

A Comparative E-Government Analysis of New Jersey's 10 Largest Municipalities

Marc Holzer, Ph.D.
Professor and Chair,
Graduate Department of Public Administration
And
Director,
National Center for Public Productivity

James Melitski, Ph.D.
Director,
E-Governance Institute
and
Associate Director,
National Center for Public Productivity

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All responsibility for the contents of this paper resides with the authors.



The National Center for Public Productivity
7th Floor Hill Hall · 360 King Blvd Newark, NJ · 07102-1801
phone: (973) 353-5093 ext. 23 fax: (973)353-5907

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Prepared by:

National Center for Public Productivity
Graduate Department of Public Administration
Rutgers University—Campus at Newark

Marc Holzer, Ph.D.
Professor and Chair,
Graduate Department of
Public Administration
and
Director, National Center
for Public Productivity
e-mail: mholzer@andromeda.rutgers.edu

James Melitski, Ph.D.
Director, E-Governance Institute
and
Associate Director,
National Center for
Public Productivity
e-mail: jmelitsk@rci.rutgers.edu

Research assistance provided by: Chan-Gon Kim & Lung-Teng Hu

Prepared for:
The Cornwall Center for Metropolitan Studies
Rutgers University—Campus at Newark
47 Bleeker St., Newark, NJ 07102
Phone: 973-353-1750 Fax: 973-353-1753
Web: <http://www.cornwall.rutgers.edu/>

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Introduction

New Jersey is one of the most technologically advanced states in the U.S., and its residents are among the most technology savvy in the country. In a 2000 profile of citizen Internet use in New Jersey, the Eagleton Institute (2000) found that 80% of New Jersey residents have access to the Internet. In addition, the Eagleton study reported that, when given examples of state e-government services, 83% of those surveyed recalled having contact with state government over the Internet. Furthermore, the need for increased e-government is illustrated by the high percentage of New Jersey residents (76%) that support giving residents the option of using the Internet to obtain government services.

Clearly, there is a demand for e-government services in New Jersey, and state government has responded by becoming an innovator in the provision of services online. A 2002 study by the Taubman Center at Brown University ranks New Jersey second in the nation, behind only Tennessee, for the provision of e-government services at the state level. While New Jersey's ranking for providing state services on the Internet is consistently among the best in the country, the state's local government capabilities have lagged behind.

In 2001, Kaylor (2001) performed an analysis of local e-government services by analyzing U.S. cities with populations between 200,000 and 300,000. New Jersey's two largest cities, Newark and Jersey City, ranked 41st and 43rd respectively out of 50 cities. Our research views this disconnect between state and local services – between New Jersey as 2nd among states versus Newark and Jersey City as 41st/43rd among cities of similar size -- as a critical need to be addressed by the states' urban centers. To address that gap in state-local e-government capabilities, this research assesses the services provided by New Jersey's largest municipalities online, and suggests a blueprint for improvement.

Our research also serves as a benchmark for measuring future improvement. The first section of this report discusses the methodology used in the research, and the second section discusses areas in which each municipality was evaluated. The third section discusses findings with regard to how New Jersey municipalities performed in our evaluation. The fourth and final section makes recommendations as to how local governments might improve their e-government capabilities in the future.

SECTION 1. METHODOLOGY

This research examines and compares the e-government capabilities of the ten largest municipalities in New Jersey. The rationale for selecting the largest municipalities stems from the e-government literature, which suggests a positive relationship between population and e-government capacity at the local level (Moon, 2002; Moon and deLeon, 2001; Musso, et. al., 2000; Weare, et. al. 1999). Accordingly, this study selected the following ten New Jersey municipalities (in descending order of size) based on their population in the 2000 U.S. Census: Newark, Jersey City, Paterson, Elizabeth, Edison, Woodbridge, Dover, Hamilton, Trenton, and Camden.

Similar to other approaches evaluating e-government applications at the federal, state and local levels, our research examines local government services using an e-government model of increasingly sophisticated e-government services. Over the past several years, researchers have used different continua for evaluating e-government services, and in 2002 Moon developed a framework for categorizing e-government models based on the following components: information dissemination, two-way communication, services, integration, and political participation. Our methodology for evaluating e-government services includes such components; however, we have added an additional factor, security.

