Electronic Government at the Grass Roots:
Contemporary Evidence and Future Trends

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Abstract

In this article we explore the short and largely undocumented history of electronic government, discuss the literature of e-government at the local government level, and document the adoption and sophistication of e-government among US local governments. We employ data from a survey conducted in the winter of 2000 to examine local government adoption of electronic government. We compare the results of that survey to a normative model of e-government maturity. We have found that the emergence of electronic government at the local level is still in its formative stages. Local e-government offerings tended to be more basic when compared to the normative model although many local governments indicate that they have plans to develop more sophisticated offerings in the future. E-government adoption also generally tracks well with previously documented patterns of technology adoption.

Electronic Government at the Grass Roots: Contemporary Evidence and Future Trends

Over the past few years electronic government, or e-government, has been embraced by American local governments as quickly as or more quickly than any governmental technology in history. As recently as 1995 only an estimated 8.7 percent of local governments had sites on the World Wide Web, a.k.a. the Web, on which they provided information or delivered services [20]. Two years later that fraction had more than quadrupled to 40 percent [16], and by the winter of 2000, it had more than doubled again to 83.7 percent [15]. Given this trend line, the percentage of local governments with e-government offerings surely will have reached or exceeded 90 percent by this writing. Other studies have shown that all state governments and nearly all federal agencies have web sites on which they offer information and services. As a further indication of the growing significance of e-government, the Gartner Group[7] has projected that all levels of government in the US will increase spending on e-government from $1.5 billion in 2000 to $6.2 billion in 2006.

Additionally, two Hart-Teeter surveys for the Council for Excellence in Government [4] [5] indicate a rapid growth in use of government web sites by Internet users. The first study noted that electronic government was a "revolution," while the second report referred to e-government as "mainstream," an indication of the rapid diffusion of this technology. In 2001 the survey found that most Internet users (76 percent) and a majority of Americans (51 percent) had at least visited a government web site. This same report found that from 2000 to 2001 a greater percentage of Americans were willing to invest tax dollars in creating and maintaining electronic government applications (up from 30 percent to 37 percent). It also found that 78 percent of decision makers in government had a favorable attitude toward electronic government, seeing it as having a positive effect on the business of government.

In this paper we examine the adoption of e-government by local governments (cities and counties) in the US and the sophistication of those e-government offerings. We begin with a brief review of the current literature about e-government, particularly what other researchers have found in surveys and case studies of e-government. In our examination of the literature we focused on works that bring hard data to bear on the adoption and extent of sophistication of e-government in the US.

We also explore a normative model for gauging the extent and sophistication of e-government offerings. We do so because, although current data show that governments in the US have adopted e-government, adoption data tell us little about the sophistication of those offerings. And, it is as a result of the greater sophistication of e-government that the most advanced types of interactions between citizens and their governments occur. Thus, it is important to know how advanced local governments are with respect to e-government in serving their citizens.

From there we present data from the *2000 Electronic Government Survey* conducted by the International City/County Management Association (ICMA) and Public Technology, Inc. (PTI) in the winter of 2000. This survey is the earliest comprehensive view of the adoption of e-government by US local governments and should provide an important baseline for examining the future adoption of this important technology. Our examination focuses on extent of adoption of e-government, perceived impacts from e-government, sophistication of e-government offerings, and barriers to adoption of e-government. Finally, we present concluding observations and discuss the implications of our findings for the future of e-government among US local governments.

What is E-Government?

A variety of definitions of e-government are available [10] [22] [24] [8] [18]. For purposes of this research we define e-government simply as...the delivery of government services and information electronically 24 hours per day, seven days per week" [14]. Unfortunately, this definition does not permit an assessment of the sophistication of e-government installations or offerings. For example, whether these sites are limited or extensive, primitive or sophisticated in their offerings and capabilities, whether they provide honest, reliable information and quality services or provide information and services that are "challenged," and whether they transmit information one-way or enable site users to engage in transactions across varying vertical and horizontal boundaries, are matters that our definition cannot address. Yet as Pardo [18] has observed, anyone "...can build a Web site, ... but digital government is more than that" (p. 1). Thus, researchers need to examine both the pure adoption and the sophistication of e-government. In order to assess the sophistication of local e-government practices, we used the normative model used by Layne and Lee [9]. It examines e-government maturity along two dimensions and provides four stages of maturity. The two

dimensions capture the increasing sophistication of e-government offerings as measured by the degree of organizational and technological complexity and the degree of integration in terms of data and service delivery. When examined against these two dimensions, the authors are able to describe four stages of e-government maturity as follows: 1) catalog, 2) transaction 3) vertical integration, and 4) horizontal integration.

