

**Urban E-Government:
An Assessment of City Government Websites**
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Executive Summary

E-government refers to the delivery of information and services online through the Internet. Many city governmental units have placed a wide range of materials on the web from publications to databases. In this report, we study the features that are available online at city government websites in the United States. Using a detailed analysis of 1,506 government websites in the 70 largest metropolitan areas, we measure the information and services that are online, chart the variations that exist across cities, and discuss how urban e-government can be improved.

In general, we found that cities have made some strides toward placing information and services online. However, there is considerable variation

across cities in how much material is on city government websites. Not all cities have made the same progress and a large number of cities need to address problems in the areas of privacy, security, and special needs populations such as the handicapped. We close our report by making several practical suggestions for improving the delivery of government information and services over the Internet.

Among the more important findings of the research are:

1) only 7 percent of sites are multi-lingual, meaning that they offer two or more languages

2) 25 percent of websites feature a one-stop services "portal" or have links to a government portal

3) 13 percent offer services that are fully executable online

4) the most frequent services are paying parking tickets online and filing complaints about street lights, rodent control, and potholes

5) 64 percent of websites provide access to publications and 38 percent have links to databases

6) 14 percent show privacy policies, while 8 percent have security policies

7) only 11 percent of government websites have some form of disability access, meaning access for persons with disabilities

8) less than 1 percent of sites have commercial advertising

9) cities vary enormously in their overall e-government performance based on our analysis. The most highly ranked city governments include San Diego, followed by Albuquerque, Seattle, Washington, D.C., Salt Lake City, Virginia Beach, Kansas City, Denver, San Jose, and Indianapolis

10) the lowest ranked cities in our study include Albany, Cleveland, Louisville, Greenville, South Carolina, and Miami, Florida

A Note on Methodology

In our analysis of websites, we looked for material that would aid an average citizen or business person logging onto a governmental site. This included contact information that would enable a citizen or business person to find out who to call or write at an agency to resolve a problem, material on information, services, and databases, features that would facilitate e-government access by special populations such as the handicapped and non-

native language speakers, interactive features that would facilitate outreach to the public, and visible statements that would reassure citizens worried about privacy and security over the Internet.

The data for our analysis consisted of 1,506 city government websites for the 70 largest cities in America. The list of cities assessed was based on the most populous metropolitan areas as assessed by the U.S. Census Bureau in 2000. Among the sites analyzed in each city were those of executive offices (such as a mayor or city manager), legislative offices (such as city councils), and major agencies serving crucial functions of government, such as health, human services, taxation, education, economic development, administration, police, fire, transportation, tourism, and business regulation. We looked at an average of 21.5 websites per city. The analysis was undertaken during Summer, 2001 at Brown University in Providence, Rhode Island. Tabulation for this project was completed by Benjamin Clark, Kim O'Keefe, Julia Fischer-Mackey, Sheryl Shapiro, and Chris Walther.

Websites were evaluated for the presence of 28 features dealing with information availability, service delivery, and public access. Features assessed included type of site, name of city, branch of the world, office phone number, office address, online publications, online database, external links to non-governmental sites, audio clips, video clips, non-native languages or foreign language translation, commercial advertising, user payments or fees, subject index, various types of handicap access, various measures of privacy policy, security features, presence of online services, number of different services, links to a government services portal, digital signatures, credit card payments, email address, search capability, comment form or chat-room, broadcast of events, automatic email updates, and personalization of website.

For e-government service delivery, we looked at the number and type of online services offered. Features were defined as services only if the entire transaction could occur online. If a citizen had to print out a form and then mail it back to the agency to obtain the service, we did not count that as a service which could be fully executed online. Searchable databases counted as services only if they involved accessing information that resulted in a specific government service response. The remainder of this report outlines the detailed results that came out of this research.

