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The City of Binghamton's E-Governance Initiative: Maturing Towards Transformation

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THE CITY OF BINGHAMTON'S E-GOVERNANCE INITIATIVE: MATURING TOWARDS TRANSFORMATION

BY

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Executive Summary

As use of the internet has rapidly increased around the globe, it has become vital that municipalities are able to effectively communicate with, provide services to, and engage, constituents using online tools. Trade and academic research and literature has delved into the myriad opportunities these tools present, including increased transparency, open two-way communication between officials, administrators and the public, and increased efficiency and ease of access to services through online transactions. Additionally, transformative tools are able to increase citizen awareness, participation, and engagement. While the City of Binghamton has been successful in implementing many of the features of effective e-governance, room for improvement remains.

For this research, an e-governance maturation model was used to identify the e-governance development stage of the City of Binghamton, large best practices cities, small best practices cities, and cities comparable to Binghamton in population size and median household income. The stages of the development model include (1) information, (2) interaction, (3) transaction, and (4) transformation. Additionally, comparisons were made between large and small best practices cities to determine the impact of population size on a city's ability to implement e-governance tools. Median household incomes were analyzed to determine to what extent potential financial limitations burden cities. Findings include the following;

- The City of Binghamton has successfully moved through the information stage, has implemented 71.4% of the interaction indicators, 66.6% of the transaction indicators, and 25% of the transformation indicators.

- The City of Binghamton has been more successful in implementing indicators of the information, interaction, and transaction stages of e-governance development compared to rust belt cities with comparable population sizes and median household incomes.
- Among best practices cities, variations in city population sizes do not have a noteworthy impact on successful e-governance implementation, with the exception of the use of mobile-governance and ease of website navigation.
- Lower median household incomes in cities are associated with less e-governance implementation throughout all stages, as proven by implementation rates of 83% and 80% for higher incomes municipalities, and 52% and 62.5% for those with lower incomes.

The websites of best practice cities were used to determine the most effective use of e-governance tools, particularly in the transformation stage where Binghamton faces its greatest challenges, in order to provide city officials with recommendation for the immediate and long-range future. Recommendations include the development and implementation of an inclusive, up-to-date community calendar, posting of volunteer opportunities, and more effective use of web 2.0 tools. Additionally, considerations for future development include personalized dashboards and mobile-governance, the use of cell phone and tablet-based technologies.

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Dan, thank you for teaching me that intelligence should be inspiring not intimidating, that teaching and learning is a vast improvement over arguing and competing, and that you never truly know a person until you have investigated their iPod.

I am honored to have shared this experience with all of you. Good luck and congratulations on your numerous, forthcoming accomplishments.

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Introduction

The primary function of the City Clerk is to provide all necessary support to the Binghamton City Council and its individual members. In doing so, the City Clerk compiles and submits requests for legislation to the City Council, drafts legislation, creates meeting agendas and minutes, communicates with constituents on behalf of Council-members, and keeps members up-to-date on activities in the community. Communication with constituents is driven primarily by citizen complainants to Council-members or office staff and Freedom of Information Law (FOIL) requests. Occasionally, information is disseminated to citizens who may be concerned with a particular issue.

The City Clerk is responsible for posting City Council business meeting minutes, and all meeting agendas, online for the public and local news outlets to access. Additionally, the City Clerk is required to publish City Council meeting dates, times, and locations in compliance with the New York State Open Meetings Law. Currently, the Binghamton City Council is composed of seven members and members may serve two, four-year terms. The City Clerk is a political appointee of the City Council and typically serves a four-year term as well.

While supporting the City Council is the primary task of the City Clerk, several other responsibilities are completed by the Clerk and other office staff. First, the office serves as the official permit and license issuing agent for the City. In this capacity, the City Clerk's Office provides permits to individuals, not-for-profit organizations, and businesses planning events within City limits, such as: block parties, 5k road races, and fireworks displays. Marriage and professional licenses are also provided. Secondly, the office is also responsible for dog control services, including licensing, contracting for

shelter care, and responding to resident concerns. Lastly, all FOIL requests submitted to the City are processed and tracked by this office.

Problem Statement

Significant emphasis has been placed on increasing the effectiveness of online government tools in recent years as internet use, on both personal computers and smart phones, has rapidly expanded. President Obama has encouraged the use of the internet to create greater government transparency and accountability, as well as citizen engagement (Cogburn & Espinoza-Vasquez, 2011). Efforts have been also been undertaken at the state level, including Governor Andrew Cuomo's recent announcement of the creation of a New York State electronic town hall (http://governor.ny.gov/citizenconnects/). Additionally, cities across the nation have begun to use online citizen engagement tools and other practices determined to be successful at increasing efficiency and effectiveness. While Binghamton has worked to meet many of the early indicators of effective e-governance, room for improvement remains (Backus, 2001).

The City's weaknesses limit the ability of government employees and officials to encourage citizen participation, while also limiting the City's access to other benefits including increased efficiency in processing transactions (Evans &Yen, 2006). As indicated by the poor attendance and the limited number of speakers at City Council business meetings (See Appendix A for complete list of public speakers at meetings) and public hearings (See Appendix B for complete list of public speakers at hearings), the City Clerk's Office, in collaboration with City Council, does little to encourage interaction between City Council-members and residents of the City of Binghamton. Constituents are required to contact the City Clerk's Office, or individual Council-

members, in order to obtain information not placed on meeting agendas or minutes. One way to increase interaction between citizens, City Council, and other City departments is through further development of the City's e-governance initiative. Additionally, effective use of e-governance can encourage the rebuilding of citizen trust in government, a weakness commonly discussed in academic literature (Holzer, Melintski, Rho, & Schwester, 2004).

Failure to fully capitalize on the benefits of the City's online platform impacts numerous departments within City Hall. Following the flood of 2011, Binghamton residents became exasperated when the City failed to provide an online index of licensed electricians in the area; information partially obtained through the licensing process carried out by the City Clerk's Office. While code officials required homes damaged during the flood to be repaired by licensed electricians, a thorough list of these individuals was not available. Because this information had not been provided previously, the City Clerk's Office had not obtained contact or employment information for those obtaining licenses, making the publication of this data impossible for the office.