That additional e-government factor was grounded in recent calls for increased security, particularly of our public information infrastructure. Concern over the security of the information systems underlying government applications has led some researchers to the conclusion that e-government must be built on a secure infrastructure that respects the privacy of its users (Kaylor, 2001).

Our instrument for evaluating city and municipal websites in New Jersey consists of five components: 1. Security and Privacy; 2. Usability; 3. Content; 4. Services; and 5. Citizen Participation. Previous e-government research varies in the use of scales to evaluate government websites. For example, one researcher uses an index consisting of 25 dichotomous (yes or no) measures (West, 2000; West 2001); other assessments use a similar four-point scale (Kaylor, 2001) for assessing each measure.

Table 1 (below) summarizes the measures used in our research to assess a website's capabilities in each of the five categories. For each of those five components, our research applies 12 to 24 measures, and each measure was coded on a four-point scale (0, 1, 2, 3; see Table 2 below). Furthermore, in developing an overall score for each municipality we have equally weighted each of the five categories so as not to skew the research in favor of a particular category (regardless of the number of questions in each category).

Table 1. E-Government Measures

E-government Category	Number of Key Concepts	Potential Raw Score	Potential Weighted Score	Keywords
Security/ Privacy	21	32	20	Privacy policies, authentication, encryption, data management, and use of cookies
Usability	25	36	20	User-friendly design, branding, length of homepage, targeted audience links or channels, and site search capabilities
Content	22	56	20	Access to current accurate information, public documents, reports, publications, and multimedia materials
Service	20	58	20	Transactional services involving purchase or register, interaction between citizens, businesses and government
Citizen Participation	12	36	20	Online civic engagement, internet based policy deliberation, and citizen based performance measurement
Total	100	218	100	

Our research instrument goes well beyond previous research (West 2001 and Kaylor 2001), utilizing 100 measures, of which 49 were dichotomous. The remaining 51 measures were scored according to the scale in Table 2, below. The dichotomous measures in the “service” and “citizen participation” categories correspond with values on our four point scale of “0” or “3”; dichotomous measures in “security/privacy” or “usability” correspond to ratings of “0” or “1” on our four point scale.

Table 2. E-Government Scale

Scale	
0	Information about a given topic does not exist on the website
1	Information about a given topic exists on the website (including links to other information and e-mail addresses)
2	Downloadable items are available on the website (forms, audio, video, and other one-way transactions, popup boxes)
3	Services, transactions, or interactions can take place completely online (credit card transactions, apply for permits, searchable databases, use of cookies, digital signatures, restricted access)

That is, our instrument placed a higher value on some dichotomous measures, due to the relative value of the different e-government services being evaluated. For example, evaluators using our instrument in the “service” category were given the option of scoring websites as either a “0” or “3” when assessing whether a site allowed users to access private information online (e.g. educational records, medical records, point total of driving violation, lost property). “No access” equated to a rating of “0.” Allowing residents or employees to access private information online was a higher order task that required more technical competence, and was clearly an online service, or “3,” as defined in Table 2.

On the other hand, when assessing a site as to whether or not it had a privacy statement or policy, evaluators were given the choices of scoring the site as “0” or “1.” The presence or absence of a security policy was clearly a content issue that emphasized placing information online, and corresponded with a value of “1” on the scale outlined in Table 2. The differential values assigned to dichotomous categories were useful in comparing the different components of municipal websites with one another.

To ensure reliability, each municipal website was assessed by two evaluators, and in cases where significant variation (+ or – 10%) existed on the raw score between evaluators, websites were analyzed a third time. Furthermore, an example for each measure indicated how to score the variable. Evaluators were also given comprehensive written instructions for assessing websites.

SECTION 2. DEFINITIONS OF MEASURES

This section details the five e-government categories and discusses specific measures that were used to evaluate websites. The discussion of security and privacy examines privacy policies and issues related to authentication. Discussion of the usability category involves traditional web pages, forms and search tools. The content category is addressed in terms of access to contact information, access to public documents and disability access, as well as access to multimedia and time sensitive information. The section on services examines interactive services, services that allow users to purchase or pay for services, and the ability of users to apply or register for municipal events or services online. Finally, the measures for citizen participation involve examining how local governments are engaging citizens and providing mechanisms for citizens to participate in government online.