Overview of City E-Government

The most noteworthy feature is the extent to which city e-government reflects the particular issues and challenges affecting urban America. Of the cities offering online services, the most common types are paying parking tickets and filing complaints dealing with street lights, potholes, and rodents. Surprising, in light of the multi-lingual nature of many city populations, only 7 percent of city websites offer more than one language (typically Spanish). Police

departments are the most likely to offer bilingual websites (English and Spanish).

A number of cities have made progress at putting publications, forms, and databases online for citizen access. Rather than having to call or visit particular agencies, many government agencies have put material online that the public can download from city websites. A relatively small number of city websites (13 percent) provide services that are fully executable online. There is considerable variation across cities in the extent to which citizens can access government services through the Internet.

Most cities (75 percent) do not have portals that link the services of various agencies and departments. Portals offer many advantages for government offices. Having a single entry point into a government helps citizens because these portals integrate e-government service offerings across different agencies. Portals reduce the need to log on to different agency websites to order services or find information. Instead, citizens can engage in "one-stop" shopping, and find what they need at a single source.

There is some regional variation in the kinds of material available online. Midwestern cities, for example, are most likely to have information on tornado watches and flooding, while East Coast cities focus on hurricane-related warning material. These differences obviously reflect variations in geographical risks facing cities in different regions of the country.

Finally, as we discuss later in this report, there remains a need for continuing advancement in the areas of privacy, security, and interactive features, such as search engines. Compared to various commercial websites, the public sector lags the private sector in making full use of the technological power of the Internet to improve the lives of citizens and enhance the performance of governmental units. Given public concerns about privacy and security on the Internet, governmental agencies need to do more to reassure the public that urban e-government is safe and secure for users.

Online Information

In looking at specific features of government websites, we wanted to see how much material was available that would help citizens contact government agencies and navigate websites. In general, contact information is quite prevalent. The vast majority of sites provide their department's telephone number (92 percent) and mailing address (83 percent). These are materials that would help an ordinary citizen needing to contact a government agency reach that office. In addition, features such as a subject area index that organize a site and tell a citizen how to navigate the site were abundant. Eighty-five percent of government sites had subject indices.

In terms of the content of online material, many agencies have made extensive progress at placing information online for public access. Sixty-four percent of government websites around the world offered publications that a citizen could access, and 38 percent provided databases. Sixty-seven percent had links to external, non-governmental sites where a citizen could turn for additional information.

Percentage of City Websites Offering Publications and Databases

<i>Phone Contact Info.</i>	92%
<i>Address Info</i>	83
<i>Links to Other Sites</i>	67
<i>Publications</i>	64
<i>Databases</i>	38
<i>Index</i>	85
<i>Audio Clips</i>	1
<i>Video Clips</i>	3

As a sign of the early stage of global e-government, most public sector websites do not incorporate audio clips or video clips on their official sites. Despite the fact that these are becoming much more common features of e-commerce and private sector enterprise, only one percent of government websites provided audio clips and three percent had video clips. A common type of audio or video clip was a greeting or speech by the mayor

Services Provided

Fully executable, online service delivery benefits both government and its constituents. In the long run, such services have the potential to lower the costs of service delivery and make services more widely accessible to the general public, because they no longer have to visit, write, or call an agency in order to execute a specific service. As more and more services are put online, e-government will revolutionize the relationship between government and citizens.

Of the websites examined around the country, however, only 13 percent offer services that are fully executable online. Of this group, 9 percent offer one service, 2 percent have two services, 1 percent offer three services, and 1

percent have four or more services. Eighty-seven percent have no online services.

The most frequent service found online included paying parking fees and filing complaints about street lights, potholes, and rodent control.