The authors describe the stages as being cumulative in that a government has to pass through all preceding stages to move to the next higher one. One of the strengths of this model is the recognition that enabling more mature, and therefore more complex, e-government offerings involves organizational issues as much as technological ones. Because it deals with both the organizational and technological complexity and data and service integration, it provides a broad basis for evaluating the sophistication or maturity of e-government offerings. As a result, we have chosen this model as a normative basis for evaluating the progress of e-government offerings at the local level. Using the Layne and Lee model it is possible to assess the extent to which e-government sites have progressed in their relative sophistication from essentially one-way information providers to fully integrated (vertically and horizontally) purveyors of information and deliverers of services with extensive transaction capabilities. We use the data from the *2000 Electronic Government Survey* as the empirical component of that assessment.

The State of E-Government

The contemporary literature on e-government, including both surveys and case studies, can be characterized as being both recent and scant. Undoubtedly, this is because e-government itself is such a recent phenomenon, and a lag time of a few years often occurs before scholarship catches up with practice. In developing this paper, we examined this literature and report its findings in the paragraphs that follow.

Norris and Demeter also found that "computer adoption [including the adoption of web sites] is related primarily to city size, although region of the country, form of government, and metropolitan status may play a role" (p. 18). This finding is highly consistent with findings from more than two decades of research into the adoption of IT by local governments.(Among others, these works would prominently include publications emanating from the URBIS studies conducted by Kenneth L. Kraemer and his associates such as James N. Danziger, William H. Dutton, Debora E. Dunkle, John L. King, Rob Kling, Alana Northrop and James N. Perry.)

It has been further supported by work by Norris and

Campillo (in progress), who conducted a regression analysis using the 1997 ICMA/PTI survey data to find that 28 percent (R^2 = .277) of the variation in local government adoption of leading edge or innovative information technologies can be explained by a combination of city demographic variables. Larger cities, those with the council-manager form of government, those in the west and south, and central cities are more likely to adopt leading edge information technologies than medium and small cities, mayor-council cities, cities in the northeast and north central regions, and suburban or independent cities [13]. Population was the key variable with a regression coefficient of 0.370.

In 1997 Stowers conducted a content analysis of the official web sites of the 50 states and of all cities over 100,000 in population. Among other things she found wide variations among state and local government sites in terms of coverage and emphasis; a greater informational content and content about functions and services than about policy; and greater overall emphasis on economic development than any other single area. Finally, she found that although 90 percent of state and 78 percent of local sites provided e-mail or telephone contact information for local elected and appointed officials, the sites were predominantly passive rather than active. That is, they provided information one-way rather than being interactive.

In the second half of 2000, Kaylor, Deshazo and Van Eck [8] examined the Web offerings of 123 US cities between 100,000 and 200,000 in population. Their principal finding was that, for the most part, the sites that they reviewed were quite limited. Their definition of e-government differs from ours and adds a qualitative dimension: the ability of citizens using a web site to interact with the local government "...in any way more sophisticated than a simple email letter to the generic city (or webmaster) email address provided at the site" (p. 297). As they noted, "without question, our most striking finding is the number of cities in our study with no e-government at all using our definition of the term" (p. 299). Like scholars who have preceded them, Kaylor, Deshazo and Van Eck, found a direct relationship between city size and extent of e-government adoption. Finally, they observed that e-government is a "moving curve" (p. 294), and they called for "carefully generated descriptive statistics...that chart the development of public sector web sites" (304-305).

In 2000 and 2001, West conducted studies of local, state, and federal e-government. In the first study, [22] he surveyed the Chief Information Officers (CIOs) of the 50 states and of 38 federal agencies and conducted a content analysis of over 1,800 state and federal web sites. Among other things, he concluded that of the sites he examined only "22 percent (389 in all) contained one or more online service. Of these, 292 offered just one service" (p. 13). Additionally, and not surprisingly, he found that federal sites were superior to state sites in terms of information and services and that there was considerable variation among state sites.