In a city struggling to retain residents, the possibility of encouraging interest in the community and inspiring a desire to remain can provide opportunities. The City of Binghamton should aim to disseminate the greatest amount of information available to its citizens, information relating to government activities, actions, and decisions, as well as information about the greater community. Therefore, the purpose of this capstone project was to determine ways in which the Binghamton City Clerk's Office, City Council-members, and other City officials and departments can effectively advance the City's e-governance initiative, thereby encouraging citizen engagement with the municipal

government and broader community. This paper was developed to outline answers to the following questions;

(1) What is the current development stage of the City of Binghamton's e-governance initiative?

(2) What challenges and limitations are faced by City of Binghamton, and other municipalities, in the development and implementation of effective e-governance?

(3) What best practices can the City Clerk's Office, City Council, and Binghamton city government employ to increase the effectiveness of the City's e-governance initiative?

Literature Review: E-governance

Selecting a universal definition and purpose for e-governance appears to be an area of contention among scholars (Streib & Willoughby, 2005). In its most basic form, e-governance is the dissemination of information and the offering of services through the internet or by other electronic means (Mossberger & Jimenez, 2009). For some, the focus of e-governance remains on the use of technology to increase efficiency and conserve public sector resources. In this light, the primary goal of e-governance initiatives is to reduce the cost of everyday activities, transactions, and management (Mayer-Schonberger & Lazer, 2007, Edmiston, 2003). Others argue that new technologies should be used to increase citizen participation in the democratic process, regardless of associated costs, through online public forums, digital town hall meetings, or other avenues allowing for open, two-way communication between officials, administrators, and citizens (Dawes, 2008). For the purpose of this report, e-governance is viewed in a broad context, defined as "the use of information and communication technologies, and

particularly the internet, as a tool to achieve better government" (OECD, 2003). While these technologies can be used to increase internal efficiency, this report focuses on external use.

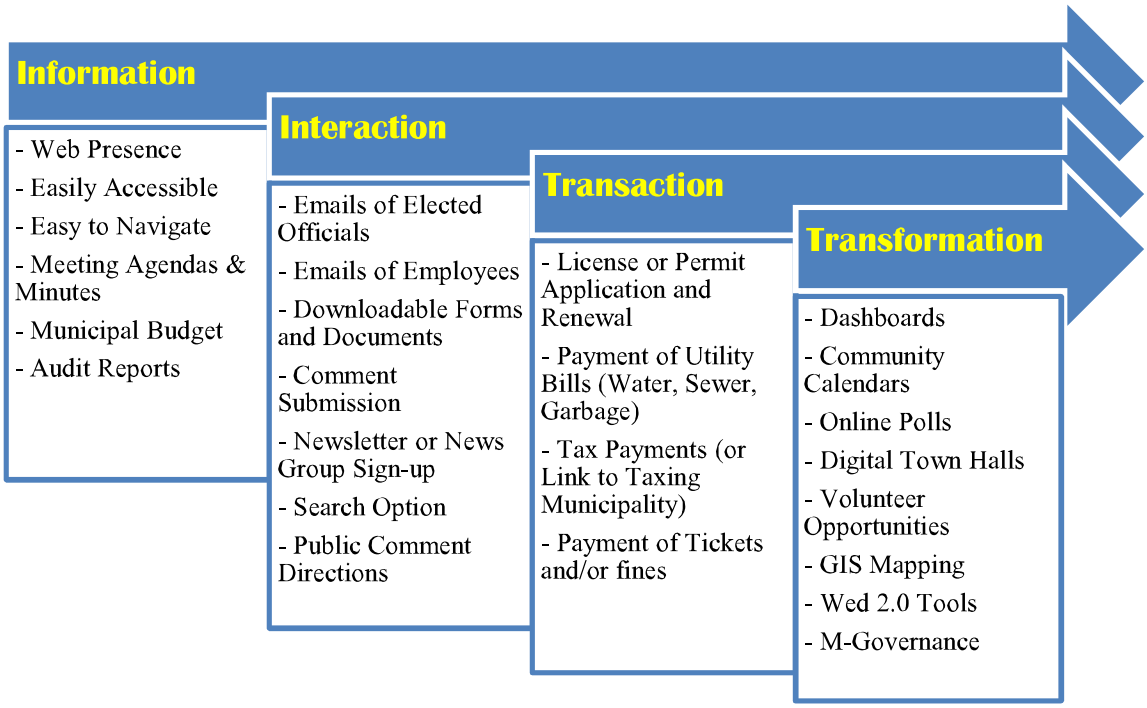
Stages of E-governance Development

Rather than signifying serious differences in the objectives of e-governance initiatives, variations in the literature may be explained by the numerous stages of development in which e-governance can be found today. Early e-governance efforts frequently entail the posting of basic organizational facts, followed by contact information. Later stages involve the implementation of online transactions, synchronous communication tools, and web 2.0 features including social media and blogs. Maturation models are commonly used to explain the stages of e-governance development, while detailing the characteristics of each stage (Brown, 2007; Backus, 2001). Figure 1 depicts the four stage model illustrated by Backus, (2001) and adopted from the Maturity Model published by Gartner, (2000) an international e-business research consultancy firm.

Information

In their infant stage, most e-governance initiatives involve the creation of municipal websites used for the online dissemination of information. Primary goals include increased government transparency and citizen awareness. Commonly provided information includes the location of government offices, hours of operation, and meeting agendas and minutes (Scott, 2006). While documents focusing on areas of interest to constituents may be provided (Lee, 2004), Backus (2001) relates this stage to the distribution of leaflets or brochures. Information is frequently developed for an

Figure 1



unspecified population and opportunities for constituent feedback are minimal (Mandarano, Meenar & Steins, 2010).

To begin the information stage, municipalities must develop a city website that citizens can access through online searches (Backus, 2001). Meeting agendas and minutes must be published during this stage. City Council meeting agendas and minutes are initially provided, followed by the posting of these materials by various city commissions and boards. One of the most influential ways in which this stage of development encourages transparency is through the posting of municipal budgets and financial audit reports (Scott, 2006).

Interaction

During the second phase of the maturation process, tools are used to encourage communication between citizens and elected officials and/or government administrators.

Email is the primary instrument implemented by the majority of municipalities (Dawes, 2008). While one-to-one communication with officials is vital, it is predominantly asynchronous during this early phase. An organizational culture founded in openness and transparency will be required for successful interaction to occur (Edmiston, 2003). This shift in organizational culture is one of the most commonly noted e-governance implementation obstacles (Streib & Willoughby, 2005).