Top 10 Online Services

<i>Pay Parking Tickets or Traffic Violations</i>	30 websites
<i>Complaint Filing</i>	27
<i>Service Request</i>	24
<i>Permit Applications</i>	18
<i>Job Application</i>	16
<i>Document Request</i>	13
<i>Pay Utility Bills</i>	11
<i>Request Police Documents</i>	10
<i>Pay Taxes</i>	9
<i>Report Crimes</i>	9

One feature that has slowed the development of online services has been an inability to use credit cards and digital signatures on financial transactions. On commercial sites, it is becoming a more common practice to offer goods and services online for purchase through the use of credit cards. However, of the government websites analyzed, only 4 percent accepted credit cards and two-tenths of 1 percent allowed digital signatures for financial transactions. Since some government services require a fee, not having a credit card payment system makes it difficult to place government services that are fully executable online.

Services by Top Cities

Of the 70 cities analyzed, there is wide variance in the percentage of government sites with online services. In general, large cities are most successful at placing services online, due to their ability to spread the costs of new technology out over a larger population and tax base. Las Vegas is first, with 45 percent of its websites providing some type of service, followed by Salt

Lake City (36 percent), Albuquerque (33 percent), Indianapolis (33 percent), San Francisco (27 percent), Seattle (27 percent), Los Angeles (25 percent), New York (25 percent), Raleigh (24 percent), and Honolulu (23 percent). It is important to keep in mind that our definition of services included only those services that were fully executable online. If a citizen had to print out a form and mail or take it to a government agency to execute the service, we did not count that as an online service.

Percent of City Sites Offering Online Services

<i>Las Vegas</i>	45%	<i>Salt Lake City</i>	36%
<i>Albuquerque</i>	33	<i>Indianapolis</i>	33
<i>San Francisco</i>	27	<i>Seattle</i>	27
<i>Los Angeles</i>	25	<i>New York</i>	25
<i>Raleigh</i>	24	<i>Honolulu</i>	23

Privacy and Security

The unregulated and accessible structure of the Internet has prompted many to question the privacy and security of government websites. Public opinion surveys place these areas near the top of the list of citizen concerns about e-government. Having visible statements outlining what the site is doing on privacy and security are valuable assets for reassuring a fearful population and encouraging citizens to make use of e-government services and information.

However, few global e-government sites offer policy statements dealing with these topics. Only 14 percent of examined sites have some form of privacy policy on their site, and 8 percent have a visible security policy. Both of these are areas that government officials need to take much more seriously. Unless ordinary citizens feel safe and secure in their online information and service activities, e-government is not going to grow very rapidly.

We also assessed the quality of privacy and security statements. In looking at the content of privacy policies, only 10 percent prohibited the commercial marketing of visitor information, 2 percent prohibit the creation of cookies or individual profiles of visitors, and 9 percent prohibit sharing personal information without the prior consent of the user. On security statements, 4 percent indicated they use computer software to monitor network traffic.

Quality of Privacy and Security Statements

<i>Prohibit Commercial Marketing</i>	10%
<i>Prohibit Cookies</i>	2
<i>Prohibit Sharing Personal Information</i>	9
<i>Use Computer Software to Monitor Traffic</i>	4

Security by Top Cities

Despite the importance of security in the virtual world, there are wide variations across cities in the percentage of websites showing a security policy. Albuquerque and San Diego were the cities most likely to show a visible security policy, with 100 percent of their sites including a statement. They were followed by Kansas City (96 percent), Salt Lake City (80 percent), Washington, D.C. (54 percent), Virginia Beach (23 percent), Houston (10 percent), Raleigh (10 percent), Los Angeles (5 percent), and Oklahoma City (5 percent).

Top Cities in Security Policy

<i>Albuquerque</i>	100%	<i>San Diego</i>	100%
<i>Kansas City</i>	96	<i>Salt Lake City</i>	80
<i>Washington, D.C.</i>	54	<i>Virginia Beach</i>	23
<i>Houston</i>	10	<i>Raleigh</i>	10
<i>Los Angeles</i>	5	<i>Oklahoma City</i>	5

Privacy by Top Cities

Similar to the security area, there are widespread variations across cities in providing privacy policies on their websites. The cities with the highest percentage of websites offering a visible privacy policy were Albuquerque and San Diego (100 percent), followed by Kansas City (96 percent), Denver (92 percent), Honolulu (88 percent), Tampa (87 percent), Salt Lake City (80 percent), Orlando (77 percent), Washington, D.C. (54 percent), and Virginia Beach (23 percent).