A year later, West completed two studies [23] [24], including an analysis of 1,680 state and federal web sites and an analysis of 1,506 sites in the 70 largest US cities. With respect to state and federal sites, he found that 25 percent of sites provided online services, only a three percent increase over 2000. However, he also found that these governments had "made excellent progress on developing 'one-stop' portals that integrate web service delivery" (p.3). Nearly two-thirds (64 percent) of federal and 43 percent of state sites had links to portals. (A figure for those having portals (versus links to portals) was not available.) Finally, West found again that federal sites were superior to state sites in information and service delivery and that state sites varied widely.

Among city sites, West found that only 13 percent "provide services that are fully executable online" (p. 3). Additionally, a quarter (25 percent) either had portals or links to portals. The services most frequently found online: paying parking tickets or traffic violations (30 sites); complaint filing (27 sites); and service requests (24 sites). West also found that there was considerable variation among city sites, although, "In general, large cities are more successful in placing services online..."(p. 5). Among other things, if taken together, these studies suggest that:

- governments in the US are increasingly adopting e-government;
- the complexity and sophistication of e-government offerings are increasing over time;
- there is considerable variation in e-government content and sophistication among units and between levels of government;
- nevertheless, governments are moving from Stage 1 of e-government maturity towards Stages 2 and 3 of the Layne and Lee model; and
- size matters, with larger governments adopting earlier than small units and having more extensive and sophisticated e-government offerings.

It remains for us to present empirical data to describe the adoption and sophistication of e-government among US local governments (circa winter 2000), to compare the adoption and sophistication against data from other studies, and to draw inferences both from these data and earlier research about future patterns of e-government adoption and sophistication.

Methodology

The data for this study are from a survey conducted in the winter of 2000 by the International City/County Management Association (ICMA) and Public Technology, Inc. (PTI) of 3,749 local governments in the United States, including 2,899 municipalities above 10,000 in population and 850 counties with either the council-administrator (manager) or council-elected executive form of government. The purpose of the survey was to ascertain the extent to which local governments in the United States were engaged in electronic government, including such things as having sites on the World Wide Web and providing information and delivering services electronically. In that survey, electronic government was defined as "...the delivery of services and information, electronically, to businesses and residents, 24 hours per day, seven days per week" [14].

Over half of the local governments surveyed (50.2 percent) responded, including 50.7 percent of municipalities and 48.2 percent of counties. This is an excellent response rate and is consistent with the response rate of 50 percent obtained by ICMA and PTI in their 1997 information technology survey of municipal governments. Given differing response rates by jurisdiction type, the following were somewhat over-represented in this survey: small and medium size local governments; western local governments; central and suburban local governments; and council-manager cities and council-administrator counties. On the whole, however, the respondents were reasonably representative of US local governments.

Our analysis included simple descriptive statistics, cross tabulations and basic tests of statistical significance for relationships between reported local government demographic characteristics and various attributes or components of e-government. The demographic characteristics included: (These are standard categories used by the ICMA in its survey work and are contained in the survey database. For a full description, see 1999 Municipal Yearbook (Washington, DC: International City/County Management Association. 1999), pp. 10-19.)

- population – whether large (>250,000), medium (25,000 to 249,000), or small (<25,000);
- level of government – whether city or county;
- form of government – whether mayor-council or council-manager among cities and whether council-elected executive or council-administrator among counties;
- region of the country – whether northeast, north central, west or south; and
- metropolitan status – whether central, suburban or independent;

The e-government attributes or components included web site adoption, use of a web manager, strategic planning for e-government, perceived impacts from e-government, online transactions offered, and barriers to e-government.

Where relevant (and possible due to the vagaries of the survey instrument), we report the results of those tests if they rose to the level of statistical significance. In cases where response rates were too low to permit the tests or where the questions were constructed so that meaningful statistical analysis was not possible, we report simple descriptive statistics.