Security and Privacy

The first part of our analysis examined the security and privacy of municipal websites in two key areas, privacy policies and authentication of users. In examining municipal privacy policies, we determined whether such a policy was available on every page that accepted data, and whether or not the word “privacy” was used in the link to such a statement. In addition, we

looked for privacy policies on every page that required or accepted data. We were also interested in determining if privacy policies identified the agencies collecting the information, and whether the policy identified exactly what data was being collected on the site.

Our analysis checked to see if the intended use of the data was explicitly stated on the website. The analysis examined whether the privacy policy addressed the use or sale of data collected on the website by outside or third party organizations. Our research also determined if there was an option to decline the disclosure of personal information to third parties¹. This included other municipal agencies, other state and local government offices, or businesses in the private sector. Furthermore, we examined privacy policies to determine if third party agencies or organizations were governed by the same privacy policies as the municipal website. We also determined whether users had the ability to review personal data records and contest inaccurate or complete information.

In examining factors affecting the security and privacy of local government websites, we addressed managerial measures that limit access of data and assure that was not used for unauthorized purposes. The use of encryption in the transmission of data, as well as the storage of personal information on secure servers, was also examined. We also determined if websites used digital signatures to authenticate users. In assessing how or whether municipalities used their websites to authenticate users, we examined whether public or private information was accessible through a restricted area that required a password and/or registration.

A growing e-government trend at the local level is for municipalities to offer their website users access to public, and in some cases private, information online. Other research has

¹ The New York City privacy policy (www.nyc.gov/privacy) defines third parties as follows: “third parties are computers, computer networks, ISPs, or application service providers ("ASPs") that are non-governmental in nature and have direct control of what information is automatically gathered, whether cookies are used, and how voluntarily provided information is used.”

discussed the governance issues associated with sites that choose to charge citizens for access to public information (West, 2001). We add our own concern about the impact of the digital divide if public records are available only through the Internet or if municipalities insist on charging a fee for access to public records. Our analysis specifically addresses online access to public databases, by determining if public information such as property tax assessments or private information like court documents is available to users of municipal websites. In addition, there are concerns that public agencies will use their websites to monitor citizens or create profiles based on the information they access online. For example, many websites use “cookies” or “web beacons”² to customize their websites for users, but the technology can also be used to monitor Internet habits and profile visitors of websites. Our analysis examined municipal privacy policies to determine if they addressed the use of cookies or web beacons.

Usability

This research also examined the usability of municipal websites. Simply stated, we wanted to know if sites were “user-friendly.” To address usability concerns we adapted several best practices and measures from other public and private sector research (Giga, 2000). Our analysis of usability examined three types of websites: traditional web pages, forms, and search tools.

To evaluate traditional web pages written using hypertext markup language (html), we examined issues such as branding and structure (e.g. consistent color, font, graphics, page length

² The New York City privacy policy (www.nyc.gov/privacy) gives the following definitions of cookies and web bugs or beacons: “Persistent cookies are cookie files that remain upon a user's hard drive until affirmatively removed, or until expired as provided for by a pre-set expiration date. Temporary or "Session Cookies" are cookie files that last or are valid only during an active communications connection, measured from beginning to end, between computer or applications (or some combination thereof) over a network. A web bug (or beacon) is a clear, camouflaged or otherwise invisible graphics image format ("GIF") file placed upon a web page or in hyper text markup language ("HTML") e-mail and used to monitor who is reading a web page or the relevant email. Web bugs can also be used for other monitoring purposes such a profiling of the affected party.

etc.). For example, we looked to see if all pages used consistent color, formatting, “default colors” (e.g. blue links and purple visited links) and underlined text to indicate links. Other items examined included whether system hardware and software requirements were clearly stated on the website.

In addition, our research examined each municipality’s homepage to determine if it was too long (two or more screen lengths) or if alternative versions of long documents, such as .pdf or .doc files, were available. The use of targeted audience links or “channels” to customize the website for specific groups such as citizens, businesses, or other public agencies was also examined. We looked for the consistent use of navigation bars and links to the homepage on every page. The availability of a “sitemap” or hyperlinked outline of the entire website was examined. Our assessment also examined whether duplicated link names connect to the same content.