Information dissemination differs during this phase as well; opportunities for citizen feedback increase and requests for notification of future information can be submitted (Backus, 2001; Lee, 2004; Mandarano, et al., 2010). Additionally, citizens are able to obtain documents in downloadable formats. Forms, applications, and other materials can be then be completed at home, reducing the burden placed on citizens and government employees alike (Edmiston, 2003). To achieve success, it is vital that these documents are made available in widely used formats such as ".pdf" or ".doc" (Lee, 2004). While forms are downloadable at this point, citizens are still required to complete transactions in-person, providing necessary signatures, payments, and additional documentation (Backus, 2001).

To determine whether a municipality has reached the interaction stage of the development process a number of communication and other related tools are sought. First, emails must be provided for elected officials and other government employees (Backus, 2001; Edmistion, 2003). A comment submission option should be provided to citizens who remain unsure of which official or administrator to contact directly. Citizens must be able to request further information through all of these avenues as well (Edmiston, 2003; Scott, 2006; Mandarano, et al., 2010). It is also recommended that

municipalities allow citizens to sign-up to receive newsletters, or to join news groups, during this stage. The information disseminated through these tools may cover a range of city topics or be relevant to certain departments or events (Brown, 2007). As noted above, downloadable documents and forms should be made available, as well as search functions allowing residents to retrieve specific information sought (Backus, 2001). Lastly, citizens should be instructed how to provide feedback on posted documents (Lee, 2004) or how to speak during public comment at city meetings.

Transaction

E-transactions allow the online completion of tasks that previously required in-person visits to government offices. Among the most common are payments for license renewals and the submission of applications for permits (Dawes, 2008). While these services do not encourage participant, they can lessen the burden placed on residents. Approaches to online transactions are diverse, influenced by the frequency with which the transaction occurs and the technological capabilities of the municipality or government agency. Frequent transactions may be completed through individual personalized accounts which allow citizens to track information, including utility or tax bills. Less common transactions, such as driver's license renewals, are more likely to be done without the maintenance of an individual account (Backus, 2001; Edmiston, 2003).

Benefits resulting from the implementation of e-transactions frequently extend to both governments and citizens by increasing the efficiency of everyday tasks (Backus, 2001; Dawes, 2008). In a review of reports generated following the implementation of e-transactions at DMVs in numerous cities and states, Edminston (2003) found significant improvements. Results showed that transactions which had previously taken two to eight

hours could be completed online in a matter of minutes. Savings extended to governments as well; the State of Alaska was able to reduce its per-transaction cost from $7.75 to $0.91 by implementing online license renewals.

Unfortunately, the purchase and implementation of a sophisticated online permit application tracking and payment system can be costly and remains a challenge for the Binghamton City Clerk's Office. In February of 2011, the City of Pittsburgh introduced a $1.3 million system capable of handling these tasks (Daigneau, 2011). Other cities allow this process to take place through email, though options are often limited to specific applications and permits. As noted above, other payment options include utilities, as well as tickets, fines, and property taxes or links to the taxing municipality's website (Edmiston, 2003; Brown, 2007).

Transformation

Governments currently and effectively engaged in the transformation phase represent a comparatively small, elite cluster. Not surprisingly, many of these groundbreaking initiatives have been implemented in commonly known, tech-savvy communities, such as Seattle, Boston, and San Francisco (Thaler, 2011; See seattle.gov; cityofboston.gov; sfgov.org). These cities are likely to have numerous individuals in leadership positions willing to champion the city's e-governance initiative, a key to success (Streib & Willoughby, 2005). The e-governance tools implemented by these municipalities allow individuals to maintain personalized online accounts, which integrate information from a variety of sources (Backus, 2001; Mossberger & Jimenez, 2009). To provide these services, successful governments must work collaboratively, sharing information and data among departments (Backus, 2001).

Government administrators often communicate with constituents through various web 2.0 tools, such as blogs and social networking sites, including Facebook and Twitter (Cogburn & Espinoza, 2011; Kamensky & Bruel, 2011; Goldsmith, 2011; Kerrigan, 2011). While not a government entity, the 2008 campaign of then future president Barack Obama demonstrated the powerful potential of web 2.0 tools, which appear particularly effective in engaging young adults. The campaign's website, once again being utilized for the President's re-election efforts, allows users to develop personalized profiles, where they are able to obtain information pertinent to the national campaign as well as activities in their local community (Coburn & Espinoza-Vasquez, 2011; Mandarano, et al., 2009).

The ability of e-governance tools to encourage political participation and civic engagement has been widely reviewed, and is encouraged by many. The implementation of the tools discussed to facilitate this engagement, such as digital town halls and policy forums, will occur during the transformations stage (Scott, 2006; Brown, 2007). While research indicates that use of the internet for information collection is linked with increased voter turnout in presidential election years, (Tolbert & McNeal, 2003) case study reviews of online forums have presented mixed results (Mandarano, et al., 2009; Saebo, Flak, & Sein, 2011; Holzer, et al., 2004). Forums appear most successful around the time of high profile events, such as elections (Saebo, et al., 2011). Additionally, most active discussion participants are likely to enter with a wealth of previous knowledge, likely taken from professional and/or academic experience. Engagement of less knowledgeable and previously disengaged citizens remains a challenge (Holzer, et al, 2004).

Other tools, such as GIS mapping (Community Indicators Consortium, 2007), community calendars, and volunteer opportunities allow citizens to learn about the community and to become more involved (Dawes, 2008; Brown, 2007; Scott, 2006). In recent years, discussion of mobile-governance tools has begun to infiltration e-governance dialogues. This includes the distribution of information by municipalities through text messaging and the development of applications for cellular phones; these tools are highly indicative of the transformation stage (Moon, 2004; Opsahl, 2010; O'Leary 2010).

Methodology

For the purpose of this research a range of indicators relating to each step of the maturation model were determined. These indicators were chosen from a review of academic and trade literature. A majority of the indicators were drawn directly from the literature relating to the maturation model on which this research is based (Backus, 2001), while others were frequently discussed in additional academic, trade, and, occasionally, mass media articles.

Further criteria beyond those taken from the Backus's (2001) maturation model literature were most often considered indicators of the transformation stage, including the use of GIS mapping tools (Community Indicators Consortium, 2007), mobile governance through text messaging or cell phone applications (Moon, 2004; O'Leary, 2010), use of web 2.0 tools (Cogburn & Espinoza, 2011; Kamensky & Bruel, 2011; Goldsmith, 2011; Kerrigan, 2011), and digital town halls and/or policy forums (Scott, 2006). Though not directly included in the model literature, these tools are among the most commonly discussed today. The use of web 2.0 tools, including Facebook and Twitter, is discussed

in relation to federal, state, and local governments in both academic and trade publications. A list of the indicators determined to be indicative of each stage of maturation are provided in Table 1. As the indicators were repeatedly provided, they are considered to be valid measures of the various stages of development.

