to help people understand how to use wireless technology, save money, make money and run a better business. The blogger is able to do this by writing reports and how-to books, and by providing workshops to end-users. The blog also supports the readers of his book, *Fighting the Good Fight for Municipal Wireless: Applying lessons from Philadelphia's Wi-Fi Story*. The blog allows his readers to share their opinions about municipal Wi-Fi.

- http://www.jhsnider.net/telecompolicy. As the current director of research in the Wireless Future Program at the New America Foundation, Dr. J. H. Snider offers a blog about telecom policy in general. Readers interested in municipal Wi-Fi and spectrum policy can post their comments by following the "Municipal Wi-Fi" link. This blog is important as it allows ordinary citizens to voice their opinion (good or bad) to a key public interest group.

- http://www.gigaom.com. GigaOM is a maintained by Om Malik, a senior writer for *Business 2.0* magazine in San Francisco, CA. The site seeks to engage the public in discussing broadband's impact on our society. Some of the this blog's contributors include Daniel Berninger (a senior analyst at a research institution), Jackson West (a writer for a technical magazine), and Robert Young (business entrepreneur).

- The Free Press is a nonpartisan, nonprofit organization that promotes a more equitable and democratic media policy in the United States. On June 13, 2006, Ben Scott, policy director for the Free Press, testified before the U.S. Senate Committee on Commerce, Science and Transportation regarding, in part, the Communications, Consumers' Choice and Broadband Act of 2006 (S. 2686). During his testimony, he supported the goal of this legislation to expand consumer choice and access to broadband services. The Free Press serves as an informal organization that urges activists to file informal requests to the government. Their goal is to expand diverse, local voices on the national front.

6   DISCUSSION

Public policy can significantly impact the formation and development of municipal broadband efforts. We assert that a study of the municipal broadband public policy process can help us better understand the extent and patterns of the municipal broadband policy space. These findings support the results of recent research that noted that studies of public policy process (Sabatier 1999; Schlager and Blomquist 1996; Sutton 1999) and municipal broadband (Gillett et al. 2004; Lehr and McKnight 2003; Lehr et al. 2005; U.S. Department of Commerce 2002) are essential for advancing knowledge within the field.

Figure 3 depicts the public policy process developed by the authors and applied to the development of municipal broadband in the United States. This matrix recognizes four key relationships that operate continuously and simultaneously in the interaction between each quadrant. Note that all arrows have some relation to quadrant 4.

Most important in this analysis is the growing political presence of quadrant 4 and the role the Internet has played in moving individuals to such a key, central location in the policy formation process. As noted above, around the municipal broadband issue there has been little policy direction from the federal level. This is unusual in telecommunication policy in the United States. This has left a political vacuum into which Internet activists, bloggers, and policy entrepreneurs have stepped in.

Arrow A: Collective Action. Each of these arrows represents a flow of information and people, and the creation of relationships to facilitate the movement of both between the categories. With arrow A, we see movement between individuals and organizations, between the informal and the formal. We see this arrow as depicting individuals seeking
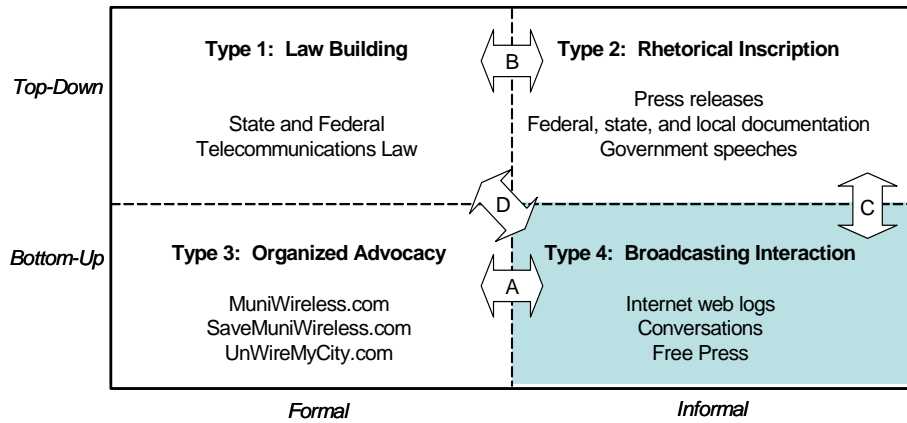
Figure 3. Flow of Information for the Four Quadrant Model

