The Diffusion and Evolution of 311 Citizen Service Centers in American Cities from 1996 to 2012

- A Study to Identify the Catalysts for the Adoption of Citizen Engagement Technology

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Dissertation submitted to the faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy
in
Public Administration and Public Affairs

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April 21, 2015
Alexandria, Virginia

Keywords: E-government, E-democracy, Information and Communication Technologies, Civic Engagement, Diffusion of Innovation, 311, Open 311, Citizen Service Center, Call Center, Government-to-Citizen Communication, Social Media, Crowdsourcing

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ABSTRACT

This study of the diffusion and evolution of the 311 innovation in the form of citizen service centers and as a technology cluster has been designed to help identify the catalysts for the spread of government-to-citizen (G2C) technology in local government in order to better position future G2C technology for a more rapid rate of adoption. The 311 non-emergency number was first established in 1996 and had spread to 80 local governments across the United States by 2012. This dissertation examines: what factors contributed to the adoption of 311 in American local governments over 100,000 in population; how did the innovation diffuse and evolve over time; and why did some governments' communications with citizens became more advanced than others?

Given the problem of determining causality, a three-part research design was used to examine the topic including a historical narrative, logistic regression model, and case studies from Pittsburgh, Minneapolis and St. Louis. The narrative found that the political forces of the federal government, national organizations, and policy entrepreneurs (Karch, 2007) promoted the 311 innovation to solve different problems and that it evolved beyond its original intent. The logistic regression model found that there was a statistically significant relationship between 311 adoption and the variables of higher population, violent crime rate, and the mayor-council form of government. The case studies revealed that mayors played a strong role in establishing citizen service centers in all three cities while 311 adopter Pittsburgh and non-adopter St. Louis seemed to have more in common in their G2C evolution due to severe budget constraints. With little written about the 311 innovation in academic journals, practitioners and scholars will benefit from understanding the catalysts for the diffusion and evolution of the 311 in order to determine ways to increase the rate of adoption for future G2C communication innovations.

Dedication and Acknowledgements

I owe my gratitude to many people who have made this dissertation possible and my mid-career graduate experience an amazing journey. I would like to thank to my Chair Patrick Roberts and the members of my committee Matt Dull, Beth Offenbacker, and Joe Rees for their guidance and support. I thank my fellow cadre of VT CPAP Doctoral Candidates including Fatima Sharif and Aaron Smith-Walter for making the process intellectually stimulating and, sometimes, enjoyable. I thank my many friends along the way and, especially, Kimberly Little for getting me to the finish line. And, of course, I thank my family for their unwavering support.

This labor of love is dedicated to my father Alphonsus, my Rock of Gibraltar, and my mother Mary, God rest her soul.

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Chapter 1. Introduction

Campaigning for mayor of New York City in the summer of 2001, Michael Bloomberg and his staff were walking in a Brooklyn neighborhood when Bloomberg spotted a leaking fire hydrant. He turned to his aides and asked "What City agency do you call to fix a fire hydrant?" After a brief pause one of the staffers recalled that the City Department of Environmental Protection (DEP) handles hydrants. The future mayor had assumed that one would call the fire department and remarked "DEP? What citizen would guess that?" When Bloomberg returned to his office he was determined to report the problem and opened the New York City phone book to discover 11 pages of City telephone listings. Bloomberg wondered why there was not a single number for citizens to use to contact the City government. This idea became a campaign promise, and the New York City 311 Citizen Service Center (NYC, 2008) was established on March 9, 2003, 14 months after he took office (ICCS, 2008).

Mayoral candidate Bloomberg's early experience highlighted the frustration citizens sometimes felt when trying to contact their local government. Bloomberg's decision to develop NYC 311 illustrates the intuitive appeal of 311 centers as the "One Call to City Hall" (Los Angeles, 2012) and for their spread since 1996. By 2012, 311 citizen service centers have become the face of local government to citizens in most major American cities. The nature of this innovation continued to change as other compatible channels of government-to-citizen (G2C) communication were added. The communication channels included citizen relationship management (CRM) systems, interactive websites, social media, interactive voice response (IVR), smart phone apps (PTI, 2009b), citizen sourcing, and open data initiatives resulting in what Everett Rogers (2003) would call a technology cluster.

1.1 Purpose of the Study

This study of the diffusion and evolution of the 311 innovation in the form of citizen service centers and as a technology cluster has been designed to help identify the catalysts for the spread of government-to-citizen (G2C) technology in local government. With little written about the 311 innovation in academic journals, practitioners and scholars will benefit from understanding the catalysts for the diffusion and evolution of 311 in order to determine better ways to increase the rate of adoption for future G2C communication innovations.

The appropriate role of the public in public administration has been an active and ongoing area of public debate since the early days of the new republic (King, 1998). Hamilton and the Federalists argued that a sound administrative system would keep the people's allegiance, thereby negating the need for direct citizen involvement. The Jeffersonians countered that citizen participation was integral to democracy and would serve as a check on the abuse of power. Today, the same arguments exist within the modern context of American representative democracy. Many elected officials and administrators continue to discourage direct citizen participation in the development of public policy, in the functions of government, and in the decision making process. Others argue that citizen involvement would produce better decisions and more efficient benefits for the rest of society (Aikins, 2010). American cities as laboratories of democracy have been reshaping their relationship with citizens through the use of technology beginning with the 311 innovation in 1996. Some forward thinking cities' goals have been to create greater two-way communication and a more conducive environment for citizen engagement. Through this research I hope to identify the catalysts that increase the rate of adoption of G2C communication innovations as a means to increase citizen engagement in government and potentially improve democracy.

1.1.1 Primary Research Question

The adoption of the 311 non-emergency number, its diffusion across the United States, and the evolution of 311 citizen service centers as technology clusters will be analyzed in this dissertation. The research question examined is: what factors contributed to the adoption of 311 by American cities with populations over 100,000; how did the innovation diffuse and evolve over time; and why did some governments' communications with citizens became more advanced than others?

Since the first use of 311 in Baltimore in 1996, American city governments have been reshaping their relationship with citizens. Citizen service centers with the 311 number now communicate with their citizens using ever changing modes of technology in order to provide information, take requests, and, sometimes, establish new forums for citizen engagement and collaboration. With almost 50 million Americans living in local government jurisdictions with access to 311 centers as of 2012, this important multi-part research question has broad implications for academics and practitioners of public administration, political science, and for American democracy. What we learn from how the 311 innovation has diffused and evolved as the epicenter of a technology cluster will help identify the catalysts for the future diffusion of G2C technology in local government.

Identifying the trigger mechanisms for the spread of G2C technology could help increase the rate of adoption of government technology for greater citizen engagement. Understanding how and why cities adopt, reinvent, and spread technology and processes at the local level may help provide a blueprint for their rapid and pervasive expansion across all levels of American government. Given the advanced government use of technology in today's information revolution, the idea of citizens playing a constructive role in the development of public policy, in

the functions of government, and in the decision making process is now possible, thereby allowing active citizens to fulfill their Jeffersonian responsibilities within American democracy.

1.1.2 Five Hypotheses

New Public Management (NPM) theory refers to "a cluster of ideas and practices (including reinvention and neomanagerialism) that seek, at their core, to use private-sector and business approaches in the public sector" and "make government work better and cost less" (Denhardt, 2000, p. 550). 311 citizen service centers are designed to improve customer (citizen) access to services, satisfy their requests, and sometimes to reduce the cost of operations through the consolidation of multiple departmental contact centers. In an effort to make government more efficient it can be argued that the larger the city, the greater the opportunities for economies of scale by developing a consolidated call center. For example, New York City consolidated 40 departmental call centers into its 311 Citizen Service Center and gained efficiencies through economies of scale. However, smaller governments may benefit to a lesser degree or not at all. While government consolidation may generate personnel and operational savings, the capital costs for new technology and facilities may not always provide a positive return on investment.

Hypothesis One: *Cities with higher populations will have larger local governments with multiple department answering points and will benefit to a greater degree through economies of scale when they develop consolidated call centers and, therefore, are more likely to adopt the 311 number.*

President Bill Clinton originally called for creation of a hotline number "to help alleviate the abundance of non-emergency calls flooding the 911 emergency systems" (COPS, 2001). Eva Liggins of the 311 Synergy Group and Dallas 311 Assistant Director stated that one of the reasons for the adoption of the 311 number was because "crime was very rampant… 911 systems

were overburdened" (J. O'Byrne, personal communication, August 9, 2011). I agree with Daley and Garand (2005) that they would consider a high violent crime rate an internal determinant or compelling factor in a city's adoption of the 311 number and that multiple internal determinants can explain state (government) action.

Hypothesis Two: *Higher 911 emergency call volume related to a city's high violent crime rate is a contributing factor to a local government's decision to adopt the 311 non-emergency number.*

In a mayor-council form of government the mayor possesses authority, which can be used in the role of policy entrepreneur to push through a non-mandated low salience policy. David Eichenthal, former President and CEO of the Ochs Center for Metropolitan Studies, stated that it was "those cities with the strongest political leadership" and strong executive sponsorship of the 311 innovation that were more likely to adopt the 311 number (J. O'Byrne, personal communication, July 22, 2011). Karch (2007) identifies policy entrepreneurs as one of the three political forces of diffusion. Mintrom and Norman (2009) discuss policy entrepreneurs in their role of agenda setting in the context of political change. Mintrom and Vergari (1996) explain that the policy entrepreneurs discover unfulfilled needs and suggest innovative means to solve them, bear the risks and consequences in pursuing change, and coordinate networks and resources necessary to undertake change. Former Mayor Richard Daley's initiative to use the 311 number as a customer service number for City departments is such an example of a mayor in the role of policy entrepreneur. Koski (2010) would characterize the adoption of the 311 number as a low salience policy; a policy that does not benefit from a groundswell of public opinion, is not mandated, and has limited internal and external pressures to implement it. In city governments an elected mayor may have the necessary political capital and administrative

authority to implement a low salience policy as compared to the manager-council or commission forms of government.

Hypothesis Three: *Given the importance of strong political leadership in implementing non-mandated change, the mayor-council form of government is more likely to adopt the 311 number than other forms of local government.*

During the disastrous hurricane season of 2005 the Florida counties of Orange and Miami-Dade learned the importance of using 311 centers as central points of contact for providing information to citizens and stakeholders regarding emergency preparedness, response, and remediation. The City of Houston's 311 center during Hurricane Ike in 2008 was used for citizens to request aid and information about evacuation efforts and to transfer calls from bedridden citizens to the Emergency Management Center. It can be argued that a city in a disaster prone region with a history of large remediation costs would be more likely to adopt the 311 number.

Hypothesis Four: *Cities that have high property damage caused by natural disasters are more likely to adopt the 311 number.*

The final hypothesis combines the role of policy entrepreneur with that of reinvention within the diffusion of innovation literature. Once again, Karch views the policy entrepreneur as a political force of diffusion while Shipan and Volden (2008) emphasize "individual decision makers – mayors, managers, council members, bureaucrats, and others" (p. 841) in subnational governments serving as laboratories of democracy. Glick and Hays (1991) discuss how policies are reinvented as they spread while Stoneman and Diederen (1994) examined the evolution of technological change. In this context the role of policy entrepreneur can be transferred to other

positions within the government after adoption, during implementation, and over time as the innovation is integrated with other technologies.

Hypothesis Five: *After politicians play their role as policy entrepreneurs for their government's adoption of 311, administrators become the policy entrepreneurs to adapt the system to local needs and to integrate it with other technologies over time.*

1.1.3 Definitions of Terminology

What is *311*? The original legal answer begins with the Federal Communications Commission (FCC), which had reserved authority over the remaining eight 3-digit N11 telephone numbers since 1992 (Cohen, 2007). After a brief pilot program in 1996, the FCC "designated the number 3-1-1 dialing code as a means of quick access to non-emergency police and other governmental services" (NECCC, 2004, p. 4). The primary goals for its creation was to alleviate congestion on 911 circuits, improve the effectiveness of emergency services, and stop the cycle of reactive policing.

However, Phil Ashtock of the Open 311 initiative believes that "311 has now become a ubiquitous term" for G2C communication and "short code as the easiest way to find (government) service, assure availability, and use it" (J. O'Byrne, personal communication, July 20, 2011). The definition has been obfuscated, by governments themselves such as the unveiling of Tempe 311 in Arizona, which requires local residents to dial the 7-digit number 350-4311 (Wrangler News, 2012). The International City/County Management Association (ICMA) and the Public Technology Institute (PTI) do not provide a clear distinction between local governments with the 311 and 7-digit numbers. Instead, they chose to focus on cities with citizen relationship management (CRM) systems (Fleming, 2001; PTI, 2009b).

What is a *311 citizen service center*? The City of Baltimore was the first to adopt the 311 non-emergency "hotline" in October 1996 (Cohen, 2007) and the City of Chicago created the first 311 Customer Service Center in January 1999 (Chicago, 2003). Through 2012, 80 local governments in the United States had established some form of 311 citizen service center. Each local government had learned from the experiences of other 311 centers and adapted the functions to meet its own local internal and external needs. There is no established definition for a 311 citizen service center. Every government could at least claim to have some type of citizen or customer service number and system for response if they designate the number for the office of the chief elected official or chief administrator. For purposes of this research a 311 citizen service center will be defined by three basic elements. First, the municipality's application for a 311 non-emergency number must have been approved by a state public utility commission (PUC). Second, the 311 number must be linked to a local government's contact center where call takers are connected to citizens via telephone. And third, the number must be integrated with a CRM system which is a broad term that encompasses a suite of technologies including phone, computer, Internet, and databases that are configured into a customized system to fit the needs of their government (Fleming, 2007).

Everett Rogers' (2003) study of the diffusion of innovation is the most important theoretical work on which this study draws. *Diffusion* is defined as "the process by which (1) an *innovation* (2) is *communicated* through certain channels (3) over *time* among members of a social system" (p. 11). An *innovation* "is an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (p. 12). The 311 innovation is described in this study as a G2C technology. *Reinvention,* also used synonymously with *evolution* for this study, is

defined as “the degree to which an innovation is changed or modified by a user in the process of adoption and implementation” (p. 17).

Other key concepts of Rogers’ Diffusion of Innovations theory are the roles of *change agents,* who persuade a client to adopt an innovation, and *opinion leaders* who influence others attitudes or behavior with relatively high frequency. These agents and leaders are acting within a *social system,* the “interrelated units that are engaged in joint problem solving to accomplish a goal” (p. 23), and *communication networks,* “interconnected individuals linked by patterned flow of information” (p. 27).

Within this public sector social system and communication network, Andrew Karch’s (2007) work in state diffusion has recognized actors that are synonymous with change agents and opinion leaders. Karch identifies the *political forces* that facilitate diffusion as national organizations, policy entrepreneurs, and national government intervention. The author believes that “the geographic reach of these forces makes them capable of actually transporting policy innovations across state lines, thereby representing a causal mechanism that could facilitate the diffusion of policies” (p. 65). A key point related to the political forces involved in the diffusion and evolution of the 311 innovation is that geographic proximity between adopting cities was not deemed a major factor when designing the research methodology for this study.

What is a *311 technology cluster*? Rogers (2003) states that when separate technologies are perceived as being interrelated, the innovation boundaries are not clear and distinct, and they are promoted by change agencies as a package of innovations, they are called technology clusters in Diffusion of Innovation theory. Given that 311 has become a ubiquitous term for G2C communication (J. O'Byrne, personal communication, July 20, 2011) and its definition has been blurred by national organizations and local governments themselves (Wrangler News, 2012;

Fleming, 2007; PTI, 2009b). A broader definition of 311 has become necessary to describe the innovation that has evolved since 1996. As of 2012, most American cities with or without the 311 non-emergency number used multiple channels of communication which may include interactive websites, interactive voice response (IVR) systems, social media (i.e., Facebook, Twitter), geographic information system (GIS) and/or Google mapping, smartphone apps, SMS/Video, instant messaging, video chat (Skype), (PTI, 2009a) citizensourcing (collaborative democracy), and online citizen forums such as Nextdoor.com, Peak Democracy, and e-Democracy.org.

1.1.4 Motivations for Establishing 311 Citizen Service Centers

According to Eichenthal (2010), cities were motivated to establish 311 centers to enable citizens to access their government easier than having to play 'blue pages roulette', where they are forced to guess the correct municipal phone number to address their question or problem. City of Austin, Texas' former Chief Information Officer (CIO) Peter Collins stated that "anytime you can centralize the point of contact for citizens, it makes it easier for them to get service" (Martin, 2004, p. 1). Former Mayor Bloomberg in celebrating the 100 millionth call to NYC 311 contended that "311 is much more than a number to call. It's been a key to making city services more efficient and accountable" (Digital Communities, 2010, p. 1).

Digital Communities (Grabner, 2009) reasoned that local governments should consider establishing a 311 center if they answer yes to any of these four questions:

- "Is your 911 contact center overwhelmed by non-emergency calls?
- Do citizens constantly complain that they are dissatisfied with the way you provide information or respond to requests for services?

- Are you always struggling to stay within contact center budgets amid ever increasing citizen demands?
- Do you feel that meaningful improvement cannot be made because you can't identify the true causes of operational inefficiencies?" (p. 1).

The City of Minneapolis certainly could have answered yes to the above questions before establishing Minneapolis 311 in 2006. Motivated to correct problems with inconsistency, coordination, and the handling of requests, the city recognized the need to improve citizen satisfaction by establishing a 311 call center to reduce or eliminate abandoned and misrouted calls, dramatically reduce the amount of numbers listed in the telephone book, reduce 911 call volume, provide a consistent message to the public, consolidate individual call centers, and improve requests to better analyze citizen service needs (Cohen, 2007).

In 2008 the Harvard Kennedy School convened a group of 25 city officials and technology and service providers to discuss the state of full-featured 311 enabled systems and postulate where they are headed in the future. The group believed that there were ten roles that 311 could play that could be motivations for establishing a 311 center (Tumin, 2008).

1. "The great citizen communicator" – provides a convenient way to push useful information out to citizens and pull citizen requests for information and services;
2. "An always-on constituent service engine" – provides mechanism for citizens to call upon government to take action;
3. "A fast-track to improving the look and feel for the city" – accelerates the pace of improvement caused by identifying problem earlier;

4. "A citizen satisfier with government" – provides easier access for citizens to connect with all agencies through their preferred communication channel resulting in a more positive image for government and its leaders;
5. "A budget-trimming, shared-service consolidator" – enables jurisdictions to consolidate and integrate department call center operations and avoid duplication of services;
6. "A revenue maker" – helps with the collection of taxes, fees, and fines;
7. "A regional or city forecast engine" – enables government to use analytics to spot trends and problems in critical service delivery areas;
8. "A safety and disaster resource" – provides two-way information flow during crises which can be modified at a moment's notice;
9. "A transparency machine for managing government" – shows elected and appointed government leaders the response times of departments and the actual cost of services delivered;
10. "A political leveler/power re-distributor" – provides equal access to citizens to mobilize government instead of using power brokers as conduits (Tumin, 2008, pp. 2-3).

Collectively, these are powerful arguments for the establishment of a 311 citizen services center. However, it can be argued that the benefits are proportionate to a city's population and size of the government given that larger local governments may benefit to a greater degree due to economies of scale.

1.2 Research Methodology and Design

What are some of the usual answers for why the 311 innovation would diffuse throughout the United States? Some may answer that it is about agenda setting and policy change generated by actors and institutions in the American Federal System: Lindblom's (1968) incrementalism; Kingdon's (1984) multiple streams; March and Olsen's (1989) new institutionalism; and/or Sabatier's (1988) advocacy coalitions. Incrementalism postulates that policy is more evolutionary or moving forward in increments. The multiple streams metaphor discusses the process streams of problems, policies and processes that at critical junctures can enhance the likelihood of an issue being placed on government's decision agenda (Kingdon, 1984). New institutionalism examines governments as a collection of structures, rules, and procedures that have a semi-autonomous role in political life (March, 1989). Advocacy coalitions do not have the power to change formal institutions, but instead employ the power of persuasion (Sabatier, 1988). While there is certainly an element of agenda setting that can explain why the 311 innovation has spread, agenda setting does not provide a complete explanation.

Others may say 311 is based on NPM's customer-centered focus for service delivery and the public sector acting as a catalyst to unleash market forces in line with the philosophy of Osborne and Gaebler's (1992) entrepreneurial spirit to transform government. However, these concepts do not entirely explain the innovation's diffusion. To begin our search for the primary causes for 311 adoption and diffusion, I believe that we must begin to look at the political forces of diffusion (Karch, 2007) and the evolving functionality of the innovation. In my interviews with 311 change agents (Appendix A) around the country, they offered up their own opinions on the subject.

During the course of the diffusion of 311 across the Unites States, a number of national organizations and federal government agencies have been involved in promoting its adoption. Addressed in greater detail in Chapter 3, I conducted telephone interviews with twelve representatives of national organizations and the federal government who had been involved in the diffusion of the 311 innovation. In regards to the early adopters Eva Liggins, Chair of 311 Synergy Group and Dallas 311 Assistant Director, stated that early adopters were "the largest cities…crime was very rampant, 911 systems were overburdened" (J. O'Byrne, personal communication, August 9, 2011). Spencer Stern, President of Stern Consulting and a partner with Government Finance Officers Association (GFOA), ICMA, and PTI characterized the early adopters as "large cities… most on east coast, top 10, top 20 cities… very few counties" (J. O'Byrne, personal communication, June 13, 2011). He stated that the "leaders focused on improving operations and elevating their own political careers." Eichenthal asserted that it was the "cities with the strongest political leadership" and those "mayors have been politically rewarded for becoming innovative." In regards to followers and late adopters of 311 Eichenthal stated that it was the smaller cities and mid-sized cities because the "bigger ones proved it can work, made it an easier sell" (J. O'Byrne, personal communication, July 22, 2011) while Stern believed that the "next wave was smaller mid-sized municipalities…city managers" (J. O'Byrne, personal communication, June 13, 2011). While the smaller mid-sized cities generally did not face the same challenge of an overburdened 911 call center or greatly benefit from departmental call centers economies of scale, these governments certainly took advantage of improved citizen services and internal accountability.

While there are many advantages to establishing a 311 citizen service center, there were also barriers to adoption. Phil Ashtock of Open311 believed that "the barriers were… technical

and political" (J. O'Byrne, personal communication, July 20, 2011) and Dr. Cory Fleming of ICMA added "cost and complexity" (J. O'Byrne, personal communication, July 19, 2011). Dr. Robert Shick of the Rutgers School of Public Affairs and Administration believed that a barrier to adoption was that "departments don't like to be measured" (J. O'Byrne, personal communication, July 20, 2011). Eichenthal stated that "311 requires a fair amount of change. In the absence of strong executive sponsorship, [it is] a barrier" (J. O'Byrne, personal communication, July 22, 2011).

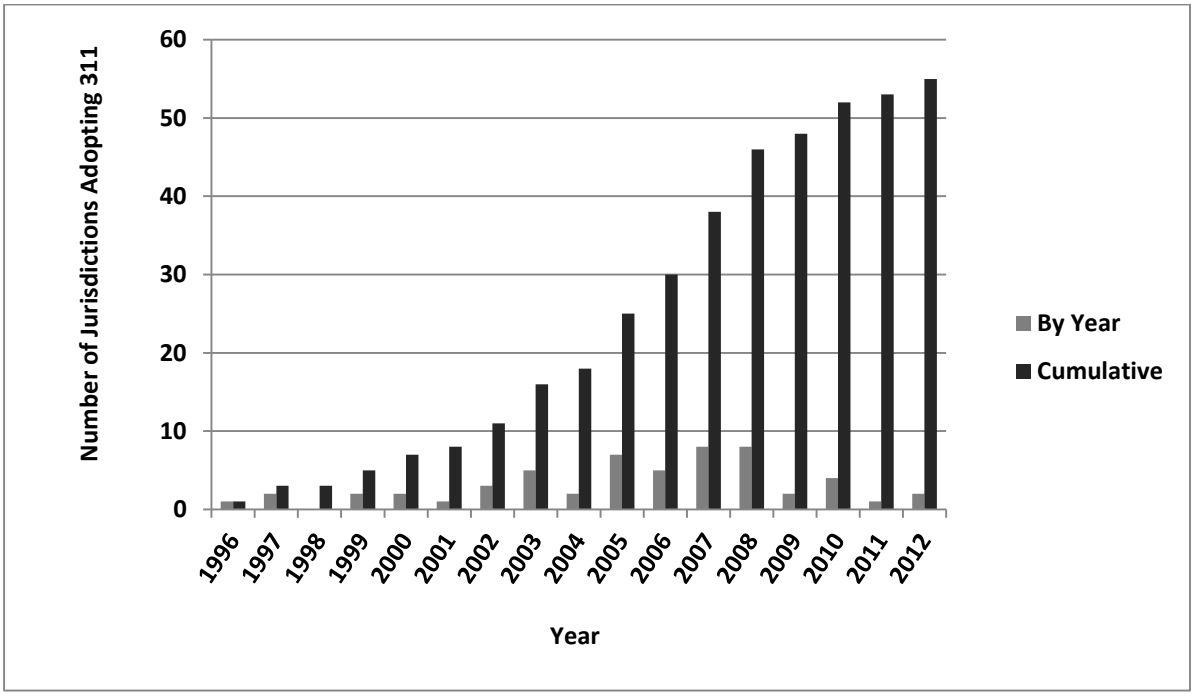
The diffusion of innovation literature offers an appropriate framework for the study of the adoption and evolution of the 311 initiative because it can provide a framework for research in identifying the catalysts for diffusion. As shown in Figure 1, the adoption of the 311 non-emergency number by local governments over the 17-year period displays the classic 'S-curve' pattern generally found in the diffusion literature. Rogers' Diffusion of Innovation (2003) research synthesized thousands of studies of change and found that innovation or reform is slow at first with experimentation, trial and error, and the challenges to initial adopters. Once several jurisdictions adopt an innovation successfully, there tends to be a steep climb in adoption, followed by a leveling off, hence the 'S-curve'.

Through the lens of Diffusion of Innovation theory and according to the variables that determine the rate of adoption, the 311 innovation as a G2C communication technology cluster will be examined in those American cities with populations over 100,000. This study seeks to explore the variables that contributed to the rate of adoption of the non-emergency 311 number by American cities from 1996 to 2012. The study will further explore how and why the local governments of these cities integrated the citizen service hotline with other technologies to improve G2C communication. And finally, the study seeks to understand why some

governments' communication with citizens became more advanced than others. The data source selection will be discussed in greater detail in Chapter 4, Section 4.2.

This dissertation will examine the how and why of the research question, and the internal and external factors involved in the innovation's diffusion from the local and national perspectives. The study will explore the role of the politicians and administrators in their

Figure 1. 311 Adoption and Diffusion 'S-Curve' from 1996 to 2012



Between the years 1996 and 2012 there were 55 cities and consolidated governments with populations over 100,000 (US Census 2003) that adopted the 311 number. 311 adoption follows the pattern an early period of slow adoption during experimentation followed by a steep climb, and then leveling off, hence Rogers' (2003) 'S-curve'.

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capacity as policy entrepreneurs (or obstructionists) at critical junctures over time while advancing (or creating barriers for) the 311 center's evolution. And furthermore, the research will examine the roles of national organizations and federal government agencies and their impact nationally and locally in the diffusion of 311 across the United States.

The research methodology for this study consists of three components designed to explore the research question from different perspectives. The purpose of this approach reflects the recognition that each component has inherent limitations. Each method is designed to support the others with findings that are ultimately integrated into the study's conclusion. As seen in Table 1, the logistic regression model and narrative explore the topic from different vantage points while the case studies tie both of these components together and attempt to fill in the gaps. Given the problem of determining causality, a three-part research design was used to examine the topic: a logistic regression model analyzing factors that may affect the adoption of the 311 number; a narrative discussing the evolving trends of the 311 technology cluster based on interviews with representatives of national organizations and the federal government, and; case studies of the 311 adopter cities of Pittsburgh and Minneapolis and non-adopter St. Louis.

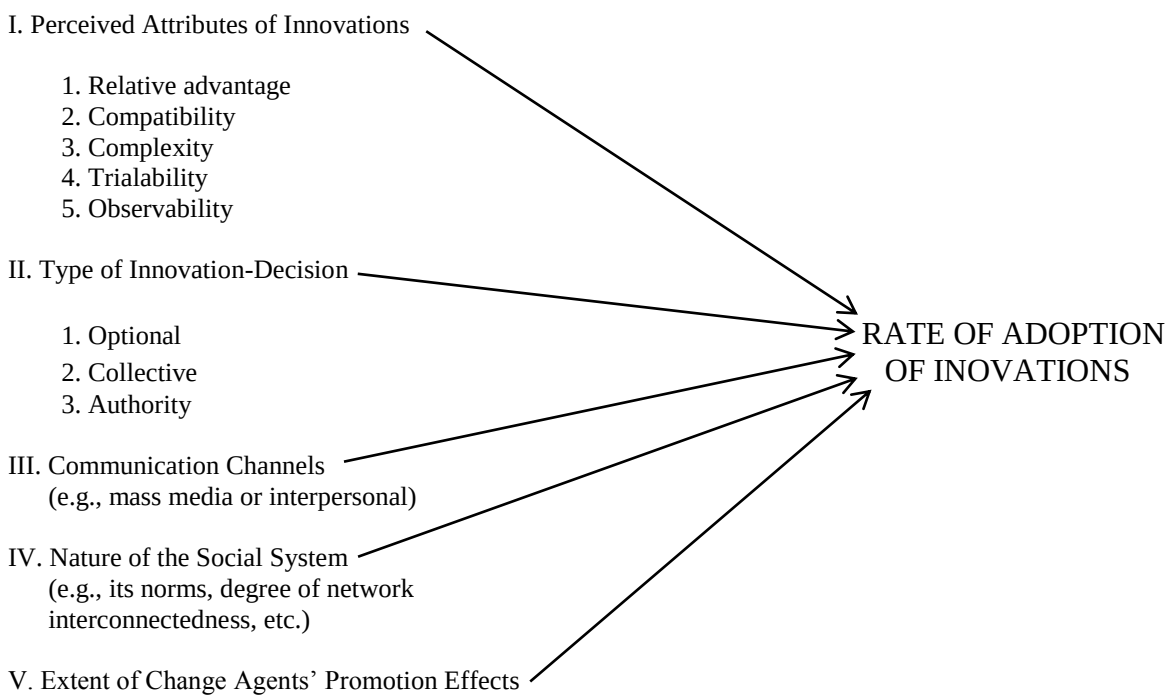
Table 1 Research Methodology and Design

Method	Political Forces	Internal Variables	External Variables	Local	National
Narrative	National Government / Organizations		X		X
Logistic Regression Model	Policy Entrepreneurs	X		X	
Case Studies	Policy Entrepreneurs and National Government / Organizations	X	X	X	X

Chapters 3 through 6 provide a narrative, logistic regression model and case studies, and the results will be viewed through the lens of Rogers' (2003) Variables Determining the Rate of Adoption of Innovations set forth in Figure 2. By comparing the results of each chapter with the

five variable types (defined in Section 2.5.3) that determine the rate of adoption, this study will generate consistent findings across research methods while remaining

Figure 2 Variables Determining the Rate of Adoption of Innovations



The five types of variables that determine an innovation's rate of adoption have not received equal attention from diffusion scholars. The five perceived attributes of innovations have been most extensively investigated and have been found to explain about half of the variance in innovations' rates of adoption. (Rogers, 2003, p. 222)

within the context of Diffusion of Innovation theory. Rogers (2003) uses the term Acceptability Research for the process to explain the rate of adoption by generalizing the attributes or relative advantage or compatibility derived from past research and used to predict the rate of adoption in the future. Its purpose is to identify a basis for positioning an innovation so that it will be more acceptable, thereby increasing the speed of adoption. Exact measurement of the rate of adoption is beyond the scope of this study. However, through this process we may be able to identify the

catalysts for the spread of G2C technology in local government, which, if identified, could be used to speed the rate of adoption for future government technology innovations.

1.2.1 Narrative

The first component of this research is the narrative in Chapter 3 which includes telephone interviews with federal and local government officials, representatives of national organizations, a 311 consultant, and a private sector 311 vendor. The participants were identified from 311-related reports and publications from the federal government and national organizations.

1.2.2 Logistic Regression Model

The second component used in the research design, the logistic regression model, examines the adoption and diffusion of the 311 non-emergency number in the United States for 55 cities and consolidated governments with populations over 100,000 (US Census, 2003) from 1996 to 2012. Although American local governments have adopted the 311 number in 80 jurisdictions, it would take a data set that includes all places with a population over 5,000 with a subtotal of 2,301 jurisdictions in 2010 (smallest place with 311 is Dyersburg, Tennessee with a population of 17,145) and 3,143 counties and county-equivalents for a total data set of 5,444 in order to capture all 80 jurisdictions that have adopted the 311 number. By limiting the data set to the 242 cities and consolidated governments over 100,000 according to the 2003 census, 55 of the 80 jurisdictions or 69% are included.

1.2.3 Case Studies

For the third component, the case studies, a baseline set of questions was developed for the telephone interviews to identify gaps in our knowledge of the political forces of diffusion (policy entrepreneurs, national organizations, and national government), the internal and external

factors of 311 diffusion, and the local and national policy environments. In each city there were three interview subjects: a representative of the mayor's office; a representative of the information technology department; and the contact center director. The interview questions focused on the policy entrepreneurs' role in their city's adoption and evolution of the 311 innovation. They three major elements: (1) who are the policy entrepreneurs at various stages (for example, transition from mayor to administrator to CIO)?: (2) why do some 311 centers become more evolved than others?; (3) and, how do Rogers' (2003) variables determining the rate of adoption of innovations actually work during the process leading up to adoption. The case studies of the 311 adopter cities of Pittsburgh and Minneapolis will be examined in Chapter 5 and will then be compared with non-adopter St. Louis in Chapter 6.

1.2.4 Limitations of the Research

Given that the diffusion and evolution of the non-emergency 311 number in the United States has not been studied academically in a comprehensive manner, there are limitations to the availability of data. The list of local jurisdictions that have adopted 311 through 2012 had to be compiled through internet searches. Although several national organizations and one federal agency have written on the topic, their perspectives and timeframes are limited. Case studies have been conducted for several of the larger jurisdictions, but comparisons are minimal.

The methodological approach using logistic regression, narrative on the evolution of 311, and case studies necessitated limiting the scope of the research topic to what has transpired up until 2012. To balance the need for a comprehensive review of the topic and the need to develop a manageable research agenda, the future implications of 311 will not be examined in greater detail.

1.3 Significance of the Study

The significance of this research stems from the need to add to what practitioners and scholars know about 311 centers, the role of politicians and administrators in the implementation process; and local governments' potential for more advanced forms of communication with citizens. This dissertation intends to lay the groundwork for future research regarding the potential expansion of local government 311 citizen service centers to facilitate more robust citizen engagement activities by building upon the infrastructure that has been developed over the last 17 years. Specifically, I believe that there is tremendous potential to expand the use of 311 centers for increased G2C and citizen-to-citizen communication through what is variously known as citizensourcing, networking distributed public expertise, wiki government, and collaborative democracy (Noveck, 2009; Dutton, 2011; Dutil et al., 2007). Such an expanded role would have significant implications for scholars and practitioners of public administration, political science, and American democracy.

This study also has implications for what we know about role of public officials in the spread of technology within diffusion of innovation theory which previously had received relatively little attention in academic publications.

1.4 Overview of the Dissertation

The introduction chapter defines 311 and explains how it is used in conjunction with local government CRM systems as an integral part of citizen service centers. The chapter discusses why local governments adopted the 311 non-emergency number and established 311 citizen service centers. The dissertation's research question and hypotheses are outlined followed by a review of the research methodology and design, limitations of the research, and significance of the study.

Chapter 2 reviews the diffusion of innovation literature relevant to the research question and hypotheses. The chapter also addresses the literature related to the 311 innovations' reinvention and evolution as well as the dissertation's methodology.

The diffusion and evolution of the 311 innovation from 1996 to 2012 is reviewed in the narrative in Chapter 3 which outlines the major trends related to 311 citizen service centers. The political forces of diffusion are discussed and culminates in a convergence of issues that mark the start of new trends for the innovation.

Given that there is no central repository for data on the adoption of the 311 non-emergency number owing to the decentralized nature of approval at the state level, the logistic regression model in Chapter 4 necessitated the creation of an original database of all known local government jurisdictions that have adopted and activated the 311 number between 1996 and 2012. The model and diffusion timeline map addresses four of the five hypotheses related to cities' crime rates, form of government, economies of scale, and natural disasters.

Chapter 5 examines two similar sized cities that had adopted the 311 number, Minneapolis (382,578) and Pittsburgh (305,704), through interviews with representatives of the mayor's office, their 311 centers, and their information technology departments. The purpose of the interviews (see Appendix C) was to examine the roles of politicians and administrators as policy entrepreneurs and their interactions at critical junctures from concept to implementation and reinvention over time. Specifically, how and why did mayor, CIO, and call center managers play roles as policy entrepreneurs and interact at decision points related to their government's communication tools for interacting with citizens? While the finding from Chapter 4 regarding logistic regression model and the diffusion timeline map addresses the first four hypotheses,

Hypothesis Five regarding the role of politicians and administrators as policy entrepreneurs in 311 adoption will be discussed in this and the next chapter.