Our research also examined online forms to determine their usability in submitting data or conducting searches of municipal websites. We examined issues such as whether field labels aligned appropriately with field, whether fields were accessible by keystrokes (e.g. tabs), or whether the cursor was automatically placed in the first field. We also examined whether required fields were noted explicitly, and whether the tab order of fields was logical. For example, after a user filled out their first name and pressed the “tab” key, did the cursor automatically go to the surname field? Or, did the page skip to another field such as zip code, only to return to the surname later?

We also checked to see if form pages provided additional information about how to fix errors if they were submitted. For example, did users have to reenter information if errors were submitted, or did the site flag incomplete or erroneous forms before accepting them? Also, did

the site give a confirmation page after a form was submitted, or did it return users to the homepage?

Our analysis also addressed the use of search tools on municipal websites. We examined sites to determine if help was available for searching a municipality's website, or if the scope of searches could be limited to specific areas of the site. Were users able to search only in "public works" or "the mayor's office," or does the search tool always search the entire site? We also looked for advanced search features such as exact phrase searching, the ability to match all/any words, and Boolean searching capabilities (e.g. the ability to use AND/OR/NOT operators). Our analysis also addressed a site's ability to sort search results by relevance or other criteria.

Content

Content is a critical component of any website. No matter how technologically advanced a website's features, if its content is not current, if it is difficult to navigate, or if the information provided is not correct, then it is not fulfilling its purpose. When examining website content, our research examined five key areas: access to contact information, public documents, disability access, multimedia materials, and time sensitive information. When addressing contact information, we looked for information about each agency represented on the website.

In addition, we also looked for the availability of office hours or a schedule of when agency offices are open. In assessing the availability of public documents, we looked for the availability of the municipal code or charter online. We also looked for content items, such as agency mission statements and minutes of public meetings. Other content items included access to budget information and publications. Our assessment also examined whether websites provided access to disabled users through either "bobby compliance" (disability access for the

blind, <http://www.cast.org/bobby>) or disability access for deaf users via a TDD phone service. We also checked to see if sites offered content in more than one language.

Time sensitive information that was examined included the use of a municipal website for emergency management, and the use a website as an alert mechanism (e.g. terrorism alert or severe weather alert). We also checked for time sensitive information such as the posting of job vacancies or a calendar of community events. In addressing the use of multimedia, we examined each site to determine if audio or video files of public events, speeches, or meetings were available.

Services

A critical component of e-government is the provision of municipal services online. Our analysis examined two different types of services: (1) those that allow citizens to interact with the municipality, and (2) services that allow users to register for municipal events or services online. In many cases, municipalities have developed the capacity to accept payment for municipal services and taxes. The first type of service examined, which implies interactivity, can be as basic as forms that allow users to request information or file complaints. Local governments across the world use advanced interactive services to allow users to report crimes or violations, customize municipal homepages based on their needs (e.g. portal customization), and access private information online such as court records, education records, or medical records. Our analysis examined municipal websites to determine if such interactive services were available.

The second type of service examined in this research determined if municipalities have the capacity to allow citizens to register for municipal services online. For example, many

jurisdictions now allow citizens to apply for permits and licenses online. Online permitting can be used for services that vary from building permits to dog licenses. In addition, some local governments are using the Internet for procurement, allowing potential contractors to access requests for proposals or even bid for municipal contracts online. In other cases, local governments are chronicling the procurement process by listing the total number of bidders for a contract online, and in some cases listing contact information for bidders.

Finally, this analysis also examined municipal websites to determine if they developed the capacity to allow users to purchase or pay for municipal services and fees online. Examples of transactional services from across the United States include the payment of public utility bills and parking tickets online. In many jurisdictions, cities and municipalities allow online users to file or pay local taxes or pay fines such as traffic tickets. In some cases, cities around the world are allowing their users to register or purchase tickets to events in city halls or arenas online.

Citizen Participation

Perhaps the most untapped area of e-government, or e-governance in this context, involves using the Internet to engage citizens in democratic processes. Citizen participation in government is a ripe area for e-government, in part because the Internet is a convenient mechanism for citizen-users to engage their government, and also because of the potential to decentralize decision-making. Despite that potential, very few public agencies offer online opportunities for civic engagement. Our analysis looked at several ways public agencies at the local level were involving citizens. For example, do municipal websites allow users to provide online comments or feedback to individual agencies or elected officials?