Table 1

	Stages of Development			
	Information	**Interaction**	**Transaction**	**Transformation**
Indicators	* Web Presence * Easily Accessible * Easy to Navigate * Meeting Agendas and Minutes * Budgets *Audit Reports	* Email Addresses of Elected Officials * Email Addresses of City Employees * Downloadable Forms and Documents * Comment Submission *Response or Public Comment Directions Provided * Newsletter, Newsgroup Enrollment * Search Option	* Utility Payments * Tax Payments or Link to Tax Collecting Municipality * Payment of Tickets and Fines	* Dashboards * Calendar of Community Events * Online Polls or Results of Previously Completed Polls *Digital Town Hall Meeting or Policy Forums * Volunteer Opportunities * GIS Mapping * Use of Web 2.0 Tools * Mobile Governance

Following the selection of indicators, a search was conducted to determine the cities thought to be engaging in best practices. Cities were taken from academic research conducted by Mossberger and Jimenez (2009) whose analysis of numerous websites resulted in a ranking of the best 75 cities nationwide (See Appendix C). Additionally, trade publications were reviewed to determine best practice award winners (For large cities see Appendix D; smaller cities see Appendix E, includes both city populations, median household incomes). A range of sources was available to validate the selection of highly effective large cities. These materials were then cross referenced to determine those appearing most frequently. In total, 18 large cities were selected for inclusion.

Unfortunately, only one source provided a listing of best practice cities with population sizes comparable to the City of Binghamton.

As a final step, a complete list of cities in rust belt states was acquired from census.gov. These cities were then sorted by population size and all cities with populations of 5,000 above or below the City of Binghamton were selected. The median household incomes for these cities were then retrieved; the ten cities with the closest income levels were chosen for inclusion in this study. As these cities have populations 5,000 above or below the City of Binghamton and likely face similar financial and economic challenges, as indicated by median household income and location within rust belt states, these cities were thought to be most comparable to the City of Binghamton (See Appendix F for listing of cities, population, and median household income). A list of the cities included in the study is provided in Table 2 below.

Table 2

Cities Included in Research		
Large Best Practices Cities	**Small Best Practices City**	**Comparable Cities**
Boston, MA	Castle Rock, CO	State College, PA
Charlotte, NC	Lynchburg, VA	East Lansing, MI
Chicago, IL	Danville, VA	Wilkes-Barre, PA
Fort Worth, TX	Annapolis, MD	Muskegon, MI
Corpus Christi, TX	Dublin, OH	York, PA
Phoenix, AZ	Manchester, CN	Warren, OH
Louisville, KY	Carson City, NV	Harrisburg, PA
San Jose, CA	Medford, OR	Altoona, PA
Columbus, OH	North Port, FL	Kokomo, IN
Tucson, AZ	Flower Mound, TX	Troy, NY
Aurora, CO		
Riverside, CA		
Virginia Beach, VA		
New York City, NY		
Plano, TX		
San Antonio, TX		
San Francisco, CA		
Seattle, WA		

Once the three groups were determined - large best practice cities, small best practice cities, and cities comparable to Binghamton - each municipality's website was reviewed using the indicators selected. In coding this information, a "0" was given to any city not providing the elements of the indicator to citizens, and a "1" was given to those with implemented indicators. Throughout this process, notes were made when a city provided any indicators in a highly effective manner. Effectiveness was determined by ease of use, engagement, and the amount of services of information made available. These websites were then revisited, the indicator was reviewed for a second time, and examples of best practices were determined in order to provide effective recommendations.

The percentage of cities meeting the requirements of each indicator were then determined for all categories. Rates of implementation were then compared to determine if differences existed between large and small best practice cities, indicating whether population size impacts the ability of municipal governments to develop and implement effective e-governance initiatives. The median income of best practice cities, large and less populated, were also compared with those of cities similar to Binghamton. The median household income of the City of Binghamton was then compared to those engaged in best practices and significant variations, if present, were determined. Lastly, comparisons were made between the ability of groups with higher median incomes levels and those with significantly lower median incomes. This information was analyzed to determine the impact financial and economic stressors and challenges on effective e-governance development and implementation.

The purpose of this research was to determine the development stage and challenges faced by the City of Binghamton. These findings, and a review of best practices, were used to develop feasible recommendations for further development by the City. Recommendations are not generalizable to other cities, but were determined in order to fill significant gaps in the City of Binghamton's current initiative. Regardless, the best practices determined were selected following the review of municipal websites from across the country, and would likely assist many other municipalities hoping to develop similar tools. To obtain more generalizable results, this study should also incorporate randomly selected cities to compare with best practices cities and those comparable to Binghamton. Given the inclusion of randomly selected cities, greater conclusions could have been drawn about the relationship between city populations, median household income, and e-governance initiatives.

Findings

The completion of this analysis allowed for the determination of the development stage of the City of Binghamton, the strengths and weakness of the City's initiative, and the success of Binghamton compared to similar cities. The impact of population size and median household income was also determined. The percentage of cities within each category meeting the criteria of specific indicators is listed in Table 3. Table 3 also provides the median and mean population size, and median and mean household income, for each category. The table's final column indicates the criteria was either met ("Yes") or not met ("No") by the City of Binghamton.

Finding 1: The City of Binghamton has successfully moved through the information stage implementing 100% of the indicators, has implemented 71.4% of the

interaction indicators, 66.6% of the transaction indicators, and 25% of the transformation indicators.

The City of Binghamton website was reviewed using the criteria established to determine the development stage, and best practices, of other municipalities. This information allowed for a comparison of the success of the City of Binghamton and those considered highly effective, as well as those with similar population sizes and median household incomes. The results of this review indicated that the City has achieved all of the milestones considered part of the information stage. Additionally, Binghamton has developed five of the seven features considered to be indicators of the interaction stage, including the posting of elected official and employee email addresses, downloadable forms and documents, a search option, and posting of information regarding public hearings or public comment timelines and instructions. The two elements of this stage not reached by the City include a comment submission option for citizen who are unsure of which governmental official or employee to contact directly and an option to sign-up for City-wide or department-specific newsletters or newsfeeds (ability to subscribe to press releases distributed through RSS feed was not considered sufficient to meet this requirement.) Overall, the City was successful in meeting the criteria of the information stage 100% of the time and has implemented 71.4% of the interaction indicators.