Chapter 6 builds on the knowledge gained from the cases in the preceding chapter by comparing them with the non-adopter City of St. Louis (319,294). The interview questions listed in Appendix C were slightly modified to accommodate its non-adoption status and the interviews were with comparable positions in the city government. The chapter identifies the similarities and differences that emerge from the interviews and discusses the significance of the comparisons between 311 adopter and non-adopter cities. This chapter builds on the findings of the 311 adopter case studies regarding the role of politicians and administrators as policy entrepreneurs in 311 adoption and compares the findings related to the non-adopter case of the City of St. Louis.

Chapter 7 addresses the evolution of 311 citizen service centers in their efforts to incorporate additional mechanisms for citizen engagement as well as the best practices of 10 American cities. The purpose of the chapter is to highlight local government's potential for more advanced communications with citizens.

Chapter 8 concludes with descriptions of what we have learned from our research that helps address the main research question and five hypotheses. The chapter examines the findings through the lens of Diffusion of Innovation theory. And finally, the limitations of the findings are acknowledged, and there is an attempt to lay foundation for future research in G2C communication.

Chapter 2. Literature Review and Conceptual Framework

This study of the diffusion and evolution of 311 in the form of citizen service centers and as a technology cluster is designed to help identify the catalysts for the spread of government-to-citizen (G2C) technology in local government in order to better position future G2C technology for a more rapid rate of adoption. The purpose of this literature review is to identify and analyze material related to this research objective. The first section will discuss the placement of this study within the broad category of diffusion of innovation (DOI) academic research. Second, the political forces of diffusion (national organizations, the federal government, and policy entrepreneurs) will be examined including their role in promoting 311 for different purposes. Third, the topic of reinvention and evolution will be reviewed related to the factors and catalysts that have been found to contribute to 311 adoption and diffusion. And finally, citizen engagement literature will be discussed given that the study is designed to identify the catalysts or trigger mechanisms for the spread of G2C technology in local government.

Literature related to this study's research methodology falls under the final topic, Conceptual Framework, which will discuss the approach to developing the study findings. Table 1 in Chapter 1, Research Methodology and Design, and Figure 2, Variables Determining the Rate of Adoption of Innovations, play a key role in understanding the conceptual framework of this dissertation. As explained in Chapter 1, Rogers (2003) calls this process Acceptability Research, which helps explain the rate of adoption by generalizing the attributes or relative advantage or compatibility derived from past research and is used to predict the rate of adoption in the future.

By comparing the results of each chapter with the five variable types that determine the rate of adoption, this study will generate consistent findings across research components while

remaining within the context of Diffusion of Innovation theory. Through this process we may be able to identify the catalysts for the spread of G2C technology in local government that could be used to speed the rate of adoption for future government technology innovations.

This dissertation fills the gap in the literature in four ways, Diffusion of Innovation (D.O.I.) studies (Section 2.1), the D.O.I subsets of the Political Forces of Diffusion (Section 2.2) and Reinvention (Section 2.3), and the technology of citizen engagement (Section 2.4). This research falls within the larger context of D.O.I. literature as evidenced by the data being displayed in the classic 'S-curve' in Figure 1. This study responses the Andrew Karch's (2007) call for further research on the influences of political forces on diffusion while the innovation's evolution over time relates directly to the D.O.I. Reinvention literature. The 311 innovation as it evolved into a government-to-citizen technology cluster has received scant attention in academic research and this research fills a much needed gap in the literature.

2.1 Diffusion of Innovation

As shown in Chapter 1 Figure 1, the adoption of the 311 non-emergency number by local governments over the 17-year period displays the classic ‘S-curve’ pattern generally found in the diffusion literature. Rogers found that innovation or reform is slow at first with experimentation, trial and error, and the challenges of initial adopters. Once several jurisdictions adopt an innovation successfully, there tends to be a steep climb in adoption, followed by a leveling off, hence the ‘S-curve’. This characteristic is the first indicator that DOI theory as a framework for this study is appropriate. In Section 1.1.1 the reader was introduced to some of the key terms from Rogers’ Diffusion of Innovation (2003) theory including diffusion, innovation, technology, reinvention, change agents, opinion leaders, social system, communication network, and technology clusters. Diffusion of Innovation plays a prominent role in this dissertation because

it is a meta-analysis of thousands of diffusion of innovation studies from its first publication in 1962 to the fifth edition in 2003. Rogers' work culled from other studies the common themes and general understandings of diffusion of innovation theory while touching upon new research in the field in each new edition.

Although Rogers' insights are extremely important to this research, there are other DOI theorists who have played critical roles in the academic conversation as a whole and for my research in particular. Jack Walker's (1969) *Diffusion of Innovations Among American States*, created a "distinctive tradition" for the cross-disciplinary study of diffusion phenomena (Savage, 1985). His main questions were: "(1) why do some states act as pioneers by adopting new programs more than others, and once the innovations have been adopted by a few pioneers, (2) how do these new forms of service or regulation spread among American states?" (p. 881). Walker found that some states were relatively quick to adopt new programs, while others were slow to adopt the same programs. A pattern emerged in which there were three categories of states: national leaders, regional leaders, and followers. Walker inferred from this finding that a system of cueing and emulation existed among the states (Menzel, 1977, p. 528).

Communication and interaction patterns of government leaders are important in exploring the diffusion of policy innovations according to Virginia Gray (1973). In the study of adoption patterns within policy areas she found that "early (late) adopters of one innovation were not necessarily the early (late) adopters" (p. 1183) of another innovation. Gray concluded that "innovativeness is not a pervasive factor; rather it is issue-and-time specific at best" (Menzel, 1977, p. 528). Eyestone (1977) found that "the diffusion of policy innovations among the states is a complicated phenomenon for which several models provide partial explanations" (p. 446).

While controlling for socioeconomic variables, Downs' (1976) research focused on one policy adopter and explored the impact of state bureaucracies and their immediate environments on the degree of policy innovation occurring. In developing his analytical work, Downs was influenced by Mohr's (1969) multiplicative model in which the decision to innovate in organizations is determined by the interaction of motivation and resources. Mohr argued that both factors must be present for the innovation to occur, thereby making both necessary and sufficient. At the same time, Mohr's model admitted the possibility that a high value on one factor could compensate for a low value on the other. Down's goal was to investigate the extent to which a focus on the bureaucracy and its task environment could increase the amount of variance explained by a policy determinants model. In his analysis he found that entrepreneurship and leadership in the bureaucracy appeared to be the most important predictors of innovation.

The examination of determinants or factors that would compel a government to adopt new policies was explored by Berry (2007). She explored the policy innovations often emulated by other governments in identical form or with modification. The compelling factors are most often characterized as internal (social, economic, and political) or external (i.e., regional or national influence). By examining these factors researchers gained insights into how and why such innovations diffuse. Daley and Garand (2005) studied both the internal determinants and external pressures of diffusion theory in their study of state environmental policymaking. The authors believed that an examination of internal factors was not the only explanation for the diffusion of the policy in question. They believed that policymaking is the diffusion of policy ideas across governments can be vertical (i.e., from the federal government to state governments) or horizontal (i.e., from one local government to another). In other words, governments also

respond to the internal and intergovernmental pressures for policy diffusion by vertical (national or regional) and horizontal (other similar governments in their region or elsewhere) influences.

Jason Jensen (2003) examined the internal determinants that influence the decision making process over time in his study of policy diffusion and institutional legitimation. His model, similar to this research, focused on 'adoption' as the dependent variable for his study of state lottery adoption and identifies a number of independent variables to test several hypotheses. Jenson stated that "all public organizations are vehicles of policy implementation and they are directly connected to the study of public policy" (p. 521). Local government's creation of 311 centers is directly related to policies for public safety, customer service and accountability. By using DOI literature as a framework for the study of the adoption, diffusion, and evolution of the 311 initiative in local government, we can better understand the innovation as a policy choice and the political processes that create the policy environment.

2.2 Political Forces of Diffusion

According to Andrew Karch (2007) the three basic questions diffusion literature has attempted to answer are: (1) why does policy diffusion occur, (2) which political actors or forces facilitate diffusion, and (3) what is being diffused? The author stated that the quantitative approach to understanding the diffusion of an innovation is inadequate to helping us understand political processes from one government to another. He believes that academics can gain greater knowledge of the processes by also identifying the catalysts or political forces within the categories of policy entrepreneurs, national organizations, and national government intervention. Karch claims that there is a gap in the literature for identifying the conditions under which catalysts are most likely to affect policy diffusion such as less publicly salient reforms by professional associations. All three of my research approaches (narrative, logistic regression

model, and case studies) will address the political forces that facilitate diffusion. Table 1 entitled Research Methodology and Design displays the role of Karch's political forces in each of this study's research methods.

City governments in the American federal system are a hotbed for policy experimentation. The policy makers in these local governments, whether they be politicians or public administrators, have various motivations for adopting policies. Individual decision makers such as mayors and managers are critical actors within cities and may be interested in adopting policies that would help their prospects for reelection or reappointment (Shipan, 2008). Koski (2010) called these critical actors "knowledge brokers" who may adopt policies that are low salience, where there is public indifference or where the policy is simply left off the radar screen. These knowledge brokers provide forums to discuss policy innovations, show political leadership, and act as a dedicated political life-support system for ideas that might otherwise be forgotten. The diffusion of low-salience policies that spread across jurisdictions, according to Koski (2010), make US cities relevant policymaking institutions that are "likely to rely on the advice of their fellow local governments that may have already invested or sunk costs in determining solutions and can speak to the success or failure of their policies" (p. 93).

In the policy entrepreneurship model Mintrom and Vergari (1996) believed that entrepreneurs perform three functions: the discovery of unfulfilled needs and suggesting innovative means to solve them; the reputational, financial and emotional risks of pursuing uncertain consequences, and; resolving collective action problems through networks that have the talents and resources to undertake change. Former Mayor Daley's initiative to use 311 as a customer service number for city departments in 1999 is an example mayoral policy entrepreneurship. Former Washington, DC Chief Technology Officer (CTO) Vivek Kundra's

innovation to conduct a contest with monetary prizes for the development of citizen apps is an example of policy entrepreneurship from that national government (Opsahl, 2009).

The political force of policy entrepreneurs are discussed by Mintrom and Norman (2009) including their role in agenda setting in the context of the policy change theories of incrementalism, policy streams, institutionalism, punctuated equilibrium and advocacy coalitions. The role of policy entrepreneurs is of particular importance in the case study chapters when examining what political actor plays a role in diffusion at various critical junctures. For example, in some cities it is conceivable that the concept of adopting 311 was first championed by a politician, implemented and customized to meet the needs of the government by the chief administrator, then later enhanced to improve G2C communication by the CIO.

While Mintrom and Vergari (1996) focused on the functions of policy entrepreneurs, Balla (2001) examined the political force of national organizations play in promoting diffusion. Balla posits that interstate professional associations provide institutional foundations for the development and dissemination of innovations by government officials with jurisdiction over particular policy areas. My research includes national organizations such as ICMA, National Association of Counties (NACo), GFOA and the National League of Cities (NLC). An example of national organizations influencing the spread of 311 is a report co-authored by ICMA, the 311 Synergy Group, and the Association of Government Contact Employees (AGCCE) entitled Recommended Practices for 311/CRM Data Reporting' (Fleming, 2011). Another type of national organization is a "think tank" defined by Weaver (1989) as a nonprofit public policy research entity. Under Weaver's definition, PTI, the Ochs Center, the Harvard Kennedy School of Government, and the Rutgers School of Public Affairs and Administration could all be considered think tanks. As an example of a think tank acting as a political force of diffusion, in

2008 the Kennedy School, invited public officials from governments with 311 centers, consultants, and technology providers from the United States and Canada to convene with academics to discuss the 311 innovation. The conference culminated in a document entitled "311: The Next Wave" which provided an overview of 311 center status in an easy-to-read magazine-style format which was broadly disseminated to public officials throughout the country (Tumin, 2008).

Karch's third political force of diffusion, the national government, can be epitomized by the U.S. Department of Justice's Community Oriented Policing Services (COPS) Office. From the very beginning when the COPS Office petitioned the FCC on behalf of the City of Baltimore to allow them to have a 311 pilot project in July 1996, they have been a source of diffusion for this innovation. Since that time the COPS Office awarded about $6 million in funding to establish 311 non-emergency systems. The COPS Office had also conducted several case studies including Minneapolis, Minnesota, and Miami-Dade County, Florida (Cohen, 2007).

2.3 Reinvention and Evolution

The notion of 311's evolution over time from a three digit telephone number to offload non-emergency calls from 911 centers to becoming a ubiquitous term for G2C communications (J. O'Byrne, personal communication, July 20, 2011) is closely intertwined with the Rogers' (2003) concepts of technology clusters and reinvention. The 311 innovation as a technology cluster was promoted as a package of innovations and has been changed, modified, and reinvented by local governments in the process of adoption and implementation.

Glick (1991) believed that little attention has been paid in academic publications to policy changes during the process and the variations among early and late adopters. The patterns of reinvention in the diffusion process will be of interest to this research, given that 311 began as

a non-emergency hotline number and later became a one-stop customer service center integrated with multiple layers of information and communication technologies.

Stoneman and Diederen's (1994) typology of technological change is: invention (the generation of ideas), innovation (the development of those ideas through the first marketing of use of the technology), and diffusion (the spread of a new technology across its potential market). Their work is beneficial to my research because it will help examine the spread of a technological innovation from inception to diffusion including the private sector point of view and the citizen's perspective (Stoneman, 1994).

The major trends in the reinvention and evolution of the 311 innovation since 1996 will be examined in greater detail in the narrative in Chapter 3. However, two early trends were the use of the 311 number for customer service and for departmental performance. Chicago Mayor Daley claimed that his city to be the first to use 311 for citizen service "to provide information and track city services from intake to resolution" (Chicago, 2003). In 2000, Mayor Martin O'Malley of Baltimore began using data generated by 311 to improve the performance of city agencies in a management strategy they called CitiStat modeled after the CompStat program of the New York City Police Department (NYPD). The data was used to discuss, examine, and analyze the past performance and future objectives of city agencies (Behn, 2006).

The emergence of the 311 innovation began during the reinventing government movement popularized by Osborne and Gaebler (1992) and was also known as New Public Management (NPM) in public administration theory. If the Old Public Administration role in government was characterized as 'rowing' or leaders designing and implementing policies focused on a single politically defined objective, then NPM's role could be characterized as 'steering' or acting as a catalyst or entrepreneur for unleashing market forces. Osborne and

Gaebler's premise for entrepreneurial government could be exemplified by local government's adoption of the private sector's constituent relationship management (CRM) systems. Alexander Schellong's (2007) research on 311 centers talks about the progression of the 311 innovation to improve citizen service and connectivity. GFOA (Kavanaugh, 2007) called on local government finance professionals who play a critical and influential roles in government policy and implementation to examine CRM systems. CRM systems, which are the backbone of 311 centers, created ease of access for citizens as constituents to have their information better managed (Kavanagh, 2007). In 2008 ICMA promoted the benefits of CRM systems including its integration with 311 and best practices (Fleming, 2008).

The Public Technology Institute (2008a) provided a detailed overview of citizen call centers and announced the formation of the 311/CRM Project Coordinating Group consisting of PTI, Rutgers, ICMA, and the Ochs Center, and was funded by the Alfred P. Sloan Foundation. In 2009 this 311/CRM Group announced the creation of a Citizen-Engaged Community Designation Program which awarded its first designations the following year (PTI, 2009a). The criteria included integrated communication channels, integrated technology, and performance reporting which were reflections of private sector management practices. The inclusion of citizen engagement processes as the final criterion represented a new and advanced trend in G2C communications which was beginning to be seen in this time period.

2.4 Citizen Engagement

As discussed previously, this dissertation is intended to better position future citizen engagement technology for a more rapid rate of adoption by studying the past diffusion of the 311 innovation as a proxy. However, a more in-depth literature review for this topic is beyond the scope of this study and will be recommended for further research in Chapter 8.

Arnstein's (1996) ladder metaphor for the eight types of citizen participation provides a basic framework for discussing 311 centers and their role in local government experimentation in "degrees of citizen power" with *Partnership* on rung six and *Delegated Power* on rung seven, Arnstein defines citizen participation partnership as power that is redistributed through negotiation between citizens and powerholders. A modern equivalent of this type of partnership is alternately called networked distributed expertise, citizen (crowd) sourcing, wiki government, mass collaboration, or collaborative democracy. Noveck (2009) defines collaborative democracy as "using technology to improve outcomes by soliciting expertise (in which expertise is defined broadly to include both scientific knowledge and popular experience) from self-selected peers working together in groups of open networks" (Noveck, 2009). Dutton (2011) argues that this process would herald in a revolution in governments by "tapping the wisdom of crowds, the idea that the many are smarter than the few" (p. 17) argue that "increased data transparency is a necessary precondition for the public to participate in and to collaborate on government, according to Lee and Kwak (2011), is increased data transparency in order to spur action, create value-added services, and facilitate innovation. Therefore, the use of technology to improve outcomes through the wisdom of crowds is helping local government in the United States begin the process of reaching the citizen power rungs of *Partnership* and *Delegated Power* on Arnstein's metaphorical ladder.

2.5 Conceptual Framework

The conceptual framework for this study consists of three interlocking components designed to address the research question, hypotheses, and the overarching purpose of identifying the catalysts for the spread of G2C technology in local government in order to position future G2C technology for a more rapid rate of adoption. The three components which

will be assessed in subsequent chapters are: (1) the logistic regression model; (2) examining the role of the political forces of diffusion (policy entrepreneurs, national organizations, and national government intervention), and; (3) case studies, all of which evaluated through the lens of Variables Determining the Rate of Adoption of Innovations (Figure 1) and Karch's (2007) political forces.

2.5.1 Research Design Components

The research design components examine the internal and external factors that contributed to the adoption of the 311 non-emergency number by American cities, how the innovation diffused and evolved over time, and why some governments' communications with citizens became more evolved than others. The methodology to be used includes a logistic regression model analyzing the factors that may affect the adoption of the 311 number by cities with a population over 100,000, a historical narrative based on interviews with representatives of national organizations and the federal government, and case studies from three cities which examine the roles of politicians and administrators as policy entrepreneurs.

The purpose of this approach reflects the recognition that each component has inherent limitations. Each research component is designed to support the others with their individual findings and is ultimately integrated into the study's conclusion. The logistic regression and narrative sections explore the topic from different vantage points while the case studies tie both of these elements together and attempt to fill in the gaps of our knowledge.

2.5.2 Political Forces of Diffusion

Karch (2007) believes that academics can gain greater knowledge of the processes by also identifying the catalysts or political forces within the categories of policy entrepreneurs, national organizations, and national government intervention. Karch claims that the catalysts

that are most likely to affect policy diffusion could be identified for innovations that are less publicly salient reforms or what Koski (2010) would call low-salience policies. All three of my research methods, narrative, logistic regression model, and case studies will address the political forces that facilitate diffusion. Table 1 entitled Research Methodology and Design displays the role of the political forces of diffusion in each of this study's research methods.

2.5.3 Variables Determining the Rate of Adoption of Innovations

Rogers' (2003) Variables Determining the Rate of Adoption of Innovations as outlined in Figure 1 will be an important element for reviewing the findings in Chapters 3 through 6. The first section of this figure are the *Perceived Attributes of Innovations* consist of: (1) Relative Advantage (degree to which an innovation is perceived as better than the idea it supersedes), (2) Compatibility (degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters), (3) Complexity (degree to which an innovation is perceived as difficult to understand and use), (4) Trialability (degree to which an innovation may be experienced with on a limited basis), and; (5) Observability (degree to which the results of an innovation are visible to others). Some DOI studies attempt to view public innovations through these five perceived attributes and have added to the list related to the uniqueness of the innovation they were studying. Two such examples are Korteland and Bekkers' (2007) study of public safety SMS-alert systems in the Netherlands and Greenhalgh et al's (2008) research on shared electronic medical records in England.

Second, the *Type of Innovation-Decision* is: (1) Optional (choice to adopt or reject an innovation made by independent individual); (2) Collective (choice to adopt or reject an innovation by consensus of system members), and; (3) Authority (choice to adopt or reject an innovation by a few powerful individuals with high status and/or technical expertise).

Third, the *Communication Channels* are defined as the "means by which messages get from one individual to another including: (1) mass media channels (means of transmitting messages that involve mass media), and; (2) interpersonal channels (involves face-to-face exchange between two or more individuals" (Rogers, 2003, p. 18).

Fourth, the *Nature of the Social System* is defined as "a set of interrelated units that are engaged in joint problem solving to accomplish a common goal" (Rogers, 2003, p. 23). The social structure is patterned after social relationships and the communication structure demonstrates how information is disseminated through the system. Norms are the established behavior patterns of the social system.

And finally, the *Extent of Change Agents' Promotion Effects*. Although this variable may also be examined through the lens of the political forces of diffusion as outlined in 2.5.2, its specific promotion effects will be detailed under this subheading. Rogers determined that the relationship between this variable and the rate of adoption of innovations may not be direct or linear.

2.6 Summary

The classic 'S-curve' for 311 adoption (see Figure 1) is a strong indicator that diffusion of innovation (DOI) theory is an appropriate framework for studying this innovation. While DOI theory is a useful conceptual framework, no one variable, factor, mechanism, method or approach will explain the nature of the adoption, diffusion, and evolution of the 311 innovation. Therefore, the three part research design of narrative, logistic regression model, and case studies is a more comprehensive approach than using any single tool alone.

While the 311 innovation falls within the overall category of DOI theory, it is also a technology cluster subject to reinvention and evolution (Rogers, 2003). DOI reinvention

literature helps us to better understand the evolution of 311 from a non-emergency number to a technology cluster. Furthermore, it helps us to better understand this innovation as a major component of today's technologies in use for citizen engagement.

The diffusion of 311, a low-salience policy, was encouraged by political forces (Karch, 2007) for different purposes. The conceptual framework for this study includes the impact of the political forces (policy entrepreneurs, national organizations, and national government intervention) as catalysts for diffusion.

The quantitative approach alone is inadequate to understanding the diffusion of an innovation and the political processes for the spread of this technology from one government to another. No single explanation, definition, or internal/external determinant can fully explain the adoption of 311, its diffusion and evolution, or local government experimentation in technology. Therefore, this three part research design and the established criteria for reviewing chapter findings will be beneficial in addressing the original research question and hypotheses.

Chapter 3. The 311 Innovation Narrative

This study of the diffusion and evolution of the 311 innovation in the form of citizen service centers and as a technology cluster will help us identify the catalysts for the spread of government-to-citizen (G2C) technology in local government in order to position future G2C technology for a more rapid rate of adoption. As first of three research components, the narrative addresses the history of the 311 innovation and will be succeeded by a logistic regression model in the following chapter and case studies in Chapters 5 and 6.

This chapter is designed to tell a richly detailed story about the origins of the 311 innovation from the concept of creating the first "National Non-Emergency Hotline" (Cohen, 2007) to it becoming a ubiquitous term for government-to-citizen (G2C) communication (J. O'Byrne, personal communication, July 20, 2011). The story of 311 is derived from reports and postings from national organizations, the federal government, media sources, news accounts, reports and academic publications. The narrative is informed by interviews with representatives from national organizations, federal and local government, industry experts, and academia who were identified in various 311 publications and reports (see Appendix B). The twelve interviews, conducted by telephone in 2011, took approximately 30 minutes and hand written notes were immediately summarized. The interviews are bolstered by information generated from books, academic articles, newspaper and magazine articles, and reports by government agencies and national organizations. The chapter will address the following: a discussion of the origins and creation of the national non-emergency hotline, how the hotline number became a one-stop customer service access point, the major trends in how the innovation evolved into a technology cluster from 1996 to 2012, and a review of the active role played by the political forces that promoted 311 diffusion for different purposes over time. The conclusion presents findings

analyzed through the prism of Rogers' (2003) Variables Determining the Rate of Adoption of Innovations (Figure 1) and Karch's (2007) political forces of diffusion (policy entrepreneurs, national organizations, and national government intervention).

3.1 The National Non-Emergency Hotline

In 1967 the national emergency number 911 was originally promoted to the public as "a method for getting police, fire, and medical personnel to emergencies fast, thereby improving services to people in need of help" (Mazerolle, 2001, p. 1). Prior to 1967, most citizens had to memorize or look up the seven digit number to call the local police, fire or ambulance dispatch. An Austin, Texas Police Department report (2003) stated that "since 1967, 911 has been used to bring lifesaving emergency services to the scenes of innumerable crimes, fires, accidents, and medical crises" (p. 1). By the mid-1980s citizens began to use the 911 emergency number to call for less urgent government assistance. The result was an overburdened 911 systems which interfered with the handling of genuine emergencies.

Former Police Chief of Santa Ana, CA and COPS Office Director Joseph Brann offers a unique perspective for the need for the non-emergency number from both a local and national standpoint. He stated that in 1989 he started looking into an alternative to the public "calling 911 for everything" (J. O'Byrne, personal communication, August 13, 2011). In an attempt to correct this problem he contacted the California Public Utility Commission (PUC) and phone utilities and asked them to provide an alternative number for non-emergencies. He said that he just "kept getting the run around." Brann recalled a similar effort by the City of Dallas, Texas after an EF4 tornado struck Dallas on April 25, 1994, killing three people, injuring 48, and leaving behind extensive damage. Once again, the 911 system was overwhelmed by callers resulting in delays by emergency responders (J. O'Byrne, personal communication, August 13, 2011). Like Brann,

Dallas' Assistant City Manager Mary Suhm once again "got the run around" when the city requested a non-emergency number from the Texas PUC and the Federal Communications Commission (FCC) (J. O'Byrne, personal communication, August 9, 2011).

With separate local efforts to establish a non-emergency number being rejected by State PUCs in California and Texas, COPS Director Brann felt that the only way to achieve the goal of reducing 911 call volume to increase local emergency response time was through federal government action. Brann caught the ear of President Clinton regarding the need for a national non-emergency number to improve 911 emergency response and to aid in community policing while attending a White House press conference in 1994 announcing AT&T's donation of 100,000 cell phones to victims of domestic violence in order to prevent further abuse. He explained to the President that if the federal government through the FCC were to set aside a three digit number for local government non-emergency calls, not only would emergency response times improve, but citizen calls for quality of life services would improve local community policing efforts. Before the press conference the President pulled aside Reed Hundt, who was named FCC Chairman in 1993, and an AT&T representative and asked them to see what could be done to expedite this initiative. The President appointed the five members of the FCC who were approved by the Senate and the President then designated who will lead the commission. Around the same time period White House Drug Czar Lee Brown and the newly appointed AT&T Director of Law Enforcement Services, John Cohen, had a discussion at a meeting in Southern California about the creation of an 800 number for non-emergency calls. Brann recalled that Brown insisted that it must be a 3-digit number channeled through the 911 system infrastructure. Cohen went back to AT&T system engineers who informed him that an additional N-1-1 number could reliably be channeled through a local government's 911 center

PBX system at minimal cost. This information negated the previously stated industry position that it was not technically feasible (J. O'Byrne, personal communication, August 13, 2011).

Brann is certain that if President Clinton had not set the wheels in motion for an N-1-1 government non-emergency number at the time, the FCC would have sold the rights to N-1-1 numbers to the private sector for business purposes. The FCC, an independent agency of the United States government, had federal jurisdiction and reserved authority over the remaining eight 3-digit N-1-1 telephone numbers since 1992 (Cohen, 2007). Brann also observed that the FCC's ultimate decision to decentralize the decision making process to state PUCs was critical in providing "greater latitude and innovation" to enable local governments to adapt the number to local needs and intentions. This same decision has had the adverse impact of making it difficult for researchers to study the 311 phenomena because there was no national repository for the listing of jurisdictions that were approved by state PUCs to utilize the 311 non-emergency number (J. O'Byrne, personal communication, August 13, 2011). Two alternatives for collecting such information was to contact the PUCs in all fifty states or to conduct internet searches. Given the nature of this innovation which is charged with disseminating information to the public, internet searches were able to capture public deliberations on adopting the 311 innovation and the grand opening for new centers.

As a national government agency created by the Clinton Administration to help local police efforts in their fight against the high crime rates during his administration, the COPS Office stepped in to lobby the FCC for a non-emergency number which could potentially reduce emergency vehicle reduce times. With the issue of crime being a major issue during the 1996 presidential campaign, President Clinton made a speech on the topic of crime in St. Louis on May 17, 1996. In the following month on June 17, 1996 the cover of the *U.S. News and World*

Report had the headline: "This is 911. Please Hold.' Why you can't get a cop when you need one," displayed over the image of a speeding police car. The accompanying article estimated that between 50 and 90 percent of all calls being made to 911 were for non-emergencies (Witkin, 1996). The COPS Office (Cohen, 2007) stated that "the growing dependence on 911 caused backlogs and inefficiencies for police agencies leading to frustration and sometimes deadly consequences for callers with emergency needs. A response to this crisis was needed to reduce the number of non-emergency calls to 911, stop the reactive cycle of police officers racing from one 911 call to another, and keep 911 phone lines open for true emergencies" (Cohen, 2007, p. 1).

During a campaign speech on July 23, 1996 in Sacramento, California as part of his community-involved policing program, President Clinton called for a national community policing number to help alleviate the abundance of non-emergency calls flooding 911 emergency systems (COPS, 2001). Three days later the COPS Office made a formal request to the FCC to reserve the number 311 as a "national non-emergency hotline" (Cohen, 2007). On October 2, 1996 the first 311 non-emergency hotline number began operation as a federal grant-funded demonstration project with the Baltimore Police Department. This project was approved despite opposition from the American Public-Safety Communications Officials, the National Emergency Number Association, and the telecommunications industry which wanted the numbers designated for commercial purposes (J. O'Byrne, personal communication, August 15, 2011), the FCC approved 311 for nationwide use on February 19, 1997.

The 311 number was originally designated by the FCC for the purpose of relieving the burden of non-emergency calls to 911 dispatch centers, but in retrospect it was a watershed moment in the history of G2C communications. The timing of the arrival of this innovation

coincided with increased usage of the Internet and the advent of the information revolution. As the public's means and options for communication have grown over time, so too did governments' ability to connect with citizens in new and innovative ways. Dr. Debra Cohen of the COPS Office said in 2007 that "311 is being increasingly viewed as a tool to enhance citizen access to government services. Its original police non-emergency role is expanding into public services and crisis management planning. The future of 311 finds citizens with increased access to government and improved service delivery. The COPS Office supports 311 systems as a vehicle for enhancing the lives of police and the citizens they serve, and helping communities meet their needs one call at a time" (Cohen, 2007, p. 1). Cohen "hoped all along that 311 would be used as a catalyst for citizen engagement to improve the quality of life in their neighborhoods" (J. O'Byrne, personal communication, August 11, 2011).

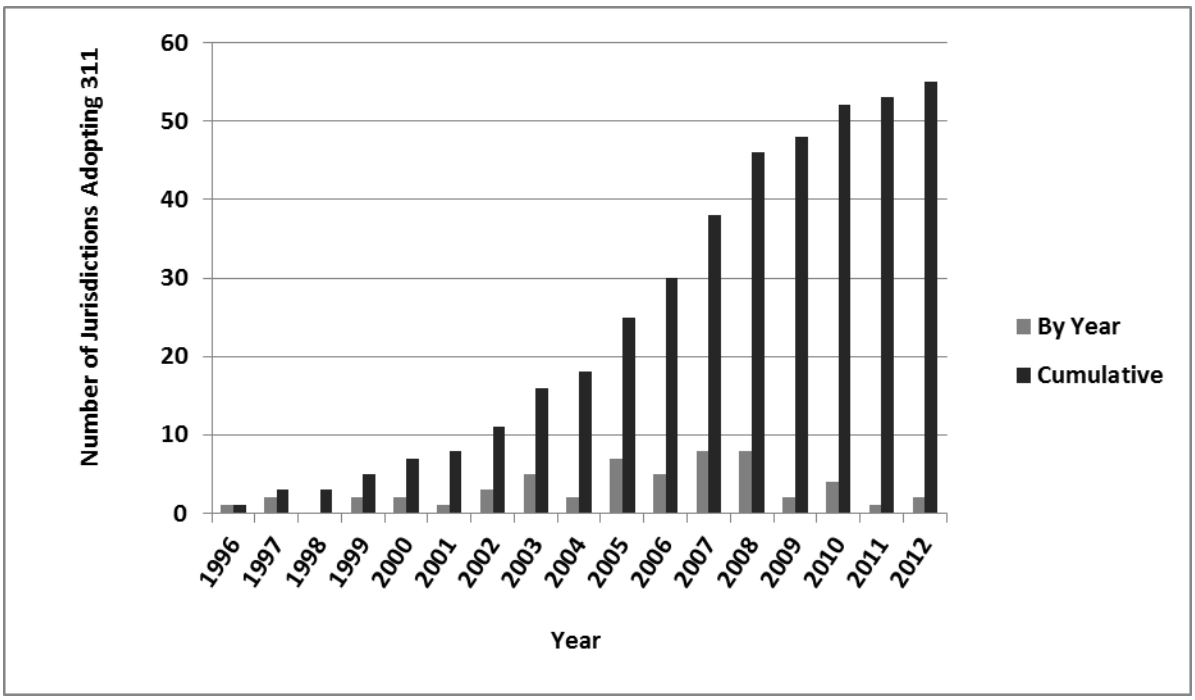
3.2 Diffusion and Evolution

Between 1996 and 2012, 80 local governments in the United States adopted the 311 number (see Figure 3), 55 of which were from cities and consolidated governments with populations over 100,000. Although this number may seem small compared with the mandated 911 emergency communications number, it took over 30 years for 911 to become universally implemented as compared with the non-mandated 311 number. Over the years the 311 innovation experienced several trends in its evolution to accomplish multiple objectives. Also, it began to be integrated with other technologies contributing to its' reinvention over time.

The first major trend after its initial use as a non-emergency hotline was initiated by the City of Chicago when they installed 311 on January 1, 1999 with the intention of improving citizen service. Mayor Daley said that Chicago was "the first to implement a comprehensive 311

system to provide information and track city services from intake to resolution, in addition to taking non-emergency police calls," thereby making Chicago the first 311 citizen service center

Figure 3 311 Adoption and Diffusion 'S-curve' from 1996 to 2012



(Chicago, 2003). With service requests now being tracked through 311 systems, it became a management tool in the year 2000 when Mayor O'Malley of Baltimore began using the data to improve the performance of city agencies in a management strategy called CitiStat modeled after the CompStat program of the NYPD. The 311 data was used to discuss, examine, and analyze the past performance and future objectives of city agencies (Behn, 2006). Christopher Ansell (2011) noted that the CompStat program pragmatically bridged the gap between Weberian bureaucracy with its focus on hierarchy and New Public Management's entrepreneurialism which calls for greater discretion for public employees. In the case of the NYPD CompStat program Ansell believes that the problem-solving capabilities of top-level executives were expanded by communicating directly with street-level bureaucrats. In regards to 311 adoption

and evolution, local government public officials used the technology to pragmatically solve problems beyond its original intent. Mayors Daley and O'Malley used their citizen service centers to improve management and accountability. Information technology directors later added layers of technology to improve communications with citizens beyond just reporting non-emergency issues.

The second trend was the 311 system's use as an important tool in disaster preparedness and response. For the hurricane-prone Florida counties of Orange and Miami-Dade, their 311 call centers helped citizens recover from the disastrous hurricane season of 2005 when they received calls for post-hurricane related services, such as flooding and downed trees. While the Federal Emergency Management Agency (FEMA) provided a number (1-800-621–FEMA) and website (www.fema.gov) for information on disaster assistance local authorities are charged with providing localized information and services in a more-timely manner. The 311 call takers provided important information on recovery services such as food distribution points, debris removal, and FEMA sponsored programs (Holmes, 2007). Minneapolis' 311 center met its communication challenge following the collapse of an I-35W bridge on August 1, 2007 by handling an enormous influx of calls and emails related to the non-emergency aspects of the bridge collapse. Citizen calls to 311 included requests for information about the bridge collapse, road closures, alternate routes, and Red Cross referrals. The center tracked requests and reports such as eyewitness accounts, missing person and victim information, expressions of condolences and sympathies, and traffic control complaints (Cohen, 2007).