Top Cities in Privacy Features

<i>Albuquerque</i>	100%	<i>San Diego</i>	100%
<i>Kansas City</i>	96	<i>Denver</i>	92
<i>Honolulu</i>	88	<i>Tampa</i>	87
<i>Salt Lake City</i>	80	<i>Orlando</i>	77
<i>Washington, D.C.</i>	54	<i>Virginia Beach</i>	23

Disability Access

Disability access is vitally important to citizens who are hearing impaired, visually impaired, or suffer from some other type of handicap. If a site is ill-equipped to provide access to individuals with disabilities, it fails in its attempt to reach out to as many people as possible. Eleven percent of government websites had some form of disability access using measures that we employed.

To be recorded as accessible to the disabled, the site had to display features that would be helpful to the hearing or visually impaired. For example, TTY (Text Telephone) or TDD (Telephonic Device for the Deaf) phone numbers allow hearing-impaired individuals to contact the agency by phone. Second, the site could be "Bobby Approved," meaning that the site has been deemed disability-accessible by a non-profit group that rates Internet web sites for such accessibility (<http://www.cast.org/bobby/>). Third, the site could have web accessibility features consistent with standards mandated by groups such as the World Wide Web Consortium (W3C) or local legislative acts. Finally, if the site provided text labels for graphics or text versions of the website, it was counting as having some degree of accessibility.

In looking at particular kinds of handicap accessibility, there were variations in how cities provided access. Four percent provided TTY/TDD phone lines, 2 percent were Bobby approved, 2 percent met the standards of the World Wide Web consortium or local legislative acts, and 6 percent had text versions or text labels for graphics.

Types of Handicap Accessibility

<i>TTY/TDD</i>	4%
<i>Bobby Approved</i>	2
<i>World Wide Web Consortium</i>	2

Disability Access by Top Cities

When looking at disability access by individual cities, it is clear there is tremendous variation in the percentage of sites that are accessible. The city doing the best job on disability access is San Diego (100 percent of their sites are accessible), Tampa (87 percent), Baltimore (76 percent), Oakland (67 percent), San Jose (35 percent), Las Vegas (27 percent), Honolulu (19 percent), Seattle (19 percent), Louisville (18 percent), and Salt Lake City (16 percent).

Top Disability Access Cities

<i>San Diego</i>	100%	<i>Tampa</i>	87%
<i>Baltimore</i>	76	<i>Oakland</i>	67
<i>San Jose</i>	35	<i>Las Vegas</i>	27
<i>Honolulu</i>	19	<i>Seattle</i>	19
<i>Louisville</i>	18	<i>Salt Lake City</i>	16

Foreign Language Access

As pointed out earlier, few (7 percent) of city government websites have foreign language features that allow access to non-native speaking individuals. By foreign language feature, we mean any accommodation to the non-native speakers, such as text translation into a different language.

The cities having the highest proportion of websites with foreign language access included Dallas (92 percent of its sites), Hartford (78 percent), Orlando (65 percent), Houston (29 percent), Grand Rapids (15 percent), Philadelphia (15 percent), Omaha (13 percent), Chicago (12 percent), Phoenix (12 percent), and Los Angeles (10 percent).

The Houston Fire Department webpage has five different languages (Spanish, Italian, German, Portuguese, and French) accessible through its site. By clicking on an icon located on its site, visitors are taken to <http://babelfish.altavista.com>, which automatically translates English websites into each of these foreign languages.