The State of E-Government Among US Local Governments, Circa 2000

In the following section we examine the adoption of web sites by local governments, their deployment of web managers the existence of strategic plans for e-government, the perceived impacts of e-government, the extent to which e-government sites enable online, interactive transactions, and the perceived barriers among local government to the adoption of e-government.

Web Site Adoption

As previously reported, web site adoption by local governments had dramatically increased from 8.7 percent in 1995 to 83.3 percent in 2000, and includes 86 percent of municipalities over 10,000 and 75 percent of appointed administrator or elected executive counties **(Table 1)**. Moreover, the 2000 survey found that 70 percent of local governments without web sites planned to have them within the next year. Adoption was related to size of government, level and form of government, region and metro status (p = <.001). More large governments, cities, council-manager city governments and council-administrator county governments, those in the west, and local governments with a metro status of central were likely to have adopted e-government than their counterparts. Many of the same relationships were observed with respect to governments that said that they had plans to adopt web sites although the relationships were weaker (p = <.05) for level of government, region and metro status. There was no statistically significant relationship between web site plans and population and form of government.

Table 1. Web site adoption

	Yes		No		Total	
	No.	%	No.	%	No.	%
Does your local government have a web site?	1,573	83.6	308	16.4	1,881	100
Does your local government plan to create a website within the next year?	207	69.9	89	30.1	296	100

Source: ICMA/PTI 2000 Electronic Government Survey.

Table 2. E-government strategic plan

	Yes		No		Total	
	No.	%	No.	%	No.	%
Does your local government have an overall e-government strategy or master plan?	153	8.8	1,590	91.2	1,743	100

Source: ICMA/PTI 2000 Electronic Government Survey.

Not surprisingly, given the data from other studies, most local government web sites are relatively young. Most (68.5 percent) were three years old or less. Large local governments, and those in the west region, and those with a metro status of central (p = <.001) had adopted sites earlier than their counterparts. There was no statistically significant difference between age of web site and on form of government.

Strategic Planning for E-government

It has long been a mantra in the field that strategic IT planning is a key ingredient in the successful deployment of IT resources [1] [2] [21] [6]. Moreover, 71 percent of state and federal CIOs interviewed in 2000 indicated that their organizations had undertaken some form of strategic planning to assist their deployment of e-government [22]. Conversely, however, in a case study of six e-government applications across federal, state and local levels of government, Cohen and Eimicke [3]concluded that shifts from traditional to web-based service delivery lacked adequate planning and financial analysis. As confirmed by the results below, it appears that the amount of strategic planning for e-government varies some by level of government with local planning for e-government lagging behind state and federal efforts. [12]

The 2000 E-Government Survey asked whether local governments had e-government strategies or master plans. Contrary to the mantra in the field and the findings from state and federal government CIOs, 91 percent of responding local governments said that they did not have strategic or master plans to guide their e-government deployment **(Table 2)**. The preparation of an e-government strategy or master plan is more likely to occur in municipalities with large populations (p < .001), in the south and west (p < .01), and those municipalities with a metropolitan status of central city (p < .001).

Perceived Impacts

There has been considerable speculation in the trade and professional literature, in the popular media and, to a lesser extent, in the scholarly literature about the potential impacts of e-government. For the most part this speculation has suggested that largely, if not exclusively, positive impacts will result from it. For example, the Bush administration has made e-government one of five facets of its management agenda, citing the potential of IT-enabled government to improve the effectiveness and efficiency of federal agencies and make government more "citizen-centric." [17]. It is clearly "early days" in local government adoption of e-government and, therefore, premature to expect definitive answers regarding e-government impacts. However, data from local governments about impacts could provide early indications of whether the speculation is grounded or groundless. Thus, the survey asked about the impacts that local officials felt had occurred as a result of their e-government offerings. Their responses provided only limited support for the projected positive impacts. For example, although 27 percent of local governments said that e-government increased efficiency, 44 percent said that it increased demands on staff and only 1.4 percent said that it reduced staff **(Table 3)**.

These findings are quite at odds with data from West's survey of federal and state CIOs in 2000, where he found that 86 percent of the CIOs "felt that e-government had improved service delivery, 83 percent believed it had made government more efficient, and 63 percent claimed that it had reduced government costs" [22]. Perhaps the reason for this is that state and federal governments have had greater experience with e-government and have more e-government offerings and, therefore, are reaping more positive results. It could also be that responses based on "perceptions" of impacts during the early stages of the diffusion of a technology innovation are not highly reliable.