The third trend was the promotion of the 311 innovation by national organizations including the GFOA, the ICMA, and the PTI which focused on local government issues. These national organizations designed to assists local governments on a national level began to

disseminate reports espousing the benefits of 311 as a way to improve the efficiency and effectiveness of local government, although sometimes for different purposes. All three of these groups are government membership organizations that promote good government initiatives in order to advance their professions (ICMA for city and county managers, GFOA for finance directors) and the effectiveness of their governments (PTI is a consortium of national public sector organizations with a focus on technology). 311 citizen service centers began to grow in complexity to become what those in the private sector referred to as multi-channel contact centers. Cities and counties were now customizing the innovation to meet their local needs and integrating it with more complex layers of technology in order to improve service to citizens. The 311 innovation's complexity grew as a technology cluster with citizen service centers providing both direct, telephone-based support from live agents and self-service through channels like the Internet and interactive voice response (IVR). As citizens became more adept at using the Internet and automated phone systems to acquire information, pay bills, make purchases, and conduct business with the private sector, expectations for communication access with government began to increase. Citizens wanted the same choices in their interaction with governments (PTI, 2009a).

The fourth trend, citizen engagement, was identified in PTI's Citizen-Engaged Communities designation program established in 2009, which recognized excellence in local government multi-channel contact centers. This new program established selection criteria beyond the traditional NPM philosophy of customer service and efficiency to also include citizen participation processes and connectivity through social media. This approach was more in line with the philosophy of New Public Service which affirms that the "primary role of the public servant is to help citizens articulate and meet their shared interests rather than to attempt to

control or steer society" (Denhardt, 2000, p. 549). The inclusion of citizen engagement represented a new and advanced trend in G2C communication.

Although examined in greater detail in Chapter 7, the trend for citizen engagement began to rapidly expand with the explosion in the use of social media and smartphones coincided with the tightening of municipal budgets due to the economic downturn being in 2008. The Open 311 (open data) movement which began when a group of big city CIOs, and later coordinated by Phil Ashtock of Open311.org, called for making information available from government databases to allow citizens to access this information, sometimes with little or no instructions. In an example of government ingenuity in fiscally challenging times, cities such as Washington, DC, New York City, and San Francisco experimented with conducting contests with prize money to entice software developers to create applications, also known as apps, to allow citizens to access government information in new and engaging formats.

Sometimes this experimentation can be a hit-or-miss in terms of success. In response to a technically savvy electorate in the Silicon Valley, Mayor Gavin Newsom of San Francisco launched SF311 on Twitter in 2009 to complement their phone-based system (NAPA, 2009) even though, as 311 Deputy Director Andy Maimoni put it, the social media tool was initially integrated in a "half baked" manner with other existing technologies. Maimoni praised this type of experimentation as an innovative approach by being willing to try new things (e.g., Facebook, Twitter) even if implementation does not go according to plan (J. O'Byrne, personal communication, March 28, 2011). This pragmatic approach to public technology experimentation was cultivated by a popular mayor who was willing to take risks to improve government communications.

However, the rapid pace in which cities were implementing new technologies and social media tools does not come without drawbacks. In the race to become a national leader in technology-based 'e-democracy' to complement their 311 service, Pittsburgh City Councilman William Peduto pushed through the launch of the iBurgh smartphone application to complement the City's existing 311 system just days ahead of Boston's unveiling in July 2009. In the rush to launch the citizen app, integration problems quickly emerged through citizen complaints. Pittsburgh's Assistant Director of the Information Systems department stated that "in a nutshell, the data was not coming through to 311" (McNulty, 2010). Although the iBurgh app remained available for downloading, the requests for service had to be manually re-inputted into the citizen request system.

3.3 The Political Forces of Diffusion

Karch (2007) believes that the three political forces of diffusion (national organizations, policy entrepreneurs, and national government intervention) are catalysts for policy change. However, in the case of technology innovation (Rice, 1980), private sector technology vendors and consultants can represent a potential fourth quasi-political force when working with their client local governments in to promote the innovation.

Karch (2007) stated that "one of the most promising developments in diffusion research is the emerging focus on political forces that operate in multiple" subnational governments, including national government intervention, policy entrepreneurs, and national organizations. "The geographic reach of these forces makes them capable of actually transmitting policy innovations across state lines, thereby representing a causal mechanism that could facilitate the diffusion of policies" (p. 65). This section will explore the three political forces of 311 diffusion through publications and press reports related to these forces from 1996 to 2012. Also, coupled

with the literature will be relevant direct quotes from twelve (12) interviews conducted by the researcher between June and August 2011. The interviewees were representatives of national government, national organizations, and influential figures involved in the diffusion of the 311 innovation as identified through reports and from the interviewees themselves.

The national government can influence local policy making in a variety of ways including providing financial incentives for demonstration projects, approving waiver requests or changing the rules to allow or disallow a function, and by adopting innovations from the state or local governments. National government intervention can also occur as a result of presidential elections, and decisions by courts or independent public authorities (Karch, 2007). It can be argued that Presidents Clinton and Obama had attempted to address the needs of urban centers, a key Democratic Party constituency, for political purposes.

President Clinton played a pivotal role in calling for a national non-emergency number during his reelection campaign in order help alleviate the abundance of non-emergency calls flooding local 911 emergency systems (COPS, 2001). Joseph Brann claimed that "it took getting the attention of the president himself who acted immediately and got cooperation." Working behind the scenes in helping to write the president's July 13, 1996 speech in Sacramento, Brann's efforts helped to influence the Attorney General's Office to support this new policy initiative and for it to ultimately receive FCC approval (J. O'Byrne, personal communication, August 13, 2011). After a successful federal grant-funded 311 demonstration project with the Baltimore Police Department beginning on October 2, 1996 and the strong support of President Clinton who was re-elected about month later, the FCC provided final approval of the use of the 311 non-emergency number for local governments throughout the United States beginning in February 1997.

Through President Clinton's second term and President George W. Bush's first, the COPS Office awarded approximately $6 million in grant funding to support the implementation, enhancement, and evolution of the 311 non-emergency number including: Baltimore, MD (FY 1996); Birmingham, AL (FY 1999); Dukes County, MA (FY 1999); Houston, TX (FY 1999); Miami, FL (FY 1999); Rochester, NY (FY 1999); Austin, TX (FY 2000); Orange County, FF (FY 2000); Charlotte/Mecklenburg County, NC (FY 2003); Columbus, OH (FY 2003); and Minneapolis, MN (FY 2003) (Cohen, 2007).

The COPS Office published numerous case studies about the benefits of adopting the 311 non-emergency number including those from Minneapolis and Orange County, FL (Cohen, 2007; Holmes, 2007). The COPS Office *Innovations* report featured Houston's 311 center was featured in 2001 and Baltimore's in 2002 (COPS, 2001; COPS, 2002). The DOJ Office of Justice Programs' National Institute of Justice issued two reports in February 2005, one aimed at local government decision makers called *Call 311: Guidelines for Policy Makers* (COPS 2005a) and the other directed towards local police officials called *Managing Calls to the Police with 911/311 Systems* (COPS, 2005b).

On his first day in office, President Obama signed the *Memorandum on Transparency and Open Government* which stated "my administration is committed to creating an unprecedented level of openness in government. We will work together to ensure the public trust and establish a system of transparency, public participation, and collaboration. Openness will strengthen our democracy and promote efficiency and effectiveness in government" (Executive Office, 2009b). Later that year the national government provided evidence that it was actually adopting innovations from local governments serving as laboratories of democracy and supporting 311 innovations. In President Barack Obama's Open Government Plan (GSA, 2009)

they cited the experiences of Washington, DC, New York City, and San Francisco as models for the federal government's development of a data catalogue. In their May 2009 launch of Data.gov, the White House called it "a one-stop shop for free access to data generated across all Federal agencies" (Executive Office, 2009a, p. 17). In the following year the White House issued memorandum on *Guidance on the Use of Challenges and Prizes to Promote Open Government* in support of the $100,000 Apps for Communities challenge modeled after similar contests in Washington, DC, New York City, and San Francisco. This initiative was part of U.S. General Services Administration Challenge.gov online platform and was jointly sponsored by the FCC and the Knight Foundation (Executive Office, 2010).

In March 2009 President Obama appointed the first-ever CIO of the US government (White House Innovation Plan, 2009) who was none other than Washington, DC's former CTO and local government innovator, Vivek Kundra. In the following month the President appointed Ansessh Chopra the first CTO. In describing the Office of the CTO, the President's Open Government Plan (GSA, 2009) called it "a 'policy entrepreneurship' organization, designed to deploy new technologies and open strategies to achieve agency priorities" and further "committed to recruiting high-level champions of innovation across government" (p. 11). CIO Kundra demonstrated his commitment to local government innovation by being on hand for San Francisco's launch of 311 Open Source (Opsahl, 2010) and CTO Chopra supported Seattle new wireless public safety network in a White House blog post (Rich, 2011). Both of these actions once again demonstrating the national government's role as a political force of diffusion. The motivation for national government acting as a political force, in this case, certainly reflects the Obama Administration goal of transparency and openness in government, but it may also be

argued that the President was also trying to help a key Democratic constituency, the Mayors and voters in urban cities.

Policy entrepreneurs, Karch's (2007) second political force, are "individuals distinguished by their willingness to use their own personal resources of expertise, persistence, and skill to achieve certain policies they favor. Policy entrepreneurs may be elected officials, executive agency officials, or private citizens, such as representatives of the business community or policy activists" (p. 66). Mintrom and Norman (2009) suggest that the elements central to policy entrepreneurship are "displaying social acuity, defining problems, building teams, and leading by example" (p. 66). These officials may work on the same issue for many years gradually building support for their proposal before experiencing success. Their preliminary work allows them to exploit opportunities when a more favorable political environment arose.

In a local government political setting, diffusion often implies that chief elected officials and administrators acting as policy entrepreneurs consider policies of other governments in their deliberations. They draw on others' experiences when evaluating the effectiveness and appropriateness of an innovation to their own jurisdiction (Karch, 2007). To this end, diffusion is not just "an increase of usage or incidence of a policy or form, but rather the result of a dynamic decision making process" (p. 56). Chicago Mayor Daley overcame departmental reluctance to implement 311 and expand its role beyond non-emergency calls because he enjoyed strong public support since taking office in 1989 and "public servants could not expect a change in leadership" (Schellong 2007, p. 85). With internal government forces protecting the status quo, change in government is extremely difficult to enact due to the many levels of employee protection including personnel, civil service and union representation. Also, the municipal legislative body's concurrence is required to secure the necessary funding and contract

approvals. In 1999 Chicago's system went operational and in 2000 the mayor created 311 City Services as a separate local government unit to give it leverage with other departments in the government. Initially Chicago's system was used for service intake and the closeout of service requests, but in 2002 it began to be used as a management tool for creating reports for the Mayor's Office, Office of Budget and Management, and department managers to help the overall city government to "achieve department goals and more effectively manage resources" (Schellong, 2007, p. 87).

Mayor Daley's policy entrepreneurship in transforming the 311 non-emergency number into a one-stop citizen service access point linked to a CRM system and used as a management tool began receiving nationwide media attention from The New York Times (Flynn, 2001; Cardwell, 2003), The Washington Post (Dvorak, 2000), and the San Francisco Chronicle (Gordon, 2003) amongst other newspaper articles and media outlets. As stated in Chapter 1, politicians can receive political benefits for re-election and moving on to higher political office if they are perceived as being intelligent, innovative, and delivering better service to their constituents. In 2003 Chicago's 311 System was awarded a Harvard University/Ford Foundation Innovations in American Government award (Chicago, 2003) and the U.S. Conference of Mayors' Public Excellence Award in 2004 (USCM, 2004). In 2003 Mayor Daley issued a report funded by their CRM vendor Motorola entitled *311 City Service Request CSR System: Making Chicago Better* which had wide distribution to other cities. Mayor Daley was acting as a strong policy entrepreneur given the extensive media attention, promotional materials, and sending his staff to other cities to convince other cities' key employees of the benefits of a 311/CRM system (Schellong, 2008).

Baltimore's 311 non-emergency number was initially implemented by their police department under Mayor Kurt Schmoke in 1996 and used primarily to reduce 911 emergency call volume. After taking office in 1999 Baltimore's Mayor O'Malley adapted the key features of Mayor Rudolph Giuliani's and the NYPD's CompStat program for a city government-wide performance management strategy using data generated by 311 (Behn, 2006). He also sent his CIO to visit the City of Chicago to learn about its 311 implementation experience. Baltimore learned from Chicago's experience and implemented their own Motorola CSR system (Schellong, 2007). O'Malley stated that "when I walked into office, I inherited a 2-billion budget and 16,000 employees, all of whom were wallowing in a culture of failure" (Henderson, 2003, p. 10). Even though Maryland was one of the wealthiest states in the country as measured by per capita income, "Baltimore had the worst crime rate and the highest population loss of just about any other city in the country" said O'Malley. He said that "the city's sorry performance was fueled by a fundamental lack of accountability and sense of mission when it came to what government was supposed to be accomplishing day in and day out" (p. 10). Mayor O'Malley promoted the CitiStat process throughout the country by giving countless speeches including Harvard University on April 19, 2001 and Brown University on September 27, 2001. Part of his message was that it was essential to cultivate an effective information and communication network. He argued that "$20,000 of software can save millions of taxpayer dollars" (Henderson, 2003, p. 33). CitiStat staff created biweekly data from city agencies, generated analyses of agency performance trends from the databases, and developed geographical information to examine the distribution of city services, needs, and challenges. Within this system the 311 Call Center became "an effective instrument of citizen access and a resource for

improving services to citizens. CitiStat has thus established the use of information technology as a critical management and civic communication tool" (p. 33).

Many parallels can be drawn between Mayor Daley and Mayor O'Malley in my interviews. David Eichenthal of the Ochs Center for Metropolitan Studies called Daley and O'Malley "strong hands-on mayors" and Steve Carter of Kana said they "saw 311 as a tool to connect citizens to government and then staff implemented and took the lead." Spencer Stern of Stern Consulting stated that "after the success of Baltimore and Chicago, people in these cities wanted to talk about it, promote, and be recognized. There was a political success factor. Mayors put a lot of political capital on the line." Although Mayor Daley never ran for higher office, David Eichenthal took this concept one step further in stating that in the "early political success of 311" the concept of customer service was politically appealing. He believed that "politicians liked to talk about it" and "mayors have been politically rewarded" including Mayor O'Malley becoming Governor of Maryland, Mayor Newsom becoming Lt. Governor of California, Chattanooga Mayor Bob Corker becoming a U.S. Senator, and Denver Mayor John Hickenlooper became Governor of Colorado. These ambitious politicians used their time in office to show their constituents, the people of their state, and the nation through the media that they were leaders who can shake up the status quo of government and can get things done. As the old says goes, "good government is good politics" and their actions could potentially pay-off in terms of re-election and higher office in the future.

As a member of the San Francisco Board of Supervisors and a candidate for mayor in 2003, Gavin Newsom sponsored Resolution No. 694-03 which urged the city's Department of Telecommunications and Information Systems and Emergency Communications Department "to develop a project plan for implementing a 311/ CRM System" (SF Board of Supervisors, 2003).

After being elected mayor the city's 311 Customer Service Center was launched in March 2007 and its the accompanying 311 website for obtaining information, reporting problems or submitting service requests went live in December 2008 (SF Mayor, 2008). Before he assumed the Office of Lt. Governor of the State of California on January 10, 2011, former San Francisco Mayor Newsom had been one of the most aggressive 311 policy entrepreneurs in the nation for innovative G2C communication using technology and social media.

Much has been written about New York City's former Mayor Michael Bloomberg's role in the implementation and expansion of the most comprehensive 311 Citizen Service Center in the nation. In his other role as a billionaire philanthropist policy entrepreneur for Bloomberg Philanthropies he announced five grants totaling $24 million to Atlanta, Chicago, Louisville, Memphis, and New Orleans to "generate innovative solutions." The grants established Innovation Delivery Teams modeled after similar national efforts in Malaysia and Britain. One of the projects awarded was for Atlanta "to implement a comprehensive 311 system to improve customer service" (Bloomberg, 2011, p. 1).

In March 2010 CIOs from seven major cities found themselves at a press conference to announce new software which would allow their Lagan (Kana) and Motorola 311 systems to "talk" to social networking sites (Douglas, 2010; Reilly, 2011). Working together at the conference gave them an idea: why not make this a habit? Joined by their common interest in technology and similar challenges, the CIOs for Boston (Bill Oates), Chicago (Hardik Bhatt), Los Angeles (Randi Levin), New York City, (Carole Post), San Francisco (Chris Vein), Seattle (Bill Schrier), and Washington, DC (Bryan Sivak) formed the Gang of Seven (G7) (Reilly, 2011).

The G7 CIOs created a formal network amongst themselves to work together on government technology projects. The group saw how San Francisco and Washington, DC collaborated on an open application interface (API) for their 311 systems and believed that they could do more by working together (Reilly, 2011). As budget cuts forced information technology (IT) departments to scale back on innovation, a group like the G7 began to pool resources, as SF CIO Vein stated to "do it cheaper, you can do it faster, and hopefully you can do it better" (Reilly, 2011, p. 4). "We're sick and tired of reinventing the wheel," said Seattle CIO Schrier, so they G7 began to develop a 'civic stack' of software (Reilly, 2011, p. 1).

The G7 group collaborated with the nonprofit organization Code for America to develop and implement technology solutions in cities every year which were made available to other cities at limited or no charge. The website civiccommons.org was to be a repository of these solutions and maintained by Code for America in San Francisco and OpenPlans (Open 311) in New York.

National organizations are the third political force of diffusion according to Karch (2007). These organizations view dissemination of best practices and policies as an important part of their mission. Think tanks and policy research institutes typically diffuse policy information to policy makers by publishing books and articles and hosting conferences. Interest groups promote an innovation's diffusion and are likely to have close ties to national, state and local offices of professional associations. Interest groups and professional associations can have a similar impact on policy diffusion can work together to facilitate the process.

In the early years of 311 adoption much of the information disseminated about 311 was through publications from the COPS Office, newspapers, and magazines. Chicago's 311 system received several national awards which helped promote their system as a best practice in

government. The IBM Endowment for The Business of Government published a report on Baltimore's CitiStat program (Henderson, 2003) and the National Electronic Commerce Coordinating Council's document on N-1-1 numbers (NECCC, 2004) addressed the topic of 311 in their publications.

In 2006 the Center for Digital Government which describes itself as "a national research and advisory institute on information technology policies and best practices in state and local government" (CDG, 2006) created an influential document entitled *An Introduction to Citizen Service Technologies and 3-1-1* that set the tone for other national organizations in subsequent years. In that same year ICMA received funding from the Alfred P. Sloan Foundation to conduct a five-year study regarding 311 and CRM (Fleming, 2006).

The GFOA issued a report in 2007 on CRM systems referencing its linkage to the 311 number (Kavanaugh, 2007). Hartford, Connecticut's Mayor Eddie Perez wrote an article in the September 24, 2007 edition of the U.S. Conference of Mayors weekly newspaper espousing the benefits of a 311 system coupled with their HARTstat performance management program (Perez, 2007).

In 2008 ICMA issued their first major report on 311, the Harvard Kennedy School issued the report from their 311: The Next Wave conference (Tumin, 2008), and the 311/CRM Project Coordinating Group formed including the Public Technology Institute, ICMA, Rutgers University, the Ochs Center for Metropolitan Studies and funded by the Sloan Foundation (Fleming, 2008). Also that same year, the National Academy of Public Administration began the three-year Collaboration Project designed to provide a forum for "the adoption and use of collaborative technologies to solve complex problems of public management" (NAPA, 2011,

p. 1). The project outlined a number of cases for best practices in collaborative technologies including one entitled *San Francisco's 311 on Twitter.*

In 2010 The Pew Charitable Trusts' Philadelphia Research Initiative issued a study called *A Work in Progress: Philadelphia's 311 System After One Year* (Jobbins, 2010). Policy diffusion through the support of national foundations including Pew and the IBM Endowment have played a minor role in the diffusion of 311 while the Sloan Foundation has played a much more prominent role.

The year 2011 brought to a close ICMA's National Study of 311 and Customer Service Technology. The roles of the organizationally maturing 311 Synergy Group and the Association of Government Contact Center Employees were featured more prominently than in the past and given equal billing on the final report with ICMA (Fleming, 2011).

Beyond the political, the fourth force in 311's diffusion and evolution, which is not mentioned by Karch (2007), is the 311/CRM private sector technology vendors and consultants who promote their installations in one or more cities as best practices in hopes of being awarded more local government projects. The private sector role in 311's diffusion helps address how the innovation was reinvented and evolved over time in partnership with their local government clients. These private sector vendors engaged their clients in identifying improvements to their products. They developed support networks between the clients designed for contact retention, continuous improvement, and marketing to other governments. The private sector 311/CRM firms that had implemented local government 311/CRM systems in the United States as of 2012 are listed in Table 2. This list was derived from an interview with technology consultant Spencer Stern of Stern Consulting.

Table 2 Public Sector 311/CRM Vendors in the United States

Vendor Name	Website (CRM Link)	U.S. Headquarters
Comcate	http://www.comcate.com/home/products.html	San Francisco, CA
Web QA	http://www.webqa.net/datasheetgov.asp	Woodridge, IL
CRW	http://www.crw.com/aboutus/	Carlsbad, CA
Gov Partner	http://www.govpartner.com/Solutions/Request-Partner.aspx	Cedar Rapids, IA
Government Outreach	http://www.govoutreach.com/productscrm.htm	Pleasanton, CA
Intelligov	http://www.intelligovsoftware.com/	Columbia, MD
Microsoft	http://crm.dynamics.com/en-us/industries/government.aspx	Redmond, WA
QScend	http://www.qscend.com/content/53/default.aspx	Waterbury, CT
Salesforce.com	https://www.salesforce.com/	San Francisco, CA
The Active Network	http://www.activegovernment.com/solutions/crm-311.htm	San Diego, CA
Lagan/Kana	http://www.lagan.com/311.aspx	Pleasanton, CA
Motorola	http://www.motorola.com/Business/US-EN/Business+Solutions/Industry+Solutions/Government/Public+Administration+Solutions	Schaumburg, IL
Oracle/Siebel	http://wiki.oracle.com/page/Siebel+Public+Sector	Redwood Shores, CA

(J. O'Byrne, personal communication, November 14, 2014)

Rice and Rogers (1980) developed a five-step model of the innovation process in organizations to analyze technology transfer decisions. They believed that the process of adopting an innovation moves from a general concept to its implementation characterized by organizational behaviors. The problem is defined, matched to a potential solution, redefined to meet broader goals of the organization, modified to the government structure during implementation, and interconnected within the organization. The reinvention of the innovation is "the degree to which an innovation is changed by the adopter in the process of adoption and implementation after its original development" (Rice, 1980, pp. 500-501). The same technological innovation may, in fact, be used for different purposes than intended.

Early adopters like Daley and O'Malley enjoyed being perceived as government innovators and received benefits to bolster their political ambitions. Hays (1996) believes that early adopters who may be considered innovators set the stage for later adopters. Although these

innovators may, in fact, be adopting more ineffective versions of the innovation, laggard governments help improve upon the early versions of the innovation. "Certainly, there is something to be said for being a pathbreaker, the first to adopt a new law where no state has feared to trend. Reinvention, however, shows that late adopters feel free to adapt these innovative policies to suit their individual needs and circumstances and, more importantly, that there are lessons to be learned from patient observation" (Hays, 1996, pp. 647-8).

The market for CRM systems in major cities in the United States in 2012 was dominated by Motorola, which in most cases had the incumbent 911 systems in most cities, and Lagan Technologies which was recently acquired by Kana of Sunnyvale, CA. When 311 began as a pilot project in Baltimore, it basically gave the city the ability to split calls to 911 and 311 in the PBX box switch thereby allowing the calls to go to different locations. Motorola acquired Suncoast's CRM system which became the basis of the CSR system in the cities of Chicago, Baltimore, and Washington, DC. Lagan Technologies of Belfast, North Ireland, specializing in CRM systems for government with a heavy presence in the United Kingdom, had their first installation go live in Minneapolis in January 2006 with several other cities quickly following suit including San Francisco, Buffalo, and Hampton, Virginia. New York City, given the scope of the project in consolidating 40 call centers decided to develop its own system with Oracle/Seibel technology with Accenture for integration. Microsoft has made in-roads with smaller cities with their Microsoft Dynamics CRM product.

As previously mentioned, local governments have a tendency to listen to other local governments when selecting a vendor. Each 311/CRM vendor produced at least one case study of a successful local government installation as part of their marketing strategy. Examples of this practice are Lagan/Kana's case study for San Francisco, Motorola for Chicago, Accenture/Oracle/Siebel for New York City, and Microsoft for Birmingham, AL. With private sector 311/CRM firms helping to

spread the innovation to most major cities over 100,000 in the United States by 2012, their goal is continuous expansion to all local governments in the United States and other countries.

3.4 Summary and Findings

In this chapter the 311 innovation narrative focuses on the political forces that facilitated diffusion. Using Rogers (2003) Variable for Increasing the Rate of Adoption (Figure 2), the 311 innovation had a significant *Relative Advantage* over 'blue pages roulette', Compatibility with most existing systems, low *Complexity*, *Trialability* on a limited basis and the *Observability* of results. The federal government met its objective of providing a voluntary mechanism to reduce call volume to 911 center, improve emergency response, and support community-policing quality of life initiatives. President Clinton and COPS Director Brann acted as policy entrepreneurs by promoting national government intervention to remove barriers and initially led the effort to create the 311 non-emergency number by requesting FCC approval, supporting a pilot project in Baltimore. The COPS Office continued the national government's diffusion of 311 by providing $6 million in incentives to 11 local governments over several years, and disseminating information through numerous publications. Later under President Obama, the federal government supported the 311 innovation as a technology cluster with actions such as appointing former Washington DC CIO Vivek Kundra as the first federal Chief Technology Officer charged with developing innovative programs modeled after local initiatives like the Apps for Democracy.

Chicago Mayor Daley and Baltimore Mayor O'Malley played significant roles as policy entrepreneurs by promoting the 311 innovation as a "one-stop" customer service number and as a performance management tool. Collectively, they promoted the innovation for practical purposes beyond its original intent included hosting city delegations, sending staff around the

country, attending numerous speaking engagements, and publishing or being the subject of numerous publications of national scope. Their efforts helped the innovation reach critical mass in 2003, a self-sustaining rate of adoption for years to come. The Gang of 7 big city CIOs also played roles as administrative policy entrepreneurs by promoting Open 311 connectivity and the civic stack of free software. Open 311 activist Phil Ashtock was also a policy entrepreneur when he used his blog to create a network to promote the open data initiative that was championed by the G7.

Local government-based national organizations including ICMA, GFOA, CDG, and PTI promoted the 311 innovation as a technology cluster with its linkage to CRM systems in order to bolster local efforts to improve local government efficiency, effectiveness, and customer service. Academic institutions, foundations, and think tanks provided forums, issued publications and, in the case Bloomberg Philanthropies, provided financial incentives to create 311 citizen service centers. One additional force which could be termed a quasi-political fourth force is the technology companies that assisted their client opinion leaders to promote the innovation such as Motorola with Mayor Daley and Lagan (now Kana) with San Francisco Mayor Newsom. These companies also have created networks of government employee users which helped with the reinvention and evolution of the product for ongoing upgrades.

Chapter 4. Logistic Regression Model

This chapter will examine the adoption of the 311 number in the United States from 1996 through 2012 using a logistic regression model featuring variables that could predict the adoption of 311. Observations from the adoption map and results of the adoption model will be synthesized in the findings to help explain the adoption and diffusion of the 311 innovation. The findings from this chapter will be used in conjunction with Chapter 3's narrative and the case studies in Chapters 5 and 6 to address the dissertation's primary research question and hypotheses.

4.1 Adoption Map

The 311 number has geographically diffused across the United States, but that diffusion has not been obvious because there is no central repository or database for 311 adoption information. The reason for this deficiency is that the FCC delegated the authority of assigning the local 311 number to the individual states' public utility commission (PUC). Therefore, I generated the list of local governments that have adopted 311 through internet searches completed at least quarterly over a 3-year period beginning in the fourth quarter of 2009. The initial list was derived from ICMA's 2008 report entitled *Customer Service and 311/CRM Technology in Local Governments: Lessons on Connecting with Citizens, Local Jurisdictions in the United States with 311 Service*. The second source was 911 Dispatch Magazine's website link entitled *Cities with 311 Non-Emergency Telephone Service* for self-reporting of municipalities. The later source was sporadically updated and not accurate for research purposes because it also contained cities with 7-digit customer service numbers (Fleming, 2008; 911 Dispatch Magazine, 2009).

The 311 adoption map (Figure 4) places the 55 of 80 local government jurisdictions that have adopted the 311 number derived from my database. The balance of the local governments

Figure 4 Adoption 1996 to 2012, Cities and Consolidated Governments over 100,000

were in cities smaller than 100,000 in population or county governments (see 4.2 Description of Data for more detail). The location points correspond to the list in Appendix A. The database formed the basis for the information presented in the 311 Adoption and Diffusion 'S-curve' from 1996 to 2012 (Figure 1). When reviewing the data from the map in relation to geography, the following observations can be made:

- 69% (38 of 55) of the 311 citizen service centers are east of the Mississippi River.
- 65% (11 of 17) of the 311 citizen service centers west of the Mississippi River are in Texas and California.
- There are no 311 citizen service centers in the Pacific Northwest (states of Washington and Oregon). The two cities with high population, Seattle (24rd most populous at 576,296

in 2003) and Portland (29th most populous at 545,271 in 2003) did not adopt 311, but 17 others in the top 30 most populous cities in the United States (57%) have adopted 311.

- If we define the Southeast by FEMA's District IV boundaries of Alabama, Florida, Georgia, Kentucky, North Carolina, Mississippi, South Carolina, and Tennessee, 37 of the 242 cities and consolidated governments with populations over 100,000 are listed. When excluding the six cities in Florida that have had their ability to adopt 311 usurped by their counties, 34% (11 of 32) of the southeastern cities have adopted 311. Also, there are eight additional 311 citizen service centers (5 counties and 3 cities under 100,000) for a total of 19 in the southeast. Given that the Southeast is a hurricane-prone region, this observation lends credence to Hypothesis Four, which posits that cities are more likely to adopt 311 if they have high property damage related to natural disasters.
- In California, only 13% (7 of 55) of the cities over 100,000 had adopted 311, but three of their four cities in the top 20 in population of American cities had adopted 311: Los Angeles (2nd with 3,838,838, adopted in 2002); San Jose (11th with 909,890, adopted in 1997); San Francisco (14th with 772,065, adopted in 2007); while San Diego (7th with 1,227,746) did not adopt 311.
- In Texas, four cities in the top 20 in population in the United States all adopted 311 between 2000 and 2002: Houston (4th with 2,041,081, adopted in 2000), Dallas (8th with 1,230,302, adopted in 2002), San Antonio (9th with 1,212,789, adopted in 2000), and Austin (16th with 682,319, adopted in 2001). When El Paso (586,392), Lubbock (206,441) and Beaumont (114, 626) are added and Laredo is excluded owing to Webb County usurping its potential for 311 adoption, only 29% (7 of 24) of the cities in Texas over 100,000 have adopted 311.

4.2 Description of Data

The logistic regression model examines the adoption of the 311 non-emergency number in the United States by cities and consolidated governments with populations over 100,000 from 1996 to 2012. Although American local governments have adopted the 311 number in 80 jurisdictions during this period, it would take a data set that includes all places with a population over 5,000 with a subtotal of 2,301 jurisdictions in 2010 (the smallest jurisdiction to adopt 311 is Dyersburg, Tennessee with a population of 17,145) combined with 3,143 counties and county-equivalents for a total data set of 5,444 to capture all 80 jurisdictions that have adopted the 311 number. By limiting the data set to the 242 cities and consolidated governments with populations over 100,000 using 2003 data, 55 of the 80 jurisdictions (69%) are captured thereby enabling a practical analysis to focus on large American cities. The 242 cities were further reduced by nine to 233 to exclude cities that are located in counties that have adopted the 311 number, thereby eliminating the local government's ability to adopt a separate 311 number. For example, in Broward County, Florida, an early adopter in 1997, the cities of Fort Lauderdale, Coral Springs, Hollywood, and Pembroke Pines could not adopt the 311 number. Also, it should be noted that the Town of North Hempstead (population 222,611 in 2000) in Nassau County, NY, is not included in our list of city governments as defined by the U.S. Census.

The data was used for 2003 because that was the year in which the diffusion 'S-curve' hit critical mass. This innovation is a relatively new phenomenon and the model was based upon adoption of the innovation. From 2003 forward we can better ascertain the influences and momentum created by the early adopters such as Baltimore and Chicago. Adoption was limited by the regulatory framework of state PUC approval and there was no national repository for the listing of jurisdictions that were approved by state PUCs to utilize the 311 non-emergency

number. Given that the limited data set was derived from internet searches by the researcher over a three year period, an event history time-series for this limited time frame was not the best approach. A most appropriate and reasonable method was to look at the adoption timeline in two segments: the eight years up to and including 2003, and the nine years that follow up through 2012.

The Dependent Variable (D.V.) for the logistic regression model is Adopt 311 (*y*). The Independent Variables (I.V.) are Population (*X1*), Violent Crime Rate *(x2*), Mayor-Council Form of Government (x*3*), and Disaster Property Damage (*x4*). Population was selected as a variable for its relationship to Hypothesis One which basically states that the larger the city, the higher the likelihood of adoption given the advantages of economies of scale by consolidating departmental answering points. The data were derived from the U.S. Census (2003) a document entitled *Cities with 100,000 or More Population in 2003 ranked by Population, 2003 in Rank Order*. Violent Crime Rate, the second variable, addresses Hypothesis Two which states that the higher the violent crime rate, the higher the 911 call volume, and the greater need to adopt the 311 non-emergency number. The data comes from the Federal Bureau of Investigation (FBI) Uniform Crime Reporting (FBI UCR, 2003). The FBI defines violent crime in the UCR Program as those offenses which involve force or threat of force including murder and non-negligent manslaughter, forcible rape, robbery, and aggravated assault (FBI UCR, 2003). Variable three, the Mayor-Council Form of Government, related to Hypothesis Three says that this local government structure is more likely to adopt 311. The potential reason is that a mayor for a local government is more likely to adopt 311 given the need for strong political leadership to implement non-mandated change. The source of information is the International City/County Managers Association Municipal Yearbook 2009 (ICMA, 2009). The fourth variable associated

with Hypothesis Four is Disaster Property Damage which posits that the greater the damage in the city's county cumulatively for a period of a 1992 to 2012, the more likely the city will be to adopt 311 thereby demonstrating the importance of 311 as a communications tool before, during, and after natural disasters. The information comes from the University of South Carolina's Spatial Hazard Events and Losses Database for the United States (SHELDUS, 2013) which was the only source of information which could address the issue of damage due to natural disasters available to the researcher. The database provided the results of a search of total property loss from the counties that contain cities over 100,000 (2000) for 18 different types of natural hazard events from October 2, 1996 (the first day Baltimore's 311 number was operational) to December 31, 2012 (end of research period) adjusted to 2012 dollars for comparable analysis. Due to the limitations of the SHELDUS database and the manner in which FEMA reports damage collectively by county and not by cities, a further breakdown addressing factors such as per capita income, population, and the geographic size of the counties was not possible.

4.3 Four Hypotheses

The logistic regression model addresses the first four hypotheses. The local government experiences listed after each of the four hypotheses in this chapter will allow us to better understand the practical implications and the potential importance of adopting the 311 number by American cities. The hypotheses are derived from interviews, public administration literature, and the history of the 311 innovation to date.

Hypothesis One: *Cities with higher populations will have larger local governments with multiple department answering points and will benefit to a greater degree through economies of scale when they develop consolidated call centers and, therefore, are more likely to adopt the 311 number.*

Generally speaking, the larger the population of a local government's jurisdiction, the larger the size of the overall government in terms of General Fund Budget, the number of employees, and the size of its individual departments. The larger the department, the greater the likelihood of it having its own call center to service a greater volume of service requests. In this hypothesis, larger cities with multiple department answering points are more likely to consolidate into a centralized call center with their major objectives being improved customer (citizen) service, efficiency, and departmental accountability.

The early 1990's gave rise to the theory of New Public Management (NPM) and the entrepreneurial approach to public administration. Hood (1995) believed that this approach was in response to 'megatrends' at the time: (1) the slowing down or reversing of government growth; (2) a shift to privatization, and; (3) the development and use of information technology for the production and distribution of public services. Osborne and Gaebler's *Reinventing Government* (1992) promoted the concept of entrepreneurial government seeking to impose private market incentives to enhance government's relationship with citizens (customers) by providing improved public services at less cost (Feldman, 1999). In Reinventing Government and NPM, public servants and administrators are supposed to be motivated by the entrepreneurial spirit and ideological desire to reduce the size of government and generally make it more efficient (Denhardt, 2000). "The reinventing paradigm, as laid out by Osborne and Gaebler and others, argued that governments can fundamentally change the way they conduct business and thereby increase their efficiency, effectiveness, flexibility, and capacity to innovate. Local government 'entrepreneurs' were urged to innovate with new technologies and service-delivery incentives" (Kearney 2005, p. 27)."