political information concerning municipal broadband networks individually at first, then moving toward more collective action. Technology plays a large role in this arrow as more and more individuals first seek political information via the Internet, may make their first political statements via the Internet and then once finding like-minded others, may act politically with others in a more formalized way. This arrow is double headed. Type 4 provides a conduit into type 3, and vice versa. Individuals hear about the issues and ideas from webloggers in type 4 and then move to join something more formalized in type 3. Type 3 is a means to organize type 4—channeling energy and money into more formalized lobbying attempts.

Arrow B: Policy Inscription. Policy is influenced by the language used by government and industry leaders. Inscription is a process by which various stakeholders who have political, social, or 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 (Akrich 1992; Akrich and Latour 1992; Callon 1992; Latour 1992). It is obvious that these municipal networks 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 these networks. In this case, public discussions, press releases, and public commentaries on municipal networks feed directly into public opinion and the policy process itself. For example, rhetorical analysis points to the fact that municipal networks are being textually defined in the public sphere as a solution to the complex problem of the digital divide. Municipal officials have made textual efforts to "inscribe" these networks with concepts of social inclusion, utility status, social revitalization, and equality. It is possible that these municipal labeling efforts reflect a need to sway taxpayers toward a more favorable stance concerning the development of these networks, especially in the light of continued state and federal legislation that threatens continued municipal deployment.

Arrow C: Appropriating the Master's Tools. The rhetorical outputs from the type 2 quadrant are not the ethereal audio or video recordings of the past, due in part to technological changes, political text, audio, and video are now available to every Internet

user. Statements made concerning municipal networks can be examined, reexamined, downloaded, cut, and reused by anyone with political will and know-how. The informal top-down speech we have come to call rhetorical inscription here made by government and industry leaders is commented on, repurposed, and in many cases mocked, by the individual bloggers found in our type 4 quadrant. This effectively crates a recursive dialogue between the more formal and informal aspects of public speech concerning telecommunications policy.

Arrow D: Direct Citizen Lobbying: Until recently the methods the average citizen possessed with which they could contact their elected officials to influence formal policy was limited to paper letter writing, phone calls, and very rare office visits. Again, technical infrastructure changes have made the perception of social distance short, in that the average citizen can e-mail policy makers directly, chat or instant message with them more interactively, or participate in a politician's online web presence. Individuals found in quadrant 4 may move from seeking political information and posting their own political opinions to actively lobbying policy makers concerning telecommunications policy. An example of this direct citizen action can be seen through the Electronic Frontier Foundation.

> When our freedoms in the networked world come under attack, the Electronic Frontier Foundation (EFF) is the first line of defense…defending free speech, privacy, innovation, and consumer rights today.…EFF fights for freedom primarily in the courts, bringing and defending lawsuits even when that means taking on the US government or large corporations (Electronic Frontier Foundation, http://www.eff.org/about).

However, the EFF also claims to provide individual citizens with the tools to be their own lobbyist through their "Action Center…Here you can contact your representatives on impending legislation that will have a direct effect on your civil liberties online."

These efforts have already met with limited success. This public momentum has driven many of the state legislative efforts to end in compromise, resulting in less stringent, negotiated legislation. Many of the state-level bills that have passed have done so through amendment and compromise. States with pending legislation have learned from others and have created bills that are far more flexible in what municipalities can and cannot do in their efforts to implement more affordable broadband. Similarly, policy decision makers have also learned more about incumbent providers and what roles they should and should not serve in the delivery of services.

There is an increased desire among citizens to participate in decisions that will affect them, and an increasing need for the policy development process to be informed by input from diverse sources, especially from those involved or affected. For many, the threat of poor and expensive broadband service was enough of a catalyst to encourage them to act politically, and the Internet provided that vehicle.

7   CONCLUSIONS

In this paper we have highlighted three things. First, that public organizations are engaged in a technologically driven servitization of their traditional service products.

Second, that public organizations must approach this servitization differently because of the decision-making role of the citizens in the process. Third, it is essential to study the influence citizens have on this process through studying the public policy process around decisions concerning the delivery of technology and technologically driven services.