Table 3. Perceived impacts

How has e-government changed your local government?	No.	%
Increased demands on staff	344	21.9
Changed role of staff	323	20.5
Business processes are being re-engineered	283	18.0
Business processes are more efficient	214	13.6
Reduced time demands on staff	135	8.6
Reduced administrative costs	79	5.0
Reduced number of staff	11	0.7
Increased non-tax-based revenues	10	0.6

Source: ICMA/PTI 2000 Electronic Government Survey.

E-government Transactions

Whether local governments have web sites or not says little about the extent or sophistication of their e-government presence. Based on prior research we expected to find from the 2000 survey that most local governments were either at or just beyond Stage 1 of e-government development of the Layne and Lee model. That is, their offerings would principally be informational, although moving in the direction of transactional (Stage 2).

The 2000 e-government survey asked several questions about interactive service delivery, divided into financial and non-financial areas. In all cases, very small (sometimes-tiny) minorities of local governments reported that they provided services interactively. For example, fewer than three percent reported offering interactive financial transactions (paying tickets – 1.7 percent; paying utility bills -- 2.7 percent; paying license or permit fees – 1.7 percent). Fewer than five percent reported offering interactive transactions in four non-financial areas (voter registration – 2.0 percent; property registration – 1.0 percent; business licenses – 3.3 percent and permit application and renewal – 4.9 percent). Slightly larger minorities reported offering interactive capability in four additional non-financial areas (program registration – 7.5 percent; requesting services – 18.1 percent; requesting records – 15.0 percent; and interactive maps – 11.2 percent). (Because the numbers of respondents to these questions were so small and also because the way in which the questions were formulated on the survey instrument, we were unable to undertake tests for statistical significance for possible associations between local government demographic variables and whether non-adopting governments had plans to adopt any of these online interactive transactions.)

Although few local governments offered online interactive or transactional services in 2000, larger fractions said that they planned to offer such services within the next year (**Table 4**). For example, among financial transactions, 40.9 percent said that they planned to offer the ability to pay license/permit fees on their web sites; 30.8 percent said utility bills; 29.7 percent said tickets; and 21.5 percent said taxes. And between 10.3 percent (voter registration) and 39.7 percent (permit application or renewal) said that they planned to offer non-financial services interactively. As Norris has noted with respect to the adoption of leading edge information technologies, however, what local governments say they plan to do and what they actually do can often be different [12]. Thus, these indications of plans should be reviewed critically against actual adoption data in coming years.

Table 4. Interactive services planned

Financial transactions	No.	%
Payment of taxes	405	21..5
Payment of utility bills	580	30.8
Payment of license fees	770	40.9
Payments of tickets/fines	559	29.7
Other	92	4.9
Non-financial transactions		
Requests for service (streetlight repair, pot holes, etc.)	535	28.4
Requests for local government records	493	26.2
Interactive maps	520	27.6
Registration for programs (parks and recreation, etc.)	633	33.7
Permit application or renewal	747	39.7
Business license application or renewal	614	32.6
Voter registration	194	10.3
Property registration (animal, bicycle, etc.)	332	17.6
Other	25	1.3

Barriers to E-government

This portrait of the adoption of e-government clearly shows that, at the time of the survey, most US local governments were at the very early stages of e-government development. The obvious question is, why?

Certainly, one of the reasons is that most local government web sites (68.5 percent) were then less than four years old. Since it takes time (and other scarce resources) to develop web sites, we would expect that newer web sites would be less mature than older ones.

Another reason could be that few local governments have web managers whose sole responsibility it is to develop and maintain web sites. As Norris and Kraemer [16] have shown, a substantial infrastructure is needed to support local government-wide IT resources and services,

and the existence of an IT infrastructure is related to the ability of local governments to implement innovative information technologies. Without such infrastructure, local governments cannot easily (or at all) adopt innovative information technologies. The same may well be true of the need for infrastructure, including web managers, for e-government adoption.