The consolidation of multiple department call centers would be considered an entrepreneurial approach to communications that would enhance government's relationship with citizens (customers) by providing improved public services at less cost. The Center for Digital Government in 2006 stated that cities that have implemented CRM systems, a critical component of 311 citizen service centers, brought "discipline, routine and consistency to the way service agents handle calls to fulfill requests and respond in a manner that is smarter, faster, and cheaper" (p. 6). An example of the public appeal of combining 311 and CRM was the City of Chicago's billboard slogan in their initial public awareness campaign: "Burning Building Call 911, Burning Question Call 311". Mayor Daley claimed that Chicago was "the first to implement a comprehensive 311 system to provide information and track city services from intake to resolution, in addition to taking non-emergency police calls" (Chicago, 2003) and he established 311 City Services as a separate unit of government in 2000 (Schellong, 2007). New York City described NYC 311 as "one-stop shop for all government information and non-emergency services (NYC 311, 2012),"and Los Angeles' "One Call to City Hall" slogan has been used by many cities (Los Angeles, 2012).

Mayor O'Malley promoted Baltimore's CitiStat performance management strategy and his 311 Call Center as "an effective instrument of citizen access and a resource for improving services to citizens" in 2001 and stated that $20,000 of software can save millions of taxpayer dollars (Henderson, 2003, p. 33). Some examples of savings due to 311 call center consolidations are:

- "The City of Chicago's Bureau of Electricity saved $6.9 million in one year by eliminating multiple crews being assigned to the same area;

- The City of Baltimore achieved $13.2 million in reduced overtime rates, increased productivity and elimination of wasteful programs;
- The City and County of San Francisco reduced overtime by 20% for its Housing Authority department by consolidating the maintenance reporting hotline with the 311 call center" (Lagan, 2012).

The City of New York, as the nation's most populous city (population 8,098,066 in 2003), with largest local government by number of employees, 221,500 and by budget, $44.8 billion in 2003 (NYC Controller, 2003) seized on a tremendous opportunity to capitalize on economies of scale by developing a consolidated call center which went "live" in March 2003. New York City consolidated 40 departmental call centers into their 311 Citizen Service Center and gained efficiencies through economies of scale. Former Mayor Bloomberg stated that "citizens in need of government assistance faced more than 4,000 entries in 11 pages of the New York City Phone Book. Customers were often transferred or hit other dead ends when reaching out to city government for help" (Accenture, 2011, p. 2). The City's Independent Budget Office (2008) stated that "prior to the establishment of the 311 system, most non-emergency calls were handled by the Mayor's Action Center and over 40 helplines operated by various city agencies, including 14 from public safety; 8 for infrastructure, regulatory and community services; 7 for business affairs and waste management; and 11 for health and human services" (p. 2). Since the original consolidation of the more than 40 call centers and hotlines, former Mayor Bloomberg at the time expanded the scope of the 311 system to include human services information and referrals through a consolidation with United Way's 211 service in 2008 (GovTech, 2008), and the Board of Education in 2009 to make information about the school system more accessible to the parents of the 1.1 million students (Mayville, 2009).

Hypothesis Two: *Higher 911 emergency call volume related to a city's high violent crime rate is a contributing factor to a local government's decision to adopt the 311 non-emergency number.*

A US News and World Report article stated that "police executives call it the 'tyranny of 911' – the relentless drumbeat of calls that send cops bouncing all over town like so many pinballs" (Witkin, 1996). Life-threatening situations did "not always get the prompt attention they deserve because frivolous 911 calls send police off on unnecessary runs. And the sheer volume of calls sometimes overwhelms 911 operators and phone lines, meaning some desperate callers get a recording or are put on hold." An example of violent crime as a compelling factor for the adoption of a non-emergency number is an incident in Philadelphia in November 1994 in which a fight among rival groups of teens led to the beating death of 16-year-old Eddie Polec. The delay in police response was characteristic of the public's addiction to calling 911 for non-emergency reasons. Police had no time for crime prevention and analysis because they spent most of their time running from one 911 call to the next (Witkin, 1996).

President Clinton's original justification for the creation of the 311 hotline number was "to help alleviate the abundance of non-emergency calls flooding the 911 emergency systems" (COPS, 2001). Dallas 311 Assistant Director Eva Liggins believed that one of the reasons cities were adopting the 311 number was because "crime was very rampant, 911 systems were overburdened" (J. O'Byrne, personal communication, August 9, 2011).

According to a DOJ report entitled *Misuse and Abuse of 911* (Sampson, 2004) there were two primary ways to reduce non-emergency calls to 911. The first way is to educate citizens through a public service campaign. The 911 system in Pinellas County, Florida hired a Public Education Coordinator to teach the public about the correct use of 911 for emergencies only

(Sampson, 1999). In 1999, the City of San Diego began a campaign to raise the visibility and public awareness of their existing 7-digit non-emergency number (Gregory, 2001). For many jurisdictions this approach was an affordable alternative that did not require the expense of network and equipment upgrades, additional personnel or new facilities (Sampson, 2004). The second way according to a State of California study is to implement a 311 system. State of California Assembly Bill 1198 (Chapter 887, States of 1997) "required the State 9-1-1 program to conduct a pilot program to evaluate alternative means to reduce the use of 9-1-1 telephone number for non-emergency assistance" (Keene, 2000, p. 1). In response, the California Department of General Services (DGS) examined the November 1997 implementation of the 311 non-emergency number in the city of San Jose. DGS concluded that 311 implementation reduced non-emergency calls, and "therefore, lessened the burden placed on local agencies responsible for providing public safety answering systems**"** (p. 2). The DGS report concluded that both approaches were effective in reducing 911 call volume (Keene, 2000).

In an October 2001 report by the DOJ National Institute of Justice entitled *Managing Calls to the Police: An Assessment of Non-Emergency Call Systems*, the University of Cincinnati Evaluation Team analyzed the technological approach to handling non-emergency calls by comparing Baltimore's 911 call volume two years prior and two years after the implementation of 311. The report stated that "one-third of the surveyed patrol officers perceived a reduction in the number of calls to which they were dispatched" since the implementation of the 311 system and believed that the number of low priority calls that were dispatched decreased. "The study found that the data supported a 25% reduction in 911 calls that could be directly attributed to the introduction of the 3-1-1 system" (Mazerolle, 2001, pp. 10-12).

In a March 31, 1997 article in *Government Technology* regarding the Baltimore 311 pilot program, Major Tim Longo of the Baltimore City Police stated that "our initial two goals with the new system were to reduce the number of 911 calls and to reduce the burden on the 911 system, and we have succeeded." He said that "instead of our police force having to be reactive, they can move among the neighborhoods and begin to suppress crime by being more visible and available" (Maxwell, 1997, p. 1).

Hypothesis Three: Given the importance of strong political leadership in implementing non-mandated change, the mayor-council form of government is more likely to adopt the 311 number than other forms of local government.

Eichenthal stated that it was "those cities with the strongest political leadership" who were more likely to adopt the 311 number (J. O'Byrne, personal communication, July 22, 2011). Karch (2007) identifies policy entrepreneurs as one of the three political forces of diffusion and Mintrom and Norman (2009) discuss policy entrepreneurs in their role of agenda setting in the context of political change. Mintrom and Vergari (1996) explain that policy entrepreneurs perform three functions: they discover unfulfilled needs and suggest innovative means to solve them; they bear the reputational and other risks involved in pursuing change that have uncertain consequences, and they resolve collective action problems by coordinating networks that have the talents and resources necessary to undertake change. Koski (2010) would characterize the adoption of the 311 number as a low-salience policy which does not have the benefit of a groundswell of public opinion, is not mandated, and has limited internal and external pressures to implement it. In city governments an elected mayor is more likely to elevate the level of attention to a policy and have the necessary political capital and administrative authority to implement a low-salience policy than other forms of local government.

As demonstrated by Mayor Daley's initiative to use the 311 number as a customer service number for city departments in his role as policy entrepreneur, he overcame departmental reluctance to implement 311. Due to his strong public support, department managers and union officials could not expect a change in leadership (Schellong, 2007). In 1999 the system went operational and in 2000 "the mayor decided to create 311 City Services as a separate unit of local government to give it leverage and weight within government" (pp. 85-86). Initially designed to take service requests, the system was later used as a management tool to create reports for the Mayor's Office, Office of Budget and Management, and department managers to help them achieve goals and better manage resources (Schellong, 2007).

An example of a mayor taking the lead as a policy entrepreneur and exercising strong political leadership for the implementation of 311 appears in the following Chattanooga 311 timeline. Mayor Bob Corker conducted his due diligence on creating a "One Call" center starting in February 2002, announcing Chattanooga 311 as a priority in May 2002, and its formal launch in February 2003. The implementation timeline demonstrated how a mayor can use their management authority and political capital to implement a non-mandated change. Like the mayors of Chicago and Baltimore before him, Mayor Corker used the 311 number and Motorola CSR System to consolidate departmental answering points, improve customer service, and track data generated for performance management purposes.

Eichenthal of the Ochs Center for Metropolitan Studies called Daley and Baltimore Mayor O'Malley "strong hands-on mayors (J. O'Byrne, personal communication, July 22, 2011)" and Steve Carter of Kana said they "saw 311 as a tool to connect citizens to government and then staff implemented, took the lead" (J. O'Byrne, personal communication, August 3, 2011). Spencer Stern of Stern Consulting stated that "after the success of Baltimore and Chicago,

people in these cities wanted to talk about it, promote, and be recognized. There was a political success factor, mayors put a lot of political capital on the line" (J. O'Byrne, personal communication, June 13, 2011). Although Mayor Daley never ran for higher office, Eichenthal took this concept one step further stating that in the "early political success of 311" the concept of customer service was politically appealing. He stated that "politicians liked to talk about it" and "mayors have been politically rewarded" (J. O'Byrne, personal communication, July 22, 2011) including Mayor O'Malley becoming Governor of Maryland, San Francisco Mayor Newsom becoming Lt. Governor of California, Chattanooga Mayor Corker becoming a U.S. Senator, and Denver Mayor John Hickenlooper becoming Governor of Colorado.

Hypothesis Four: *Cities that have high property damage caused by natural disasters are more likely to adopt the 311 number.*

A number of local governments have found that 311 citizen service centers are effective in "issuing disaster warnings, publicizing evacuation instructions, directing residents to shelters, addressing the special needs of disabled residents, relaying information" in relief and recovery efforts (Phelan, 2009, p. 1). Those roles, however, took time to develop and strong leaders to carve out the relationships and processes that make 311 services most effective in those functions. The lessons they have learned about cooperation, planning, and recovery are paving the way for an expanded 311 role in emergency response" (Phelan, 2009).

Local governments with 311 and CRM systems benefit by responding to citizen requests for information in a number of types of emergencies and disasters (ICMA, 2011). The list of potential natural disasters that may affect local government includes: excessive heat, droughts, blizzards, ice storms, floods, hurricanes, tornadoes, and wildfires. Large-scale emergencies include: chemical spills, plant/mine explosions, hostage situations, mass shootings, airline

crashes, terrorist attacks, and infrastructure failure (i.e., bridge collapse). However, 311 centers are generally used for more common local emergencies such traffic accidents, road closings, water main break, power outage, and protests. (Fleming, 2011, p. 4).

Four cities offer particularly poignant examples of experienced emergencies and disasters related to Hypothesis Four come from Baltimore, Chicago, Hampton (VA), Miami-Dade County, Minneapolis, Orange County (FL), and Riverside (CA).

Within hours of the September 11, 2001 terrorist attacks the Baltimore City Police convened an emergency meeting of city agencies at command center to discuss rumors of a potential attack on Baltimore's I-95 tunnels. As calls began to stream into the 911 and 311 centers, the information was uploaded into network servers and maps were automatically regenerated to reflect the new information. Armed with up to date information, 311 call takers were able to address inquires about road closings, the status of government buildings, reported suspicious activity, and to dispel rumors (COPS, 2002).

In Chicago, 311 provided similar capacity for assisting the city in its response to the rapid spread of the West Nile Virus in 2002 when 22 residents died from the virus. The following year public health officials examined data to see what they could have done differently. The answer was found in the calls to 311 for the Sanitation Department who picked up dead crows. From this information they created maps of the 311 data and human cases of the virus, and strategically placed larvicide to kill mosquitoes that transmit the disease before they hatched, thereby preventing any further major outbreaks (Kiviat, 2005).

Hampton, Virginia had already planned the use of its 311 Call Center in its Emergency Operations Plan in 2001 when Hurricane Isabel struck in 2003. The call center began seeing an increase in calls from low lying areas about the potential for mandatory evacuations. Over the

next several days with few television and radio stations available due to power outages, rumors and problems began to surface caused by the lack of news. Initially working off emergency generators, the 311 center was staffed around-the-clock for two weeks to provide timely and accurate information for citizens seeking knowledge and assistance in the wake of this devastating storm (Fleming, 2011).

Another example was Orange County, Florida's Government Service Center (GSC) in 2004. Their 7-digit non-emergency number helped residents by providing information before, during, and after being hit by three hurricanes between August 13th and September 26th. With the credibility gained during the previous year, the Board of Supervisors invested in implementing a new 311 number that went live in June 2005. During the disastrous hurricane season of 2005 Orange County's 311 center was severely tested. The 311 center responded successfully by helping citizens with post-hurricane recovery by responding to calls such as flooding and downed trees. 311 call takers also provided information on services such as food distribution points, debris removal, and FEMA-sponsored programs. (Holmes, 2007).

The Miami-Dade 311 Answer Center experienced a natural disaster when Hurricane Wilma struck in October 2005. A post-evaluation report (Miami-Dade, 2006) said that the Miami-Dade's 311 center had "proven to be particularly critical during hurricane activations by providing citizens easy access to government information. It also serves to divert calls from 911 emergency systems, enabling 911 to remain available for truly life-threatening situations" (p. 1). As evidenced by disasters in Baltimore and Hampton, rumor control can be a major concern of local governments. Miami-Dade had a 7-digit rumor control hotline that was left in place after the implementation of the new 311 system. By the time the fourth hurricane hit Miami-Dade in 2005, "the overwhelming majority of calls for information and service were placed by someone

dialing the 3-1-1 number (79%), as opposed to the rumor control hotline 468-5900" (p. 1). From these examples, it may be concluded that citizens found the 311 number easy to remember and the responses they received for information from the 311 center to be beneficial.

The City of Minneapolis's 311 center met their communication challenge following the collapse of an I-35W bridge on August 1, 2007 by handling significant call volume and emails related to the non-emergency aspects of the bridge collapse. Citizen calls to 311 included requests for information about the bridge collapse, road closures, alternate routes, and Red Cross referrals. The center tracked citizen requests and reports such as eyewitness accounts, missing person and victim information, expressions of condolences and sympathies, and traffic control complaints (Cohen, 2007).

Southern California experienced a number of catastrophic wildfires that destroyed more than 1,600 homes in October 2007. In Riverside, California one of these fires melted a main power line which caused a city-wide blackout that lasted more than six hours. With ashes from the fires blowing into residential areas, many Riverside residents contacted the 311 Call Center for information. The center received many questions such as how to protect their property from the fires and where to find a shelter in the event of evacuation. Volunteers also contacted the 311 center offering to help transport livestock, work at first-aid stations, and provide equipment such as generators, blankets, and bottled water (Fleming, 2011).

4.4 Variables and Expected Relationships

The Dependent Variable (D.V.) is Adopt 311 (*y)* as listed in Appendix A and the Independent Variables (I.V.) are: Population (*x1*); Violent Crime Rate *(x2*); Mayor-Council Form of Government (*x3*), and; Disaster Property Damage (*x4*). While contemplating hypotheses in an earlier phase of my research, three other variables were used in the model and

all were determined to have an insignificant relationship to adoption of the 311 number. The variable of per capita income was used to determine if wealth and was a potential factor in the adoption of the 311 number. Second, government expenditures as reported to the US Census Bureau were considered based on the concept of ability to pay for capital improvements. And third, in an attempt to look at technology use in the population, I was able to identify a variable called the Tech Pole Index (Gertler, 2002) which compares a region's share of national employment in high technology industries to the overall share of national employment. For example, would San Francisco or San Jose's proximity to Silicon Valley have a relationship to their cities adopting the 311 number. All three variables did not have a significant relationship in models regarding the adoption of the 311 number and were ruled out at an earlier stage in the process.

Adopt 311 (*y)* – There are 242 cities and consolidated governments with populations over 100,000 (Year 2003) in our database. Those that adopt the 311 innovation have a value of 1 (one) and those that do not have are assigned the value of 0 (zero). Local governments in 55 of 242 jurisdictions with populations over 100,000 adopted the 311 number between 1996 and 2012.

Population (*x1*) – Population of each of the 242 cities and consolidated governments with populations over 100,000 in 2003. Of the 55 local government jurisdictions that adopted the 311 number between 1996 and 2012, the largest was the City of New York had the largest population with 8,098,066 (2003). The expected relationship between the Population variable and Adopt 311 is positive.

Violent Crime Rate *(x2*) – Data are derived from the Federal Bureau of Investigation (FBI) Uniform Crime Reporting (UCR), 2003 for the 242 cities and consolidated governments over 100,000 (Year 2003). According to Blumstein and Rosenfeld (2008) "2000 was not quite a

turning point in the sense that it showed a trough in the crime rate, but it was certainly a turning point in converting the steady decline of the 1990s to a very flat trend that continued at least until 2005" (p. 17**)**. The FBI UCR (2003) for the year of 2003 was selected because it represented a year of stability in the midst of volatile trends as well as the point of critical mass for 311 adoption. The expected relationship between the Violent Crime variable and Adopt 311 is positive.

Table 3 Expected Relationships of the Independent Variables

Dependent Variable = Adopt 311	
Independent Variables	**Expected Relationship**
Population	**+**
Violent Crime Rate	**+**
Mayor-Council	**+**
Damage	**+**

Mayor-Council Form of Government (*x3*) – The 2009 ICMA Yearbook lists the form of government for all 242 cities with populations over 100,000 (2003) with the mayor-council form of government selected in comparison with all others (Manager-Council, Commission, Representative Town Meeting). The ICMA *Municipal Yearbook 2009* was used as a resource for baseline data was revised to be the accurate form of government for the year 2003. After 2003, only the cities of Hartford, CT (adopted 311 in 2003) changed its form of government from council-manager to mayor-council, and El Paso, TX and Topeka, KS changed from mayor-council to council-manager, all in 2004 (Murphy, 2012). For all cities over 100,000 in 2003,

89 had mayor-council forms of government. The expected relationship between the Mayor-Council variable and Adopt 311 is positive.

Disaster Property Damage ($x4$) – The SHELDUS (2012) database includes natural disaster property loss data as reported by county governments to FEMA from the implementation date of Baltimore's 311 center on October 2, 1996 to the last day of the study period on December 31, 2012 in 2012 dollars for the selected county of all 242 cities with populations over 100,000 (2003). SHELDUS database was limited by the manner in which FEMA reports damage collectively by county and not by cities. A further breakdown addressing factors such as per capita income, population, and the geographic size of the counties was not possible. The expected relationship between the Disaster Damage variable and Adopt 311 is positive.

4.5 Description of the Logistic Regression Model and Results

A binary logistic regression model was used because this regression model that uses a quantitative variable (x) to predict the outcome of categorical variables (y) which have only two outcomes (i.e. adopt, yes or no). Probit logistic regression could have been used but the logistic regression model is easier to interpret.

Table 4 Data Observations

Number of Observations Read	242
Number of Observations Used	220

There was an N of 220 cities instead of the original 242 cities because 22 observations were deleted due to missing values for the response or explanatory variables (Table 3). Of the 220 cities, 53 cities adopted 311 and 167 did not (Table 4). Some data was eliminated because a number of cities did not report their crime statistics to the FBI for tabulation. Also, some cities

such as those in Florida had their ability to adopt the 311 number usurped by their county governments.

Table 5 Response Profile

Ordered Value	Adopt	Total Frequency
1	1	53
2	0	167

The model shows a statistically significant relationship between the dependent variable Adopt 311 and the independent variable of Population with a p-value of 0.0024 in Table 5. Although this result is statistically significant, there is no variation in the odds ratio for population. The odds ratio is the ratio of the odds of an event occurring in one group to the odds of it occurring in another group. In this case, the odds of an increase of 1 in a new city with a population of over 100,000 would have corresponding increase in the odds of adoption by 1. This limited odds ratio may be explained due to the limited sample size. Hypothesis One attempted to ascertain if there was a relationship between population as a proxy for larger local governments having a greater propensity to adopt 311 given the incentives for consolidation. The results show that there is a relationship to adoption, but the number of observations make this results less than conclusive.

The dependent variable of Adopt 311 and the independent variable of Violent Crime Rate showed a statistically significant relationship in the model with a p-value of 0.0020. Although this result is statistically significant, like the population variable, there is limited variation in the odds ratio for population. In this case for the odds ratio, if there was a new city with a violent crime rate added to the database, for every increase of 1 there would be a shows that for every

Table 6 Results

Effect	Odds Ratio Point Estimate	Pr > ChiSq (p-value)
Population	1.000	0.0024
Violent Crime	1.001	0.0020
Mayor	2.325	0.0256
Damage	1.000	0.9198

increase of 1 there will be a corresponding increase in the odds of adoption by slightly over 1 (1.001). This limited odds ratio may be explained due to the limited sample size or that the UCR violent crime statistic was not detailed enough. If the violent crime rate was measured to the point where we could ascertain variations by several more decimal points, the results may have been more conclusive. Hypothesis Two was intended to understand if there was a relationship between high violent crime as a component of high 911 call volume leading to a greater likelihood of adopting the 311 number. The results show that there is a statistical relationship to adoption, but the number of observations make this results less than conclusive.

The model demonstrated a statistically significant relationship between the dependent variable of Adopt 311 and the independent variable of Mayor-Council with a p-value of 0.0256. However, in this case as opposed to the variables of population and violent crime, the odds ratio was much higher. When we see an increase of 1 to the database of 1 city, we are over twice as likely (2.325) to see an adoption of the 311 innovation. Hypothesis Three was based on the premise that the mayor-council form of government has the advantage of being able to capitalize on the use of administrative authority and political capital to implement non-mandated change. The model's results are both statistically significant and valid from an odds ratio perspective.

These results help us to better understand that the mayor-council form of government is an advantage for the adoption of the 311 innovation in American cities and consolidated governments with populations over 100,000.

The relationship between the dependent variable of Adopt 311 and the independent variable of Damage was determined to be an insignificant relationship in the model with a p-value of 0.9198. The Damage variable also had limited results related to the odds ratio. Like the variables population and violent crime, an increase of 1 city to the database there will only be a corresponding increase of 1 adoption. Hypothesis Four sought to determine if the advantages of having a 311 center as a communication tool in response to disasters is a determining factor in adopting 311. The model's results show a statistically weak relationship between the variables and the odds ratio results showed no variation. These results lead us to believe that even though 311 has proven to be effective in helping cities respond to disasters, this model cannot help us determine if adopting the 311 number to help cities better respond to disasters was a contributing factor in the local decision making process.

In this second step, the logistic regression model was modified to exclude the variable Damage. According to the p-values, all covariates are now significant. The odds of adoption increase by 1.001 percent with each additional unit of Violent Crime Rate. Violent crimes are defined by the FBI's UCR Program as offenses that involve force or the threat of violence. This amalgamated statistic which is standardized as a percentage includes four offenses: murder and non-negligent manslaughter, rape, robbery, and aggravated assault. The odds of adoption increase by 1 percent with each additional thousand of Population. The odds of adoption increases 2.325 times when Mayor-Council = 1 compared with Mayor-Council = 0. All the above values can be found in the table "Odds Ratio Estimates".

In the SAS statistical software which was used, a measure of R-Square for logistic regression is not provided because it generally is not applicable to the logistic regression model. In its place the three techniques for comparing model fit statistics of AIC, SC, and -2 Log L were used. However, the Akaike information criterion (AIC) is a measure of the relative goodness of fit for this statistical model. Given a collection of models for the data, AIC estimates the quality of each model, relative to each of the other models and provides a reasonable means for model selection. AIC is founded on information theory: it offers a relative estimate of the information lost when a given model is used to represent the process that generates the data. In doing so, it deals with the trade-off between the goodness of fit of the model and the complexity of the model. The smaller the AIC value the better the fit. In results of our model were considered low with the intercept only values were 244.935 and the Intercept and Covariates was 201.157. The results in the second model when Damage is excluded posts similar positive results as to the Goodness of Fit for the model.

4.6 Summary and Findings

In Chapter 4 the logistic regression model focused directly on hypotheses 1 through 4 to help determine if there is a statistical relationship between the adoption of 311 and certain variables. Hypothesis One proposed that the higher the population, the greater the city government's benefit from consolidation and efficiencies by adopting the 311 number. The model showed a strong statistical relationship between adopting the 311 innovation and population for cities over 100,000, but the odds ratio was inconclusive due to the small sample size. Hypothesis Two conjectured that the higher the 911 call volume related to a city's high violent crime rate, the more likely a city government was to adopt the 311 number in order to offload non-emergency calls. Once again, the variable of high violent crime rate had a

statistically significant relationship in the adoption of the 311 number. Hypothesis Three focused on the mayor-council form of government and how strong political leadership can be a major factor in overcoming the obstacles to adopt the non-mandated 311 number. The mayoral form of government showed a statistically significant relationship for adopting the low salience policy of having a 311 number. However, the odds ratio results show that an increase in the database of 1 would be twice as likely to adopt the 311 innovation. The results of this model related to Hypothesis Three is that a mayor form of government related to 311 adoption is not only statistically significant, but of real significance. However, Hypothesis Four related to high property damage from natural disaster was not a significant finding. It was argued that 311 centers played a beneficial role in disaster preparedness and recovery such as for hurricanes in the southeastern United States, but the data leads us to believe that this aspect was not a significant reason to adopt the 311 innovation and the odds ratio was also inconclusive.

The most important result of our model is that Hypothesis Three, which lends credence to the idea that big city mayors in the early years leading up to 2003, the year of critical mass, paved the way for later adopters of the 311 innovation. This would reinforce the notion that the big city mayors were acting as policy entrepreneur by adopting the 311 number.

It can be argued that a several components of Rogers' Variables Determining the Rate of Adoption may shape this innovation. The type of innovation decision for city mayors was both optional (non-mandated low salience policy) and required the necessary authority to implement thereby making the mayoral form of government more likely to adopt the 311 innovation.

Although 311 centers played a beneficial role in disaster preparedness and recovery from disasters, the variable Damage did not have a statistically significant relationship to adoption in this model and provided an inconclusive odds ratio. Another approach for future research may

be a geospatial study regarding the 311 adoption and diffusion to ascertain if proximity and population density within states were contributing factors. Also as identified in the adoption map, it would be of interest to conduct further case studies regarding the 311 adoption and diffusion in the individual states of California, Florida, Mississippi, Ohio, and Texas as well as the combined Pacific Northwest states of Washington and Oregon because the political forces, policy entrepreneurs and the relationships between cities might be more readily identified. Such case studies may shed light details leading to adoption and diffusion. For example, why did all four of the largest cities in Texas adopt 311 in the early years between 2000 and 2002?

Chapter 5. Adoption Case Studies

The narrative in Chapter 3 took a broad approach to this research while the logistic regression model in Chapter 4 specifically addressed the first four hypotheses. The third component of this research, the case studies, was designed to identify the catalysts for the adoption and diffusion of the 311 innovation. The case studies in this chapter selected were representative U.S. cities that had adopted 311 and were large enough to readily demonstrate the changing roles of policy entrepreneurs and the innovation's evolution within the city governments as anticipated in hypothesis 5. Hypothesis 5 posits that after politicians play their role as policy entrepreneurs for their government's adoption of 311, administrators then become the policy entrepreneurs to adapt the system to local needs and integrate it with other technologies over time. As outlined in Table 5, the cities of Pittsburgh, Pennsylvania and Minneapolis, Minnesota were selected because both cities began the operation of their 311 centers in 2006, had populations within the range of 300,000 and 400,000, had the mayor-council form of government, and had high violent crime rates in 2003, the year the rate of adoption reached critical mass.

However, since there are 43 cities in the United States with populations higher than 400,000 and 187 between 100,000 and 300,000, it could be argued that the selected population range was not representative of all 242 cities within the database.

The case studies are based on interviews conducted between June and October 2012 with twelve city officials holding the positions of call center directors, representatives of the IT departments, and representatives of the mayors' offices. The city officials were asked a series of 15 questions (see Appendix C) under the five categories of: Baseline (questions 1, 2 regarding department mission and role), Diffusion (questions 3, 4 regarding catalysts), Evolution

Table 7 All U.S. Cities with Populations between 300,000 and 400,000 in 2003

311 Adopter City	State	Population	Mayor-Council	Violent Crime Rate[bc]	Year Adopted
Minneapolis	*MN*	*378,602*	*Y*	*1193.1(High)*	*2006*
Pittsburgh	*PA*	*335,302*	*Y*	*1061.4 (High)*	*2006*
Non-adopter City					
St. Louis	*MO*	*340,256*	*Y*	*2181.9 (High)*	*Not adopted*
Tampa	FL	320,908	Y	1786.5 (High)	Not adopted
Cincinnati	OH	324,297	N	1127.4 (High)	Not adopted
Tulsa	OK	393,907	N	1092.6 (High)	Not adopted
Toledo	OH	309,499	N	1028.1 (High)	Not adopted
Raleigh	NC	310,157	N	646.1 (Low)	Not adopted
Wichita	KS	356,123	N	625.9 (Low)[d]	Not adopted
Arlington	TX	355,385	N	524.2 (Low)	Not adopted
Santa Ana	CA	347,016	N	515.3 (Low)	Not adopted
Colorado Springs	CO	374,818	N	462.4 (Low)	Not adopted
Anaheim	CA	336,132	N	392.4 (Low)	Not adopted
Adopted with County					
Miami	FL	381,651	Y	1875.3 (High)	2005

[a] Variations in population coverage and reporting practices may cause differences in reporting from year to year
[b] Rates are the number of reported offenses per 100,000 population
[c] Sources: FBI, Uniform Crime Reports, prepared by the National Archive of Criminal Justice Data, Date of download: December 27, 2012 Uniform Crime Reporting Statistics - UCR Data Online, http://www.ucrdatatool.gov/
[d]Wichita Police Dept Kansas 2003 - Due to changes in reporting practices, annexations, and/or incomplete data, 2003 figures are not comparable to previous years' data

(questions 5–7 regarding changes over time), Policy Entrepreneurs (questions 8-10 regarding influential positions), and Integration, Citizen Engagement, and Future Initiatives (questions 11-15, self-explanatory). The format for the case study comparisons begins with a brief profile of the cities' demographics, external economic environment, internal government structure, and background on their 311 citizen service centers. The answers to the survey questions within each of the five categories for similar city government positions are compared and synthesized. The findings are culled from the interviews which are summarized by position and the overall city comparisons which are then evaluated through the lens of Rogers' (2003) Variables Determining the Rate of Adoption of Innovations (Figure 1-2) and Karch's (2007) political forces that

facilitate diffusion. After each interview by position (call center director, representatives of mayors' offices and IT departments), the potential catalyst for increased rate of adoption were identified and marked by code (i.e. H1 = hypotheses 1) in Table 6. The potential catalysts are listed in the text and the corresponding cumulative number of mentions are tallied by city. The intent of this process is to address the primary research question and the five hypotheses. Hypotheses Five is of particular interest in Chapters 5 and 6 because the case study method may help to better identify the roles of politicians and administrators as policy entrepreneurs. In Chapter 6 the case studies will be taken one step further by comparing the results of this chapter's 311 adopter cases with that of a non-adopter city with similar characteristics, St. Louis, Missouri.

5.1 Case Study Methodology

According to Robert Yin (2009) "a case study is an empirical inquiry that: investigates a contemporary phenomenon in depth and within real life context, especially when; the boundaries between phenomenon and context are not clearly evident" (p. 18). The case studies in Chapters 5 and 6 are part of this study's mixed methods research which combines quantitative and qualitative research techniques. This approach "forces the methods to share the same research questions, to collect complicated data, and to conduct counterpart analyses (p. 63)". The case studies used three cities as the units of analysis based on interviews of public officials using a questionnaire (Appendix C). The questionnaire was conducted by telephone and the researcher took notes outlining the key points from the participants' statements. The criteria for evaluating the statements were linked back to the original hypotheses, Karch's political forces, and Rogers' variables for determining the rate of adoption through and evaluated through a matrix.

The case studies used three of Yin's (2009) six sources of collecting case study evidence: documentation, archival records, and interviews. This study uses documentation from public records even though there can be problems with retrievability using this source. Archival records through internet searches were also used because conducting field visits to the three cities was not feasible. Yin states that "many people have been critical on the overreliance on documents in case study research (p. 105)". Archival records such as budget and personnel records were difficult to obtain and the accuracy and conditions under which it was produced could not be verified when six years had passed between the time of 311 adoption and the interviews (Yin, 2009).

According to Yin (2009), case study interviews are guided conversations with a consistent line of inquiry. The actual stream of questions in the case study interview is more likely to be fluid than rigid. When conducting telephone interviews the researcher must satisfy the needs for the line of inquiry and put forth a non-threatening questions in the open-ended interview (Yin, 2009). The telephone interview works best in small scale research if you contact them first to explain what interview is about and arrange a time for the call (Travers, 2001). Travers (2001**)** states that "some interviews will almost certainly be worth their place provided you can identify a small number who are key or representative (p. 61)". A small number of expert 'elite' interviewees in positions of authority within each city were identified as capable of giving answers with insight. Interviews with such people are relatively unstructured, for a number of reasons: "they know more about the topic and setting than you do, they can tell you what questions you should be asking; they will have their own structuring of knowledge; the best you can hope for is that you will raise topics that they will respond to; information about other documents or records, and; they will be expect a level of control (Travers, 2001, p. 63)".

Yin (2009) called this style used in these case studies a 'focused interview' where a person is interviewed for a short period of time with open-ended and the researcher assumes a conversational manner. In regards to using recording devices, he believes that it is a matter of personal preferences. Audio recordings can certainly provide more accurate documentation, however a downside could be that an interviewee may refuse permission or be uncomfortable with it. Recording devices on telephones also can be clumsy and create distractions. Transcription takes an enormous amount of time and energy. Based upon my own experience, I believed that some public officials would decline to be interviewed if I required that they be recorded, a risk that I could not take given the limited number of officials in each city that could knowledgably address my questions.

In tabulating the results after writing up my notes immediately following the interviews, Travers (2001) suggests making up a grid, spreadsheet, or matrix that assigns each substantive statement to a category. After the statements are placed within the matrix within categories, a count analysis can help identify patterns of responses. Such patterns can provide material for summarizing the results of the interviews into key findings.

Like Travers, Yin calls for creating a case study database in order to determine whether any meaningful patterns are emerging and increase the reliability of the entire case study. The matrix is Table 6 categorizes each substantive stamen using the criteria of the hypotheses, Karch's (2007) political forces, and Rogers (2003) Variables Determining the rate of Adoption. For case study analysis, Yin believes that one of the most desirable techniques is to use a pattern marking logic. If patterns develop, the results can help a case study to strengthen its internal viability (p. 136).

Yin states that one method for the written product of the case study is the question and answer format, which is used in Chapters 5 and 6. This type of format can be used for multiple and single cases and does not contain a tradition narrative. In this format, the composition is based on the questions and answers in the case study database. Yin (2009) states that "for reporting purposes, the content of the database is shortened and edited for readability, with the final product still assuming the format, analogously, of a comprehensive examination" (pp. 171-2).

Table 8 Potential Catalysts for Increased Rate of Adoption as Identified in Interviews

Potential Catalysts for Increased Rate of Adoption	**Identified in Interviews**	
Hypotheses	**Pittsburgh**	**Minneapolis**
H1 - Higher Population and Economies of Scale	**1**	**1**
H2 - High Violent Crime	**0**	**0**
H3 - Mayor-Council Form of Government, Strong Leader	**6**	**5**
H4 - Natural Disasters Response	**1**	**1**
H5 - Changing Roles of Policy Entrepreneurs and Internal Evolution	**8**	**7**
Political Forces		
PF1 - Policy Entrepreneur	**11**	**8**
PF2 - National Organizations	**0**	**0**
PF3 - National Government Intervention	**0**	**1**
Variables Determining Rate of Adoption of Innovations		
V1 - Attributes of Innovations (relative advantage, compatibility, complexity, trialability, and observation)	**10**	**14**
V2 - Type of Innovation-Decision (optional, collective, authority)	**7**	**7**
V3 - Communication Channels (mass, internal)	**5**	**5**
V4 - Nature of the Social System (norms, degree of network, interconnectedness)	**1**	**1**
V5 - Extent of Change Agents (Policy Entrepreneurs) Promotion Effects	**5**	**5**

The case study comparisons begin with a brief profile of the cities' demographics, external economic environment, internal government structure, and background on their 311 citizen service centers. The answers to the survey questions within each of the five categories for similar city government positions in are compared and synthesized. The findings are culled

from the interviews were summarized by position and the overall city comparisons. The results were then evaluated through the lens of Rogers' (2003) Variables Determining the Rate of Adoption of Innovations (Figure 1), Karch's (2007) political forces that facilitate diffusion, and the five hypotheses. Each interview was marked by code (i.e. H1 = hypotheses 1) in the case study text. Each coded substantive statement was then tabulated in Table 6 as a potential catalyst for increased rate of adoption. The larger the number represented a potential pattern and are explained in the chapter summary and findings in section 5.6. The intent of this process is to address the primary research question and shed light on the roles of politicians and administrators as policy entrepreneurs. In Chapter 6 the same methodology is used and the coded substantive statements of the St. Louis interviews are compared with those of Pittsburgh and Minneapolis.