The Nashville Metropolitan Transit Authority does a similar thing, through a link to <http://www.systransoft.com> translation services. This automatic language

translation software converts English into Spanish, Italian, German, Portuguese, and French, thereby extending the reach of the agency website.

On its portal site, Grand Rapids has a link to free translation from SDL International into Spanish, French, German, Italian, Norwegian, and Portuguese. For its Spanish version online, Orlando's portal has seals of approval from the Hispanic Chamber of Commerce of Central Florida and the Florida State Hispanic Chamber of Commerce.

We found that many police departments offered bilingual websites (in English and Spanish) that are very helpful to Spanish-speaking citizens. This is another way for police departments to become more responsive to community needs.

Ads and User Fees

Overall, use of ads to finance government websites is not very prevalent. Only 1 percent of sites had commercial advertisements on their sites, meaning non-governmental corporate and group sponsorships. In general, tourism and transit authority sites were most likely to have ads. For example, these websites had banners or "fly-by" ads for hotels, travel agents, or special travel packages. None of the sites we examined throughout the country required user fees to access online information and services.

When defining an advertisement, we eliminated computer software available for free download (such as Adobe Acrobat Reader, Netscape Navigator, and Microsoft Internet Explorer) since they are necessary for viewing or accessing particular products or publications. Links to commercial products or services available for a fee included as advertisements as were banner, pop-up, and fly-by advertisements.

Cities that had advertising on their websites were the Houston Fire Department that had a link to Firehouse.com, a commercial magazine and email alert service that focuses on fire-related products. The Nashville Transit Authority had a banner ad for the Belcourt Neighborhood Theater. The Buffalo Mayor's page featured a "pop-up" advertisement that alternated between spots for Northwest Airlines and Lycos. The Rochester, New York Arts and Cultural Council had an ad for Horses on Parade, an online live auction that also has a capacity to order tickets online. The El Paso Tourism site had an ad for the El Paso Association for the Performing Arts which advertised a Shakespeare festival. The Richmond, Virginia Transit Authority did not have an ad, but indicated it was accepting banner ads for companies wishing to advertise on its site.

Public Outreach

E-government offers the potential to bring citizens closer to their governments. Email is an interactive feature that allows ordinary citizens to pose questions of government officials or request information or services. In our study, we found that 69 percent of government websites offered email contact material so that a visitor could email a person in a particular department other than the Webmaster.

Percentage of City Government Websites Offering Public Outreach

<i>Email</i>	69%
<i>Search</i>	54
<i>Comments</i>	17
<i>Email Updates</i>	2
<i>Broadcast</i>	2
<i>Personalized Sites</i>	0

While email is certainly the easiest method of contact, there are other methods that government websites can employ to facilitate public feedback. These include areas to post comments (other than through email), the use of message boards, and chat rooms, which appeared on 17 percent of sites. Websites using these features allow citizens and department members alike to read and respond to others' comments regarding issues facing the department.

Fifty-four percent of the sites we examined had the ability to search the particular website. This is a feature that is helpful to citizens because it allows them to find the specific information they want. Two percent of sites offer live broadcasts of important speeches or events ranging from live coverage of the government hearings and broadcasts of public speeches to weekly Internet radio shows featuring various department officials. Two percent of government websites allow citizens to register to receive updates regarding specific issues. With this feature, web visitors can input their email addresses, street addresses, or telephone numbers to receive information about a particular subject as new information becomes available. The information can be in the form of alerts notifying citizens whenever a particular portion of the website is updated. Three-tenths of one percent of websites allowed the users to personalize the site to their particular interests.

Top E-Government Cities

In order to see how the 70 cities ranked overall, we created a 0 to 100 point e-government index and applied it to each city's websites based on the availability of contact information, publications, databases, portals, and number of online services. Four points were awarded to each website for the presence of each of the following 22 features: phone contact information, addresses, publications, databases, links to other sites, audio clips, video clips, foreign language access, not having ads, not having user fees, disability access, having privacy policies, security policies, an index, allowing digital signatures on transactions, an option to pay via credit cards, email contact information, search capabilities, areas to post comments, broadcasts of events, option for email updates, and personalization. These features provided a maximum of 88 points for particular websites.