Additional reasons for the current state of e-government in local government can be found in answers to the 2000 survey about barriers to adopting e-government (**Table 5**). (The survey did not ask questions that would permit us to address whether local governments were providing e-government that was integrated either vertically (Stage 3) or horizontally (Stage 4). However, evidence from other studies would suggest that they are only just beginning to do so [8]). According to the local government respondents, the five greatest barriers to the adoption of e-government, in order of frequency of response, were: lack of technology or web staff; lack of financial resources; lack of technology or web expertise; issues regarding security; and the need to upgrade existing information technology.

Table 5. Barriers to e-government

Which, if any, of the following barriers to e-government initiatives has your local government encountered?	No.	%
Lack of technology/webstaff	1,031	54.8
Lack of financial resources	840	44.7
Lack of technology/web expertise	723	38.4
Issues regarding security	652	34.7
Need to upgrade technology (PCs, networks, etc)	525	27.9
Lack of information about e-government applications	438	23.3
Issues regarding privacy	429	22.8
Issues relating to convenience fees for on-line transactions	409	21.7
Lack of support from elected officials	192	10.2

Source: ICMA/PTI 2000 Electronic Government Survey.

Clearly, these could be significant barriers to the adoption of e-government. For example, if local governments lack technology and web staff and expertise, they would be hard pressed to implement and manage even very basic web sites. If they lack financial resources, they may not be able to afford to develop and support e-government offerings. If local governments have concerns about security of their systems and data, even after other barriers may be overcome, they may remain cautious about what they place on the web and whether web offerings are interactive. Finally, if they need to upgrade existing IT infrastructure to support e-government, they are likely to lag behind organizations whose IT infrastructure is more compatible with the demands of the current Web environment. Thus, there

should be little wonder that local governments have moved ahead slowly in the further and more sophisticated development of their e-government presence.

Conclusions and Implications

The contemporary literature on e-government (scant though it is) and data from the 2000 E-Government Survey show that while most local governments have a presence on the Web and are at least at the beginning stages of e-government development, few of them offer sophisticated online services involving interactive transactions. At least that was true in the winter of 2000. However, e-government is a rapidly moving and evolving target. The literature on innovation adoption and diffusion [19] shows that innovation adoption among potential adopting units increases over time (resembling an S curve). As numerically more units adopt an innovation, the innovation also penetrates more deeply into organizations and permits a wider array of uses and potentially greater payoffs [12]. Hence, we would expect future studies to show an increase in both adoption and sophistication of e-government among local governments with increasingly fewer units being at Stages 1 and 2 in the Layne and Lee model and relatively more at Stages 3 and 4.

The data from the 2000 survey also permit us, once again, to note that size matters with respect to IT adoption in local government. Population drives a goodly share of the adoption of e-government. However, population is also joined by other demographic variables including level of government (city v. county), form of government (council-manager v. mayor-council in cities and council-administrator v. council-elected executive in counties), region (west v. other regions), and metro status (central v. suburban or independent) to help explain e-government adoption with the very few exceptions noted earlier.

These data also tell us that regardless of the hype surrounding it, e-government at the grass roots in the US is not a panacea. Even though the hype suggests that local governments will become more effective and efficient if they adopt e-government, local government managers do not see it quite this way. The mixed results on both perceived results of adoption to date and the lack of clarity on barriers indicate a need for further data gathering and analysis. Until that time, local governments likely find e-government is a mixed blessing, increasing efficiency but also adding demands onto staff while not reducing staff. Thus, while providing additional convenience for citizens to access governmental information and services, e-government must be viewed as a net addition (with attendant costs) to the already extensive menu of local government activities and services.

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References

[1] Abramson, Mark A. and Grady E. Means. 2001. The Challenges of E-Government: Initial Lessons Learned from the "Early Days." *E-Government 2001*. New York: Bowman & Littlefield..

[2] Caudle, S.L., Marchand, D.A., Bretschneider, S.I., Fletcher, P.T., and Thurmaier, K.M. 1989. *Managing Information Resources: New Directions in State Government*. Syracuse, NY: Syracuse University.

[3] Cohen, Steven and William Eimicke. 2001. The Use of the Internet in Government Service Delivery in *E-Government 2001*, eds. Mark A. Abramson and Grady E. Means. New York: Rowman and Littlefield.