Our analysis examined whether local governments offer current information about municipal governance online or through an online newsletter or e-mail listserv. Our analysis also examined the use of internet based polls about specific local issues. In addition, we examined whether communities allow users to participate and view the results of citizen satisfaction surveys online. For example, some municipalities used their websites to measure performance and published the results of performance measurement activities online.

Still other municipalities used online bulletin boards or other chat capabilities for gathering input on public issues. Most often online bulletin boards offer citizens the opportunity to post ideas, comments, or opinions without specific discussion topics. However, in some cases agencies attempt to structure online discussions around policy issues or specific agencies. At the national level, EPA recently experimented with allowing citizens to post comments about prospective agency rules online. At the local level, communities such as Long Valley, New Jersey (<http://www.longvalleynj.com/mboard.asp?button=8>) and Dansville, New York (http://dansville.lib.ny.us/cgi-bin/BBS/bbs_forum.cgi?first_days_old=60&forum=open) allow citizens to discuss community affairs in specific areas such as public works, education, planning and zoning, and local recreation.

In some cases, state and local governments are beginning to use the Internet to solicit comments on proposed rules and regulations. Such is the case in Virginia's Regulatory Town Hall (<http://townhall.state.va.us/>), where the state lists proposed rule changes and allows users to deliberate public policy online. Our research looked for municipal use of the Internet to foster civic engagement and citizen participation in government

SECTION 3. FINDINGS AND RECOMMENDATIONS

Table 3 (below) contains the weighted scores for each of the ten New Jersey municipalities analyzed in this study (e.g. each category was equally weighted despite having different numbers of questions and the maximum). Collectively, they scored lowest in the security/privacy category (average score of .60 out of a possible 20 points). This was particularly evident in the fact that only two of the ten municipalities, Woodbridge and Hamilton, had privacy statements on their website.

Table 3 E-government Scores of New Jersey Municipalities

	Security/ Privacy	Usability	Content	Service Provision	Citizen Participation	Total	Rank Order
Hamilton	3.928571	14.73684	6.086957	5	10	39.75237	1
Trenton	0.714286	13.15789	2.608696	3.181818182	6.5	26.16269	2
Edison	0	7.894737	3.26087	4.090909091	6	21.24652	3
Newark	0	7.894737	1.521739	3.863636364	7.5	20.78011	4
Dover	0	8.684211	3.043478	2.272727273	6	20.00042	5
Camden	0	9.736842	3.478261	4.090909091	0.5	17.80601	6
Woodbridge	1.071429	8.157895	2.826087	2.954545455	2	17.00996	7
Elizabeth	0.357143	9.473684	2.173913	2.272727273	2	16.27747	8
Paterson	0	8.947368	1.086957	1.136363636	0	11.17069	9
Jersey City	0	7.631579	0.869565	0.227272727	2	10.72842	10

Security and Privacy

Clearly, security and privacy was an area in which New Jersey municipalities need improvement. To assist local governments in developing privacy policies for their websites, we have developed the guidelines listed below. They are not meant as a one-size-fits-all solution to privacy policies; rather they consist of critical issues that municipalities should consider when developing privacy policies. Local governments need to develop privacy policies that are appropriate to the level of services offered on their websites. Such policies should form the foundation upon which future e-government applications are built.

Suggested Security/Privacy Guidelines:

- Develop a privacy policy or statement for city or municipal websites.
- Provide direct access to the privacy policy on every page that requires or accepts data, including the homepage.
- Identify the organizations or agencies collecting information on city websites.
- Develop and publish a policy or statement that addresses restrictions on how the city or municipality collects data about users. For example, does the city or municipality have a policy on the use of cookies or web beacons on its web pages?
- Develop and publish a policy or statement for using data collected on the city or municipal website. The statement should address managerial measures that limit the access of data and assure it is not used for unauthorized purposes.
- Develop and publish a policy or statement about third party access to data collected on city websites. For example will the data be available to other public agencies, will the data be available to private companies? Will private companies be charged a fee for access to the data?
- Develop and publish a policy or statement so that users can choose not to have their personal information given or sold to third parties.
- Develop and publish a policy or statement that addresses users' abilities to review personal data records and correct inaccuracies or completeness of the information.
- Develop and publish a policy or statement that addresses the use of a digital signature or encryption.
- Develop and publish a policy or statement that addresses how users will be notified of privacy policy changes or updates.
- Establish a specific contact or e-mail address for inquiries regarding the privacy policy.