The City's results in the transaction and transformation stage indicated greater room for improvement. Of the three transactions sought, the City offered two. While citizens are able to pay utilities and some fines online, they are not provided online tax payment options or payment information. Additionally, the city does not allow for online

Table 3 **Research Results by City Categories**

Indicator	Number of Large Cities Identified as Engaging in Best Practices (out of 18)	Number of Cities with Populations of 30,000 - 74,999 Identified as Engaging in Best Practices (out of 10)	Number of Cities with Similar Population Sizes, Median Household Incomes, to Binghamton (out of 10)	City of Binghamton
Information Stage Indicators				
Web Presence	100%	100%	100%	Yes
Easily Accessible	100%	100%	100%	Yes
Easy to Navigate	78%	100%	70%	Yes
Meeting Agendas & Minutes	100%	100%	80%	Yes
Budgets	100%	100%	80%	Yes
Audit Reports	89%	100%	60%	Yes
Interaction Stage Indicators				
Email Addresses of Elected Officials	94%	100%	70%	Yes
Email Addresses of City Employees	78%	90%	40%	Yes
Downloadable Forms and Documents	100%	90%	100%	Yes
Comment Submission	56%	40%	60%	No
Response Options to Posted Information	83%	80%	40%	Yes
Newsletter or Newsgroup Enrollment	89%	100%	20%	No
Search Option	100%	100%	70%	Yes
Transaction Stage Indicators				
Utility Payments	100%	90%	40%	Yes
Tax Payments or Link to Collecting Municipality	61%	70%	20%	No
Payment of Tickets, Fines	89%	50%	40%	Yes
Transformation Stage Indicators				
Personalized Accounts, Dashboards	0%	20%	10%	No
Calendar of Events	94%	70%	70%	Yes
Online Polls, Results of Previous Polls	17%	30%	10%	Yes
Digital Town Hall Meetings	11%	1000%	0%	No
Volunteer Opportunities	100%	100%	20%	No
GIS Mapping	94%	90%	20%	No
Use of Web 2.0 Tools	100%	100%	70%	No
Mobile Governance	89%	20%	10%	No
Total Percentage	*83%*	*80.0%*	*52%*	*62.5%*
Median Population Size	627,918	52,954	44,399	Total Population - 44,803
Mean Population Size	1,112,135	53,334	43,618	
Median Household Income	$53,545	$55,391	$30,435	Median Household Income - $29,813
Mean Household Income	$49,900	$65,458	$30,782	

submission of permit or license applications; though not included in this research because of coding challenges, this tool is indicative of transaction stage success.

Aspects of the transformation stage proved challenging for the City as well. In some instances, tools indicative of the transformation stage can be difficult and costly to develop. Examples of these tools include mobile phone applications, personalized and integrated dashboard accounts available to each citizen, digital town hall meetings and policy forums, and GIS maps capable of providing a wide range of data. Conversely, there are elements of the transformation stage that are relatively simple to development and maintain. The City has previously used its website to disseminate surveys to citizens (and others in the surrounding area) and results are available online. The City also provides an events section on the website. Unfortunately, the event information provided is limited, and often pertains to initiatives in which the City administration is involved. Lastly, the City's use of social media and other web 2.0 tools is minimal, at best. Of the numerous city departments, only the Youth Bureau provides a link to its Facebook page. While the Mayor's office maintains a Facebook page, a link is not provided on the City website and information is frequently distributed in original press release format, rather than tailored for social media audiences.

Finding 2: The City of Binghamton has been more successful in implementing indicators of the information, interactions, and transaction stages of e-governance development compared to rust belt cities with comparable population sizes and median household incomes.

Comparing the results of the review of the City of Binghamton's website with similar cities indicates that Binghamton has been more successful in implementing

indicators of the first three stages of development, while seeing nearly identical results in the transformation stage (25% for the City of Binghamton compared to 26% for others.) While Binghamton meets 100% of the requirements of the information stage, the success rate of comparable cities remains at 82%. A significant gap remains between the City of Binghamton, with 71.4% of indicators implemented, and other cities, with 54% of indicators implemented, in the interaction stage as well. Additionally, the City of Binghamton has double the success rate in the transaction stage compared to similar cities (33.3% compared to 66.6 %.) Binghamton and similar cities share analogous struggles in the transformation stage, implementing 25% and 26% of indicators respectively. Only in use of web 2.0 tools, particularly providing links to the Facebook pages and Twitter feeds of the city government or elected officials, did Binghamton fall short.

Finding 3: Among best practices cities, variations in population size do not appear to have a noteworthy impact on successful e-governance implementation, with the exception of the use of mobile-governance and ease of website navigation.

In order to understand likely impediments to effective, additional e-governance development by the City of Binghamton, smaller cities, with populations between 30,000 and 74,999, determined to be engaged in best practices were also reviewed using the pre-determined criteria. A comparison of the large and small best practices cities indicates that population size is less likely to be an impediment to e-governance development. That being said, it must be noted that the median household income of the ten small best practices cities included in this study was $55,391 compared to $49,900 for larger cities (average median household incomes also varied with small cities averaging $65,453 and

large cities averaging $53,545.) Therefore, the limited differences seen may have resulted, in part, from variations in income and the city's taxing potential.

A review of the percentage of best practices cities, comparing large and less populated municipalities, indicates that the percentage of cities meeting a criteria varied by more than 20% on only two of 23 indicators. The most significant difference appears in the use of mobile governance tools, including the use of text message alerts and offering of mobile applications. While 88.2% of large best practice cities offered m-governance tools, only 20% of small cities did the same. Indicating future development, the creation of mobile applications was included in the strategic development plans posted online by two additional small cities.

The other difference seen between these two groups appears to highlight a potential benefit for less populated municipalities. In meeting the easy to navigate criteria, smaller municipalities were successful during 100% of website reviews, compared to 76.5% of large municipalities. To understand the difficulties associated with the development of a thorough and easy to navigate website, a visit to nyc.gov is recommended. While New York City has developed a website with the information required to engage citizens, it can be difficult to navigate through the vast amount of information and departmental web-pages.

Finding 4: Cities with lower median household incomes appear to face greater challenges in the implementation of e-governance throughout all stages, as proven by implementation rates of 83% (large cities) and 80% (small cities) for higher income municipalities, and 52% and 62.5% for those cities with lower median household incomes.