Municipalities are complex organizations engaged in the service economy. In some ways, the public sphere is the quintessential service provider, addressing citizen needs for public safety, recreation, elections, and building permits. The public sector, like the private sector, has struggled to transform its service delivery to citizen customers using ICTs with the goals of lowering costs, becoming more effective and efficient, and becoming more responsive to citizen customer needs.

In addition, the public sector, like the private sector, has used these technological affordances to jump into new markets. Unlike the private sector, this municipal jump to provide telecommunications services has provoked public and private outcry and initiated legislative efforts to curtail the move. Essentially, while both public and private organizations have moved to offer more services online and in diverse service-oriented markets, in the public realm policy matters.

If municipalities are going to encourage citizens to go online to apply for permits, register to vote, seek employment, or pay utility bills, among other public services, then they also must ensure that citizens have the infrastructure to do so. Broadband services have come to be seen as a public utility, a necessity for citizens to fully participate in civic life, as well as a responsibility of local government. Unlike the private sector, municipalities operate in the collective in which they are governed by the will of the people and strategic and operational decisions are often made through public policy. While private organizations are affected by, and seek to influence, public opinion, they are not governed by it.

Public policy is an essential piece to understanding the development and deployment of ICT-based services by municipalities.

Little research has been conducted which actually examines different constituencies and their relations in the role of policy in planning and implementing municipal broadband initiatives in the United States. Recent research (Davis et al. 2002) suggests that IT-dependent services are development drivers for at-risk communities. While others have called for new ways of providing telecommunications services in the wake of government broadband interventions, few have examined the choices and trade-offs made by different constituencies and their relations. The ecology of political rhetoric among public officials is more interesting and more relevant to policy than the old stereotypes would suggest. The data clearly indicate that municipal broadband projects are very convoluted and complex, not a one-dimensional sphere, and those different groups have varied preferences as to where and how they influence and formulate policy on that sphere.

Although this analysis provides some answers, other questions remain. This paper provided a description of the interactions existing between the four types of municipal wireless broadband constituents (law building, rhetorical inscription, organized advocacy, and broadcasting interaction). Therefore, future research might consider addressing the following questions: What interactions have priorities over others? What sequence of interactions has been observed? Considering different municipalities have different policy making processes than others, which cities have been more successful than others? What contributed to these differences? Also, the missing, or unidentified arrows seem

potentially more interesting that those identified in the matrix. For instance, future studies could examine the interaction between Type 1 (Law Building) and Type 3 (Organized Advocacy) in that the statements and actions taken by organized groups might influence legislators. Similarly, organized groups might influence Type 2 (Rhetorical Inscription).

In the situation of municipalities offering telecommunication services, the boundaries between the public sphere and the private sphere become permeable. Both public and private organizations experience servitization stemming from technological changes, market forces, and citizen-customer expectations. The most important difference between these two change processes is the role of the public in the decision-making process. It is essential to study the role of public constituent groups in the decisions about how to deliver electronic services and services electronically to citizens because of their key role in the process.

References

Akrich, M. 1992. "The De-Scription of Technical Objects," in *Shaping Technology/Building Society*, W. E. Bijker and J. Law (eds.), Cambridge, MA: MIT Press, pp. 205-224.

Akrich, M., and Latour, B. 1992. "A Summary of Convenient Vocabulary for the Semiotics of Human and Nonhuman Assemblies," in *Shaping Technology/Building Society*, W.E.Bijker and J.Law (eds.), Cambridge, MA: MIT Press, pp. 259-264.

Baumgartner, F. R., and Jones, B. D. 1993. *Agendas and Instability in American Politics*, Chicago: University of Chicago Press.

Bleha, T. 2005. "Down to the Wire," *Foreign Affairs*, May/June, pp. 111-125.

Brooks, S. 1989. *Public Policy in Canada: An Introduction*, Toronto: McClelland and Stewart.

Buncombe, A. 2006. "FCC Investigates Fake News," *The Independent UK – Online Edition*, May 31 (http://www.alternet.org/mediaculture/36878/).