[4] Council for Excellence in Government. 2000. *E-Government: The Next American Revolution*. http://www.excelgov.org/egovpoll/report/poll_report.PDF (accessed on the World Wide Web October 1, 2000).

[5] Council for Excellence in Government. 2002. *E-Government: to Connect, Protect, and Serve Us.* http://www.excelgov.org/techcon/0225poll/index.htm (accessed on the World Wide Web May 31, 2002).

[6] Fletcher, Patricia T. 1999. Strategic Planning for Information Technology Management in State Government. In *Information Technology and Computer Applications in Public Administration: Issues and Trends*, ed.G. David. Garson, 81-98. Hershey, PA: Idea Group Publishing.

[7] Gartner Group, "Gartner Says U.S. E-Government Spending to Surpass $6.2 billion by 2005." Press Release 041100c. http://gartner11.gartnerweb.com/public/static/aboutgg/pressrel/pr041100a.html.

[8] Kaylor, Charles, H., Deshazo, Randy, and Van Eck, David. 2001. Gauging E-government: A Report on Implementing Services Among American Cities. *Government Information Quarterly*, 18: 293-307.

[9] Layne, K. and Lee, J. 2001. Developing Fully Functional E-government: A Four Stage Model. *Government Information Quarterly* 18: 122-136.

[10] McClure, David L. 2002. Testimony before the Subcommittee on Government Management, Information and Technology, Committee on Government Reform, House of Representatives. US General Accounting Office GAO-T-AIMD/GGD-00-179.

[11] Norris, Donald F., and Kenneth L. Kraemer. 1996. Mainframe and PC Computing in American Cities: Myths and Realities. *Public Administration Review*, Vol. 56, No 6 (November/December).

[12] Norris, Donald F. 1999. Leading Edge Information Technologies and American Cities. In *Computer Applications and Public Administration*, ed. G. David Garson. Hershey, PA: Idea Group Publishing.

[13] Norris, Donald F., and Diana Campillo. 2002. in progress. "Factors affecting the adoption of leading edge information technology by local governments. Baltimore, MD: Maryland Institute for Policy Analysis and Research, University of Maryland, Baltimore, County.

[14] Norris, Donald F., Patricia D. Fletcher and Stephen H. Holden. 2001. *Is Your Local Government Plugged In? Highlights of the 2000 Electronic Government Survey*. Washington, D.C.: ICMA, 2001.

[15] Norris, Donald F., Stephen H. Holden, and Patricia D. Fletcher. 2001. *E-Government: Web Sites and Web Access*. Special Data Issue No. 4. Washington, D.C.: ICMA.

[16] Norris, Donald F., and Lori A. Demeter. 1999. Computing in American City Governments. In *1999 Municipal Yearbook*. Washington, D.C.: ICMA.

[17] Office of Management and Budget. 2002. *New E-Government Strategy is Roadmap to Better Service 24 New Initiatives Help Millions Who Access the Government Online* OMB Press Release 2002-11. (2/27/2002) Washington, DC: Office of Management and Budget.

[18] Pardo, Theresa. 2000. Realizing the Promise of Digital Government: It's More than Building a Web Site. Albany, NY: Center for Technology in Government.

[19] Rogers, Everett. 1985. *Diffusion of Innovations*. Fourth Edition. New York, NY: The Free Press.

[20] Sprecher, Milford H., Haywood Talcove and Dale Bowen. 1996. *Government Technology* (1):47-49.

[21] Stowers, Genie D.L. 2001. Commerce Comes to Government on the Desktop: E-Commerce Applications in the Public Sector in *E-Government 2001*, eds. Mark A. Abramson and Grady E. Means. New York: Rowman and Littlefield.

[22] West, Darrell M. 2000. *Assessing E-Government: The Internet, Democracy and Service Delivery by State and Federal Governments*. Available at: www.insidepolitics.org.

[23] West, Darrell M. 2001a. *State and Federal E-Government in the United States, 2001*. Available at: www.insidepolitics.org.

[24] West, Darrell M. 2001b. *Urban E-Government: An Assessment of City Government Websites*. Available at: www.insidepolitics.org.