Citizens need to know what to expect of the information they provide to public agencies.

Fears include “Big Brother” and the reality that local government agencies are often the only providers of certain services, such as building permits. As a result, public agencies are held to a higher standard for creating online systems that prevent unauthorized access of data, as well as policies for determining what information will be shared and who it will be shared with.

Usability

The usability category was the area in which municipalities evaluated in this research scored the highest. The usability score for municipalities analyzed in this study averaged 9.63 out of a possible 20 points. Most municipalities did well with respect to their html or basic web

pages. Municipal web pages were professional looking, color and font use was consistent, navigation bars were used and worked well, and websites generally used default colors on their home pages. Areas needing the most improvement dealt with the use of forms and search tools. Municipalities using forms to collect data needed to better align text and fields. The forms also need to provide information about required field and indicate incorrect information before accepting data. In addition, users should be given the option to correct errors and the sites need to consistently use confirmation pages after data is submitted.

Sites evaluated in this study also need to use search tools more effectively. Sites need to develop more robust searching mechanisms that allow users to limit the scope of their search to specific areas of the site. In addition, municipalities need to provide advanced searching features on their websites that allow users to narrow or sort results. In addition, sites need to develop tips for searching their sites that include whether or not Boolean searching – AND/OR/NOT – operators can be used.

Content

While the overall usability of sites was good, the content and services provided varied considerably. For example, only three of the ten municipalities (Hamilton, Dover and Camden) provided materials on their website in languages other than English. In addition, only three municipalities (Trenton, Woodbridge, and Edison) used their websites to post position vacancies. Several municipalities used their websites to post audio or video files of public events, meetings or speeches. However, in general, content areas in all municipalities need improvement.

Specifically, access to public information for the disabled residents needs to be improved. Software programs for assisting the visually impaired are widely available, but they only work if

websites are developed in a particular manner. As a result, “Bobby” regulations (defined above) have been developed to determine if websites are available for the visually impaired. None of the municipalities in our research indicated that their websites were “Bobby” compliant. In addition, no municipalities indicated that they provide TTD access for the hearing impaired. Finally, municipalities need to make greater use of emerging technologies such as geographic information systems (GIS).

Citizen participation

Engaging citizens and fostering their participation in government is often a difficult task. While the Internet can be used to aid in the process of engaging citizens, it is an area that has not yet been fully explored. As a result, many of the municipalities analyzed in this study were not using the Internet to encourage citizen participation in government. The average citizen participation score was 4.25 on a scale of 20, and scores varied from .5 to 10 out of 20. Hamilton and Newark fared the best in our citizen participation analysis, scoring 10 and 7.5 respectively.

One of the more innovative citizen participation experiments involved the Newark Police department and the message board that was available on their website between November 2002 and February 2003. The board, which was temporarily discontinued but has since been reinstated, allowed users to ask anonymous questions, and response times to inquiries varied from 1-4 days.

Table 4, below, lists the number of “posts” (or messages submitted) on the Newark Police department’s website between November 2002 and February 2003. As the table illustrates, use of the website grew steadily each month that it was in operation. It should also be noted that

while the response rate varied from month to month, the average response rate for posts was approximately 50%. After reading many of the posts on the discussion board, however, it was clear that not all posts were meant as questions that needed a response.

Table 4. Analysis of Newark Police Department Message Board

Month	Posts	Official Responses	Response Rate
Nov 2002	40	22	55%
Dec 2002	42	22	52.4%
Jan 2003	79	30	38%
Feb 2003	30	22	73.3%
Total	191	96	50.2%

We have selected five examples from the Newark Police Department bulletin board to illustrate the strengths and weaknesses of local government bulletin boards. Example 1 was a police related inquiry that was appropriate for the board. In the example, a citizen asked about a missing person. The official response by the police department was, “Call me at 973-XXX-XXXX, I’d like to ask you some additional questions.” Later, the person asking the initial question posted the following follow-up: “thank you for your response... We have found him... He was arrested in Newark and was shipped to Passaic country... Once again thank you for your help and response.”