5.2 Case Study Economic Conditions in 2003

In 2003, the year of the 311 innovation's point of critical mass, the post 9/11 economy effecting cities was in difficult shape. Cities throughout the United States were experiencing increased fiscal stress with revenues declining including sales tax, income tax, and tourism taxes. State budget deficits resulted in reductions in state aid and other types of support. Meanwhile, pressures for increased expenditures were not abating including personnel costs (wages, health care costs, and pensions), and public safety with increased concerns about crime and homeland security. The result was that many city officials were making tough decisions to reduce the municipal workforce, scale back budgets, reduce capital investment, raising fees and taxes, and drawing down reserves (Pagano, 2003).

That same year, a National League of Cities annual financial survey stated that four in five (81%) of the cities were less able to meet their fiscal needs during 2003 than in the previous

year. This was the highest negative response since 1990. For cities over 300,000 the negative rating was even higher at 84%.

In a 2004 report by the Allegheny Institute, Pittsburgh was compared to cities on the 300,000 to 400,000 range including Minneapolis and St. Louis because they were northern/'rust belt' cities had similar characteristics including topography, weather, industrial heritage, and current economic position which may not be prevalent in the south or west. The report used per capita income comparisons, general fund spending, expenditures on police and fire, and staffing per 1000 residents (Montarti, 2004).

Table 9 Allegheny Institute (2004) Comparison of Certain Northern and 'Rust Belt' Cities

City	Population 2002	Square Miles	Per capita Income 2000	Per capita spending FY 2004	Per capita police spending FY 2004	Per capita debt service FY 2004
Pittsburgh	327,898	55.6	18,816	1,189	275	274
Minneapolis	375,635	54.9	22,685	698	239	390

(Montarti, 2004)

5.2.1 The City of Pittsburgh's 311 Response Center

Incorporated in 1816, the City of Pittsburgh is known as the "Steel City" and the "City of Bridges." It is located in the southwestern portion of Pennsylvania in Allegheny County at the confluence of the Ohio, Monongahela, and Allegheny rivers. Pittsburgh is the second largest city in the state, has a population of 335,302 (U.S. Census, 2003), and occupies 58.3 square miles. The city's population peaked in the 1950 at 676,806 and declined to 305,704 by 2010.

Pittsburgh's mayor-council form of government consists of an elected mayor, and elected city council by district. The mayor is elected to a four-year term and appoints various

department heads. The City offers a full range of services including police, fire, emergency medical services, sanitation, and parks and recreational activities. Relevant to this study, the 311 Response Center and City Information Systems reported directly to the mayor (Pittsburgh, 2012).

The mayor proposes the annual operating and capital budgets which must be approved by the City Council. In November 2003 the city filed for "financially distressed" status under the State's Municipal Financial Recovery Act (Act 47). The State issued its initial Recovery Plan on June 11, 2004 which was approved by the Pittsburgh City Council on June 29, 2004. The Plan called for expenditure cut backs and a proposed a new tax levy structure. By the end of 2009 the City had accumulated a positive fund balance of $61.4 million.

On January 3, 2006 Mayor O'Connor took office. Shortly thereafter he was diagnosed with cancer and died on September 1, 2006. City Council President Luke Ravenstahl was sworn in as Mayor of the City of Pittsburgh at the age of 26, becoming the youngest mayor in the history of any major American city. He was elected in his own right in a special election in November 2007 and later re-elected in November 2011 for another four year term.

The adoption of the 311 non-emergency number was initiated by Mayor O'Connor. He proposed the creation of a "311 city help line" as part of the Mayor's Service Center in January 2006. Mayor Ravenstahl followed through on the former mayor's proposal and unveiled the 311 Response Center on October 24, 2006. Picking up on similar slogans for other 311 centers around the country, Ravenstahl was quoted as saying "think of it this way: Burning building? Call 911. Burning question? Call 311" (GovTech, 2006, p. 1). The Mayor promoted the new 311 system extensively with new billboards throughout the city and postcards mailed to residents (GovTech, 2006). The number was linked to a CRM system based on an antiquated Oracle

database and integrated with email, and the later PittsMaps GIS system (J. O'Byrne, personal communication, June 27, 2012).

In reviewing statements within these documents and archival information as it relates to the criteria in Table 6, the potential catalysts for increased rate of adoption are Mayors O'Connor and Ravenstahl (H3) acted as policy entrepreneurs (PF1) with the authority to enact the 311 innovation (V2) and promote (V5) its use through mass media communication channels (V3). This information regarding Pittsburgh's local government will be contrasted with Minneapolis in the next section.

5.2.2 The City of Minneapolis' 311 Call Center

Incorporated in 1867, the City of Minneapolis is known as the "City of Lakes" and the "Mill City." It is located in southeastern Minnesota in Hennepin County on the banks of the Mississippi River. Minneapolis is the largest city in the state, had a population of 378,602 (US Census, 2003) and occupies 59 square miles. The City's population peaked in 1950 at 521,718 and declined to 386,700 by 2010 (Minneapolis, 2011).

The City operates a mayor-council form of government with the mayor and members of the City Council elected by district to four-year terms. The mayor nominates department head candidates for approval by the Executive Committee (Mayor, City Council President, and City Controller) and the City Council. The mayor proposes the annual operating and capital budgets which must be approved by the City Council. The City provides a full range of services including police, fire, public works, health, and family support. The City Coordinator (chief administrator) reports directly to the mayor and oversees Minneapolis 311 Call Center and Business Information Services (information technology department). Mayor R.T. Rybak has been mayor since first being elected to office in 2001 (Minneapolis, 2011).

Minneapolis serves as the center of finance, industry, trade, and transportation for the Upper Midwest region of the United States. Six Fortune 500 companies make their headquarters within their city limits (Minneapolis, 2011). Minneapolis area businesses "appear to be bucking some of the gloomy economic sentiment seen across the country," said Toby Madden, regional economist at the Minneapolis Federal Reserve, which tracks the economic outlook for the central bank's Ninth District (Star Tribune, 2011).

Since 1996 when Baltimore became the first city in the nation to adopt 311, the City of Minneapolis had considered using 311 as a method of improving service delivery to its citizens. City leaders visited Baltimore in 1997 and 2001 to examine their 311 Call Center. Minneapolis officials also visited Houston and Dallas, both of which were in the process of implementing 311 for their cities. Prior to establishing their consolidated 311 center there were 13 city-wide call centers and 11 hotline numbers. Minneapolis, Charlotte-Mecklenburg, NC and Columbus, OH received grants to establish 311 centers from the US Department of Justice COPS Office Homeland Security and Crisis Management (FY'03) program in 2003. The grant guidelines stated that the funds were to be used "to establish and evaluate 311 systems that incorporated multiple public service agencies and enhanced homeland security and/or crisis management plans and practice" (Cohen, 2007, p. 2).

A 2007 COPS Office funded study of Minneapolis 311 stated that many calls prior to 311 were misrouted, dropped, or sent to voice mail (Macro Group, 2007). A significant percentage of callers gave up and ended the call before they had the information they needed. The 311 Call Center opened on January 4, 2006 with a robust database including 96 services that were made available for callers to request action. Minneapolis Mayor Rybak stated that "our new 311 system has so many benefits, not just for city departments, but especially for the residents, who

now have a simple, streamlined way to access city information and services" (Macro Group, 2007).

Like Pittsburgh, Mayor Rybak (H3) acted as a policy entrepreneur (PF1) with the authority to enact the 311 innovation (V2) and promoted (V5) its use through mass media communication channels (V3). Minneapolis consolidated of 13 department call centers (H1) and the new 311 Call Center had relative advantage, compatibility, and observability (V1). National government intervention (PF2) took place when the COPS Office providing funding in 2003 to study the implementation of 311 and Minneapolis city leadership acted as policy entrepreneurs (PF1) when they toured for 311 centers tours in the cities of Baltimore, Dallas, and Houston in 1997 and 2001.

5.3 Interviews with 311 Citizen Service Center Directors

The 311 citizen service center directors interviewed via telephone were Wendy Urbanic, 311 Coordinator for the City of Pittsburgh's 311 Response Center on June 14, 2012 and Don Stickney, Director for the City of Minneapolis's 311 Call Center ("Minneapolis 311") on July 13, 2012. Each participant was provided with a copy of the questions (see Appendix C) in advance and the interviews lasted between 30 and 45 minutes. As 'elite' interviewees the participants, in many cases, anticipated questions later on in the questionnaire and sometimes provided broader answers than the question requested.

5.3.1 Baseline Questions

The questionnaire's two baseline questions concerned their department's mission and role in government-to-citizen communications. Wendy Urbanic, 311 Coordinator, oversees the City of Pittsburgh's 311 Response Center and reports directly to the mayor. Ms. Urbanic, in response to the baseline questions stated that one of the goals of the Ravenstahl administration is "to make

government easily accessible and to remove barriers that prevent residents, commuters, businesses, and visitors from contacting the proper departments and personnel" (J. O'Byrne, personal communication, June 14, 2012)." Their Mayor wanted a 'one-stop shop' to provide answers to questions and process requests for City services. The 311 center is the liaison between City departments, other government entities, and the public. The center handles non-emergency and anonymous requests for the public safety departments including police, fire, EMS, and Animal Care and Control. The center is open Monday through Friday, 9am to 5pm, but transitions to a 24-hour operation as needed such as for their February 2010 blizzard. When a special concern arises such as housing foreclosures and property assessments, the mayor advises residents to contact 311.

The Minneapolis 311 website states that "Minneapolis 311 is more than a phone number. It's also an online resource for access to City services" (Minneapolis, 2012). Director Don Stickney stated that government-to-citizen communications "is a two-way process with the community". He explained that there are three important aspects of Minneapolis 311: (1) accountability for effective utilization of resources, (2) citizen request tracking and expectations, and (3) leveraging information technology to redesign business processes.

Pittsburgh's Mayor Ravenstahl acted as a policy entrepreneur (PF1) and used his decision-making authority (V2) and the powers of his office (H3) to promote the use of the new 311 Response Center (V5). The mayor's statements described the relative advantage, compatibility, and observable results (V1) for citizens and city departments (H5). Pittsburgh 311 Coordinator Urbanic described the center's use in natural disasters (H4) for their blizzard of February 2010. Minneapolis 311 Director Stickney described the relative advantage and observable results (V1) of the 311 system. Stickney described the changing roles of the policy

entrepreneur from Mayor Rybak (PF1) when he promoted the system for adoption (V5) to its multiple internal government uses (H5).

5.3.2 Diffusion Questions

The two diffusion questions ask about the catalysts for their government's adoption of the 311 innovation. Urbanic stated that the Pittsburgh 311 Response Center was established by former Mayor O'Connor as part of the Mayor's Service Center, and was reaffirmed by Mayor Ravenstahl after he took office. The center was originally under the jurisdiction of the Parks Director, then the Director of Neighborhood Initiatives, followed by the new Operations Department, and now the Mayor's Office. Ms. Urbanic was not with the City when it was established in 2006.

Mr. Stickney reiterated that Minneapolis 311 has three important aspects (accountability, citizen requests, and changing business processes). As budgets continued to be reduced, there continues to be a motivation to meet citizen expectations by the delivery of effective services.

Although first promoted by Mayor O'Connor and implemented by Mayor Ravenstahl (PF1, V5), oversight of the function moved to several different departments over time (H5) thereby documenting the changing role of policy entrepreneurs for the innovation. Minneapolis once again discussed the internal evolution of the 311 system (H5) as it was adapted under the pressures of budget reductions.

5.3.3 Evolution Questions

The three evolution questions focused the 311 innovation as a technology cluster and how it changed over time. Pittsburgh's CRM system was in use for many years by the Mayor's Service Center prior to the implementation of 311. Before implementing 311, the City had an extensive IVR system which is still used by departments. Urbanic stated that the volume of calls

has increased significantly and more requests were coming electronically. They use Google Voice to transcribe voice mail messages. In an effort to become the first city to offer a smart phone application in 2010, a City Councilman in partnership with Carnegie Mellon University rushed the unveiling of the unreliable iBurgh app which was not reliable and the information had to be inputted manually because it was not integrated with the CRM system. City Information Services is presently working on the city's database for easier use of the information by the public. Pittsburgh's 311 Response Center provides voice mail after hours. The City has Facebook and Twitter accounts for making announcements and sharing information.

Stickney stated that the foundation or backbone of Minneapolis 311 since 2005 was based on the major upgrade of the City's telephone system. The City investment in its voice channel allowed for the systematic migration to multiple channels including customer self-service, social networking including Facebook and Twitter, websites, and the implementation of a new 311 smartphone application.

The Pittsburgh 311 Response Center demonstrated the 311 innovation's relative advantage, compatibility, and observable results (V1). Although other enhancements to the 311 technology cluster were initiated internally by departments, a City Councilman acted as a policy entrepreneur by working with a local university to release a flawed smartphone app that was not integrated with the city's CRM system. It could be argued that the failure of the iBurgh app was a result of the innovation not being promoted by the mayor (V5) or effectively integrated by city departments (H5) and, therefore, is an affirmation of the importance of mayoral leadership (H3). Stickney's answers once again discussed the relative advantage, compatibility, trialability, and observable results (V1) of Minneapolis 311.

5.3.4 Policy Entrepreneur Questions

The three policy entrepreneur questions asked what government positions played roles in the implementation and enhancement of the 311 technology cluster over time. Pittsburgh's Ms. Urbanic stated that the Information Technology Department provides options to departments and to the City as a whole through the Mayor's Office as needs arose. The Mayor's communication staff completed most of the investigations for new communication channels including social media.

Mr. Stickney stated that Mayor Rybak has been a significant influence for 10 years as a champion of communication with citizens. The City CIO is influential from a technology perspective, and Minneapolis 311 has also played a significant role. Communication decisions are normally made on a collaborative basis amongst a number of parties including the City Coordinator, 311 Director, CIO, Mayor, and City Council. Over time, the 311 center had gained in influence as the voice of the customer.

The Mayor as supported by his communication staff is clearly the policy entrepreneur in Pittsburgh and the IT department views itself as a means for implementing the Mayor's vision. In Minneapolis the Mayor has also played the role as policy entrepreneur and "champion for communication with citizens," but the role of the CIO and 311 Director as internal policy entrepreneurs has increased over time. Although the mayors of Pittsburgh and Minneapolis were the initial catalysts for the adoption of the 311 innovation (PF1) and they used their offices' authority (V2) to implement and promote the innovation (V5), the internal decision-making process became more collective (V2) as the policy entrepreneur (PF1) role changed to internal departments (H5). The changing policy entrepreneur roles also reflect a different means of communication (V3: mass media vs. internal) and internal communication structure and norms

(V4) for how information is disseminated internally and the established patterns of behavior within the government. This process of improving government-to-citizen communications could be described as a loop or symbiotic relationship starting with the mayor and his external relations, then implemented by internal departments and modified to meet their needs and that of their particular constituents.

5.3.5 Integration, Citizen Engagement, and Future Initiatives Questions

The remaining five questions addressed the integration of 311 with other technologies, how G2C initiatives are monitored and assessed, and where they think their government's G2C communication initiatives were headed in the near future. A community group requested that Pittsburgh's Urbanic open a private Facebook account as a communication tool to reach residents. She has found that Facebook has been a great resource for disseminating information. The City has an ongoing negative experience with an independently established SeeClickFix app that randomly sends complaints and it is difficult to respond directly to the person submitting the problem. She claims that it is both tedious and exacting in attempting to keep up with and integrate technology as quickly as it develops. Technology is now making government so much more accountable, accessible, and transparent. Ms. Urbanic stated that "I think the trend will be increasingly interactive, but it will be more electronic and less personal. Government will continue to introduce methods and venues to increase citizen involvement and to reach more individuals using less resources and expanded self-service options" (J. O'Byrne, personal communication, July 13, 2012).

Mr. Stickney has taken a methodical approach to the unveiling of new communication channels in order to ensure the full integration of technologies. In the future, he sees using social media such as Twitter and Facebook for service requests. He foresees the 311 system's

interoperability with other platforms including an Open 311 initiative which would allow more public access to existing resources. He views citizens as sensors in the community as the City moves towards more social networking, with citizens helping citizens beyond City-neighborhood relations. For example, after a tornado struck Minneapolis in 2011, volunteer coordinators spontaneously appeared in neighborhoods. Stickney sees the continued transition of personal computers and laptops to tablets and smartphones. Citizens' access through mobile devices has doubled in the last two years.

Once again, the director recognized the changing roles from the mayor to departments (H5), authority to collective decision-making (V2), mass media to interpersonal communication channels (V3) within an interconnected internal and external social structure with established patterns of behavior (V4). However, the directors noted that there was a shift in citizens' behavior to becoming more likes sensors in the community and having a greater propensity for electronic interaction. This change in behavior necessitates the need for the government to adapt its G2C communications strategy beyond the traditional neighborhood relations approach.

For the future, both representatives discussed increasing the complexity of integration and the rapid pace of technological change as a potential barrier. As other cities learn from their experience regarding the higher level of complexity of the 311 innovation as a technology cluster, the question of its diminished relative advantage may affect the rate of adoption (V1). Like Pittsburgh, Minneapolis also used their 311 center to assist during natural disasters (H4) such as Pittsburgh's blizzard in 2010 and Minneapolis' tornado in 2011.

5.4 Interviews with Information Technology Department Representatives

Tajuana Stephenson, Software Development Manager with the City of Pittsburgh's City Information Systems department was interviewed on July 10, 2012 reports directly to CIO

Howard A. Stern, PhD., who reports to the Mayor. Gina Filigenzi is the Manager of Enterprise Information with the City of Minneapolis' Business Information Services was interviewed on August 16, 2012 and works for CIO Otto Doll who reports to the City Coordinator.

5.4.1 Baseline Questions

Ms. Stephenson of the City of Pittsburgh stated that the mission of City Information Systems (CIS) is to coordinate technology projects within City departments. The Mayor typically takes the initiative to coordinate with citizens and CIS implements the Mayor's request. Ms. Filigenzi of the City of Minneapolis stated that the role of Business Information Systems is to handle mobile and real-time information. She stated that they are a service that provides technology and communication tools to City departments.

Both the Pittsburgh and Minneapolis' IT departments view their role as following the mayor's lead (PF1, H3) and then implementing the mayor's vision. However, as an internal service department they must take initiatives on behalf of departments (H5) requesting better communication with their constituents.

5.4.2 Diffusion Questions

Ms. Stephenson stated that in the early 1990s Pittsburgh had a Mayor's Service Center with a 7-digit number for citizens to call in complaints. The requests would be sent to departments and they would fix the problems. This process could take weeks or even months. Later, a more automated system was established after a consultant worked with department heads to create systems and forms. Mayor Ravenstahl wanted 311 to be a conduit to make it easier for citizens to dial in for services. The Mayor conducted a public service campaign with billboards and postcards to residents. His initiative to adopt 311 was assisted by CIS and the City Council was in favor of it because of the information it could provide.

Ms. Filigenzi was not involved in the decision making process, but was familiar with the concept of having one number for all requests in order to centralize services, provide better accountability, and provide a better customer experience. She said that Minneapolis' "big three" key stakeholders of this initiative, the Mayor, City Council President, and City Coordinator were in favor of creating the system.

Both Pittsburgh and Minneapolis reiterated the relative advantage, compatibility, and observable results (V1) of the 311 innovation. Their mayors were leaders (PF1, H3) that promoted (V5) the 311 innovation's advantages to their constituencies. The Minneapolis 311 Director believed that the "big three" key stakeholders including the City Council President and City Coordinator as part of the authority decision-making process (V2) were critical decision-makers within the entire process.

5.4.3 Evolution Questions

Ms. Stephenson stated that Pittsburgh's 311 database has changed over time with the key addition of the PittsMaps geographic information system (GIS) which made it easier to follow up with residents. They had a negative experience with a beta smartphone application in 2010. The Mayor's communication staff handles Twitter, Facebook, RSS Feeds, and alerts from their website. The City implemented Google Voice in January 2012 which translates and transcribes after hours 311 voicemail messages. They are currently looking at other Google applications beyond Voice and Gmail.

Ms. Filigenzi stated that Minneapolis has seen some big changes in recent years starting with the telecommunication system upgrade in 2005. With this foundation, a centralized system for enhanced reporting, functional reports, and integration with email was created. Since then, voice and email have been joined with web-chat, a smartphone application, and a social media

presence through Facebook and Twitter. Going forward, she sees greater analysis of data including social media data mining or and citizen service analytics.

Both cities mentioned the compatibility, relative advantage, trialability, and observable results (V1) of the 311 system. In Pittsburgh the Mayor's Office communications staff handles social media that is not integrated with the 311/CRM system and compatibility (V1) is a concern after the flawed iBurgh smartphone app initiated by a City Council member. For Minneapolis, the investment in new technology as a foundation prior to 311 implementation continues to pay dividends for compatibility and integration with other systems, thereby limiting complexity (V1).

5.4.4 Policy Entrepreneur Questions

In Pittsburgh the Mayor's Office of Communications is generally the catalyst for new communication mechanisms with citizens. CIS was exploring a new IVR system with Carnegie Mellon University for reporting issues and complaints. With the exception of the iBurgh smartphone app by a member of the City Council, usually departments make the lower level decisions on what mechanisms to use, but on a larger scale it's the mayor's initiative that has remained constant. Other departments provide supporting data for decisions such as the City Planning Department for GIS.

Filigenzi stated that her department has not been much of a catalyst because they were a service agency. The customer comes to the department with a need or request and we recommend the best solution. The Minneapolis mayor was very much behind the adoption of the 311 number and was supported by the City Coordinator and City Council. Other key department heads had to give up power and information which was a shift in in philosophy and culture. She stated that "Information is power." Filigenzi characterized Mayor Rybak as a very tech savvy mayor in touch with the people, and a proponent of all means for people to communicate.

The City Council member in Pittsburgh, who was a policy entrepreneur (PF1) for the flawed iBurgh app that was not integrated with the 311/CRM system, may have strengthened the Mayor's position as policy entrepreneur for G2C technology (PF1, H3). After this failure, no other technology initiatives emanated from the City Council in the subsequent years up until the time of this interview this interview in 2012. The mayor's staff in Pittsburgh were collective catalysts for the mayor's communication initiatives. The Minneapolis mayor was described as tech savvy and a proponent of new types of communication with citizens (H3) before passing lower level decisions down to departments (H5). Although the IT departments' representatives continue to reinforce that their CIO were not major policy entrepreneurs, their actions spoke otherwise.

5.4.5 Integration, Citizen Engagement, and Future Initiative Questions

Ms. Stephenson stated that the IT department head had to develop policies before going "live" with a new communication channel. Pittsburgh wanted to maintain freedom of speech, so legal counsel outlined what departments could post, and the mayor's communication staff monitored those postings. She sees greater communication in everyday life and considers this a reflection of the initiatives that the City has and will develop to communicate with the public.

Ms. Filigenzi stated that there are always major challenges for integrating technologies, so they have tried to contract with established technology firms for project implementations. The big trend now is a movement towards the use of more social media, smartphone apps, and open data initiatives. Social media data mining, discussed in greater detail in Chapter 7, is also a potential way in the future to give citizens more options to interact with 311 with more 2-way communications. The impetus for new communication technology was for government to be

more responsive to changing demographics, and technology usage with a majority of people using smartphones, and younger people texting.

In Pittsburgh the IT department head developed new policies and coordinated with legal counsel and the Mayor's Office before going "live" with a new communication channel. This is clear evidence of policy entrepreneur (PF1) activity as passed on from the Mayor (H5). Future compatibility and complexity (V1) for implementing new technology in an environment of rapidly changing communication demographics will continue to be of concern for both cities.

5.5 Interviews with Mayor's Office Representatives

Mayors' office representative Chuck Half, City Innovation and Performance Manager of the City of Pittsburgh, was interviewed by telephone on June 27, 2012 and Andy Holmaas, Director of Community Outreach for the City of Minneapolis was interviewed on October 15, 2012. Owing to their busy schedules they provided limited answers, perhaps caused by the pressures and time constraints of their offices.

5.5.1 Baseline Questions

Mr. Half of the Pittsburgh Mayor's Office described his role as providing information to and from operating departments in order to improve government performance. He stated the mission of the Mayor's Office as it relates to communications is openness to citizens with the key issues being government speech, advice, and consent.

Mr. Holmaas said that the City encourages communications with residents that "we often talk to residents about how government needs to be a two-way street. If there is a pothole it can be fixed a lot faster if it is reported by a resident than if it has to be found by a member of the Public Works staff" (J. O'Byrne, personal communication, October 15, 2012).

Both mayors' office representatives discuss the compatibility (V1) of technology to communicate with citizens as a natural outflow of their role and duties. It is interesting to note that while the Pittsburgh representative discussed internal communications, the Minneapolis representative focused on external communications (V3). This may be a result of their different type of roles within their offices.

5.5.2 Diffusion Questions

In regards to diffusion and the catalysts for adopting the 311 number, Mr. Half stated that 311 has great ease of use by citizens and has simply become "part of content". Mr. Holmaas stated that Mayor Rybak saw the value of the 311 program and wanted it for Minneapolis in order to make it easier for the City to connect with residents.

5.5.3 Evolution Questions

Mr. Half emphasized that citizens are now able to get valuable information on performance metrics and operational actions such as getting potholes filled. The other key components of Pittsburgh's 311 evolution was their 311/CRM database, the GIS department, the 311 staff, and the inbound information that populates its databases. Google Voice is a new City initiative as well as the Mayor's Office use of social media. Other important changes have been SMS video, 311 website web forms, and PittsMaps (GIS). Mr. Holmaas stated that Minneapolis has been making many changes including the introduction of a new smartphone application and interactive website which allows for citizens to request service or self-service.

Pittsburgh emphasized the observability (V1) of results enabling citizens to obtain information on performance metrics and operational actions. The on-going complexity (V1) for implementation of new technologies will continues to be a concern.

5.5.4 Policy Entrepreneurs Questions

Mr. Half stated that it was the mayor and his communication staff who act as policy entrepreneurs. Mr. Holmaas also said that the influence of the mayor on G2C communications has remained constant. He emphasized the importance of the 311 department and how it has been used to shape programs through the information received from citizens.

Both representatives, not unexpectedly, stated that the mayor has been the policy entrepreneur on G2C matters. The mayors as policy entrepreneurs (PF1) and leaders (H3) uses his authority (V2) to promote the innovation while passing on the lower level decisions to departments (H5) who worked through a collective decision-making process (V2).

5.5.5 Integration, Citizen Engagement, and Future Initiatives Questions

Mr. Half was concerned about the limited integration between 311 and other city systems. In the future, he sees more two-way communication with citizens, and crowdsourcing with citizens and community groups using open databases on issues such as for condemned buildings. Mr. Holmaas sees the recent changes as very positive and foresees continued expansion of G2C technology including more use of mobile applications.

The complexity (V1) of the integration issue will continue to be a concern in Pittsburgh and both representatives expressed optimism regarding the future diversification of G2C communication channels.

5.6 Summary and Findings

The questionnaire answers within each of the five categories for similar positions in each city were compared and synthesized. The findings were culled from the interviews which are summarized by position and the overall city comparisons are evaluated through the lens of

Rogers' (2003) Variables Determining the Rate of Adoption of Innovations (Figure 2), Karch's (2007) political forces that facilitate diffusion, and the five hypotheses.

The patterns that developed in the matrix of potential catalyst in Table 6 helped the researcher develop a number of findings. The first finding demonstrates a consistent pattern of mayors as policy entrepreneurs (PF1) acting as strong leaders (H3) with the decision-making authority (V2) to enact the 311 innovation and promote it through mass media channels (V3).

Second, the mayors then passed the implementation and lower level decisions to internal departments who worked as policy entrepreneurs (PF1) through a collective decision-making (V2) process, thereby documenting the changing role of policy entrepreneurs for the innovation (H5). The changing policy entrepreneur roles also reflect a different means of communication (V3: mass media vs. internal) and an internal communication structure and norms (V4) for how information was disseminated internally through established patterns of behavior within the government. This process of improving government-to-citizen communications could be described as a loop or symbiotic relationship starting with the mayor and his external relations, then implemented by internal departments and modified to meet their needs and of their particular constituents. However, the call center directors noted that there was a shift in citizens' behavior to becoming more likes sensors in the community and having a greater propensity for electronic interaction. This change in behavior necessitates the need for the governments to adapt their G2C communications strategy beyond the traditional neighborhood relations approach.

Third, both cities reiterated the relative advantage, compatibility, and observable results (V1) of the 311 innovation. For the future, both cities' representatives discussed the increasing complexity of integration and the rapid pace of technological change as a potential barrier. As

other cities learn from their experience regarding this higher level of complexity of the 311 innovation as a technology cluster, the question of its diminished relative advantage may affect the rate of adoption (V1). Like Pittsburgh, Minneapolis also used their 311 center to assist during a natural disaster (H4).

Fourth, both Pittsburgh and Minneapolis' IT departments view their role as following the mayor's lead (PF1, H3) and then implementing the mayor's vision. However, as an internal service department they must take initiatives on behalf of departments (H5) requesting the means for better communication with their constituents. Although the IT departments' representatives continue to emphasize that their CIO were not major policy entrepreneurs, there action spoke otherwise. In Pittsburgh the IT department head developed policies and coordinated with legal counsel and the mayor's office before going "live" with a new communication channel. This is clear evidence of policy entrepreneur (PF1) activity as passed on from the mayor (H5). Future compatibility and complexity (V1) for implementing new technology in an environment of rapidly changing communication demographics will continue to be of concern for both cities.

And finally, although other enhancements to the 311 technology cluster were initiated internally by departments, a Pittsburgh City Councilman acted as a policy entrepreneur (PF1) by working with a local university to release a flawed smartphone app that was not integrated with the city's CRM system. It could be argued that the failure of the iBurgh app was a result of the innovation not being promoted by the mayor (V5) and effectively integrated into city systems (H5) and, therefore, affirming of the importance of mayoral leadership (PF1, H3).

Chapter 6. Non-Adoption Case Study

Building upon the findings from the narrative in Chapter 3 and the logistic regression model in Chapter 4, this chapter will be used in tandem with the case study analysis in Chapter 5 to help us fill in the gaps of our knowledge as it relates to the research question, hypotheses, and potential catalysts for increasing the rate of adoption. The questionnaire answers of the city officials from the 311 adopter cities of Pittsburgh and Minneapolis and overall case studies findings from Chapter 5 will be compared with those of the non-adopter case of the City of St. Louis, Missouri (340,256 in 2003). This St. Louis case study comparison may help isolate catalysts for 311 adoption and diffusion that have transpired in the adopter cities which may not have occurred or have been triggered in this non-adopter city. As shown in Tables 5 and 11, St. Louis met the criteria of the mayor-council form of government, high violent crime rate, and population range similar to that of Minneapolis, MN and Pittsburgh, PA thereby exemplifying a stable, cross-case relationship (Seawright, 2008).

Table 10 Adopter and Non-Adopter Case Study Selection

311 Adopter	Non-Adopter
Minneapolis, MN 2006 (Year Adopted) 378,602 (2003 Population) Mayor-Council Form of Government 1193.1(2003 Violent Crime Rate)	**St. Louis, MO** Not Applicable 340,256 (2003 Population) Mayor-Council Form of Government 2181.9 (2003 Violent Crime Rate)
Pittsburgh, PA 2006 (Year Adopted) 335,302 (2003 Population) Mayor-Council Form of Government 1061.4 (2003 Violent Crime Rate)	

The St. Louis case study is based on interviews conducted between June and October 2012 with city officials holding the positions of call center directors, representatives of the IT departments, and representatives of the mayor's office. The interview questions listed in

Appendix C were slightly modified to accommodate the city's non-adoption status. The city officials were asked a series of 15 questions under the five categories of: Baseline (questions 1, 2), Diffusion (questions 3, 4), Evolution (questions 5-7), Policy Entrepreneurs (questions 8-10), and Integration, Citizen Engagement, and Future Initiatives (questions 11-15). The format for the case study comparisons begin with a profile of St. Louis's demographics, external economic environment, internal government structure, and background on its Citizen Services' Bureau.

Table 11 Potential Catalysts for Increased Rate of Adoption as Identified in Interviews

Potential Catalysts for Increased Rate of Adoption	**Identified in Interviews**		
Hypotheses	**Pittsburgh**	**Minneapolis**	**St. Louis**
H1 - Higher Population and Economies of Scale	**1**	**1**	**0**
H2 - High Violent Crime	**0**	**0**	**0**
H3 - Mayor-Council Form of Government, Strong Leader	**6**	**5**	**5**
H4 - Natural Disasters Response	**1**	**1**	**0**
H5 - Changing Roles of Policy Entrepreneurs and Internal Evolution	**8**	**7**	**0**
Political Forces			
PF1 - Policy Entrepreneur	**11**	**8**	**6**
PF2 - National Organizations	**0**	**0**	**0**
PF3 - National Government Intervention	**0**	**1**	**0**
Variables Determining Rate of Adoption of Innovations			
V1 - Attributes of Innovations (relative advantage, compatibility, complexity, trialability, and observation)	**10**	**14**	**5**
V2 - Type of Innovation-Decision (optional, collective, authority)	**7**	**7**	**3**
V3 - Communication Channels (mass, internal)	**5**	**5**	**7**
V4 - Nature of the Social System (norms, degree of network, interconnectedness)	**1**	**1**	**7**
V5 - Extent of Change Agents (Policy Entrepreneurs) Promotion Effects	**5**	**5**	**0**

The synthesized answers to questions within each of the five categories have been compared by position within the three cities, summarized, and repeated for all three positions. As in Chapters 3, 4, and 5, the findings are culled from the position summaries and overall comparisons between

the three cities are assessed through the lens of Rogers' (2003) Variables Determining the Rate of Adoption of Innovations (Figure 1-2), Karch's (2007) political forces that facilitate diffusion, and the five hypotheses. Through this process, the case studies will address the primary research question and, in particular, Hypothesis Five to identify gaps in the knowledge of the political forces of diffusion, the internal and external factors of 311 adoption, and the local and national environments leading to our identification of catalysts for 311 adoption and diffusion.

6.1 Case Study Economic Conditions in 2003

As discussed in Chapter 5, a National League of Cities annual financial survey stated that four in five (81%) of the cities were less able to meet their fiscal needs during 2003 than in the previous year. This was the highest negative response since 1990. For cities over 300,000 the negative rating was even higher at 84%. In an Allegheny Institute report in 2004, St. Louis was compared to cities in the 300,000 to 400,000 range including Minneapolis and Pittsburgh due to similar northern/'rust belt' city characteristics including topography, weather, industrial heritage, current economic position which may not be prevalent in the south or west (see Table 10). The report used per capita income comparisons, general fund spending, expenditures on police and fire, and staffing per 1000 residents (Montarti, 2004).

The City of St. Louis is known as "The Gateway to the West" and the "Home of Blues." It was founded in 1764, and seceded from St. Louis County in 1822 to become an independent city. It is located on the eastern border of Missouri and on the Mississippi River. It is the second largest city in Missouri, has a population of 348,189 (U.S. Census, 2003) and occupies 61.4 square miles. The city's population peaked in 1950 at 856,796 and further declined to 319,294 in 2010 (St. Louis, 2011).

Table 12 Allegheny Institute (2004) Comparison of Certain Northern and 'Rust Belt' Cities

City	Population 2002	Square Miles	Per capita Income 2000	Per capita spending FY 2004	Per capita police spending FY 2004	Per capita debt service FY 2004
Pittsburgh	327,898	55.6	18,816	1,189	275	274
Minneapolis	375,635	54.9	22,685	698	239	390
St. Louis	338,353	61.9	16,108	1,217	385	117

(Montarti, 2004)

The City operates a mayor-council form of government with the mayor and the 28-member Board of Aldermen elected to four-year terms. One unique aspect of the City's governmental structure is the Board of Estimate and Apportionment (E&A) which consists of the Mayor, City Comptroller, and President of the Board of Aldermen. The E&A plays a significant role in the City budget process as well as in approving contracts. By law, the E&A must recommend a balanced budget to the Board of Aldermen, the Board may decrease, but not increase any recommended appropriation amount, although the Board and E&A may mutually agree upon changes. If the budget is not agreed upon, the original budget takes effect on July 1st of each year. The City provides a full range of services including public utilities, parks and recreation, street maintenance, health and hospitals, and human services.