Each site then qualified for a bonus of six points if it were linked to a portal site, and another six points based on the number of online services executable on that site (1 point for one service, two points for two services, three points for three services, four points for four services, five points for five services, and six points for six or more services). Twenty-five percent of sites linked to a city governmental portal. One percent of city websites had four or more services. The e-government index therefore ran along a scale from 0 (having none of these features, no portal, or no online services) to 100 (having all 22 features plus having a portal and at least six online services). This total for each website was averaged across all of a specific city's websites to produce a 0 to 100 overall rating for that urban area.

The top city in our ranking is San Diego at 52.9 percent. This means that every website we analyzed for that city has slightly more than half the features important for information availability, citizen access, portal access, and service delivery. Other cities which score well on e-government include Albuquerque (49.9 percent), Seattle (48.4 percent), Washington, D.C. (45.4 percent), Salt Lake City (44.2 percent), Virginia Beach (43.1 percent), Kansas City (42.7 percent), Denver (42.6 percent), San Jose (42.0 percent), and Indianapolis (41.9 percent).

The lowest ranked cities in our study included Albany (17.2 percent), Cleveland (21.1 percent), Louisville (24.4 percent), Greenville, South Carolina (24.6 percent), and Miami (24.8 percent).

Top E-Government Cities

<i>San Diego</i>	52.9%	<i>Albuquerque</i>	49.9%
<i>Seattle</i>	48.4	<i>Washington, D.C.</i>	45.4

<i>Salt Lake City</i>	44.2	<i>Virginia Beach</i>	43.1
<i>Kansas City</i>	42.7	<i>Denver</i>	42.6
<i>San Jose</i>	42.0	<i>Indianapolis</i>	41.9
<i>Minneapolis</i>	41.1	<i>Honolulu</i>	40.5
<i>Los Angeles</i>	40.1	<i>Tacoma</i>	40.1
<i>Richmond</i>	39.9	<i>Boston</i>	39.5
<i>New York</i>	39.5	<i>Memphis</i>	38.7
<i>Tampa</i>	38.3	<i>San Francisco</i>	38.2
<i>Austin</i>	37.9	<i>Baltimore</i>	37.3
<i>Pittsburgh</i>	37.1	<i>Providence</i>	36.9
<i>Orlando</i>	36.4	<i>Oakland</i>	36.2
<i>Columbus</i>	35.7	<i>Las Vegas</i>	35.5
<i>Atlanta</i>	35.3	<i>Long Beach</i>	35.0
<i>Oklahoma City</i>	34.2	<i>Chicago</i>	34.1
<i>Sacramento</i>	34.0	<i>Charlotte</i>	33.6
<i>Portland</i>	33.4	<i>Houston</i>	33.1
<i>Dayton</i>	32.2	<i>Fort Worth</i>	31.9
<i>Tucson</i>	31.7	<i>Syracuse</i>	31.5
<i>Jacksonville</i>	31.5	<i>Omaha</i>	31.0
<i>Hartford</i>	30.5	<i>Cincinnati</i>	30.3
<i>New Orleans</i>	30.3	<i>Fresno</i>	30.2
<i>Raleigh</i>	30.1	<i>Norfolk</i>	30.1
<i>Philadelphia</i>	30.0	<i>Greensboro</i>	29.9
<i>Nashville</i>	29.6	<i>Milwaukee</i>	29.5