Though it appears that community size does not have a significant impact on e-governance development, the opposite is true of median household income. In 2009 inflation-adjusted dollars, the median household income for large best practices cities was $49,900, while median household income was $55,391 for smaller best practice municipalities. In total, only four of the 28 best practice cities reviewed had a median household income level within $10,000 of the City of Binghamton, while only one of the 28 cities had a lower median household income. Of the 28 best practices cities reviewed, eight had a median household income of more than twice that of Binghamton (above $59,626), while an additional 12 cities has median household incomes 1.5 times, or more, greater than Binghamton (above $44,715). Of the less populated cities, 40 percent had median household incomes of $70,000 or more, with the largest median household income of $114,560 being more than 3.84 times greater than that in Binghamton.

Additionally, ten small cities, located in rust belt states, were selected for inclusion and review. The population of these cities is within 5,000 persons of the population of the City of Binghamton and the median household income varies by no more than $9,003 from the City of Binghamton. Reviews of the websites of comparable cities elucidated the impact of median household income, and related revenue generation challenges, on a city's ability to develop an effective e-governance strategy and move through the stages of maturation. The percentage of cities comparable to Binghamton meeting the requirements of indicators fell 0-80 percent below best practices cities. For example, while 90% of small best practices cities, with median household incomes reaching up to $114,560, had implemented GIS mapping tools, while only 20% of cities comparable to the City of Binghamton had done the same. Results show that cities

comparable to Binghamton fell short of achieving the same implementation rates of best practices cities by 30 percent or more on nine of the 23 indicators. Interestingly, differences were most likely to appear in the middle development stages of interaction and transaction, as nearly all cities were able to meet the information criteria and best practice cities had lower implementation rates of transformation criteria. Differences of more than 30 percent were also seen between cities comparable to Binghamton and large best practices cities in the payment of tickets or fines online, as well as mobile governance.

The results of this research are well-aligned with previous findings. The financial costs associated with e-governance development are a primary area of concern for many local governments. During a 2001 survey, 70.2% of local government respondents stated that financial constraints were a "substantial barrier" to e-governance implementation (Edmiston, 2003). Streib and Willoughby (2005) found that large cities, with greater access to funds, were the most likely to have highly developed e-governance structures. Additionally, cost-savings resulting from the implementation of e-governance tools often occurs over extended periods of time, as efficiency begins to increase. For officials facing short election cycles, a focus on long-term savings appears problematic (Edmiston, 2003).

While not directly related to the ability of the City of Binghamton to implement its e-governance initiative, the City's median income being well-below the national average may provide additional challenges, particularly citizens' access to information. The digital divide, "a perceived gap in computer and internet access across economic, demographic, or social lines," (Edmiston, 2003, p. 31) remains a pressing concern in

digital government. Some believe that limited access to e-governance tools may further disenfranchise populations already at risk of alienation, including non-English speakers. This challenge continues for many municipalities, even as internet access is expanded through city programs, libraries, and other developing opportunities.

Additionally, cities must develop online documents, tools, and programs compatible with a wide-range of computer systems and software placing increased demands on limited financial resources. As challenges arise, municipal employees must be prepared to answer questions concerning the use of online tools, location of information, and security. Assisting citizens with e-governance navigation will be a new role for most government employees, one for which they must be properly prepared (Streib & Willoughby, 2005). The City of Binghamton may benefit from the inclusion of these skills on reconfigured job descriptions as staff move to other positions or retire.

Recommendations and Future Considerations

A review of municipal websites both large and of similar size to the City of Binghamton highlighted a variety of best practices capable of being employed to encourage information dissemination, two-way communication, and citizen engagement. As the City of Binghamton has been successful in moving through the information stage and achieved a significant percentage of the requirements of the interaction stage, the best practices provided will assist in moving towards transformation. It is clear that certain practices will be easier to cultivate in the immediate future, while others will remain development goals for the years to come.

While certain practices may be beyond Binghamton's current capacity, others are comparatively simple. As indicated by the maturation model above, municipalities rarely

move from the primary stages of development to transformation. What is necessary is consistent evolution and attention to further, more effective development if the City hopes to use online tools to better engage and inform the citizenry. The following are recommendations for the City of Binghamton, intended move the City further in the e-governance development process. While not the ultimate goal, as new technologies and opportunities are constantly emerging, if implemented, these suggestions should assist the City of Binghamton in better informing citizens, providing improved customer service, and more effectively engaging community members with the municipal government and the Binghamton community as a whole.

Recommendation 1: Inclusive, Up-to-Date Community Calendar

With one exception, the large cities frequently ranked among the best for e-governance provided website visitors with well-developed online community events calendars. Among the common features of those engaged in best practices are (1) the inclusion of city events, such as City Council meetings, (2) the inclusion of community events, such as charitable fundraisers, (3) links to the event or sponsoring organization's websites, and (4) frequent updates. The cities providing effective calendars use these tools to engage citizens with a wide-range of interests. The City of Lexington, Kentucky is an excellent example, providing information on the Fall Fashion Encore, Family Business Summit, and Volunteer opportunities (www.louisvilleky.gov/MetroFest/Calendar/).

While the City of Binghamton provides a list of events, information is most often related to initiatives in which the administration is involved. By providing a more thorough list of government and community activities, the city would establish itself as a

knowledge source of community information. To initiate this process, the City Clerk's office could begin to obtain information from permit applications seeking approval for various events such as parades or fundraisers. Applicants could be asked if they wish to have their event listed on the community calendar and to provide a website address, and a link could then be provided.

Recommendation 2: Posting of Volunteer Opportunities

Many effective e-governance initiatives use online tools to not only engage citizens with the local government, but with the community as well. One way to do this is through the posting of volunteer opportunities. The way in which municipalities engage in this activity varies significantly. While certain municipalities list only volunteer opportunities with the City (see www.myvolunteerphoenix.org/#s for city volunteer opportunities and an easy-to-use format), others provide a list of local not-for-profit organizations that accept volunteers (a single page format, and feasible first step.) In addition, those engaged in best practices (1) provide opportunities to volunteer with the city, including through service on boards and commissions, (2) provide links to not-for-profit organizations accepting volunteers, (3) connect citizens to local, national, or global volunteer match websites, and (4) provide descriptions of day-long volunteer event opportunities. The City of Seattle provides all of this information, as well as donation opportunities on its website at http://seattle.gov/html/citizen/volunteer.htm.