According to the City's 2011 Consolidated Annual Financial Report (CAFR), even though the population of the city has decreased by 8.3% since 2000, Downtown St. Louis' population has increased by 155% as a direct result of dozens of former manufacturing buildings being converted into lofts and apartments. The City's service sector has been the main source of growth in recent years and future growth is anticipated in other sectors including medical and

business services, education, and tourism. The median household income was $29,156 and median family income was $32,585. The City's violent crime rate was 2181.9 in 2003.

In regards to the City's fiscal condition, it continues to address the challenges of the current economic climate and the growth rate uncertain. To maintain a balanced budget, the City continues its efforts to contain payroll costs and the costs for fuel and street maintenance supplies. In April 2011, St. Louis voters approved the retention of the Earnings Tax which represents 37% of the total revenues generated in the fiscal year ending June 30, 2011.

6.1.1 The City of St. Louis' Citizens' Services Bureau

The City of St. Louis' centralized call center known as the Citizens' Services Bureau (CSB) was established under Mayor Vincent Schoemehl in 1985 and celebrated its "25 years of customer service" in 2010 (St. Louis, 2012). The CSB takes citizen service requests calls for all City operating departments through a 7-digit telephone number at (314) 622-4800. Prior to 2009 when the City implemented a new CRM system, the center's database was an antiquated DOS-based system tied to individual department databases, thereby making the tracking citizen requests very cumbersome. Customer service representatives had to memorize information to ask citizens and the lack of connectivity to GIS maps made inputting addresses inconsistent. The City's new CRM system tracks citizen requests at the call center which are then routed to 55 agencies. Seven agencies receive 80% of the requests: Refuse, Traffic, Forestry, Building, Animal Care & Control, and Operation Brightside (graffiti removal) (Riordan, 2010).

In 1985 Mayor Schoemehl acted as a policy entrepreneur by creating a centralized call center with a 7-digit number. The option to adopt the 311 number was not available to St. Louis until 1997 after FCC delegation of authority to state PUCs, so the city's actions before that year are not applicable to this study for direct comparison purposes. Unlike Minneapolis, St. Louis

still did not implement the 3-digit number. Both the creation of the centralized call center in 1985 and the implementation of the CRM system in 2009 were vast improvements over their previous systems thereby demonstrating their relative advantage and compatibility (V1).

6.2 Interview with Citizen Service Center Director

Cindy Riordan, Customer Service Manager for the City's Citizens' Service Bureau (CSB) was interviewed on June 14, 2012. In the non-adopter city of St. Louis, her position is comparable with those of Pittsburgh's 311 Coordinator Wendy Urbanic and Minneapolis 311 Director Don Stickney. Each participant was provided with a copy of the questions in advance similar to those in Appendix C having been slightly modified to accommodate their non-adopter status. The interviews lasted between 30 and 45 minutes. The participants, in many cases, anticipated questions and sometimes provided broader answers than the question requested.

6.2.1 Baseline Questions

The two baseline questions ask about their department's mission and role in government-to-citizen communications. Riordan stated that customer service is the primary focus of the CSB and that it works with operating departments to understand and communicate with citizens. The premise of the CSB is similar to those of Pittsburgh and Minneapolis, to be a 'one-stop shop' to provide answers to questions and process requests for city services.

The CSB acts as a communications hub between departments and citizens to answer questions and process requests which could be characterized as interpersonal communications (V3) to departments and mass communications (V3) to citizens.

6.2.2 Diffusion Questions

The diffusion questions, in this case, ask why their government did not adopt the 311 innovation. According to Riordan, the City never made a conscious decision not to adopt the

311 number. The CSB was established in 1985 with the 7-digit number of (314) 622-4800 and predates the nation's first 311 number by more than a decade. She believes that the number is so entrenched that it would be confusing to citizens if they changed it. Riordan believes that the general knowledge of the 7-digit number has the same relative advantage (V1) as the comparable 311 adopter cities because of it being in use for over 25 years. It could be argued that the implementation of the 311 number would not have a relative advantage over St. Louis's 7-digit number due to its 27 year history of usage in the city. However, determining such a premise would require a survey of St. Louis citizens which is beyond the scope of this study.

6.2.3 Evolution Questions

The three evolution questions focused on how the city's call center and its related technology has changed over time. Even before the CSB was established in 1985, there was a paper-based constituent services person on staff. Between 1985 and 2000, the CSB was part of the Mayor's Office followed by the Public Safety department, and its five different directors. Before the City had a website, they were accepting email requests for services which were then manually re-entered into a computer. Later, web forms were created with the content manually re-entered. A CityWorks CRM system was implemented in 2009 and requests are geocoded and assigned tracking numbers. An interactive voice response (IVR) system has not been implemented. The Mayor's Office has established a Twitter account and they receive between 5 and 10 requests per day which are re-entered into the CRM system manually.

In 1985 St. Louis' Mayor Schoemehl acted as a policy entrepreneur by creating an early version of a citizen service center. Riordan believes that later administrations did not feel the need to adopt the 311 number because the 7-digit number was so well known, thereby negating the relative advantage. St. Louis, like Pittsburgh, based its call center on a system created

in-house and eventually upgraded its CRM system in recent years which created integration problems as new layers were added. The norms of the social structure (V4) for St. Louis and Pittsburgh may have been hampered by negative fiscal conditions while experiencing dramatic population decline between 2000 and 2010 resulting in negligible available capital funds for system upgrades. Minneapolis had a stable population within the same period and was able to make a substantial investment in new technology infrastructure in 2005.

The CSB was originally put in the Mayor's Office and moved under the direction of the Public Safety department in the year 2000. The Mayor's Office communication staff posts information on social media on behalf of the city, a process not integrated with the CSB and its CRM system.

6.2.4 Policy Entrepreneur Questions

The three policy entrepreneur questions asked about what government positions played roles in the implementation and enhancement of the G2C technology over time. The Mayor's Office and the CSB had been influential in continuing to be open to new and better ways to communicate with citizens. G2C decisions were usually done on an operating department basis (V2). Departments were very much on their own in choosing what communication tools they wish to use such as the Streets Department's use of Twitter. The Mayor and cabinet level department heads are said to be in sync regarding the need for open government and communication with citizens (V4).

With citizen communication decisions made on the operating department level, the process may be considered collective decision-making or even optional by individual departments. This decentralization is in contrast to the more centralized norms of behavior in Pittsburgh and Minneapolis. This process calls into question whether St. Louis has a strong

mayor form of government and if the mayor acts in the role of policy entrepreneur on a city-wide scale for G2C communication initiatives. If not, then his role as policy entrepreneur would not be transferred internally as stated in Hypotheses Five. In 1985, then Mayor Schoemehl acted as a policy entrepreneur by creating a centralized call center and the norms of behavior for St. Louis politics and the internal social structure may have changed since that period.

6.2.5 Integration, Citizen Engagement, and Future Initiative Questions

The remaining five questions addressed the integration their call center with other technologies, how G2C initiatives are monitored and assessed, and where they think their government's G2C communications initiatives are headed in the near future. In regards to integration, Ms. Riordan stated that "sometimes we all don't stay on message" (V4). Riordan sees a danger if every city department has a Facebook and Twitter account. Some neighborhoods' safety patrols have requested an app to keep track of requests such as street lights reported out through the CSB (V3), but the City has not yet implemented such an app.

Success or failure is determined anecdotally with no performance measures or polling. In regards to the future, Ms. Riordan said that "we take our direction from what citizens are asking for" (V2). No matter who they are or who they know, they can get things done from the City through CSB. She believes that citizens are now more interested in helping out on projects.

All three cities discussed the increasing complexity (V1) of integration and the rapid pace of technological change. Also, as their citizens' communication channels (V3) change over time the city needed to keep pace with and adapt new communication technology. Riordan's statement that "sometimes we all don't stay on message" is indicative of the norms of behaviors within the social structure (V4) and their internal collective decision-making process which more decentralized than that of Pittsburgh and Minneapolis.

6.3 Interview with Information Technology Department Representative

Sonya Pellis, Web Manager, was interviewed on June 26, 2012. She reports jointly to the Mayor's Community Information Office and the IT Services agency which is headed by an interim director.

6.3.1 Baseline Questions

While the Mayor's Office is outward facing, the IT Services agency is an internal service department. The web development section is responsible for ensuring that methods for the public interface with City government.

Ms. Pellis finds herself in the dual role of assisting the mayor's communication staff with external G2C functions and for the IT Services department for internal department service requests (V3). She plays a coordination role, but this does not seem to be indicative of the changing roles of policy entrepreneurs and internal evolution.

6.3.2 Diffusion Questions

The City had an existing 7-digit non-emergency number and Ms. Pellis assumes that not adopting 311 was related to cost and the difficulty of integrating the existing system with separate departmental systems.

St. Louis believed that the age and complexity of their existing system and the separate department systems may have been a contributing factor in not considering the adoption the 311 number. This is a different position than Pittsburgh and Minneapolis which saw the adoption of 311 as compatible (V1) with existing CRM systems.

6.3.3 Evolution Questions

In the late 1990s to early 2000s, St. Louis had a Community Information Network with the City acting as an internet service provider. This system gave neighborhood groups their own

electronic bulletin board space to provide information to their neighbors (V3, V4). This very active service later declined after community groups developed their own solutions. The Community Information Network was initially replaced with a centralized DOS-based complaint and request system that was less neighborhood focused, and had new methods for connecting with citizens. This could be indicative of the changing norms and behavior of citizens' communication methods and channels (V4) which the city then adapted in a unique way. The Community Information Network of the late 1990's early 2000's was an established neighborhood based social system for disseminating information through established patterns or norms of behavior (V4). The DOS-based system which was replaced by a new centralized CRM system in 2009 was used more for direct citizen requests and changed the need for the neighborhood groups to act in a liaison function.

6.3.4 Policy Entrepreneur Questions

In the late 1990s and early 2000's the catalyst for G2C communications was the Director of Planning and Research with an emphasis on GIS property information. More recently, the Mayor's Office has been a G2C catalyst. St. Louis has been without has been without an IT Director since 2008, which has hampered strategic initiatives. The IT department has been "a bit of a football passed around" having been delegated to three offices including the E&A, Public Services, and now under the current Mayor. In a budget savings measure, the St. Louis Police Department entered into a contractual agreement on November 17, 2010 with the City to provide information technology oversight and additional personnel acting in dual roles. The contract was for a six-month term with the ability to extend the contract for multiple six month extensions (St. Louis Police Commission, 2010). The police department's IT manager Dele Oredugda first

began informally assisting the City government with information technology matters in 2008 and he continues to act in the dual role to this date.

Ms. Riordan states that he Mayor has a strong vision and personality and had taken an active role in technology matters (PF1, H3). In the past the Director of Planning and Research was a catalyst for new initiatives, but the Mayor's position as policy entrepreneur for G2C technology is similar to that seen in Pittsburgh and Minneapolis. While Ms. Riordan's answers lead us to believe that their CIO was not major policy entrepreneur, the St. Louis IT department has been in an even weaker position to influence city policy due to the lack of a permanent director for years and technology oversight being likened to "a bit of a football passed around."

In St. Louis's decentralized system related to IT initiatives, the lead policy entrepreneur seems to change as to which talented person fills the policy vacuum at any given time. The Department of Human Resources having taken a separate communication initiative with their constituent groups was another example of this decentralized process. A major issue seems to be the 4 ½ year period in which the IT Services department did not have a permanent director. This policy vacuum for this important position leaves the city with the lack of an authority figure with the vision and talent to implement a G2C communication strategy.

6.3.5 Integration, Citizen Engagement, and Future Initiative Questions

Integration is a problem because St. Louis has a decentralized decision making structure which leaves some departments to initiate their own Facebook and Twitter accounts. Therefore, it is difficult to leverage departments in a centralized way. The Mayor had implemented a Twitter account for service (PF1, H3) which it was not integrated with the City's CRM system and required manual double entry. The information is limited to 140 characters so the details of

a graffiti complaint may not identify if the location is on public or private property, if it is on wood or concrete surfaces, and the exact GPS coordinates would be unknown.

St. Louis has limited financial resources so they scaled down their web pages to fit mobile phones in order to get "more bang for the buck." Website traffic is monitored through Google Analytics and feedback through their website's green, yellow, and red system criteria. In the past, they had more direct feedback from advisory boards, neighborhood groups, and internal employee groups.

Ms. Riordan's closing comments regarding the future of G2C communications focused on adopting standards for citizen access to government databases (Open 311). There was no specific internal government plan, but she is confident that it will involve more migration to Google tools including Gmail, Google Plus, blogging, and Google groups. She was happy that the Mayor's Office is providing more strategic thinking on G2C communications and sees applications for mash-ups of databases and geographic information. On positive side is that the internal government structure has allowed an entrepreneurial spirit to identify solutions. However, there is a "glass ceiling" for individuals to push through reforms.

The theme of the future compatibility and complexity (V1) for implementing new technology in an environment of rapidly changing communication technologies and demographics resonates amongst all three cities. Even the lack of integration between systems, the St. Louis mayor plays a limited role as a policy entrepreneur for his office by using social media and other channels to communicate directly with citizens (PF1, H3).

Once again, it is difficult for St. Louis to act in a centralized manner regarding technology, so each department, including the Mayor's Office, has enacted their own initiatives. The lack of available resources for new initiatives creates added complexity (V1) for

implementation of any citywide effort. Added to this, having no IT director and the lack of a separate internal IT plan has created a "glass ceiling" which hampers the entrepreneurial spirit for reforms.

6.4 Interview with Representative of the Mayor's Office

Kara Bowlin, Public Information Officer (PIO) in the Mayor's Office was interviewed on July 10, 2012. She reports directly to St. Louis Mayor Francis G. Slay.

6.4.1 Baseline Questions

Ms. Bowlin stated that the informal G2C mission of the City and the Mayor's Office is to contact citizens and neighborhood groups through different medium including email, Twitter, and Facebook. Recently, the mayor has implemented Twitter for the submission of requests. The mayor tweets frequently and has over 15,000 followers (PF1, H3). This initiative fits into their mission for taxpayers to know what the City is doing and why it is being done. This process is a less costly way to dialogue with regular citizens. Individual departments use Twitter and most requests are reported back to the CSB. She sees no reason for the Mayor's Office to have a heavy hand in departments' G2C strategies, but wants a coordinated message. She believes that there is no way to manage social media by departments, but the Mayor is "lucky to have directors that talk to the media and to citizens directly".

The Mayor's communication staff plays a role of communicating directly with citizens through mass media and social media channels (V3). Ms. Bowlin feels that the Mayor has a good rapport with the department directors in regards to the dissemination of information through its usual norms of behavior (V4), so a "heavy hand" is not needed. However, she does find it challenging to the ability to project a city-wide coordinated message.

6.4.2 Diffusion Questions

Ms. Bowlin has no knowledge of why 311 was not adopted, but assumes that it was probably due to cost. She believes that St. Louis has a weaker mayor-council form of government because the Mayor must propose the recommended budget as part of the three-person E&A in conjunction with the City Comptroller and President of the Board of Alderman. The Board of Aldermen makes cuts, the Mayor and his departments must manage within the constraints of these reductions, and the Board of Alderman does not receive any direct repercussions for their actions. However, the Mayor's Office had been able to find new ways of doing more with less. With few resources, directors have had to take on more responsibility for the role of communicating with the public.

PIO Bowlin believes that most young people in St. Louis want to be more involved with their government and are more likely to vote. Their use of multiple means of communication makes a multichannel approach necessary. With multiple means of G2C communication, a more user-friendly government can be created and citizens can let the City know what's going on in the community more quickly. In addition to electronic means, the Mayor uses the traditional means of attending community events and neighborhood meetings.

The St. Louis Mayor counters any perceived weakness in structural power by aggressively using G2C communications to reach out directly to constituents. The Mayor further reduces oversight of his authority by using his campaign's Twitter account to communicate directly with citizens and his 15,000 followers (PF1, H3). While the Pittsburgh and Minneapolis interviewees discussed 311's compatibility or "ease of use" as reasons for adoption, the St. Louis Mayor's Office focused on low cost/high impact means of communication through social media. PIO Bowlin makes the clear distinction between the communication patterns of young people as

compared with older residents, thereby making a multichannel approach necessary in today's world.

Ms. Bowlin contends that St. Louis has a weaker form of mayor-council government which thereby gives the Mayor less authority (V2) for implementing technology initiatives on a citywide basis. She sees the patterns of communication changing between the city and citizens, especially with the younger demographic (V4).

6.4.3 Evolution Questions

In addition to the use of social media such as Facebook and Twitter, St. Louis has become the first in the Midwest to switch to Google Apps for Government which provides more effective means of internal communications, editing documents, calendars, Google Drive, and cloud-based information storage. One of the perceived reasons for the Mayor's active use of Twitter is that one of the founders of Twitter is from St. Louis.

Either by necessity or choice, the St. Louis mayor's representative was helping the Mayor be a policy entrepreneur in the face of difficult fiscal constraints. The use of social media by the Mayor's Office and Google Apps for Government to provide new tools for internal communication for the entire government mirrors actions taken by the equally fiscally constrained City of Pittsburgh. Necessity is the mother of invention for these two cities while a more prosperous Minneapolis methodically adds new communication channels for better internal integration. While the tracking and executing of citizen requests for service may be superior in Minneapolis owing to their technology infrastructure, their communication directly with citizens only seemed to be marginally constrained. The topic of budget savings through the implementation of G2C communication will be discussed in greater detail in Chapter 7.

6.4.4 Policy Entrepreneur Questions

As stated earlier, the St. Louis Mayor has been a catalyst for G2C communications during his 12 years in office. The City has not had a permanent IT Director for the last 4 ½ years. While resources are limited, the Mayor has focused on low-cost means for communicating with the public while allowing departments to communicate directly with citizens.

All three mayors' representatives, not unexpectedly, stated that the mayor has been the policy entrepreneur on G2C matters.

6.4.5 Integration, Citizen Engagement, and Future Initiative Questions

Although there are integration problems caused by the use of social media, the CSB re-enters information into the CRM system. St. Louis is looking at the potential of smartphone application to take CSB complaints and their website has been modified for mobile phone use. Feedback is anecdotal through Tweets, the CSB, Google Alerts, and Google Analytics. In the future, Ms. Bowlin sees more use of social media, better access to city data (Open311), and continued use of email reporting. Pragmatically, she sees the City adapting to whatever means of communication technology that citizens are using. Also, she sees more use of Nixel for emergency warnings alerts to cellphones as more people sign up for the service. This means of communication allows the city to pinpoint specific areas and neighborhoods for information and alerts.

The complexity of the integration issue will continue to be a concern for both St. Louis and Pittsburgh and all three representatives expressed optimism regarding the continued diversification of G2C communication channels.

6.5 Summary and Findings

The questionnaire answers within each of the five categories for similar positions in St. Louis, Pittsburgh and Minneapolis were compared and synthesized. The findings were culled from the interviews which are summarized by position (call center directors, representatives of mayors' offices and IT departments) and the overall city comparisons are evaluated through the lens of Rogers' (2003) Variables Determining the Rate of Adoption of Innovations (Figure 1-2), Karch's (2007) political forces that facilitate diffusion, and the five hypotheses. After each interview substantive statements identified as the potential catalysts for increased rate of adoption, marked by code (i.e. H1 = hypotheses 1) and the corresponding cumulative number of mentions are tallied by city in the Table 9 matrix.

In 1985 Mayor Schoemehl acted as a policy entrepreneur by creating a centralized call center with a 7-digit number. The option to adopt the 311 number was not available for St. Louis until 1997 when it was approved by the FCC for use by local governments. The city's actions before that year were not applicable to this study for direct comparison purposes. In 2009 the city implemented a new CRM system, as Minneapolis did in 2005 prior to adopting the 311 number in 2006, yet St. Louis still did not implement the 3-digit number. Both the creation of the centralized call center in 1985 and the implementation of the CRM system in 2009 were vast improvements over their previous systems thereby demonstrating their relative advantage and compatibility (V1). Riordan believes that later administrations did not feel the need to adopt the 311 number because the 7-digit number was so well known, thereby negating the relative advantage (V1). St. Louis, like Pittsburgh, built its call center on an in-house system and eventually upgraded to a new CRM system. New G2C communication channels have not been integrated including social media and smartphone applications. The norms of the social structure

(V4) for St. Louis and Pittsburgh may have been hampered by negative fiscal conditions while experiencing dramatic population decline between 2000 and 2010 resulting in negligible available capital funds for system upgrades. Minneapolis had a stable population within the same period and was able to make a substantial investment in new technology infrastructure in 2005.

The St. Louis Mayor's Office and the CSB had been influential in continuing to be open to new and better ways to communicate with citizens. The CSB acts as a communications hub between departments and citizens to answer questions and process requests (V3) for departments and mass communications (V3) to citizens. G2C decisions were usually made by operating departments (V2). Bowlin felt that the creation of a new smartphone app, as requested by neighborhoods' safety patrols to keep track of requests such as street lights reported out through the CSB (V3) would be beneficial.

In regards to coordinating city-wide communications, Riordan stated that "sometimes we all don't stay on message" (V4) and sees a danger if every city department has their own Facebook and Twitter accounts. The Mayor's communication staff plays a role of appealing directly to citizens through mass media and social media channels (V3). Bowlin feels that the Mayor has a good rapport with the department directors for the dissemination of information and norms of behavior (V4), so a "heavy hand" is not needed.

Ms. Pellis finds herself in the dual role of assisting the mayor's communication staff with external G2C functions and the IT Services department for internal department service requests (V3). She plays a coordination role, but this does not seem to be indicative of the changing roles of policy entrepreneurs and internal evolution.

With citizen communication decisions made on the operating department level, the process may be considered collective decision-making or even optional by individual departments. This decentralized process is in contrast to the more centralized authority norms of behavior in Pittsburgh and Minneapolis. This process calls into question whether St. Louis has a strong mayor form of government, and if the mayor acts in the role of policy entrepreneur on a city-wide scale for G2C communication initiatives. If not, this decentralized process would further call into question the St. Louis mayor's role as policy entrepreneur and would not be transferred internally as stated in Hypothesis 5. In 1985, then Mayor Schoemehl acted as a policy entrepreneur in creating a centralized call center. The norms of behavior for the St. Louis government and its internal social structure may have changed since that period.

Departments are very much on their own for their choice of communication tools in St. Louis such as the Streets Department's use of Twitter. The Mayor and cabinet level department heads were said to be in sync regarding the need for open government and communication with citizens (V4).

Bowlin affirmed that St. Louis had a weaker form of mayor-council government which gives the mayor less authority. Given the on-going fiscal constraints and lack of an appointed IT Director, it is unclear if a collective consensus (V2) for implementing technology initiatives on a citywide basis is a reasonable possibility.

Bowlin sees the changing patterns of communication between the city and citizens, especially with the young (V4) demographic. This could be indicative of the changing norms and behavior of citizens' communication methods and channels (V4) and that were adapted for the city in a unique way. The Community Information Network of the late 1990's early 2000's was an established neighborhood based social system for disseminating information and

established patterns or norms of behavior (V4). The new centralized CRM system was used more for direct citizen requests and changed the need for the neighborhood groups to act in a liaison function.

The St. Louis Mayor counters any perceived weakness in structural power by aggressively using G2C communications to reach out directly to constituents. The Mayor further reduces oversight of his authority by using his campaign's Twitter account to communicate directly with citizens and his 15,000 followers (PF1, H3). While Pittsburgh and Minneapolis interviewees discussed 311's compatibility or "ease of use" as reasons for adoption, the St. Louis Mayor's Office focused on low cost/high impact means of communication through social media making the clear distinction between the communication patterns of young people in the urban center compared with older residents, thereby making a multichannel approach necessary in today's world.

Either by necessity or choice, the St. Louis mayor's representative is helping the Mayor be a policy entrepreneur in the face of strong fiscal constraints. The use of social media by the Mayor's Office and Google Apps for Government to provide new tools for internal communication for the entire government mirrors actions taken by the fiscally constrained City of Pittsburgh. Necessity is the mother of invention for these two cities while a more prosperous Minneapolis methodically adds new communication channels for better internal integration. While the tracking and executing of citizen requests for service may be superior in Minneapolis owing to their technology infrastructure, the St. Louis Mayor's communication with directly citizens has continued through low cost/high impact means such as social media and the City website being optimized for mobile use.

All three cities discussed the increasing complexity (V1) of integration and the rapid pace of technological change. Also, as their citizens' communication channels (V3) changed over time when the cities needed to keep pace with and adapt new communication technology. Riordan's statement that the lack of departments staying on message is indicative of the nature of behaviors within the social structure (V4) and their internal collective decision-making process. The norms of behavior and collective decision-making processes in St. Louis were much different than that of Pittsburgh's and Minneapolis' more centralized approach.

While the IT departments' representatives in Pittsburgh and Minneapolis answers lead us to believe that their CIO/CTO are not major policy entrepreneurs, the St. Louis IT department has been in an even weaker position to influence city policy owing to the lack of a permanent director for years and oversight being likened to "a bit of a football passed around." In St. Louis's decentralized system related to G2C initiatives, the lead seems to change as to which talented person fills the policy vacuum at the moment. This vacuum for this important position leaves the city with a lack of a centralized vision for G2C communication technology. Although St. Louis did implement a new CRM system in 2009, it was more likely due necessitated by the functional obsolescence of the old DOS-based system.

Riordan's closing comments about the future of G2C communications were regarding adopting standards for citizen service data for access to government databases (Open311). There was no specific internal government plan, but she is confident that it will involve more migration to Google tools including Gmail, Google plus, blogging, and Google groups. She was happy that the Mayor's Office was providing some strategic thinking on G2C communications and sees applications for mash-ups of databases and geographic information.

Chapter 7. Citizen Engagement Technology Adoption

This study of the diffusion and evolution of the 311 innovation in the form of citizen service centers and as a technology cluster has been designed to help identify the catalysts for the spread of G2C technology in local government in order to better position future government-to citizen (G2C) technology for a more rapid rate of adoption. While the narrative, logistic regression model, and case studies in Chapters 3 through 6 have addressed the research question and five hypotheses from different vantage points, this chapter examines why some governments had become more advanced than others and takes a look at recent trends in order to better understand where G2C innovation may be headed in the near future.

The first section provides an overview of local government experimentation in electronic government citizen engagement in recent years. The second section examines four local governments that were awarded the Public Technology Institute's Citizen Engaged Community designation in 2010 and what we can learn from their experiences. Third, six American cities that have implemented citizen participatory platforms provide examples of best practices in collaborative democracy and solutions to problems through the development of citizen apps. And finally, the summary and findings are designed to lay the groundwork for the future research section in the final chapter.

7.1 Local Government Experimentation in Citizen Engagement

The appropriate role of the public in public administration has been an active and ongoing subject of debate since the founding of the United States. Some scholars such as King (1998) say that "participation through normal institutional channels has little impact on the substance of government politics" (p. 317) although voting and the election of new leaders arguably have an impact. In the early days of the new republic Hamilton and the Federalists

argued that a sound administrative system would keep the people's allegiance thereby negating the need for direct citizen involvement beyond elections (Aiken, 2010). The Jeffersonians argued that citizen participation was integral to democracy and would be a check on the abuse of power. In a letter to President Washington in 1792, Thomas Jefferson stated that a legislature "withdrawn such a distance from the eyes of their constituents, and so dispersed as to be inaccessible to public information… will form the most corrupt government" (Jefferson, 1792, p. 1). Today, the same arguments exist within the modern context of American representative democracy. Many elected officials and administrators continue to discourage direct citizen participation in the development of public policy, in the functions of government, and in the decision making process. Others argue that citizen involvement would produce better decisions and more efficient benefits for the rest of society (Aikins, 2010). At the heart of the debate over whether to incorporate enhanced communication mechanisms for citizen engagement is the role of citizens in the state and whether or not to allow their direct involvement in government. American cities are now beginning to reshape their relationship with citizens by providing new platforms for communication and harnessing citizen expertise. These cities as laboratories of democracy and their policy entrepreneurs' experimentation with G2C technology are beginning to foster a more positive environment for citizen engagement and collaborative democracy.

The first 311 non-emergency hotline number was established in Baltimore in 1996 and local governments have established eighty 311 citizen service centers as of 2012. Today most, if not all, of these call centers have since expanded beyond the original concept of non-emergency telephone number. 311 centers have integrated technology for multichannel G2C communications as a technology cluster including interactive websites, email, text, web chat, CRM, IVR, SMS video, social media, smartphone apps, citizensourcing, and open data

initiatives. Regardless of the means by which their constituents wish to communicate, many local government 311 centers are reaching out through multiple communication channels to provide information, take requests for services, and establish new forums for citizen engagement.

The first recognition program that demonstrated the importance of citizen participation processes for local government communications was established by the Public Technology Institute and first awarded in 2010 (see Table 11). The Citizen-Engaged Communities designation program recognized excellence in citizen service centers based on the categories of integrated communication channels, integrated technology, performance reporting, and citizen participation processes. For the first time, standards of excellence were defined for this non-standardized innovation. This new designation program established selection criteria beyond the traditional NPM customer service and efficiency to also include citizen participation processes and Web 2.0 connectivity through social media tools such as Facebook and Twitter (PTI, 2010).

To meet PTI's (2010) criterion for citizen participation processes, a local government must provide examples of using communication technology for direct participation including interactive applications and forms, surveys, focus groups, forums for suggestions, service requests, and discussion. PTI stated that "citizens want to feel connected to government and to ensure that their issues and concerns are a priority" (PTI, 2010, p. 1).

The citizen participation trend identified by PTI in 2010 continues to evolve with local governments allowing citizens to access government databases with little or no instructions. In an example of government ingenuity in fiscally challenging times, many cities such as Washington, DC, New York City, and San Francisco have conducted contests with prize money to entice developers to create applications, also known as citizen apps, to allow citizens to access government information in new and engaging formats. Public access to government databases

allows local governments to effectively experiment with what is variously known as the networking of distributed public expertise, citizensourcing, crowdsourcing, wiki government, mass collaboration, and collaborative democracy. The term collaborative democracy will be used for purposes of this research, defined by Noveck (2009) as "using technology to improve outcomes by soliciting expertise (in which expertise is defined broadly to include both scientific knowledge and popular experience) from self-selected peers working together in groups of open networks" (p. 17).

Traditional thought on citizen participation is for government to solicit citizens' opinions in response to, for example, policy options on the basis of their experience. Collaborative democracy attempts to engage citizens in using their expertise which might be based on "scientific, technical, or experiential knowledge, such as being at the location of a problem" (Dutton, 2011, pp. 2-3). Dutton argues that citizens are more than constituents and have the potential to be experts on particular issues. The government's challenge is to find ways to bring citizen expertise to effectively impact important issues in a timely way (2011).

Lee and Kwak (2011) believe that they have developed a roadmap for government to harness citizen expertise in their work assisting federal agencies in the implementation of President Obama's Open Government Directive (2009). This framework, which could be a model for local government, consists of four stages. They call for: (1) increased data transparency; (2) open participation; (3) open collaboration in order to realize; (4) ubiquitous engagement. By focusing on one implementation stage, they believe that government can "effectively build the infrastructure and capabilities for open government without overburdening government employees or overwhelming the public" (p. 12). The combination of increased data

transparency and open participation is designed to be a catalyst for action, to create public value, and spur innovation.

In Lee and Kwak's (2011) stages for open participation and their advancement towards ubiquitous engagement the authors recommend the use of social media and Web 2.0 platforms. The Oxford dictionary defines Web 2.0 as "the second stage of development of the World Wide Web, characterized especially by the change from static web pages to dynamic or user-generated content and the growth of social media" (Aarts, 2014). Web 2.0 platforms include ideation tools that streamline and integrate the process of generating, screening, and selecting new ideas. The benefits of their approach to governments' harnessing citizen engagement is "real-time, instant, diverse feedback; ongoing, community-based dialogues; reduced time and cost for innovation, leading to more innovation; and the public's increased sense of community with government agencies" (Lee and Kwak, 2011, p. 13).

7.2 Citizen-Engaged Communities: Four Cases

PTI was one of the first national organizations to recognize the importance of advanced citizen participation processes in local government citizen service centers by creating the Citizen Engaged Community award designation. Of the nine award-winning cities in 2010 (see Table 11), six had call centers linked to their 311 non-emergency number. As previously stated in Chapter 1, there is no established definition of a 311 citizen service center and every government could at least claim to have some type of citizen service number and system for response if they at least designated the chief elected official's or chief administrator's office. For purposes of this study, a 311 center must have the use of the 311 number approved by their state PUC and have it linked to a CRM system at a call center with dedicated call takers. The city officials from the 311 award-winning cities who agreed to be interviewed were New York City's 311 Citizen

Table 13 Public Technology Institute Citizen Engaged Communities Award Designees

2010-2012	2011-2013	2012-2014
Corpus Christi, TX Greensboro, NC Hampton, VA* Miami-Dade County, FL* New York, NY* Philadelphia, PA* San Francisco, CA* Winston-Salem, NC	Santa Monica, CA Chesapeake, VA Durham, NC Winston-Salem, NC Boston, MA Denver, CO* Indianapolis, IN Kansas City, MO* Minneapolis, MN* Philadelphia, PA*	Evanston, IL* Ann Arbor, MI Hamilton Township, NJ Buffalo, NY* Corpus Christi, TX Leon County, FL Winston-Salem, NC Charlotte/Mecklenburg, NC* Denver, CO* Miami-Dade County, FL* Montgomery County, MD* New York, NY* Orange County, FL* Philadelphia, PA* Sacramento, CA* San Francisco, CA*

*311 adopted as of 2012 (PTI, 2012)

Service Center Executive Director Joe Morrisroe (J. O'Byrne, personal communication, March 31, 2011), San Francisco 311's Deputy Director Andy Maimoni (J. O'Byrne, personal communication, March 28, 2011), Buffalo's Director of Citizen Services Oswaldo Mestre, Jr. (J. O'Byrne, personal communication, March 24, 2011), and Hampton 311's Call Center Manager Liz Nisley (J. O'Byrne, personal communication, March 30, 2011). The four officials were asked a series of questions related to the PTI award criteria and their motivations for adopting the 311 number (see Appendix D). Their responses were then condensed and categorized into themes to highlight their commonalities and differences. The objective was to gain insights into why these cities' 311 citizen service centers had developed more advanced citizen participation processes than other cities and identifying best practices.

7.2.1 Theme 1: City Size

New York City and San Francisco were able to generate economies of scale when establishing their 311 centers. New York City consolidated 40 department call centers and San Francisco initially merged 3 including the transit system. Three examples of economies of scale and positive return on investment from three cities with strong mayors and 311 centers can be seen in Table 15.

Buffalo used a $400,000 grant from the State of New York to purchase a CRM system to transform the Mayor's Complaint Hotline into the 311 Call and Resolution Center. The 311

Table 14 Examples of 311/CRM Economies of Scale and/or Return on Investment

Municipality	**311/CRM Economies of Scale and/or Return on Investment**
Baltimore, MD	• 25% reduction of 911 calls (~5,000 calls per week) • 50% decrease in average answer time for 911 calls • Number of abandoned 911 calls was reduced by 50% • Reduced overtime (excluding the police department) by 40%; Savings of $6 million in fiscal year 2001, and savings of $10 million in fiscal year 2002 were achieved • 95% success rate in repairing potholes within 48 hours • Response time for pavement cave-ins is down dramatically from 11.6 days in 2005 to 2.4 days in 2006.
Chicago, IL	• Experienced 125,000 fewer dispatches of squad cars as a result of 311 handling non-emergency calls. The city's 311 system also is able to process 20% of the police department's case reports each year. • As a result of CRM-led process improvement efforts, the city was able to reduce the time between when a report of a pavement cave-in is first reported by a constituent to when it is repaired by the city by almost 80 percent and by almost 20 percent for sewer cave-ins.
San Francisco, CA	• Four uniformed officers that were taking non-emergency calls were re-assigned within the public safety team after the 311 launch.

(J. O'Byrne, personal communication, S. Stern, 2013)

Customer Service Center in Hampton, VA grew out of its strategic planning process in the mid-1990s where focus groups told public officials about their difficulty in accessing departments to address their concerns.

The New York City and San Francisco respondents discussed the high level of technology use by their constituents, elevated citizen expectations, and their willingness to experiment with new initiatives. Joe Morrisroe of New York City stated that "citizens will support and be engaged in a test, a learning approach." Andy Maimoni discussed San Francisco's innovative approach of being willing to try new things (e.g., Facebook, Twitter) even if they are only "half baked" and not initially integrated with other existing technology.

According to Oswaldo Mestre, Buffalo's Mayor Byron W. Brown and his administration looked at best practices around the country and were trying to change the "culture" of the city government to be more efficient, more accessible, and more customer-service driven. They took the approach of continually building upon small successes in order to establish credibility with citizens as well as internal departments. As one of the pioneer 311 centers established in 1999, Liz Nisley explained that Hampton takes pride in its long standing cutting edge public management practices and willingness to experiment with new initiatives.