Callon, M. 1992. "The Dynamics of Techno-Economic Networks," in *Technology Change and Company Strategies: Economic and Sociological Perspectives*, R. Coombs, P. Saviotti, and V. Walsh (eds.), London: Academic Press, pp. 72-102.

Chrispeels, J. H. 1997. "Educational Policy Implementation in a Shifting Political Climate: The California Experience," *American Educational Research Journal* (34:3), pp. 453-481.

Christman, J. B., and Rhodes, A. 2002. *Civic Engagement and Urban Improvement: Hard to Learn Lessons from Philadelphia*, Philadelphia: Research for Action.

Chung, J. 2001. "Vertical Support, Horizontal Linkages, and Regional Disparities in China Typology, Incentive," *Issues and Studies* (37), pp. 121-148.

Clay, E. J., and Schaffer, B. B. 1986. *Room for Manoeuvre: An Explanation of Public Policy in Agriculture and Rural Development*, London: Heinemann.

Considine, M. 1994. *Public Policy: A Critical Approach*, Melbourne, Australia: MacMillan.

Davis, C., McMaster, J., and Nowak, J. 2002. "IT-Enabled Services as Development Drivers in Low- Income Countries: The Case of Fiji," *The Electronic Journal on Information Systems in Developing Countries* (9:4), pp. 1-18.

Demsetz, J. 1999. "Industry Structure, Market Rivalry and Public Policy," *Journal of Law and Economics* (16), pp. 1-9.

Dunn, W. N. (ed.). 1994. *Public Policy Analysis: An Introduction*, Englewood Cliffs, NJ: Prentice-Hall, Inc.

Dunsire, A. 1978. *Implementation in a Bureaucracy*, Oxford, UK: Martin Robertson.

Dye, T. R. 1972. *Understanding Public Policy*, Englewood Cliffs, NJ: Prentice Hall.

Fischer, F. 1995. *Evaluating Public Policy*, Chicago: Nelson-Hall Publishers.

Frederich, C. J. 1963. *Man and His Government*, New York: McGraw-Hill.

Gerston, L. N. 1997. *Public Policy Making: Process and Principles*, New York: M. E. Sharpe.

Gillett, S. E., and Lehr, W. H. 1999. "Availability of Broadband Internet Access: Empirical Evidence," paper presented at the 27th Annual Telecommunications Policy Research Conference, Alexandria, VA, September 25-27, 1999.

Gillett, S. E., Lehr, W. H., and Osorio, C. 2004. "Local Government Broadband Initiatives," *Telecommunications Policy* (28), pp. 537-558.

Gillmor, D. 2004. *We the Media: Grassroots Journalism by the People, for the People*, New York: O'Reilly Media, Inc.

Goggin, M. L., Bowman, A. O. M., Lester, J., and O'Toole, L. 1990. *Implementation Theory and Practice*, New York: HarperCollins.

Grindle, M., and Thomas, J. 1990. "After the Decision: Implementing Policy Reforms in Developing Countries," *World Development* (18:8), pp. 1163-1181.

Groosman, L., and Hamilton, A. 2004. "Meet Joe Blog," *Time*, June 24 (http://www.time.com/time/magazine).

Guiraudon, V. 2000. "European Integration and Migration Policy: Vertical Making as Venue Shopping," *Journal of Common Market Studies* (38), pp. 249-269.

Kubler, D., Schenkel, W., and Leresche, J. P. 2003. "Bright Lights, Big Cities? Metropolisation, Intergovernmental Relations and the New Federal Urban Policy in Switzerland," *Schweizerische Zeitschrift für Politikwissenschaft* (9:1), pp. 261-282.

Lafferty, W. M., and Hovden, E. 2003. "Environmental Policy Integration: Towards an Analytical Framework," *Environmental Politics* (12:3), pp. 1-22.

Latour, B. (ed.). 1992. *Where are the Missing Masses? The Sociology of a Few Mundane Artifacts. Shaping Technology/Building Society*, Cambridge, MA: MIT Press.

Lehr, W., and McKnight, L. 2003. "Wireless Internet Access: 3G vs.WiFi?," *Telecommunications Policy* (27:5/6), pp. 351-370.