It is important to note that many messages were not technically police related, and the police department did an admirable job of addressing such inquiries. Example 2 was a question that police officers probably have to address regularly. The initial question related to a court order that the “poster” (or person submitting the message) received for failing to go to court. The poster stated that they had been given a traffic ticket despite not having been in Newark for several years. The police department responded as follows, “Unfortunately the Newark Police can’t assist you in this matter, only the Newark Municipal Court. I would contact the court system for advice on the best method to adjudicate this matter. Don’t delay because failure to

comply in a timely matter will result in a warrant being issued for your arrest. You can contact the Newark Municipal Court at 973-XXX-XXXX.”

Example 3 was clearly a sanitation department question that probably should have been addressed elsewhere. Unfortunately, there was no such forum where a sanitation question could be posted, and so the police department did its best to field the question. The bulletin board user asked, “who could I contact about the lack of snow removal in Newark? Is there a number or website?” The police department appropriately responded by posting the contact information for the sanitation department.

In another inquiry that was not police related, a user asked a question about a child abuse case in Newark that received considerable media exposure throughout the area. The user asked, “What is the best way to help?... Is there an organization taking donations for their care? How do I contact the appropriate people.” The police responded by alerting the user to a charitable fund that had been established to aid abused children, and the user was given an appropriate phone number to call for more information.

Example 4 consisted of a thread of messages posted by several individuals that contained no questions, and as a result did not receive a response. The initial post begins, “I see all of my posts have been deleted, I guess the truth hurt...” This post illustrated that moderating Internet bulletin boards is often a difficult task, particularly a local government bulletin board. While the police department apparently deleted several inappropriate threads, the one associated with this post was not deleted and users were allowed to voice their dissatisfaction. Furthermore, because no question was asked, this example also illustrates why it is probably impossible for local government message boards to have a 100% official response rate.

Example 5 was a post that was initiated by the police department to address several inappropriate posts (including example 4). The post states, “Postings are not deleted because they offer an opposing viewpoint. In fact, the Newark Police Department embraces dissimilar views in an attempt to improve services we provide. However, the Newark Police Department cannot embrace defamatory rhetoric intended to malign the reputations of extremely hard working public servants...”

After attempting to respond to several specific issues raised by previous posters, the official response ended by stating, “Newark really is a beautiful city. I fear that you have rationalized and justified your disdain for this City by attacking its police services. I hope you will not leave after having tried to embrace your problems constructively.” Clearly, these examples demonstrate the difficulties associated with maintaining and moderating a municipal bulletin board. Perhaps the greatest difficulty associated with local government bulletin boards is the informal culture that exists in many online communities. For example, users often write using informal grammar, ask questions, or criticize official policies, and local government officials must prepare formal responses in each instance.

The Newark Police Department did an admirable job of responding to queries on their bulletin board. Most posts that did not receive a response had either been answered elsewhere on the message board or involved a post that did not ask a specific question. Posts that did not ask specific questions tended to be either inflammatory or congratulatory. In the future, the police department should seek not only to improve the response rate, but also to improve the answers given. The case of the Newark Police department message board illustrates both the possibilities and difficulties of using the Internet to engage citizens. The Newark Police department is to be

commended for its efforts, and the examples cited clearly indicate a need for a city-wide bulletin board, not only for police matters.

In addition, the police department website was obviously maintained by someone other than the city webmaster, and it contained several links that were more current than the general city web site. This was the case in many municipalities, and determining what constitutes a municipal website was often difficult. For example, if the police department maintains its own domain name³, should it be considered a part of the city website? For the purposes of this research we considered separate agency websites as part of the municipal website. However, determining where municipal websites begin and end is not as objective as one might expect. Defining the boundaries of a municipal government website was particularly difficult because innovative local governments often work closely with contractors, quasi-governmental agencies, nonprofit organizations, economic development corporations, and state agencies that provide local government services.