Table 15 PTI's 2010 Citizen-Engaged 311 Designated Communities

City	State	Form of Gov't	Population (2003)	Violent Crime Rate (2003)[a]	Year 311 Adopted
New York	NY	Mayor	8,098,066	734.1	2003
San Francisco	CA	Mayor	772,065	741.5	2007
Buffalo	NY	Mayor	288,187	1,361.6	2008
Hampton	NY	City Manager	147,777	406.7	1999

[a]Sources: FBI, Uniform Crime Reports, prepared by the National Archive of Criminal Justice Data, Date of download: Dec 27 2012, Uniform Crime Reporting Statistics - UCR Data Online, http://www.ucrdatatool.

In identifying the various reasons for establishing their 311 centers, it was clear that the larger cities had the advantage of potential cost savings through economies of scale by consolidating multiple department call centers. When faced with financial pressures during the recent economic downturn, New York City and San Francisco sought to demonstrate their worth to elected officials and taxpayers by providing high quality service to fend off significant budget reductions (see Table 14). The smaller cities had much less room for error when municipal revenues were decreasing in a down economy. All sought to "add value" through social media

Table 16 City/County Response to Budget Crisis in Relation to 311 Centers, 2009-2010

	Status Quo	Closed Center	Reduced Hours	Outsource Operation	Delayed Operation	Cancelled Plans	No Expansion	Cut Staff	Merged	New Center Planned	Expanded Tech Access
Albuquerque, NM	X										
Atlanta, GA										X	
Baltimore, MD									X		
Birmingham, AL								X			
Char-Meck, NC			X								
Cobb Co., GA					X						
Dallas, TX			X								
Denver, CO			X								
Detroit, MI			X						X		
El Paso, TX				X						X	
Evanston, IL										X	
Gwinnett Co., GA						X					
Hampton, VA								X	X		
Miami-Dade, FL			X								
Minneapolis, MN			X								X
Mont Co., MD										X	
New Orleans, LA		X									
New York, NY	X										
Philadelphia, PA	X						X				
Portland, OR	X						X				
Sacramento, CA			X								
San Fran, CA	X										X
Savannah, GA	X						X				
Solano Co., CA	X										
Somerville, MA	X										

The data for this table was derived from Lexus Nexus searches of hometown newspapers of governments with 311 citizen service centers in March 2010.

and other relatively small investment initiatives without significant increases in cost. All hoped to expand self-service options and personalization to maximize customer service and to limit increases in personnel expenses.

New York City and San Francisco, in recognition of their positions as "world class" cities, adopted the attitude that their citizens expect them to be more technologically advanced. In the words of New York's Morrisroe: "Hey, we're the Big Apple and we expect to be the best in the world." The San Francisco's Andy Maimoni noted the influence of the city's proximity to Silicon Valley and its reputation as an international center for high-tech firms. Buffalo seemed to be in the process of adopting the best practices of cities from around the country, while working to change the internal culture of city government and external expectations of its citizens. Hampton takes pride in its "cutting edge" approach to public management and its relations with citizens, thereby providing an on-going collaborative relationship with the community.

7.2.2 Theme 2: Common Visions

All of those interviewed described their management approach in strikingly similar language by employing such terms as customer service, accountability, transparency, open government, process improvement, continuous improvement, and best practices. The four cities seemed to continuously monitor what other local governments were initiating and to see what they might learn from them. All were customer-service driven in their attempt to improve citizen access to information and services. They all claimed to be building their knowledge bases and attempting to get information out to their citizens. All were looking at low-cost self-service options and multiple channels of communication to continually improve service while limiting expenses. All evidently were attempting to leverage community assets, including human capital and technology, to reap the maximum positive impact in the community. All were prepared to adjust and remain flexible to existing and new means of communication. According to Joe Morrisroe of New York City, city officials needed to be prepared for "what two kids in a garage

may be inventing at this very moment". While this section reflects an important tension between customer service and helping to create the capacity for engagement as a result of creating a 311 center, there has been no assessment of such capacity and represents an opportunity for future research.

7.2.3 Theme 3: Executive and Department Support

All of the cities had strong executive-level support. New York City's former Mayor Bloomberg, the billionaire founder of the information and technology firm Bloomberg LP, was in a dominant position to implement his vision of a consolidated 311 call center given the City's strong mayor form of government. Mayor Gavin Newsom of San Francisco had been a persistent proponent of establishing a 311 center from the time he was a member of the Board of Supervisors and as Mayor he implemented his vision. The consolidated San Francisco government structure retains elements of both city and county governments with an executive mayor and a Board of Supervisors with significant power. San Francisco's structure sometimes makes carrying out mayoral objectives more difficult than in New York City. The San Francisco 311 staff, in an attempt to preserve support, was conscientious about disseminating information about the services being provided in each Supervisor's district to show their value to the members of the legislative body. Buffalo also has a strong mayor-council form of government. However, being the mayor of the nation's third poorest city in terms of per capita income means that keeping the support of the Common Council, given its budget approval authority, was crucial in the midst of stagnant or falling city revenues. Hampton's manager-council form of government seems to operate more as a collaborative partnership among elected officials, the city manager, and staff.

Department support, cooperation, and partnership cannot be underestimated in its relationship to 311 centers. While New York City's Mayor was in a stronger position to consolidate 40 call centers and impose technological solutions on departments, San Francisco's diffused power structure has led to a more incremental approach to implementation after the initial consolidation of 3 department call centers. Andy Maimoni of San Francisco explained that part of its success can be attributed to taking the time to understand the processes of the departments in order to develop answers to frequently asked questions (FAQs) so as to provide first call resolution for most information requests. San Francisco officials choose not to attempt to force technological solutions on departments, but allowed departments to approach them to suggest improvements and partnerships (e.g., the Recreation and Parks Department's promotion of its Cleaning, Greening, and Beautification Community Volunteer Program). Within all of these 311 centers, the iterative process of citizens asking questions, and making service requests to department had led to the streamlining of processes over time. Buffalo's Oswaldo Mestre claimed that departmental accountability to the Mayor's Office helped created an atmosphere of continuous improvement, thereby enhancing the reputation of the 311 Call and Resolution Center as the number to call when citizens wanted to get things done.

7.2.4 Theme 4: Community Involvement

The respondents all claimed to have close working relationships with community organizations and individual citizens. New York City had 59 Community Services Boards that serve as the "eyes and ears" of the City below the borough-government level. San Francisco has a progressive activist community that prides itself on grassroots collaboration. In addition to Buffalo's relationship with community groups, block clubs and neighborhood watches, its City-sponsored Citizens Academy was instrumental in lobbying the Mayor and Common Council to

transform the antiquated Mayor's Complaint Hotline with its DOS-based system into the 311 Call and Resolution Center at a new physical location. Hampton has an on-going community outreach process of involving citizens in strategic planning processes that were then translated into actionable items for implementation. As smaller cities, the respondents in both Buffalo and Hampton seemed to have more direct connections to grassroots community groups and citizens, thereby magnifying their role in influencing local government as stakeholders and voters.

7.2.5 Theme 5: Technological Solutions

Former Mayor Bloomberg, as founder of an electronic information technology company, had a high regard for using technology to solve organizational problems and improve customer service. In addition to former San Francisco Mayor Newsom's advocacy of technological solutions for customer service, many members of the 311 management team previously worked in private sector firms in Silicon Valley and were also strong supporters of using information and communication technologies in government. Buffalo's search for best practices led it to seek a state grant to purchase a CRM system and to continuously look for ways to improve communications with citizens through multiple relatively inexpensive solutions such as Facebook. Hampton's City Manager and several technologically minded members of the City Council continued to find ways to electronically communicate with citizens including blogs, e-newsletters, and online surveys.

Organizationally, Bloomberg chose to place the new consolidated 311 center under the umbrella of the Department of Information Technology (DoIT) given the system's technological and electronic communications backbone. The placement of NYC311 within this larger department was almost irrelevant given the Mayor's ability to get departmental cooperation due to the city's strong mayor form of government. In addition, it can be argued that NYC311

significantly benefited from DoIT's approach to continuous improvement through technological solutions. San Francisco and Buffalo placed their 311 center under their mayor's office which provided the 311 center with leverage for their interactions with departments. In Hampton, the 311 center was placed under the jurisdiction of the city manager's office.

All of these cities continued to pursue options for greater personalization and self-service contingent upon available resources while continuing to support for maintaining live call takers. The San Francisco interviewee expressed the concern that the center needed to be able to overcome language barriers with a population that was 30% Asian. Maimoni explained that many Asian immigrants are from countries that "did not necessarily want to hear from them." He hoped that the 311 center with its many bilingual call takers and the AT&T language line for 3-way translation services would be a way to break down barriers between government and ethnic communities. It could be argued that maintaining live call takers was especially important in cities with lower income populations and relatively high concentrations of groups with language, education, and technological barriers to accessing government.

7.2.6 Theme 6: Future Trends

Subject to budget constraints, the four cities were looking to find ways for higher levels of self-service and the personalization of information. All aspired to greater integration with GIS and to establish SMS reporting and tracking through smartphones. Andy Maimoni gave an example of someone taking a geocoded photo of graffiti in the middle of a park by tennis courts thereby allowing the City to more easily find the location. New York City, San Francisco, and Buffalo reportedly are contemplating or are in the initial stages of providing access to open data and citizen-sourcing solutions for mining the government's knowledge base. Harvard Kennedy School Professor Stephen Goldsmith, then New York City's Deputy Mayor of Administration

and former Mayor of Indianapolis, championed making data sets available by allowing citizens to nominate which problems the City should be addressing. New York City's Joe Morrisroe said that Washington, DC's movement to provide data to the public with little or no instructions "changed the game" for G2C communications. Washington, DC, New York City, San Francisco, and many other cities have provided prize money for citizen app contests to provide a low-cost way for developers to create useful interfaces with city information.

The four cities continued to monitor other local governments' progress in implementing new G2C tools through formal and informal networks. With the trend towards communicating through social media, city CIOs were taking the lead by offering new communications channels as they become available, sometimes leading to initial integration problems with 311 CRM systems.

7.3 Community Intelligence Platforms

Desouza (2012) applies Arnstein's (1969) ladder of participation metaphor as a lens for understanding the evolving roles of government and citizens in the identification and implementation of solutions to local problems using collaborative platforms, mobile technologies, and open data initiatives. Arnstein's ladder had three levels for citizen engagement – nonparticipation, tokenism, and citizen power (1969). Desouza developed two models as a framework for citizen power in the modern context. First, the *Government Centric and Citizen Information Model* calls soliciting citizen participation though idea generation and voting while the implementation decisions are retained by the government. The second is the *Government Centric and Citizen App Model* which calls for increasing the level of citizen authority in specified government decisions.

Examples of American cities experimenting with aspects of the Government Centric and Citizen Information Model that will be examined are Philadelphia's Change for Us, Miami-Dade's Gov Idea, and Austin's Speak Up Austin. The Government Centric and Citizen App Model initiatives that will be explored are Washington, DC's groundbreaking Apps for Democracy contest, Baltimore's continued pioneering efforts in Open 311 and their 311 Mobile App, and the City of Chicago, Cook County, and the State of Illinois joining forces to establish Apps for Metro Chicago.

The Speak Up Austin, Philadelphia's Change for Us, and Miami-Dade's My Gov Idea citizen engagement platforms leveraged citizen knowledge by generating ideas to solve local problems (Desouza, 2012). The first Government Centric and Citizen Information model which focuses on collaborative democracy is Philadelphia's Change for Us (Philadelphia, 2012). First launched in New York City, Philadelphia partnered with CEOs for Cities and Code for America to modify their citizen engagement platform to be used under a free open source license and free for use by other local governments. According to the City of Philadelphia's website, "Change by Us Philly is an online marketplace for community projects that allows you to share ideas for making the city better, and to turn those ideas into projects that have real impact. From tools to network and manage events to helping you connect with local resources, the site supports a number of ways to get involved" (Nemani, 2012). One glance at the opening page of the website featuring a hand holding a post-it note with a handwritten idea to be stuck on a board with other ideas gives citizens intuitive knowledge of how the system works.

Miami-Dade's My Gov Idea (2012) asks citizens "Do you have an idea that can save money, improve efficiency, and streamline delivery of services to the residents of Miami-Dade County? Then…submit your ideas…help us improve upon our mission to deliver excellence

every day – and in new and more efficient ways." Citizens can also take the lead with their own idea or submit it directly to the experts in the government. After submitting the idea, government employees known as Idea Specialists review the ideas and post the most feasible ones to the My Gov Idea website for feedback. Voting and public comments, along with the recommendations from technical experts, determine which ideas are most innovative and promising enough to be presented to key government decision makers and placed into action (Miami-Dade, 2012).

Speak Up Austin launched in summer of 2011, (Desouza, 2012) "is an application that engages citizens in social issues. Local problems identified by public agencies are posted on the application. Problems are organized into categories (e.g., public transportation, utilities, waste, etc.). Citizens can read any of the posted problems and propose ideas to resolve them" (p. 4). Their citizens can vote for the posted ideas and the highest votes are acted upon in some manner. Through this program the City of Austin hopes to foster citizen engagement for more effective government decision-making.

The Government Centric and Citizen App Model as demonstrated by Washington, DC, Baltimore, and Chicago provide examples of government leveraging community knowledge. Former Washington, DC CTO Kundra wanted to find a way to make DC.gov's Data Catalog more useful to citizens, visitors, businesses, and government agencies. His innovative answer was to hold a contest to put data in the hands of talented software developers and provide them with cash prizes and recognition to develop technology for their community and city government (Corbett, 2010). The Apps for Democracy contest cost the city $50,000 and returned 47 iPhone, Facebook, and Web applications with an estimated value in excess of $2,300,000 to the City. Mayor Adrian M. Fenty summed up the importance of this contest by stating that "my

administration is committed to making government more accessible and more transparent, and through this contest we've gotten help from the most talented developers. With these innovative applications, we can put government literally in the hands of the people" (Farnham, 2008, p. 1). The groundbreaking Apps for Democracy contest later inspired San Francisco's Data Challenge, New York City's Big Apple Apps, and the federal government's Apps for America contests.

Ashtock's Open311 blog (2011) recognized the City of Baltimore's long history in 311 leadership since 1996 Rawlings-Blake unveiled the Baltimore 311 mobile app in 2011 to access more than 50 different service requests and allow citizens real-time collaboration with their city government (Baltimore, 2011). The Open 311 API they used allowed any developer to create an app that can integrate directly with their 311 system.

The Apps for Metro Chicago (MCIC, 2011) contest was launched as partnership between the City of Chicago, Cook County, State of Illinois, and Chicago Metropolitan Agency for Planning in 2011. Unlike previous contests, this civic apps competition was facilitated by the Metro Chicago Information Center (MCIC) with the role of fostering relationships between civic organizations, Chicago residents, and apps developers to address the varied needs of Metro Chicago (MCIC, 2011). Mayor Rahm Emanuel stated that "data belongs to the people" and "this competition will allow individuals to interact directly with their government and make a large difference in the way we live in Chicago" (ABC 7 WLS, 2011, p. 1).

These community intelligence platforms call for government to operate openly and without strict controls. Agencies must shift their mindset to allow the emergence of solutions, ideas, and problems by operating outside the boundaries of traditional rules and structure. The "chaotic spaces" created can still operate within constraints and provide solutions to many types of problems (Desouza, 2012).

7.4 Summary and Findings

PTI's Citizen-Engaged Communities award winners reinforced the Hypothesis One results that economies of scale were an importance consideration for New York City and San Francisco. All 4 cities were continuously monitoring communication channels to identify examples of "cutting edge" best practices from other cities acting as policy entrepreneurs (Karch, 2007). The mayors of the three larger cities were strong policy entrepreneurs thereby reinforcing Hypothesis Three, but Hampton's City Manager also acted as a strong policy entrepreneur consistent with their local tradition of government experimentation and citizen participation. Hampton certainly seemed to buck the trend of big city mayors and high crime rate for this 311 pioneer in 1999. Despite Rogers' (2003) attribute for innovation (see Figure 2) regarding complexity, these governments continuously looked for technological solutions to problems. The external environment of the economic downturn had an impact on all the governments' decisions to look for ways to reduce the transaction costs for interacting with government resulting in diversifying communication modes to include the low cost, high exposure methods of interactive websites, social media, and smartphone apps.

We learned from the PTI Citizen Engaged Communities interviews that larger governments benefit from economies of scale by consolidating departmental contact centers and which, in turn, provided an opportunity to make technological leaps. Executive and departmental support as well as having a penchant for technological solutions were key contributors for improvement in G2C communication technology. Having a common vision for citizen access to government and community involvement were two ingredients for citizen engagement success. Finally, the combination of continuous budgets constraints, a vision for greater citizen engagement, and the tendency towards technological solutions had provided an

environment for creative solutions involving higher levels of self-service, personalization of information, and G2C collaborative solutions.

For the six cities examined through the lens of community intelligence platform models, we witnessed local governments' citizen engagement innovations which may, over time, become best practices for cities to emulate, thereby increasing the rate of adoption for these innovations. Within the Government Centric and Citizen Information model, Philadelphia, Austin, and Miami-Dade County created online marketplaces for community projects, to share ideas with fellow citizens, and lay a role in partnering with the government to improve its quality of life. In the Government Centric and Citizen Apps model, Washington, DC, Baltimore, and Metro Chicago created means for constructive collaboration with citizen experts for technological innovations with real results.

American cities are beginning to reshape their relationship with citizens by providing new platforms for communication and harnessing citizen expertise. These cities acting as laboratories of democracy and their policy entrepreneurs' experimentation with G2C communication are beginning to foster a more positive environment for citizen engagement and collaborative democracy. However, their collective efforts remain in relative infancy and have yet to demonstrate widespread change in how American government operates at the local level. These trends should continue to be monitored and present rich subject matter for future research.

Chapter 8. Conclusion

The classic 'S-curve' for 311 adoption over the 17 year period (Figure 1) is a strong indicator that Rogers' (2003) diffusion of innovation (DOI) theory is the appropriate framework for studying the 311 innovation. While DOI theory is a useful framework, no single variable or research approach fully explains the adoption, diffusion, and evolution of the 311 innovation. The diffusion of 311, a low-salience policy, was encouraged by political forces (Karch, 2007) for different purposes, ranging from improvements to emergency vehicle response time to improved customer service and management accountability. The research framework for this study included the impact of the political forces (policy entrepreneurs, national organizations, and national government intervention) as catalysts for diffusion. The regression model alone was inadequate to understanding the adoption of the innovation and the political processes for the spread of this technology from one government to another. Therefore, the three part research design of narrative, logistic regression model, and case studies was justifiably the most appropriate approach.

This study of the diffusion and evolution of the 311 innovation in the form of citizen service centers and as a technology cluster has attempted to identify the catalysts for the spread of government-to-citizen (G2C) technology in local government in order to better position future G2C technology for a more rapid rate of adoption. The research question is: what factors contributed to the adoption of 311 in these local governments; how did the innovation diffuse and evolve over time; and why did some governments' communications with citizens became more advanced than others? The findings were identified and assessed through the lens of Rogers' (2003) Variables Determining the Rate of Adoption of Innovations (Figure 1-2), Karch's (2007) political forces that facilitate diffusion, and the five hypotheses.

This final chapter will address the Summary and Findings and be followed by Discussion and Implications, Limitations, and Future Research.

8.1 Summary and Findings

The summary and findings will be discussed in five sections: (1) Hypotheses; (2) Rogers' Variables for Determining the Rate of Adoption; (3) Karch's Political Forces; (4) the Research Question, and; (5) Catalysts for a More Rapid Rate of Diffusion.

8.1.1 Hypotheses

Hypothesis One asks if there was a relationship between adopting the 311 innovation related to population size, the corresponding size of local government, and the potential for positive economies of scale during implementation. The logistic regression model showed a strong statistical relationship between population and the adoption of the 311 innovation, but the odds ratio was inconclusive. However, interviews in Chapters 3 and 7 as well as Table 12 lend credence to support this hypothesis. Generally speaking, the larger the population of a local government's jurisdiction, the larger the size of the overall government in terms of General Fund Budget, the number of employees, and the size of its individual departments. The larger the department, the greater the likelihood of it having its own call center to service a greater volume of information and service requests. Given that this study only focuses on cities with populations over 100,000, the results may have been emphasized to a greater degree if the population threshold was lowered. In this hypothesis, larger cities with multiple department answering points are more likely to consolidate into a centralized call center with their major objectives being improved customer (citizen) service and efficiency. As America's largest local government, New York City as able to consolidate 40 departmental call centers when they created their 311 Citizen Service Center. Other examples of economies of scale achievements

are Chicago's Bureau of Electricity which saved $6.9 million in one year by eliminating multiple crews being assigned to the same area, Baltimore achieved $13.2 million in reduced overtime rates, increased productivity and eliminated wasteful programs (J. O'Byrne, personal communication with S. Stern, November 14, 2014) and San Francisco has reduced overtime by 20% for its Housing Authority department by consolidating the maintenance reporting hotline with the 311 call center (Lagan, 2012).

The economies of scale issue could be considered a New Public Management (NPM) or entrepreneurial approach to public administration. Hood (1995) believed that NPM was in response to the 'megatrends' at the time: (1) the slowing down or reversing of government growth; (2) a shift to privatization, and; (3) the development and use of information technology for the production and distribution of public services. Osborne and Gaebler's Reinventing Government (1992) promoted the concept of entrepreneurial government seeking to impose private market incentives to enhance government's relationship with citizens (customers) by providing improved public services at less cost (Feldman, 1999). The consolidation of multiple department call centers was an entrepreneurial approach to communications that enhanced government's relationship with citizens by providing improved public services at a lower cost.

Hypothesis Two focused on the premise that high violent crime rate and results in higher 911 call volume was a catalyst for the adoption of the 311 non-emergency number. The logistic regression model showed a statistically significant relationship between high crime rate and adoption, but the odds ratio was also inconclusive. President Clinton's original justification for the creation of the 311 hotline number was "to help alleviate the abundance of non-emergency calls flooding the 911 emergency systems" (COPS, 2001). Dallas 311 Assistant Director Eva Liggins believed that one of the reasons cities were adopting the 311 number was because "crime

was very rampant, 911 systems were overburdened" (J. O'Byrne, personal communication, August 9, 2011). An article stated that "police executives call it the 'tyranny of 911' – the relentless drumbeat of calls that send cops bouncing all over town like so many pinballs (Witkin, 1996, p. 30)." Life-threatening situations did "not always get the prompt attention they deserve because frivolous 911 calls send police off on unnecessary runs. And the sheer volume of calls sometimes overwhelms 911 operators and phone lines, meaning some desperate callers get a recording or are put on hold" (Witkin, 1996, p. 31).

With many of the largest cities having adopted the 311 innovation to alleviate 911 call volume and, later, as an additional means to improve services for citizens, how can we generalize this specific catalyst for the deployment of future G2C innovations. I believe that we must look for how technology can help solve a major compelling issue facing the local government at the time. Today, budget constraints are an everyday concern for cities especially since the economic downturn of 2008. This proved to be a catalyst for the implementation of low cost self-service G2C alternatives including social media, mobile apps, and interactive websites.

Given the importance of strong political leadership in implementing non-mandated change, the mayor-council form of government was more likely to adopt the 311 innovation according to the logistic regression model's results for Hypothesis Three. The model showed a statistically significant relationship and a strong odds ratio result. Karch (2007) identified policy entrepreneurs as one of the three political forces of diffusion. Koski focused on the role of knowledge brokers in his research of policies that are low salience, those where there is public indifference or simply left off the radar screen. These knowledge brokers provided forums to discuss policy innovations, show political leadership, and act as a dedicated political life-support system for ideas that might otherwise be forgotten. Individual decision makers may sometimes

be knowledge brokers and interact within subnational governments to adopt or reject policies which may not be on the government's radar screen. Once an innovation has been established successfully by several early adopters, "organizations that have not adopted an innovation can have a 'fear of appearing different from many adopters' which may cause an institutional 'bandwagon effect.' The more adopters there are, the more legitimacy for the innovation grows as well as the consequent pressure on non-adopters (Jenson, 2003, p. 523)."

David Eichenthal of the Ochs Center stated that it was "those cities with the strongest political leadership" and strong executive sponsorship of the 311 innovation that were more likely to adopt the 311 number (J. O'Byrne, personal communication, July 22, 2011). Chicago Mayor Daley and Baltimore Mayor O'Malley played significant roles as policy entrepreneurs by promoting the 311 innovation as a "one-stop" customer service number and as a performance management tool. Their collective efforts to promote the innovation for practical purposes beyond its original intent helped the innovation reach critical mass in 2003, a self-sustaining rate of adoption for years to come. Their promotional efforts included hosting other cities' delegations, sending staff around the country, attending numerous speaking engagements, and publishing or being the subject of numerous publications of national scope.

Chicago Mayor Daley overcame departmental reluctance to implement 311 and expand its role beyond non-emergency calls because he enjoyed strong citizen approval and "public servants could not expect a change in leadership, because since taking office in 1989, the Mayor had strong citizen approval" (Schellong, 2007, p. 85). With internal forces protecting the status quo, change in government is extremely difficult to enact due to the many levels of personnel protection including personnel, civil service and union protection as well as the ability to secure

the necessary funding and contract approvals for the project which require the municipal legislative body's approval.

Spencer Stern of Stern Consulting stated that "after the success of Baltimore and Chicago, people in these cities wanted to talk about it, promote, and be recognized. There was a political success factor. Mayors put a lot of political capital on the line." Although Mayor Daley never ran for higher office, David Eichenthal took this concept one step further stating that in the "early political success of 311" the concept of customer service was politically appealing. He stated that "politicians liked to talk about it" and "mayors have been politically rewarded" including Mayor O'Malley becoming Governor of Maryland, Mayor Newsom becoming Lt. Governor of California, Chattanooga Mayor Bob Corker becoming a U.S. Senator, and Denver Mayor John Hickenlooper became Governor of Colorado. These ambitious politicians used their time in office to show their constituents, the people of their state, and the nation through various medium that they are leaders who can shake up the status quo of government and can get things done.

Hypothesis Four was related to high property damage from natural disaster and was not a significant finding and the odds ratio was inconclusive according to the logistic regression model. It is clear that 311 centers can play a beneficial role in disaster preparedness and recovery from disasters such as for hurricanes in the southeastern United States, but the model results lead us to believe that this aspect was generally not a significant reason to adopt the 311 innovation. According to an article in American City & County entitled "Rescuing 911: 311 Services Proves Invaluable in Emergencies" (Phelan, August 1, 2009) the roles of 311 centers in connecting with citizens before, during, and after disasters "took time to develop and strong leaders to carve out the relationships and processes that make 311 services most effective in

those functions. The lessons they have learned about cooperation, planning, and recovery are paving the way for an expanded 311 role in emergency response" (Phelan, 2009).

The changing role of the policy entrepreneur functions from politicians to administrators and the evolution of the 311 innovation was the subject of Hypothesis Five. Not being an appropriate variable for the logistic regression model, the case studies and narrative were the primary means for addressing this hypothesis.

The adoption case studies of Pittsburgh and Minneapolis showed a pattern of mayors initially acting as strong leaders and policy entrepreneurs with the decision-making authority to adopt and promote the 311 innovation before passing the baton to internal administrators for installation and eventual evolution. During implementation lower level decisions were then made by administrators who worked as policy entrepreneurs within a collective decision-making process, thereby demonstrating the changing role of policy entrepreneurs for the innovation. This evolutionary process of improving government-to-citizen communications started with the mayor and his external relations, then implemented by internal departments and modified to meet their needs and that of their particular constituents. Call center directors believed that there was a shift in citizens' behavior to becoming more likes sensors in the community and having a greater propensity for electronic interaction. This change in behavior necessitated the need for the government to adapt its G2C communications strategy beyond the traditional neighborhood relations approach.

Although the pattern of the mayor demonstrating strong political leadership as a policy entrepreneur was the case in Pittsburgh and Minneapolis, this was not the case in the more decentralized decision making structure of St. Louis. This evidence supports the importance of a strong mayor to provide the political leadership to adopt and implement a non-mandated policy.

All three case study cities' IT departments viewed their role as following the mayor's lead and then implementing the mayor's vision. However, as an internal service department they took initiatives on behalf of departments requesting better communication methods to connect with their clients or constituents. The IT departments' representatives stated that their CIOs were not major policy entrepreneurs, but their actions spoke otherwise. All of the call center directors and CIOs acted as policy entrepreneurs to address new internal and external communication issues and improved government efficiency and effectiveness through a continuous re-engineering process.

8.1.2 Rogers' Variables for Determining the Rate of Adoption

Rogers (2003) uses the term Acceptability Research to describe the process of explaining the rate of adoption by generalizing the attributes, relative advantage, or compatibility derived from research and used to predict the rate of adoption in the future. Its purpose was to identify a basis for positioning an innovation so that it will be more acceptable, thereby increasing the speed of adoption. Exact measurement of the rate of adoption is beyond the scope of this study. However, this process can help identify the catalysts for the spread of G2C technology in local government which could be used to speed the rate of adoption for the introduction of new government technology innovations. In the summaries for Chapters 3 through 6 which consisted of the narrative, logistic regression model, and case studies adoption the results were viewed through the lens of Rogers' (2003) Variables Determining the Rate of Adoption of Innovations set forth in Figure 2. By comparing the results of each chapter with the five variable types (defined in Chapter 2) that determine the rate of adoption, this process attempted to generate consistent findings across research approaches while remaining within the context of Diffusion of Innovation theory.

In Chapter 3 the 311 innovation had a significant *relative advantage* over 'blue pages roulette', *compatibility* with most existing systems, low *complexity, trialability* on a limited basis and the o*bservability* of results.

Chapter 4 stated that utilizing the 311 number to offload non-emergency calls due to high 911 call volume related to a city's violent crime rate would provide a *relative advantage* for adoption. The *type of innovation decision* for big city mayors was both *optional* (non-mandated low salience policy) and required the necessary *authority* to implement thereby making the mayoral form of government more likely to adopt the 311 innovation.

The adopter city case studies in Chapter 5 showed a distinct relationship between mayors as policy entrepreneurs acting as strong leaders with the *decision-making authority* to enact the 311 innovation and promote it through *mass media channels*. The mayors then passed the implementation and lower level decisions to internal departments who worked as policy entrepreneurs through a *collective decision-making* process. The changing policy entrepreneur roles reflected a different *means of communication (mass media vs. interpersonal)* and an *internal communication structure* and *norms of behavior* for how information is disseminated internally and the established patterns of behavior within the government.

Both Pittsburgh and Minneapolis reiterated the *relative advantage, compatibility,* and *observable* results of the 311 innovation. For the future, both cities' representatives discussed the increasing *complexity* of integration and the rapid pace of technological change as a potential barrier. As other cities learn from their experience regarding this higher level of *complexity* of the 311 innovation as a technology cluster, the question of its diminished *relative advantage* may affect the rate of adoption.

In the non-adopter case study of St. Louis in Chapter 6, their use of a 7-digit customer service number for over 25 years negated the need to adopt the 311 number thereby diminishing the *relative advantage* of adopting the 311 number. The *norms of the social structure* for St. Louis and Pittsburgh may have been hampered by negative fiscal conditions resulting in the lack of available capital funds for system upgrades while Minneapolis was able to make a substantial investment in new technology infrastructure.

The St. Louis Mayor's communication staff played a role of appealing directly to citizens through mass media and social media *communication channels*. The Mayor had a good rapport with the department directors for the dissemination of information and *norms of behavior*, so a "heavy hand" was not needed. However, the ability to have a citywide coordinated message was a challenge. The St. Louis Mayor and cabinet level department heads were said to be in sync regarding the need for open government and mass communication with citizens. Departments were very much on their own for what communication tools they wished to use such as the Streets Department use of Twitter. With citizen communication decisions made on the operating department level, the process may be considered *collective decision-making* or even *optional* by individual departments. This decentralized process is in contrast to the more centralized *authority* process of Pittsburgh and Minneapolis. This approach calls into question whether St. Louis has a strong mayor form of government and if the mayor acts in the role of policy entrepreneur on a city-wide scale for G2C communication initiatives. If not, then his role as policy entrepreneur would not be transferred internally as stated in Hypothesis Five. In 1985, then Mayor Schoemehl acted as a policy entrepreneur by creating a centralized call center, so the *norms of behavior* for St. Louis politics and the internal social structure may have changed since that period.

Ms. Bowlin affirmed that St. Louis has a weaker form of mayor-council government which gave the mayor less authority than the *collective consensus* in regards to implementing technology initiatives on a citywide basis. She also sees *changing patterns of communication* between the city and citizens, especially with the young. This could be indicative of the changing *norms of behavior* of citizens' *communication methods* and *channels* which the city was adapting to in its own unique way.

All three case study cities discussed the increasing *complexity* of integration and the rapid pace of technological change. Also, as their citizens' *communication channels* change over time the cities need to keep pace with and adopt new communication technology. Ms. Riordan's statement that "sometimes we all don't stay on message" is indicative of the *nature of behaviors within the social structure* and their *internal collective decision-making process* which is much different than that of Pittsburgh and Minneapolis. The theme of the future *compatibility* and *complexity* of implementing new technology in an environment of rapidly changing communication demographics resonates amongst all three cities.

8.1.3 Karch's Political Forces

The political forces of the national government, national organizations, and policy entrepreneurs played major roles in the adoption, diffusion, and evolution of the 311 innovation. The national government met its objective of providing a voluntary mechanism to reduce call volume to 911 centers, improve emergency response, and support community-policing quality of life initiatives. Later under President Obama, the federal government supported the 311 innovation as a technology cluster by appointing former Washington, DC CIO Vivek Kundra as the first federal Chief Technology Officer charged with developing innovative programs modeled after local initiatives like the Apps for Democracy.

Brann is certain that if President Clinton had not set the wheels in motion for an N-1-1 government non-emergency number at the time, the FCC would have sold the rights to N-1-1 numbers to the private sector for business purposes. The FCC had federal jurisdiction and reserved authority over the remaining eight 3-digit N-1-1 telephone numbers since 1992 (Cohen, 2007). Brann also observed that the FCC's ultimate decision to decentralize the decision making process to state PUCs was critical to provide "greater latitude and innovation" to enable local governments to adopt the number to local needs and intentions. This same decision has had the adverse impact of making it difficult for researchers to study the 311 phenomena (J. O'Byrne, personal communication, August 13, 2011).

Local government-based national organizations including ICMA, GFOA, CDG, and PTI promoted the 311 innovation as a technology cluster with its linkage to CRM systems in order to encourage local government efficiency, effectiveness, and customer service. Academic institutions, foundations, and think tanks were other national organizations that provided forums, issued publications and, in the case Bloomberg Philanthropies, provided financial incentives to create 311 citizen service centers.

Chicago Mayor Daley and Baltimore Mayor O'Malley played significant roles as policy entrepreneurs by promoting the 311 innovation as a "one-stop" customer service number and as a performance management tool. Their collective efforts to promote the innovation for practical purposes beyond its original intent included hosting city delegations, sending staff to their cities around the country, attending numerous speaking engagements, publishing or being the subject of numerous publications of national scope, and helping the innovation reach critical mass in 2003, a self-sustaining rate of adoption for years to come. Former DC CIO Kundra and the Gang of 7 big city CIOs also played roles as administrative policy entrepreneurs by promoting Open

311 connectivity and the civic stack of free software. Open 311 activist Phil Ashtock was also a policy entrepreneur when he used his blog to create a network to promote the open data initiative that was championed by the Gang of 7.

In the review of PTI's 2010 Citizen-Engaged Communities award winners all 4 cities were continuously monitoring communication channels to identify examples of "cutting edge" best practices from other cities that were acting as policy entrepreneurs (Karch, 2007). The mayors of the three larger cities were policy entrepreneurs, but Hampton's City Manager also acted as a strong policy entrepreneur consistent with their local tradition of government experimentation and citizen participation.

One additional force which could be termed a quasi-political fourth force are the technology companies that assisted their client *Opinion Leaders* to promote the innovation such as Motorola with Mayor Daley and Lagan (now Kana) with San Francisco Mayor Newsom. These companies created networks of government employee users to act as referrals for their project and with each other for the reinvention and evolution of the product for ongoing upgrades.

8.1.4 The Research Question

The research question was divided into three parts: what factors contributed to the adoption of 311 by American cities with populations over 100,000; how did the innovation diffuse and evolve over time, and; why did some governments' communications with citizens became more advanced than others? The question was designed to enable the researcher to examine the 311 innovation as a proxy for positioning future G2C innovations for a rapid rate of adoption.

The findings from the hypotheses, Rogers' Variables for Determining the Rate of Adoption, and Karch's Political Forces will now be addressed related to each of the research question's components.