While a searchable database of opportunities may be a long-term goal, the city could begin to compile a list of local not-for-profit organization accepting volunteers and post this information on the website. Links could be provided to the organization's webpage, where further details are frequently provided. Additionally, volunterrmatch.org,

a website link provided by many best practices municipalities, offers a range of volunteer opportunities in Binghamton and the surrounding areas.

Recommendation 3: More Effective Use of Web 2.0 Tools

In a recent article for Governing Magazine, Kamensky and Breul (2011) explained a variety of ways in which municipalities can benefit from the use of web 2.0 tools, particularly social media. The authors pinpointed five opportunities, including the ability to obtain citizen reaction to an issue or decision, feedback received when various groups do not agree on a decision or proper course of action, new ideas or information provided to increase efficiency or effectiveness, citizen engagement when participation or ownership of an issues are desired, and an effective channel for information dissemination when citizens need to be informed about a particular issue or decision.

Cities effectively using these tools tend to make them easily accessible to citizens, who are rarely required to undertake lengthy searches for links. Often, links to the Facebook pages, Twitter feeds, Flickr accounts, blogs, and other tools, of all city departments and officials are provided in a single location. A single location allows citizens to search for the elected official or city department providing the information relevant to their interests. This decreases the likelihood that cities will lose "followers" by providing too much information, or information considered inconsequential by recipients (www.louisvilleky.gov/SocialMediaCenter.htm; www.nyc.gov/html/misc/html/social_media.html).

Web 2.0 tools can also be used to facilitate digital town hall meetings with elected officials. While only two examples of digital town halls were discovered through this research, both allowed citizens to submit questions through Twitter by using a

designating and distributed hash tag. Additionally, citizens in Lexington, Kentucky are able to submit questions through the mayor's Facebook page. The use of Twitter and Facebook, both free tools, may help to encourage digital town halls in the future without generating any significant, additional financial encumbrances.

Currently, the Binghamton Youth Bureau is the only department in City Hall with a link to its Facebook page posted. While the Mayor's office does maintain a Facebook page, it cannot be reached from the Mayor's official page on the city's website. Additionally, research indicates that municipalities with well-followed social media sites tailor messages uniquely for these platforms. In particular, it is important that information is not disseminated in press release format. Rather messages should contain minimal characters and provide links to further information for those interested (O'Leary, 2011). As five of the seven City Council members will not be returning in January 2012, it cannot be determined at this time if they will wish to engage in use of web 2.0 tools individually. Regardless, the City Clerk's Offices could use Facebook or Twitter to update citizens about meetings, public hearings, and approaching community events.

Future Consideration 1: Personalized Dashboards

Without question, financial concerns will limit the ability of the City of Binghamton to rapidly expand it e-governance initiative. For this reason, descriptions of best practices relating to personalized dashboards and m-governance must remain long-term goals. As these tools become more commonplace, and more is known about effective development and implementation, more financially feasible options may arise.

Personalized dashboards provide citizens with access to the information most pertinent and of greatest interest to them. Interestingly, this service was only provided by

two of the best practices cities, both of which had comparable population sizes to the City of Binghamton. Castle Rock, Colorado not only allows citizens to develop a personalized dashboard, containing information from the departments they select, but also provides citizens with the opportunity to receive text message alerts from any of those selected (the Castle Rock website can be found at http://crgov.com/ the only requirement for dashboard registration is the creation of a username and password.) Allowing the additional integration of other services, including tracking of utilities payments, may encourage use of these tools.

Future Consideration 2: M-Governance

Mobile governance, including text messaging and mobile phone applications, is a relatively new introduction in e-governance literature and practice (Moon, 2004; Opsahl, 2010; O'Leary 2010). Messaging and applications are relatively common among large best practice municipalities, while they remain rare in smaller cities. In many cities, including Chicago, Charlotte, and Fort Worth, it appears that mobile governance is used for the sole purpose of providing citizens with emergency alerts, while cities setting the precedent in mobile applications often provide transportation information, such as bus schedules and trackers in Boston and San Francisco, and the iFerry application offered in Seattle. Other applications, such as New York City's "You the Man" application can help to increase public safety. The app allows users to calculate blood alcohol content, contact the nearest car service, and play a game to select a designated driver (www.nyc.gov/html/mome/digital/html/apps/apps.shtml). While application development can prove challenging, technically and financially, some cities have instituted contests to encourage the development of application later offered by the municipality.

Conclusion

Considering the challenges likely faced by the City of Binghamton, the municipality has been comparatively successful in its efforts to implement an effective e-governance initiative. Yet, as is consistently the case with today's technology, room for improvement remains, particularly in regards to the implementation of indicators of the transformation stage. Transformation stage indicators not only encourage interaction between government and citizens, but facilitate and inspire citizen involvement in the local community as well. The benefits of the implementation of these tools must be considered, rather than simply overruled by financial concerns.

As the City Clerk's Office is currently redesigning the permit application process, and related documents, an opportunity for the collection of the data needed to implement the recommendations above has arisen. Because permits are required for many events in the City of Binghamton, including street closures, use of city parks, and other activities, the City Clerk's Office could use the application process as a means to gather event information, as well as organizational and volunteer information from local not-for-profits. While this may not generate a complete list of events, organizations, and volunteer opportunities, the use of collected data would likely encourage others to begin providing information to the City of Binghamton and inspire other departments to begin collecting information as well.

Appendix A

Public Comment at Binghamton City Council Business Meetings

2010 - Public Comment		2011 - Public Comment	
Speaker	**Number of Comments**	**Speaker**	**Number of Comments**
Jack Sheehan	10	Jack Sheehan	14
Sharon Nieminski	10	Sharon Nieminski	11
John Solak	10	Debra Hogan	8
Debra Hogan	8	John Solak	7
David Shady	3	David Schede	6
Alan Nixon	3	Tom DeHaven	2
David Schede	2	Barry Blakeslee	1
David Haughtalen	2	Michelle Warner	1
Ellie Fargaglia	2	Leslie Cody	1
John Young	1	Mary Anderson	1
Xuan Yu	1	Mary Webster	1
Lana Brooks	1	Katie Laskaris	1
Mallory Steenstrup	1	Beau Rodrigues	1
Michael Weintraub	1	Edward Crumb	1
Bat Ami Bar-On	1	Jim Fitch	1
Ray Scott	1	Anthony Masser	1
Robert Murphy	1	Marianne Kratz	1
Tarik Abdelazim	1	Donald Karn	1
Dave Tanenhaus	1	Jake Lake	1
Kathy Reno	1	Chris VanMeter	1
Mary Webster	1	Mark Furman	1
Connie Barnes	1	Harold Miller	1
Roasemary Markoff	1	James Milligan	1
Amy Shapiro	1	Peter Orville	1
Matt Thorn	1	Barry Kaufman	1
Richard Allen	1		
David Holleran	1		
Barry Koffman	1		
Dave Hotel	1		
Carol Marchesani	1		
Bill Bernstein	1		
Ron Sall	1		
Mark Yanaty	1		
Marianne Kratz	1		
Ron Jones	1		
Ron Hopkins	1		
Vick Chaubry	1		
Total	**78**	**Total**	**68**