In addition, autonomous public agencies often maintain the content of their websites, which can vary from municipal homepages in terms of accuracy and timeliness. For example, the Newark homepage stated that online payment of traffic tickets, court fines, property taxes and utility bills was “coming soon.” However, the police department website linked directly to the state-sponsored New Jersey Municipal Courts Direct Traffic Ticket information system, which allowed for payment of traffic tickets and parking tickets. Complicating matters further, the state-sponsored municipal court website had a privacy policy and was Bobby compliant. For

³ The New York City privacy policy (www.nyc.gov/privacy) defines domain name and IP address as follows: “Domain Name is an alphanumeric value that represents the plain language (English or such other local language as is relevant) translation of the IP address assigned to a specific user or collection of users. For example, if a user had an IP address of 123.123.123.123, the Domain Name that represented that address might be WWW.HOME.COM. An IP address is a numeric value assigned to an Internet Service Provider, a computer network, an individual computer or router, or a firewall (collectively, “users”) so that other computers on the Internet may direct Internet message or other traffic to such users. Until the IP addressing system is changed, an IP address will take the form of XXX.XXX.XXX.XXX, where the X’s are numbers between 1 and 9, and 0 for some positions.”

the purposes of this research, the state sponsored municipal court traffic information system was not considered part of a municipality's website because municipalities had little control over its development.

SECTION 4. CONCLUSION

This research identifies areas in which the ten largest New Jersey municipalities can improve their e-government programs. As was suggested in Section 3, the e-government category needing the most improvement in the municipalities examined for this study was "security and privacy." Specifically, New Jersey municipalities need to develop privacy policies for their websites. Such policies are indicative of an agency's approach to users' privacy and the security of the infrastructure underlying e-government applications. The New York City privacy policy on its website (<http://www.nyc.gov/privacy>) is an excellent example of a privacy policy that scores well when evaluated with our index (15 out of a possible 20 points in the "security/privacy" category). We recommend that each municipality re-examine the security architecture for their information systems and draft or revise their existing privacy policies to this standard.

In addition, service provision and citizen participation represent two key areas where municipalities need to show improvement. This report suggests that municipalities should use the Internet as an alternative for providing city and municipal services, as well as engaging citizens in government. Specifically, New Jersey municipalities need to use the internet as a mechanism for interacting with and engaging citizens. Furthermore we advocate that municipalities use their websites to help measure and enhance their performance through citizen-

driven government performance initiatives and citizen surveys, such as those found on the National Center for Public Productivity website: (<http://newark.rutgers.edu/~ncpp>)

The content and usability of municipal websites were areas in which municipalities that were analyzed as a part of this study fared best. Information on municipal websites was generally user friendly and the content was, by and large, current and accurate. Municipal websites are often organized according to how the internal web developer understands the organization of each government agency. While this is useful for government employees familiar with the organization structure, it is less useful for citizens. Citizens do not necessarily think of their local government in terms of organizational departments; instead they view local government in terms of their personal needs. Municipalities need to develop their websites from citizen perspectives.

Keeping web content current is also essential. A 2001 report prepared as an e-government survey for the International City/County Management Association (ICMA) indicated that the majority of city and municipal websites were less than 3 years old (Norris, Fletcher, and Holden, 2001). Because local government websites are relatively new, their initial e-government goals often end with the publication of their website. Municipalities must recognize that the publication of their first website is not the end of their e-government needs, but rather the beginning. Local governments need to engage citizens continuously with current and relevant information.

In conclusion, this research critiques websites of the largest ten municipalities in New Jersey, provides benchmarks for measuring future improvement, and provides communities with advice for improving their websites based on best practices in other communities. To accomplish these goals we suggest that New Jersey municipalities think strategically about the

development of their websites. While smaller municipal governments often use informal feedback mechanisms to structure their websites, we advocate formal strategic planning, and a regular assessment process to develop goals, objectives and priorities for local government websites.

Excellent examples of strategic e-government plans for local government agencies can be found in Long Beach, CA (<http://www.ci.long-beach.ca.us/egov/longbeachegov.htm>), Mesa, AZ (<http://www.ci.mesa.az.us/isd/strategy.asp>) and Fairfax, VA. (<http://www.co.fairfax.va.us/gov/dit/itplan.htm>). New Jersey municipalities need to continuously think strategically about their websites. These new initiatives should fit into a municipality's overall strategic framework for e-government and information technology. By moving the development of municipal websites forward in this manner, local governments will more likely develop quality e-government services that meet the needs of all stakeholders, including public managers and citizens. Local government websites and e-government need to be seen as tools for breaking down barriers between citizens and government, improving the performance and delivery of local government services, engaging citizens by fostering their participation in government, and facilitating democratic governance.

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