<i>Tulsa</i>	29.4	<i>Dallas</i>	28.4
<i>Phoenix</i>	28.3	<i>Detroit</i>	28.1
<i>San Antonio</i>	28.0	<i>West Palm Beach</i>	28.0
<i>Grand Rapids</i>	27.9	<i>Knoxville</i>	27.1
<i>Buffalo</i>	27.1	<i>St. Louis</i>	26.4
<i>Birmingham</i>	26.1	<i>Rochester</i>	25.7
<i>El Paso</i>	25.0	<i>Miami</i>	24.8
<i>Greenville</i>	24.6	<i>Louisville</i>	24.4
<i>Cleveland</i>	21.1	<i>Albany</i>	17.2

Differences by Branch of Government

There are some differences in e-government by branch of government. In general, portal sites that serve as the gateway to many city government websites had less contact information (phone numbers and mailing addresses) than executive or legislative sites. However, portal sites featured a higher percentage of publications and databases than true for non-portal websites. Portals also were more likely to offer foreign language translation, online services, and credit card payment options than executive or legislative sites.

	Executive	Legislative	Portal
<i>Phone</i>	93%	93%	66%
<i>Address</i>	83	88	62
<i>Publication</i>	62	74	98
<i>Database</i>	37	25	63
<i>Links</i>	66	61	97
<i>Audio Clip</i>	1	1	12
<i>Video Clip</i>	2	7	16
<i>Foreign Lang</i>	6	7	15

<i>Ads</i>	0	0	2
<i>User Fees</i>	0	0	0
<i>Index</i>	84	86	98
<i>Privacy</i>	14	13	28
<i>Security</i>	7	7	16
<i>Software</i>	4	4	10
<i>Disability</i>	11	6	21
<i>Services</i>	11	6	60
<i>Link to Portal</i>	25	25	31
<i>Credit Cards</i>	2	3	40
<i>Digital Sign</i>	0	0	3
<i>Email</i>	68	88	74
<i>Search</i>	53	52	78
<i>Comment</i>	16	16	31
<i>Broadcast</i>	1	9	18
<i>Updates</i>	2	6	9
<i>Personalization</i>	0	0	3

Conclusions

To summarize, we find that some helpful material has been placed online, but that much more work needs to be undertaken by city governments to upgrade e-government. Aside from publications and links to other sources of information, few city governments offer online services, describe their privacy and security policies, or provide any type of disability access. In addition, other than email contact information, many cities have been slow to embrace the interactive features of the Internet that facilitate communication between citizens and government agencies. One of the prime virtues of the web is its capacity for interactivity, such as features that put citizens in control of online

information. However, most sites do not help citizens tailor the information to their particular interests or needs.

It is important that all cities recognize the special nature of their citizenry. In many metropolitan areas, this includes a large percentage of non-English speakers, individuals with various kinds of physical handicaps, and people who need assistance on how to navigate government websites. City governments must make special efforts to serve these populations. Websites need to offer more uniform, integrated, and standardized navigational features that make sites easy to access.

In addition, city governments need to figure out how to take advantage of features that enhance public accountability. Simple tools such as website search engines are important because such technologies give citizens the power to find the information they want on a particular site. Right now, only half of government websites are searchable, which limits the ability of ordinary citizens to find information that is relevant to them.

The same logic applies in regard to features that allow citizens to post comments or otherwise provide feedback about a government agency. Citizens bring diverse perspectives and experiences to e-government, and agencies benefit from citizen suggestions, complaints, and feedback. Even a simple feature such as a comment form empowers citizens and gives them an opportunity to voice their opinion about city government services they would like to see. Given the range of services cities deal with, such as garbage collection, police and fire, streets, potholes, and rodent control, it would be especially valuable for city government websites to employ features that facilitate citizen feedback and enhance governmental accountability.

City governments have an opportunity to use video streaming technology to place city council and school board meetings online for public viewing. This would give citizens more information about what is going on inside City Hall, and put them in a position where they could hold leaders accountable for decisions that are made.

City agencies need to undertake steps that allow for online credit card transactions and digital signatures. It will be difficult to extend some services online without there being some means by which citizens can transfer funds electronically through the website. Some city services such as collecting taxes online or applying for business permits require paying a fee. Without credit card and/or digital signatures, it will be impossible to make such services fully executable online.