Source: Binghamton City Council Business Meeting Minutes, 01/06 2010 – 11/09/2011

Appendix B

Speakers at Public Hearings

Public Hearings - 2010	Number of Speakers	Public Hearings - 2011	Number of Speakers
Introductory Local Law 10-1	1	Introductory Local Law 11-1	0
Introductory Ordinance 10-21	1	Introductory Ordinance 11-23	3
Introductory Local Law 10-2	0	Introductory Ordinance 11-24	4
Introductory Ordinance 10-57	0	Introductory Local Law 11-2	3
Introductory Ordinance 10-59	0		
Introductory Local Law 10-3	0		
Introductory Ordinance 10-59	0		
Introductory Local Law 10-3	4		
Total	**6**	**Total**	**10**

Source: Binghamton City Council Business Meeting Minutes, 01/06 2010 – 11/09/2011

Appendix C

Top 75 Cities as Ranked by Mossberger & Jimenez, 2009

1	Seattle, WA	39	Las Vegas, NV
2	Phoenix, AZ	40	Fresno, CA
3	San Francisco, CA	41	Aurora, CO
4	Louisville, KY	42	Henderson, NV
5	New York, NY	43	Portland, OR
6	Boston, MA	44	Charlotte, NC
7	Virginia Beach, VA	45	Kansas City, MO
8	Chicago, IL	46	Arlington, TX
9	San Jose, CA	47	Jacksonville, FL
10	Columbus, OH	48	Milwaukee, WI
11	Mesa, AZ	49	Atlanta, GA
12	Nashville, TN	50	Fort Wayne, IN
13	St. Louis, MO	51	Colorado Springs, CO
14	Austin, TX	52	Anaheim, CA
15	Plano, TX	53	Cincinnati, OH
16	Los Angeles, CA	54	Riverside, CA
17	San Diego, CA	55	Miami, FL
18	Baltimore, MD	56	Corpus Christi, TX
19	Washington, D.C.	57	Pittsburgh, PA
20	Tampa, FL	58	Honolulu, HI
21	San Antonio, TX	59	Fort Worth, TX
22	El Paso, TX	60	Oakland, CA
23	Oklahoma City, OK	61	Anchorage, AR
24	Greensboro, NC	62	Detroit, MI
25	Philadelphia, PA	63	Lexington, KY
26	Long Beach, CA	64	Tucson, AZ
27	Wichita, KS	65	Cleveland, OH
28	St. Petersburg, FL	66	Omaha, NE
29	Houston, TX	67	Indianapolis, IN
30	Memphis, TN	68	Stockton, CA
31	Albuquerque, NM	69	Buffalo, NY
32	St. Paul, MN	70	Santa Ana, CA
33	Dallas, TX	71	Lincoln, NE
34	Sacramento, CA	72	Toledo, OH
35	Minneapolis, MN	73	Bakersfield, CA
36	Glendale, AZ	74	Raleigh, NC
37	Denver, CO	75	Newark, NJ
38	Tulsa, OK		
*Yellow indicates inclusion in research			

Appendix D

Large Best Practices Cities

Large Best Practices Cities		
City	**Population**[1]	**Median Household Income**
Boston, MA	617,695	$52,433
Charlotte, NC	669,064	$52,364
Chicago, IL	1,843,405	$46,781
Fort Worth, TX	679,077	$48,015
Corpus Christi, TX	283,843	$42,694
Phoenix, AZ	1,445,632	$48,881
Louisville, KY	597,337	$39,280
San Jose, CA	945,942	$78,660
Columbus, OH	787,033	$43,569
Tucson, AZ	520,116	$37,635
Aurora, CO	309,091	$49,626
Riverside, CA	291,294	$57,344
Virginia Beach, VA	434,922	$63,370
New York City, NY	8,302,659	$50,173
Plano, TX	261,902	$80,866
San Antonio, TX	638,141	$43,087
San Francisco, CA	797,271	$70,040
Seattle, WA	594,005	$58,990
Average	**1,112,135**	**$53,545**
Median	**627,918**	**$49,900**

[1] All population and median household income data was taken from the 2005-2009 American Community Survey Estimates. This was preferential as it was the most recent time period for which this data was available for **all cities** included in this research.

Appendix E

Small Best Practices Cities

Small Best Practices Cities		
City	**Population[2]**	**Median Household Income**
Castle Rock, CO	41,320	$86,777
Lynchburg, VA	71,357	$37,281
Danville, VA	44,978	$29,482
Annapolis, MD	36,607	$71,293
Dublin, OH	37,835	$114,560
Manchester, CN	55,740	$58,685
Carson City, NV	55,260	$52,096
Medford, OR	71,918	$43,422
North Port, FL	50,647	$49,465
Flower Mound, TX	67,678	$111,523
Average	**53,334**	**$65,458**
Median	**52,954**	**$55,391**

[2] All population and median household income data was taken from the 2005-2009 American Community Survey Estimates. This was preferential as it was the most recent time period for which this data was available for **all cities** included in this research.

Appendix F

Cities Comparable to Binghamton in Population and Median Household Income

Cities Comparable to Binghamton		
City	**Population**[3]	**Median Household Income**
State College, PA	39,898	20,810
East Lansing, MI	45,563	27,898
Wilkes-Barre, PA	40,964	28,699
Muskegon, MI	39,259	29,154
York, PA	40,434	29,223
Warren, OH	43,402	31,647
Harrisburg, PA	47,418	31,676
Altoona, PA	46,287	33,623
Kokomo, IN	45,396	37,221
Troy, NY	47,556	37,865
Average	**43,618**	**$30,782**
Median	**44,399**	**$30,435**

[3] All population and median household income data was taken from the 2005-2009 American Community Survey Estimates. This was preferential as it was the most recent time period for which this data was available for **all cities** included in this research.

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