Lehr, W., Osorio, C., Gillet, S., and Sirbu, M. 2005. "Measuring Broadband's Economic Impact," paper presented at the 33rd Research Conference on Communication, Information and Internet Policy (TPRC), Arlington, VA, September 23-25; revised October 4 (http://itc.mit.edu/itel/docs/2005/MeasuringBB_EconImpact.pdf).

Lehr, W., Sirbu, M., and Gillet, S. 2004. "Municipal Wireless Broadband: Policy and Business Implications of Emerging Access Technologies," unpublished manuscript, Massachusetts Institute of Technology (http://itc.mit.edu/ itel/docs/2004/wlehr_munibb_doc.pdf).

Lenard, T. M. 2004. "Government Entry into the Telecom Business: Are the Benefits Commensurate With the Costs?," *Progress on Point*, February (http://www.pff.org/issues-pubs/pops/pop11.3govtownership.pdf).

Lewis, D. A. 1997. "The Two Rhetorical Presidencies: An Analysis of Televised Presidential Speeches 1947-1991," *American Politics Quarterly* (25:3), pp. 380-395.

Majone, G. 1989. *Evidence, Argument, and Persuasion in the Policy Process*, New Haven, CT: Yale University Press.

March, J. G., and Olsen, J. P. 1989. *Rediscovering Institutions: The Organizational Basis of Politics*, New York: The Free Press.

Morris, H. J. 2001. "Blogging Burgeons as a Form of Web Expression," *US News & World Report* (130), p. 52.

Nielsen/NetRatings. 2004. "Three Out of Four Americans Have Access to the Internet," March 18 (http://www.netratings.com/pr/pr_040318.pdf).

Ortiz, J.,and Tapia, A. 2008. "Deploying for Deliverance: The Digital Divide Discourse in Municipal Wireless Networks," *Sociological Focus* (accepted for publication).

Patton, C. V., and Sawicki, D. S. (eds.). 1993. *Basic Methods of Public Policy Analysis and Planning*, Englewood Cliffs, NJ: Prentice Hall.

Pew Internet. 2006. "Home Broadband Adoption 2006," May 28 (http://www.pewinternet.org/pdfs/PIP_Broadband_trends2006.pdf).

Pross, A. P. 1986. *Group Politics and Public Policy*, Toronto: Oxford University Press.

Ragsdale, L. 1984. "The Politics of Presidential Speechmaking." *American Political Science Review* (78), pp. 971-984.

Sabatier, P. A. (ed.). 1999. *Theories of the Policy Process*, Boulder, CO: Westview Press.

Schlager, E., and Blomquist, W. 1996. "A Comparison of Three Emerging Theories of the Policy Process," *Political Research Quarterly* (49), pp. 651-672.

Stokey, E., and Zeckhauser, R. 1978. "Thinking about Policy Choices and Putting Analysis to Work," Chapter 1 in *A Primer for Policy Analysis*, New York: W. W. Norton and Company, pp. 320-329.

Stone, D. A. 1997. *Policy Paradox: The Art of Political Decision Making*, New York: W. W. Norton.

Sundquist, J. L., and Davis, D. W. 1969. *Making Federalism Work*, Washington, DC: Brookings Institution.

Sutton, R. 1999. "The Policy Process: An Overview," ODI Working Paper No. 118, Overseas Development Institute, London.

Tapia, A., Stone, M., and Maitland, C. 2005. "Public-Private Partnerships and the Role of State and Federal Legislation in Wireless Municipal Networks," paper presented at the 33rd Research Conference on Communication, Information and Internet Policy, Washington, DC, September 23-25.

Tapia, A., Maitland, C., and Stone, M. 2006. "Making IT Work for Municipalities: Building Municipal Wireless Networks," *Government Information Quarterly* (23:3/4), pp. 359-380.

U.S. Department of Commerce. 2002. "Understanding Broadband Demand: A Review of Critical Issues," Office of Technology Policy, September 23 (http://www.technology.gov/reports/TechPolicy/Broadband_020921.pdf)..

Williams, J., and Griffin, T. 1996. "Evolution of Vertical Policy: US Steel's Century of Commitment to the Mesabi," *Journal of Industrial and Corporate Change* (5:1), pp. 147-173.

Vandermerwe, S., and Rada, J. 1988. "Servitization of Business: Adding Value by Adding Services," *European Management Journal* (6:4), pp. 315-325.

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