There furthermore needs to be more frequent updates of the government site. Some websites appeared as if they had not been updated in a year or two or had information that was several years out of date. If cities both update and

place more material online, it would encourage citizens to make greater use of e-government resources.

Appendix

Note: The following table shows the percentage of websites in each city that has the particular feature, such as online services, publications, and databases.

Table A-1 Individual City Profiles for Selected Features						
	<i>Online Service</i>	<i>Publications</i>	<i>Data bases</i>	<i>Privacy Policy</i>	<i>Security Policy</i>	<i>Handicap Accessibility</i>
Albany	0%	12%	0%	0%	0%	0%
Albuquerque, NM	33	78	39	100	100	11
Atlanta	12	54	23	0	0	0
Austin	9	78	57	0	0	9
Baltimore	4	56	44	0	0	76
Birmingham, AL	0	32	5	0	0	0
Boston	20	68	44	0	0	8
Buffalo	6	63	25	0	0	0
Charlotte	16	72	28	0	0	8
Chicago	19	85	46	4	0	8
Cincinnati	13	58	50	0	0	8
Cleveland	0	14	14	0	0	5
Columbus	15	70	60	0	0	5
Dallas	4	40	8	0	0	0
Dayton	15	54	31	0	0	0
Denver	8	81	31	92	0	8

Detroit	19	54	23	4	0	0
El Paso	7	64	21	0	0	0
Fort Worth, TX	21	75	29	8	0	0
Fresno, CA	7	53	20	0	0	0
Grand Rapids, MI	8	65	27	0	0	4
Greensboro, NC	5	55	45	0	0	14
Greenville, SC	13	50	38	0	0	0
Hartford	4	26	30	0	0	9
Honolulu	23	77	35	88	0	19
Houston	14	71	48	10	10	5
Indianapolis	33	83	67	0	0	11
Jacksonville	17	61	56	6	0	0
Kansas City	17	58	42	96	96	0
Knoxville	0	71	36	0	0	0
Las Vegas	45	91	18	0	0	27
Long Beach	14	91	64	0	0	0
Los Angeles	25	80	60	10	5	10
Louisville	0	41	0	0	0	18
Memphis	11	58	11	0	0	0
Miami	0	56	22	0	0	0
Milwaukee	12	62	54	0	0	8
Minneapolis	12	54	19	0	0	0

Nashville	13	60	37	0	0	0
New Orleans	13	69	69	0	0	6
New York	25	71	67	8	0	13
Norfolk, VA	22	65	52	9	4	4
Oakland	11	78	33	0	0	67
Oklahoma City	5	73	36	5	5	9
Omaha	7	47	13	0	0	0
Orlando	12	65	35	77	0	4
Philadelphia	15	62	42	4	0	8
Phoenix	15	69	38	0	0	0
Pittsburgh	12	72	64	0	0	0
Portland	4	85	65	0	0	0
Providence	18	91	73	0	0	9
Raleigh	24	62	29	0	10	10
Richmond	18	76	24	6	0	6
Rochester	15	30	20	0	0	5
Sacramento	20	80	73	0	0	13
Salt Lake City	36	72	40	80	80	16
San Antonio	0	58	42	0	0	8
San Diego	19	69	31	100	100	100
San Francisco	27	69	65	0	0	8
San Jose	12	77	46	0	0	35

Seattle	27	100	54	0	0	19
St. Louis	8	50	23	0	0	4
Syracuse	0	47	18	0	0	0
Tacoma, WA	19	69	19	6	0	0
Tampa	13	48	57	87	0	87
Tucson	4	72	36	4	4	8
Tulsa	7	40	33	0	0	0
Virginia Beach	13	77	35	23	23	13
Washington	15	65	65	54	54	0
West Palm Beach	0	78	17	0	0	0