8.1.4.1 What Factors Contributed to the Adoption of 311

In the hypotheses, the logistic regression model showed a statistically significant relationship between the adoption of 311 and the variables of population, high violent crime rate, and the mayor-council form of government, although the odds ratio results were inconclusive for population and high crime rate. Hypothesis One proposed that the higher the population, the greater the city government's benefit from consolidation and efficiencies by adopting the 311 number. Research related to this hypothesis found that the entrepreneurial approach of doing more with less due to pressures from the taxpaying public was a catalyst for enacting innovations that provided more service at less cost. Hypothesis Two conjectured that the higher the 911 call volume related to a city's high violent crime rate, the more likely a city government was to adopt the 311 number in order to offload non-emergency calls. Both mayors and department heads acting as policy entrepreneurs tried to address difficult problems such as rampant crime or severe budget constraints with technological solutions. Hypothesis Three focused on the mayor-council form of government and how strong political leadership can be a major factor in overcoming the obstacles to adopt the non-mandated 311 number. Mayors are motivated to solve major problems, satisfy their electorate, and potentially enhance their prospects for reelection and ambitions for higher office. The real significance as opposed to the statistical significance of this hypothesis is that a mayor's unique individual authority as compared to city manager and the commission form of governments allows them to more easily overcome local obstacles to non-mandated low salience policies.

In Rogers Variables for Determining the Rate of Adoption, the Perceived Attributes of Innovations that were most common in the results were *relative advantage, compatibility,* and *complexity*. The 311 innovation was perceived as better than the idea it superseded, was consistent with existing values, past experiences, and needs of the cities, and the innovation initially was not difficult to understand and use. However, it should be noted that the growing complexity and cost for implementing a fully integrated citizen service center as it has evolved to date has become more of an impediment to adopting the 311 innovation. The Type of Innovation Decision process that was most effective was the *authority* when a powerful mayor makes the decision although there were instances when a *collective decision making* process was effective (i.e. St. Louis, MO and Hampton, VA). The Communication Channel that was most effective for this innovation was *mass media* given that this innovation was implemented in the public realm. The Nature of the Social System's problem-solving capabilities were sometimes strongly influenced by the local patterns for the *norms of behavior* both internally and externally. And finally, the Extent of Change Agents' Promotion Effects was extremely important when the mayor acted as a policy entrepreneur to actively endorse the adoption of the 311 innovation.

Related to Karch's political forces, the national government, national organizations and policy entrepreneurs all played a major role in the adoption and diffusion of the 311 innovation. After Dallas and Santa Ana were thwarted at the local level by their respective state public utility commissions (PUCs) in Texas and California, President Clinton and COPS Office Director Brann helped pave the way for the FCC to set aside the 311 number for non-emergency calls to local governments as approved by their state PUCs. Local government-based national organizations including ICMA, GFOA, CDG, and PTI promoted the 311 innovation as a technology cluster with its linkage to CRM systems in order to encourage local government

efficiency, effectiveness, and customer service. Academic institutions, foundations, and think tanks provided forums, issued publications and, in the case Bloomberg Philanthropies, provided financial incentives to create 311 citizen service centers. Policy entrepreneurs like Chicago Mayor Daley and Baltimore Mayor O'Malley played important roles by promoting the 311 innovation as a "one-stop" customer service number and as a performance management tool.

A quasi-political fourth force created networks of government employee internal users to act as referrals for their project and work with each other to reinvention and help in the evolution of the product for ongoing upgrades.

8.1.4.2 How Did the Innovation Diffuse and Evolve Over Time

The federal government met its initial objective of providing a voluntary mechanism to reduce call volume to 911 centers, improve emergency response, and support community-policing quality of life initiatives in 1996. Later under President Obama, the federal government supported many innovative initiatives at the local level.

Once again, Chicago Mayor Daley and Baltimore Mayor O'Malley promoted the 311 innovation as a "one-stop" customer service number and as a performance management tool. Former DC CIO Kundra and the Gang of 7 big city CIOs also played roles as administrative policy entrepreneurs by promoting Open 311 connectivity and the civic stack of free software. Although the IT departments' representatives continued to reinforce that their CIO were not major policy entrepreneurs in the case study interviews, their actions spoke otherwise. Open 311 activist Phil Ashtock was also a Policy Entrepreneur when he used his blog to create a network to promote the open data initiative that was championed by the Gang of 7.

Local government-based national organizations promoted the 311 innovation as a technology cluster with its linkage to CRM systems in order to promote local government efficiency, effectiveness, and customer service.

Early adopters like Baltimore and Chicago set the stage for later adopters. Although these innovators may, in fact, be adopting more ineffective versions of the innovation, laggard governments help improve upon the early versions of the innovation. Reinvention of the innovation demonstrated that late adopters felt free to adapt the policy to suit their individual needs and circumstances. These late adopter cities learned from patient observation (Hays, 1996).

The technology companies as a quasi-political fourth force created networks of government employee users for the reinvention and evolution of the product for ongoing upgrades.

8.1.4.3 Why Did Some Become More Advanced Than Others

As for PTI's Citizen-Engaged Communities award winners, all 4 award winning cities were continuously monitoring communication channels to identify examples of "cutting edge" best practices from other cities. The mayors of the three larger cities and Hampton's City Manager continuously looked for technological solutions to problems had a local tradition of citizen participation. The external environment of the economic downturn had an impact on all the governments' decisions to look for ways to reduce the transaction costs for interacting with government resulting in diversifying communication modes to include the low cost, high exposure methods of interactive websites, social media, and smartphone apps.

The larger governments benefit from economies of scale by consolidating departmental contact centers and which, in turn, provides an opportunity to make technological leaps.

Executive and departmental support as well as having a penchant for technological solutions were key contributors for improvement in G2C communication technology. Having a common vision for citizen access to government and community involvement were two ingredients for citizen engagement success. Finally, the combination of continuous budgets constraints, a vision for greater citizen engagement, and the tendency towards technological solutions had provided an environment for creative solutions involving higher levels of self-service, personalization of information, and G2C collaborative solutions.

The four governments reviewed in Chapter 7 continuously looked for technological solutions to problems regardless of the level of complexity. The external environment of the economic downturn beginning in 2008 had an impact on all the governments' decisions by encouraging them to look for ways to reduce the transaction costs for interacting with government. The result was the diversification of communication modes including the low cost, high public exposure methods of interactive websites, social media, and smartphone apps.

For the six cities examined through the lens of community intelligence platform models the local governments' citizen engagement innovations became best practices for cities around the country to emulate. Philadelphia, Austin, and Miami-Dade County created online marketplaces for community projects, to share ideas with fellow citizens, and lay a role in partnering with the government to improve its quality of life. Washington, DC, Baltimore, and Metro Chicago created means for constructive collaboration with citizen experts for technological innovations with real results.

8.1.5 Catalysts for a More Rapid Rate of Diffusion

In our search for catalysts that would affect the rate of adoption, early on it was the large cities' ability to capitalize on economies of scale, the mayor-council form of government being

used to overcome local resistance to change, and in this case, the catalyst of high 911 call volume which may be more related to this innovation than generalizable to other innovations. The entrepreneurial approach of doing more with less due to pressures from the taxpaying public was a catalyst for enacting innovations that provided more service at less cost. Both mayors and department heads acting as policy entrepreneurs tried to address difficult problems such as rampant crime or severe budget constraints with technological solutions. Mayors were motivated to solve major problems, satisfy their electorate, and potentially enhance their prospects for reelection and ambitions for higher office. A mayor's unique individual authority as compared to city managers and the commission form of government allowed them to more easily overcome local obstacles to non-mandated low salience policies.

In Rogers Variables for Determining the Rate of Adoption, the Perceived Attributes of Innovations that were most common in the results were *relative advantage, compatibility,* and *complexity*. The Type of Innovation Decision process that was most effective was the *authority* when a powerful mayor makes the decision although there were instances when a *collective decision making* process was effective. The Communication Channel that was most effective for this innovation was *mass media* given that this innovation was implemented in the public realm. The Nature of the Social System's problem-solving capabilities were sometimes strongly influenced by the local patterns for the *norms of behavior* both internally and externally. And finally, the Extent of Change Agents' Promotion Effects was extremely important when the mayor acted as a policy entrepreneur to actively endorse the adoption of the 311 innovation.

Related to Karch's political forces, the national government, national organizations and policy entrepreneurs all played a major role in the adoption and diffusion of the 311 innovation. A quasi-political fourth force are the technology companies assisted their client Opinion Leaders

to promote the innovation. These companies were instrumental in the reinvention and evolution of the 311 innovation.

Given the catalysts we have identified with the 311 innovation from 1996 to 2012, what have we learned that could help us position future G2C communication for greater citizen engagement? First of all, the Rogers' (2003) Variables for Determining the Rate of Adoption of Innovation continues to be an appropriate means for viewing how a new technology's attributes may be perceived. The political forces that facilitate diffusion (Karch, 2007) helped to promote the 311 innovation for multiple purposes and was advantageous to its rate of adoption. One area in which I would differ with Rogers related to G2C technology is the attribute of complexity. In this era of government and citizens constantly adapting to change and new technologies, I believe that the norm for the level of complexity has moved beyond the simplicity of a 3-digit number to a tolerance for higher levels of complexity including CRM systems, social media, interactive voice response, and mobile applications. Related to Karch's political forces, the technology vendor should be added as a fourth quasi-political force of when they promote clients as Opinion Leaders and their government's best practices as well as using client employees for the continuous improvement of the product.

More specifically, I would recommend that future G2C innovation that focus on greater citizen engagement be positioned by first securing the endorsement of a high profile city and utilize the promotion capabilities of its mayor. Relatively low market entry cost and promoting the innovation's relative advantage and compatibility will be key considerations. To identify additional early adopters, look for city officials who are innovators and risk takers regardless of their position whether they be mayors, CIOs, call center directors, or department heads. Develop

partnerships with national organizations such as ICMA, NLC, USCM, NACo, CDG, and PTI to promote the innovation at forums and through their communication networks.

8.2 Discussion and Implications

The research of Anthony Downs (1976) focused on one policy adopter and explored the impact of state bureaucracies and their immediate environments on the degree of policy innovation occurring while controlling for socioeconomic variables. In developing his analytical work, Downs was influenced by Mohr's (1969) multiplicative model in which the decision to innovate in organizations is determined by the interaction of motivation and resources. Mohr argued that both factors must be present for the innovation to occur, thereby making them both necessary and sufficient. At the same time, Mohr's model admitted the possibility that a high value on one factor could compensate for a low value on the other. This dissertation research agreed with Downs' analysis that entrepreneurship and leadership in the bureaucracy appear to be one of the most important predictors of innovation while also agreeing with Mohr that the decision to innovate in organizations is determined by the interaction of motivation and resources.

With the present day sentiment of the taxpaying public continuing to expect government to do more with less, politicians and administrators are sometimes motivated by the entrepreneurial spirit and ideological desire to make government more efficient (Denhardt, 2000). Osborne and Gaebler (1992) and others, argued that governments should fundamentally change the way they conduct business by increasing efficiency, effectiveness, flexibility, and the capacity to innovate. These entrepreneurs were urged to innovate with new technologies and ways to deliver service (Kearney, 2005). The 311 innovation was initially used to improve the response time of local emergency vehicles. Later the innovation was incorporated into local

government's prevalent vision of acting more like business within the common entrepreneurial spirit by providing greater accountability, efficiency and effectiveness. The act of continuously improving government response to service requests and tracking results led to an on-going effort for process re-engineering. Higher citizen expectations for service in the face of severe budget constraints led government officials to seek low cost technological solutions with more self-service.

While strong mayors with political ambitions for reelection and higher office was a major theme throughout this research, Hampton, Virginia's manager-council form of government bucked this national trend of big city mayors and high crime rates by being a 311 pioneer in 1999. Hampton City Manager Robert O'Neil and, later, Executive Director of ICMA, acted as a strong policy entrepreneur consistent with their local tradition of government experimentation with technological solutions and citizen participation.

CIOs and 311 directors acted as successful internal policy entrepreneurs with different norms of behavior and internal collective decision making processes. However, it could be argued that City Council members are not good policy entrepreneurs due to the failure of the Pittsburgh's iBurgh app and San Francisco Commissioner Newson not being able to get 311 adopted until he became mayor. These two examples of council members acting as policy entrepreneurs affirm the importance of mayoral executive leadership for implementing a low-salience policy.

There is a trend for more multi-dimensional communication between government and citizens, between citizens, and back from citizens to administrators and elected officials. This communication is within the context of a more informed citizenry with greater access to government databases within local governments experimentation with what is variously known

as the networking of distributed public expertise, citizensourcing, crowdsourcing, wiki government, mass collaboration, and collaborative democracy.

The increasing the complexity of integration and the rapid pace of technological change may becoming a potential barrier for the adoption 311 and the implementation of a full service citizen service center calling into question its relative advantage. As other cities learn from their experience regarding this higher level of complexity for implementing the 311 innovation as a technology cluster, the question of its diminished relative advantage may affect the rate of adoption.

The existence of new citizen-sourcing technologies is no guarantee that they will be used to positively impact society and politics. Although citizen engagement technology exists, the matter of direct involvement of citizens in government by providing new ways for government officials to listen to citizens and to solicit constructive solutions to problems has not made much progress to date. In order to address governments' three major challenges: accountability, management, and legitimacy (Salomon, 2001), the citizens must be able to hold government officials accountable in between elections for their decisions on important matters that have a direct impact on their lives including issues such as land development, transportation needs, allocations to parks and recreation, the levy of taxes and fees, and the allocation of budget resources. The simple act of allowing citizens to educate themselves, collaborate with fellow citizens, and convey their solutions to elected officials and public administrators would require no change in the structure of government and would arguably improve accountability, legitimacy, and management of the people's government. The ultimate question to answer is: can the utilization of citizen-sourcing techniques and processes through technology be demonstrated to reinvigorate the democratic practice of public decision making. It will take a

courageous big city mayor acting as a policy entrepreneur to adopt existing technology for citizen engagement, align themselves with political forces of diffusion related to this topic, and to promote the ultimate success of this noble endeavor similar to what the mayors Richard Daley and Martin O'Malley did for the 311 innovation.

8.3 Limitations

The methodological approach using logistic regression, narrative on the evolution of 311, and case studies necessitated limiting the scope of the research topic to what has transpired up until 2012. In order to balance the need for a comprehensive review of the topic and the desire to develop a manageable research agenda, the future implications of 311 were not examined in greater detail. The narrative was developed from limited academic publications, news articles and interest group reports, given the infancy of this topic and difficulty in obtaining data from decentralized sources. The logistic regression model had a limited choice of application variables that are generalizable for this and other G2C innovations. The interviews were based on recollections, and many of the city officials were not in office during the 311 adoption and their local experiences only allowed guess what really happened. Some of the city officials, especially the mayors' office representatives had limited time available and their answers were sometimes incomplete. No two innovations are the same and the way one innovation's adoption and diffusion transpired can not necessarily be completely extrapolated for a future innovation's rate of adoption. This dissertation was intended to better position future citizen engagement technology for a more rapid rate of adoption, so a more in-depth literature review of citizen engagement practices and technology would have provided additional insights.

8.4 Future Research

American cities are beginning to reshape their relationship with citizens by providing new platforms for communication and harnessing citizen expertise. These cities acting as laboratories of democracy and their policy entrepreneurs' experimentation with G2C communication are fostering a more positive environment for citizen engagement and collaborative democracy. However, their collective efforts remain in relative infancy and have yet to demonstrate widespread change in how American representative government is conducted at the local level. These trends should continue to be monitored and present a rich subject matter for future research, especially as it relates to the capacity for engagement as a result of creating a 311 center.

Bingham (2005) in discussing the Blacksburg Manifesto says that "public administrators have a unique opportunity to become the direct conduit for the public's voice in policy making, implementation, and enforcement by "establishing and maintaining horizontal relationships of authority with [their] fellow citizens, seeking 'power with' rather than 'power over' the citizenry (p. 555)." The use of new G2C communication tools of citizensourcing and collaborative democracy presents public administrators with an opportunity to confront 'wicked' policy problems that would be better addressed by involving citizens in the process. The kinds of problems that "professionals in government were traditionally hired to deal with have in large part been solved – roads are paved, the houses are built, the sewers are connected (albeit not to everyone's satisfaction (Fischer, 1993, p. 172)." The more "malleable problems, the ones that could be attacked with common sense and ingenuity, have in recent decades given way to a different class of problems – problems with no solutions, only temporary and imperfect resolutions. They concern the issues of drug addiction, the development of educational

programs, the homeless, or the siting of incinerators. In contrast to the problems that typically confront the road builder, scientist, or engineer, these problems can best be described as 'wicked'. Their solutions tend to be 'tricky' and run in 'vicious' circles (Fischer, 1993, p. 172)". Fischer (1993) states that "confronted with wicked problems, policy science is plagued by two interpretive difficulties: first, it cannot establish the validity of assessment criteria independently of assessments of the social actors themselves; and second, the uncertainty of the empirical situation itself renders policy science findings open to alternative interpretations (p. 172)". The issue of assessment and effectiveness criteria utilized when involving citizens in public policy processes through various citizen engagement mechanisms is an important matter for any future G2C research.

Future research should include the implications to public administration for the new government positions in cities such as Miami-Dade County's "Idea Specialist" that are used as catalysts, facilitators, and evaluators in a collaborative democracy process. These new types of public administrators may address, according to Bingham's (2005) read of the Blacksburg Manifesto, public administrators' obligation "to sit in the midst of a three-way constitutional conflict in our representative form of governance. Flaws in representation and availing government to citizens' views, talents and expertise may enhance the legitimacy of decision making and improve trust and perceptions of government (p. 555)."

Although 311 centers played a beneficial role in disaster preparedness and recovery from disasters and it not having a significant relationship in the logistic regression model, a geospatial study regarding the adoption and diffusion of the 311 innovation may help ascertain whether proximity and population density within states have been factors in the adoption of the 311 number. Also as identified in the adoption map in Chapter 4, case studies regarding the multiple

adoptions of the 311 innovation in the individual states of California, Florida, Mississippi, Ohio, and Texas as well as the combined Pacific Northwest states of Washington and Oregon would be of interest for further study.

In practical terms Rowe (2004) stated that there is undoubtedly a certain amount of pragmatism involved in endorsing citizen participation, with institutions recognizing that a non-consulted public is often an angry one and that involving the public may be one step toward, in Arnstein's (1969) terminology, their placation. Undoubtedly, some public officials may be more concerned with increasing public confidence in the policy process than truly seeking the views of the public. These government managers may sometimes take on the role of policy entrepreneurs for innovations. As policy entrepreneurs and innovators they have the ability to devise new systems to decentralize decision making authority thereby allowing citizens to hold elected officials more accountable for the policy positions they espouse at their behest. Such government-to-citizen innovations may finally help move American government back towards ideals originally espoused by its founders.

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Appendix A. Logistic Regression Model Data, All Cities and Consolidated Governments over 100,000 (2003)

Governments	Adopt (1=Y)	Mayor (1=Y)	Population	Violent Crime	Damage
New York, NY (includes 5 counties)	1	1	8,098,066	734.1	60
Los Angeles, CA	1	1	3,838,838	1271.8	77
Chicago, IL	1	1	2,898,374	NA	408
Houston, TX	1	1	2,041,081	1175.3	811
Philadelphia, City and County of, PA	1	1	1,495,903	1378.4	52
Phoenix, AZ	0	0	1,403,228	692.8	723
San Diego, CA	0	1	1,272,746	578.7	2270
Dallas, TX	1	0	1,230,302	1370.8	103
San Antonio, TX	1	0	1,212,789	578.7	236
Detroit, MI	1	1	927,766	2018.2	234
San Jose, CA	1	0	909,890	371.3	333
Indianapolis, IN (City portion of Marion County)	0	1	800,167	883.2	132
Jacksonville, FL (consolidated with Duval County)	0	1	776,417	866.7	27
San Francisco, City and County of, CA	1	1	772,065	741.5	38
Columbus, OH	1	1	726,151	855.9	294
Austin, TX	1	0	682,319	462.1	379
Charlotte-Mecklenberg County, NC (City Portion)	1	0	668,003	1076.9	49
Memphis, TN	0	1	653,858	1577.1	141
Baltimore, MD	1	1	644,554	1735.0	13
Milwaukee, WI	0	1	594,269	890.2	329
Boston, MA (City portion of Suffolk County)	0	1	589,795	1216.2	41
Washington, District of Columbia	1	1	563,384	1568.9	24
El Paso, TX	0	1	586,392	597.2	400
Seattle, WA	0	1	576,296	684.4	1012
Denver, City and County of, CO	1	1	565,905	597.2	27
Nashville-Davidson County Metropolitan Government, TN	1	1	554,888	1501.6	1746
Fort Worth, TX	0	0	576,339	650.8	222

Governments	Adopt (1=Y)	Mayor (1=Y)	Population	Violent Crime	Damage
Tucson, AZ	0	0	563,384	1568.9	196
Portland, OR	0	0	545,271	813.5	2
Oklahoma City, OK	0	0	521,681	889.8	905
Las Vegas, NV	0	0	517,017	770.0	93
New Orleans, LA	1	1	475,128	967.3	7018
Long Beach, CA	0	0	477,368	749.7	77
Albuquerque, NM	1	1	468,764	947.0	16
Cleveland, OH	0	1	468,446	1323.5	141
Fresno, CA	0	0	449,898	779.1	77
Kansas City, MO	1	0	445,965	1379.3	210
Sacramento, CA	1	0	439,811	777.6	20
Virginia Beach, VA	1	0	439,454	212.1	35
Mesa, AZ	0	0	436,569	537.4	723
Atlanta, GA	0	1	431,043	1969.6	130
Oakland, CA	0	1	407,003	1379.1	88
Omaha, NE	0	1	401,692	654.0	732
Tulsa, OK	0	1	393,907	1092.6	136
Miami-Dade County, FL (City portion)	1	1	381,651	1875.3	4125
Honolulu, City and County of, HI (City Portion)	0	1	380,149	287.9	113
Minneapolis, MN	1	1	378,602	1193.1	267
Colorado Springs, CO	0	0	374,818	462.4	100
Wichita, KS	0	0	356,123	625.9	490
Santa Ana, CA	0	0	347,016	515.3	278
St. Louis, MO	0	1	340,256	2181.9	1110
Anaheim, CA	1	0	336,132	392.4	278
Arlington, TX	0	0	335,385	524.2	222
Pittsburgh, PA	1	1	335,302	1061.4	137
Cincinnati, OH	0	0	324,297	1127.4	156
Tampa, FL	0	1	320,908	1786.5	1784
Raleigh, NC	0	0	310,157	646.1	134
Toledo, OH	0	0	309,499	1028.1	87
Aurora, CO	0	0	288,830	588.6	196
Buffalo, NY	1	1	288,187	1361.6	107
St. Paul, MN	0	1	286,281	760.8	46
Corpus Christi, TX	0	0	282,850	870.4	122
Newark, NJ	1	1	278,551	980.4	29
Riverside, CA	1	0	277,103	691.4	191
Anchorage, AK	0	1	271,085	643.3	7
Stockton, CA	0	0	265,593	1364.9	8

Governments	Adopt (1=Y)	Mayor (1=Y)	Population	Violent Crime	Damage
Lexington-Fayette Urban County Government, KY	1	1	265,224	468.3	14
Bakersfield, CA	0	0	263,707	574.1	65
St. Petersburg, FL	0	0	253,095	1601.8	178
Louisville-Jefferson Metropolitan Government (City portion), KY	1	1	248,762	795.8	198
Norfolk, VA	0	0	242,077	569.7	63
Birmingham, AL	1	1	240,176	1393.6	1562
Plano, TX	0	0	241,793	293.2	32
Jersey City, NJ	0	1	241,443	1196.1	7
Hialeah, FL	NA	NA	NA	NA	NA
Glendale, AZ	0	0	235,819	538.5	723
Lincoln, NE	0	1	233,721	476.6	133
Greensboro, NC	0	0	230,606	670.8	152
Baton Rouge, LA	1	1	226,391	1254.0	918
Garland, TX	0	0	223,061	329.5	103
Scottsdale, AZ	0	0	220,697	223.4	723
Rochester, NY	1	1	217,527	935.1	84
Madison, WI	0	1	216,441	357.6	178
Akron, OH	1	1	214,622	607.1	321
Henderson, NV	0	0	212,571	230.0	93
Fort Wayne, IN	1	1	211,317	365.3	28
Chesapeake, VA	0	0	209,294	599.6	63
Fremont, CA	0	0	209,026	207.2	88
Chandler, AZ	0	0	206,620	302.0	723
Lubbock, TX	1	0	206,441	1157.7	246
Modesto, CA	0	0	205,691	685.0	2
Montgomery, AL	1	1	202,064	646.8	19
Glendale, CA	0	0	201,522	180.1	77
Richmond, VA	1	1	199,968	1242.2	18
Shreveport, LA	0	1	199,641	1029.8	86
Tacoma, WA	0	0	199,586	1079.2	963
Irving, TX	0	0	199,168	438.3	103
Des Moines, IA	0	0	198,568	352.0	183
Spokane, WA	0	1	198,325	585.4	9
Durham, NC	0	0	197,965	840.0	134
Yonkers, NY	0	1	197,569	444.9	30
Grand Rapids, MI	0	0	197,173	1049.8	80
Reno, NV	0	0	196,171	639.7	774
Chula Vista, CA	0	0	195,954	396.0	2270

Governments	Adopt (1=Y)	Mayor (1=Y)	Population	Violent Crime	Damage
Huntington Beach, CA	0	0	195,832	209.9	278
Mobile, AL	1	1	193,464	613.2	629
Augusta-Richmond County, GA (City portion)	0	1	193,412	NA	6
Orlando, FL	NA	NA	NA	NA	NA
San Bernardino, CA	0	1	193,641	1479.0	1910
Boise City, ID	0	1	193,414	333.5	0
Winston-Salem, NC	0	0	190,912	827.1	205
Columbus Consolidated Government, GA	1	0	188,116	444.9	8
Little Rock, AR	1	0	185,117	1543.9	160
Salt Lake City, UT	0	1	184,022	704.3	255
Newport News, VA	0	0	182,565	688.0	33
Jackson, MS	1	1	181,479	908.4	198
Oxnard, CA	0	0	179,851	449.3	19
Amarillo, TX	0	0	179,762	832.2	47
Laredo, TX	NA	NA	NA	NA	NA
Providence, RI	1	1	176,960	788.3	42
Worcester, MA	0	0	175,115	881.1	47
Knoxville, TN	1	1	174,993	972.6	8
Garden Grove, CA	0	0	169,186	432.7	278
Oceanside, CA	0	0	167,620	650.3	2270
Ontario, CA	0	0	166,796	542.0	1910
Irvine, CA	0	0	163,823	87.9	278
Tempe, AZ	0	0	163,143	620.9	723
Huntsville, AL	0	1	163,052	605.9	34
Dayton, OH	0	0	162,876	1017.3	111
Santa Clarita, CA	0	0	162,238	187.4	77
Overland Park, KS	0	0	158,875	NA	19
Tallahassee, FL	0	0	158,011	893.6	94
Aurora, IL	0	1	157,633	NA	23
Chattanooga, TN	1	0	156,596	1302.7	127
Pomona, CA	0	0	155,166	784.3	77
Santa Rosa, CA	0	0	155,099	643.5	322
Brownsville, TX	0	0	152,764	495.5	90
Fort Lauderdale, FL	NA	NA	NA	NA	NA
Moreno Valley, CA	0	0	152,355	531.7	191
Springfield, MA	1	1	152,048	1896.1	20
Springfield, MO	0	0	151,859	683.5	79
Rockford, IL	0	1	151,703	NA	45
Paterson, NJ	0	1	151,593	818.6	17

Governments	Adopt (1=Y)	Mayor (1=Y)	Population	Violent Crime	Damage
Vancouver, WA	0	0	151,353	424.2	2
Salinas, CA	0	0	150,305	798.4	137
Hampton, VA	1	0	147,777	406.7	8
Pasadena, TX	0	1	147,289	392.4	811
Kansas City-Wynandotte County Unified Government, KS	1	1	146,866	NA	30
Syracuse, NY	0	1	145,411	951.1	142
Rancho Cucamonga, CA	0	0	145,219	212.1	1910
Lakewood, CO	0	0	145,162	347.9	589
Fontana, CA	0	0	145,114	618.1	78
Hayward, CA	0	0	144,215	416.0	88
Torrance, CA	0	0	143,101	280.9	77
Salem, OR	0	0	142,501	360.7	9
Eugene, OR	0	0	141,913	336.8	5
Pasadena, CA	0	0	141,178	495.8	77
Bridgeport, CT	0	1	141,030	968.6	29
Hollywood, FL	NA	NA	NA	NA	NA
Pembroke Pines, FL	NA	NA	NA	NA	NA
North Las Vegas, NV	0	0	140,133	829.9	93
Corona, CA	0	0	139,777	200.3	191
Gilbert, AZ	0	0	138,082	124.6	723
Warren, MI	0	1	138,077	572.9	85
Grand Prairie, TX	0	0	137,407	360.2	103
Escondido, CA	0	0	137,334	430.3	2270
Naperville, IL	0	0	135,958	NA	23
Orange, CA	0	0	132,987	197.0	278
Alexandria, VA	0	0	132,468	306.5	1
Sioux Falls, SD	0	0	131,048	299.1	52
Mesquite, TX	0	0	130,778	354.0	103
Fullerton, CA	0	0	130,194	247.6	278
Sunnyvale, CA	0	0	131,048	131.2	333
Savannah, GA	1	0	129,547	828.3	18
Concord, CA	0	0	126,539	314.5	134
Sterling Heights, MI	0	0	126,517	203.1	85
Peoria, AZ	0	0	126,048	292.0	723
Lancaster, CA	0	0	125,899	1008.7	77
Fort Collins, CO	0	0	125,886	328.1	403
Palmdale, CA	0	0	125,651	732.2	77
Fayetteville, NC	0	0	125,587	979.4	140
Hartford, CT	1	0	125,381	1444.4	16

Governments	Adopt (1=Y)	Mayor (1=Y)	Population	Violent Crime	Damage
New Haven, CT	0	1	124,997	NA	4
Elizabeth, NJ	0	1	123,970	608.2	25
Thousand Oaks, CA	0	1	123,987	162.1	19
Cedar Rapids, IA	0	0	122,819	324.1	7903
Topeka, KS	0	1	122,446	594.5	23
Flint, MI	0	1	122,121	1215.2	46
El Monte, CA	0	0	121,176	602.4	77
Coral Springs, FL	NA	NA	NA	NA	NA
Stamford, CT	0	1	120,642	224.6	29
Vallejo, CA	NA	NA	NA	NA	NA
Evansville, IN	0	1	119,788	1162.9	33
Joliet, IL	0	0	118,920	NA	40
Lansing, MI	0	1	118,937	1025.8	41
Columbia, SC	1	1	118,536	1138.9	6
Simi Valley, CA	0	0	117,785	139.2	79
Waco, TX	0	0	117,549	688.2	20
Abilene, TX	0	0	117,016	441.8	57
Carrollton, TX	0	0	116,897	203.6	103
Inglewood, CA	0	0	116,165	939.2	77
McAllen, TX	0	0	115,647	442.7	36
Ann Arbor, MI	0	0	115,552	258.8	21
Cape Coral, FL	0	0	114,966	271.4	1473
Beaumont, TX	0	0	114,626	916.9	592
Bellevue, WA	0	0	114,056	143.8	1012
Peoria, IL	0	0	113,143	NA	93
Independence, MO	0	0	113,663	666.0	40
West Valley City, UT	0	0	112,945	418.8	255
Springfield, IL	0	1	112,304	NA	45
Amherst, NY	0	0	111,945	107.2	107
Lafayette, LA	0	1	111,612	952.4	488
Costa Mesa, CA	0	0	111,281	273.2	278
Downey, CA	0	0	110,992	455.0	77
Clearwater, FL	0	0	110,296	1053.5	178
Manchester, NH	0	1	109,472	275.0	37
West Covina, CA	0	0	108,824	363.0	77
Waterbury, CT	0	1	108,596	442.9	4
Norwalk, CA	0	0	107,197	643.7	77
South Bend, IN	0	1	107,191	716.5	12
Provo, UT	0	1	106,769	110.5	25
Clarksville, TN	0	1	106,710	641.0	109
Allentown, PA	0	1	106,366	602.6	33

Governments	Adopt (1=Y)	Mayor (1=Y)	Population	Violent Crime	Damage
Lowell, MA	0	0	104,995	824.8	83
Berkeley, CA	1	0	104,727	884.2	88
San Buenaventura (Ventura), CA	0	0	104,706	249.3	19
Westminster, CO	0	0	104,614	NA	196
Pueblo, CO	0	0	104,424	782.4	166
Athens-Clarke County, GA (City portion)	0	0	104,313	371.0	3
Burbank, CA	0	0	103,993	272.1	77
Richmond, CA	0	0	103,629	1040.2	134
Arvada, CO	0	1	103,191	172.5	196
Daly City, CA	0	0	102,970	334.1	176
Santa Clara, CA	0	0	102,936	245.8	333
Erie, PA	0	1	102,373	436.6	74
Green Bay, WI	0	1	102,095	448.6	1
Fairfield, CA	NA	NA	NA	NA	NA
Cambridge, MA	0	0	101,896	503.5	83
Olathe, KS	0	0	101,698	NA	19
Portsmouth, VA	0	0	101,060	892.5	6
Antioch, CA	0	0	100,918	707.5	134
Port St. Lucie, FL	0	0	100,342	280.0	1152

Sources: FBI, Uniform Crime Reports as prepared by the National Archive of Criminal Justice Data Sources.
Date of download: Dec 27 2012, UCR Data Online, http://www.ucrdatatool.gov/

Appendix B. Change Agents Interview Questionnaire, IRB # 11-366

1. Please describe the nature of your organizations role and its intentions in the spread of the 311 innovation?

2. What other organizations and/or individuals do you feel were the most influential?

3. What were some the factors that enabled the spread of 311?

4. …provided barriers to the spread of 311?

5. What were some of the characteristics of early adopters?

6. …followers?

7. What additional communication technologies which were incorporated into 311 centers do you feel are the most important? Why?

8. Where do you feel 311 centers which have now incorporated multiple channels for communications are headed in the future?

9. What sources of information related to 311 centers are available?

The participants included the following:

1. Cory Fleming, Senior Project Manager, ICMA
2. David Eichenthal, President & CEO, The Ochs Center for Metropolitan Studies,
3. Dr. Alexander Schellong, Fellow, National Center for Digital Government, University of Massachusetts, Amherst.
4. Spencer Stern, President, Stern Consulting
5. Dr. Debra Cohen, Senior Science Analyst, COPS Office, US Department of Justice
6. Dr. Ted Greenwood, Program Officer, Sloan Foundation
7. Dr. Tony J. Carrizales, Associate Director E-Governance Institute, Marist College
8. Dr. Robert Shick, Associate Professor, Rutgers School of Public Affairs and Administration.
9. Joseph Brann, Former Director, COPS Office, US Department of Justice.
10. Steve Carter, Product Manager, Kana (formerly Lagan Technologies, Ltd)
11. Phil Ashtock, Director, Open Plans
12. Eva Liggins, President of the 311 Synergy Group and Assistant Director of Dallas 311.

Appendix C. Case Study Questionnaire, IRB # 12-023

Baseline

1. How does government-to-citizen (G2C) communications fit into your government's and your department's mission?

2. Please describe the nature of you department's role in G2C communications?

Diffusion

3. What were the catalysts for your government adopting the 311 number? (Non-adopter: As an innovative city with advanced G2C communications, what were the reasons for your government not adopting the 311 number?)

4. What other organizations (including other governments) or individuals were influential in your government's adoption of the 311 number (Non-adopter, skip to #5)?

Evolution

5. Please describe how your government's G2C communications have changed over time.

6. What technologies that your government incorporated do you feel were the most important during different time periods, and why?

7. Please tell me which technologies your government has adopted, when, and what were the catalysts for proposing and implementing each technology, and why? (*List of common G2C technologies will be provided as attachment)*

Policy Entrepreneurs

8. What positions were most influential in shaping your government's G2C communications at different times?

9. Who determines (and by what criteria) which G2C tools to implement and why?

10. Have you observed any shift in influence to other positions for G2C communications within your government over time or has the formal or informal authority remained constant?

Integration, Citizen Engagement, and Future Initiatives

11. Given the rapid expansion in the use of G2C technology and social media has your government experienced any difficulties in their internal integration?

12. What type of G2C citizensourcing and/or citizen apps initiatives has your government implemented or may implement in the near future?

13. How does your government monitor and assess how the public may be participating in your G2C initiatives?

14. How do you determine success or failure?

15. Where do you see G2C communications headed in for your city and for cities across the United States in the near future?

Appendix D. PTI Citizen Engaged Communities Interview Questionnaire, IRB # 11-326

1. What were your government's reasons for seeking the PTI Citizen-Engaged Community designation?
2. Who were the individual drivers for the creation and evolution of your 311 center and what were their motivations?
3. What are the aspects of your government that led your 311 center to develop such a comprehensive system?
4. What are the aspects of your community that led your 311 center to develop such a comprehensive system?

In reviewing the four selection criteria, what were your motivations for development in these areas and do you have any plans for expansion in the near future?

5. Citizen Participation Processes
6. Integrated Communication Channels
7. Integrated Technology
8. Performance Reporting
9. Did any organizations influence the adoption, adaptation and advancement of your 311 center?
10. Did any other local governments influence the adoption, adaptation and advancement of your 311 center?