



EXPEDITING THE EXPANSION OF
DIGITAL GOVERNANCE AND
PLANNING BY PENNSYLVANIA
MUNICIPALITIES

**Graduate School of Public and International Affairs
University of Pittsburgh -- Capstone Seminar:
Planning & Digital Governance**

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EXECUTIVE SUMMARY

Purpose

The purpose of this report is to provide evidence and policy recommendations to the Pennsylvania State Planning Board, with the intent of increasing the adoption of digital governance solutions by local governments across the state. This report is based on the principle that digital technologies present opportunities for local governments to solve everyday problems while simultaneously reducing costs, becoming more responsive to constituents, and coordinating services with neighboring jurisdictions. In order to leverage these opportunities, this report focuses on what is possible by revealing technological solutions to governance problems that have been successful in local governments of varying sizes and capabilities. In addition, it outlines how local governments can ensure that digital tools are accessible to all residents, regardless of age, socioeconomic status, or disability. Further, this report offers actionable recommendations for policies and programs at the state level, which could expedite the adoption of digital technologies by local governments.

Recommendations

Evidence from studies conducted both nationally and in Pennsylvania suggests that strong leadership is necessary to drive the adoption of digital solutions. We recommend that the Pennsylvania Department of Community and Economic Development (DCED), through the Governor's Center for Local Government Services, become the leader in articulating the value of digital governance tools and providing support for adoption. This report provides recommendations in the following three areas which, when considered together, represent a comprehensive strategy that DCED could pursue to expedite adoption:

1. Technological Solutions: Local governments will not adopt digital tools unless local officials understand how these tools can help them solve problems more effectively or complete everyday tasks more efficiently. With this in mind, we outline technologies in three distinct categories to equip DCED with evidence and strategies on how digital tools can address governance challenges:

- a. **Internal technologies** involve digital tools that can help municipal governments conduct day-to-day administrative tasks more efficiently. We identify internal opportunities in the following three areas:
 - *Digitize Paper Records and Standardize document retention:* The state should require municipalities to digitize their records with state assistance, when needed, and eliminate the risks associated with maintaining paper records.
 - *Employ Cloud-based Operations:* Local governments could follow the state's lead in transitioning to cloud-based storage systems. Cloud-based storage is an affordable and flexible solution to traditional storage systems that require large, expensive hardware and constant maintenance of older storage systems.

- *Developing Within Department Apps:* Within department applications are designed to improve workflow and timely service delivery. When employed alongside digital records and cloud-based services, governments are able to share information and communicate internally with greater ease and effectiveness. With support and guidance from DCED, local governments can acquire an application portfolio that meets their needs and capitalizes on the large variety of existing applications in the market.
- b. External technologies** in the following two areas provide opportunities for local governments to interact with residents, improve service delivery, and embrace transparency and accountability
- *Establish a Social Media Presence:* Because social media is a free service and easy to implement, DCED should facilitate and encourage the use of social media as it can directly increase civic engagement and community interactions.
 - *Design User-Friendly Websites:* Because websites provide additional opportunities to connect with residents, they should be updated to provide access to various forms of government information, data, and forms in a way that is user-friendly and efficient.
- c. Cross-Jurisdictional technologies** improve intergovernmental collaboration across municipal boundaries, thereby reducing service duplication, suboptimal regional economic performance, and a lack of cross-boundary planning. To facilitate cross-jurisdictional digital governance, we recommend the following model:
- *Employ a Chief Data Officer:* A Chief Data Officer is a steward, rather than a provider, of data information, services, security, sharing, storage and accessibility. Most local governments engage collaborative projects with neighboring local governments, such as recycling, snow removal, and road maintenance. However, little data is recorded on day-to-day collaborations. Leveraging data collection and sharing technologies, governments could track of these collaborations, thereby eliminating duplication and inefficiency. However, this requires deliberate coordination. To address the challenges of coordination and harness expertise at a regional level, we recommend a model that employs Chief Data Officers: regional leaders that collect, manage, and share data across a group of local governments.

2. Equity Improvements: As governments adopt digital tools to engage with and provide information to the public, they must ensure that these tools are accessible to all residents regardless of age, socioeconomic status, or disability. We identify opportunities for equitable access in the following two areas:

- a. Website Accessibility:** Government websites are currently not accessible, primarily for people with disabilities. Therefore we advocate that state and local governments need to follow the Section 508 Refresh at level A or AA standards, which are nationwide website accessibility standards so all citizens have digital access to their government.

We recommend that municipalities work towards becoming digitally inclusive at all levels.

- b. *Broadband Internet Access:* There are approximately 1.3 million people across all of Pennsylvania without access to a wired connection capable of 25 Mbps download speeds and another 115,000 people in Pennsylvania don't have any wired internet providers available where they live. We recommend that municipalities and the state regard the expansion of high-speed Internet access to all Pennsylvanians to be vital to the stability and growth of the Commonwealth of Pennsylvania.

3. Statewide Policies to Encourage Adoption: Though some municipalities have made technological advancements without state support, not all municipalities have the requisite resources or knowledge. To establish a supportive environment for digital governance, we recommend that DCED adopt or update statewide policies and programs in the following areas:

- a. *Funding:* DCED should leverage existing funding sources, build from existing resources, and explore innovative financial partnerships within the private, public, and nonprofit sectors.
- b. *Statewide Data and Records Storage Policy:* In an effort to reduce costs and increase efficiency, a statewide policy should be designed and implemented that sets a timeline for digital storage of all records that are required of municipalities by state agencies. The policy should be coupled with financial incentives to support cloud-based storage initiatives at the municipal level in order to properly back up and make records accessible.
- c. *Forums and Symposiums:* DCED could create demand for digital tools by convening and taking part in forums and symposiums. This could include free proprietary forums at the regional level, with the aim of convening municipalities to disseminate best practices in digital governance and sharing success stories, and participation in the annual conferences of Pennsylvania local government officials. In this manner, officials would be informed on the value that new technologies can create, and which tools would help them solve problems more efficiently. Similarly, forums could be held for local government staff members to discuss the technologies that would allow them to do their jobs more effectively. DCED could also participate in existing conferences to disseminate information on funding opportunities and relevant policy changes.
- d. *Training:* There is an existing opportunity at the state level to facilitate access to free trainings and educational opportunities aimed at developing technological expertise at the municipal level. The PA Training Hub for Municipal Learning (PATH) system could provide online courses for free to members to reduce costs and remove inconvenient payment methods. Additionally, free classes would encourage users to access trainings that they otherwise could not afford. In addition, a peer-to-peer platform could be added to the PATH system to allow municipalities to share ideas and success stories. Lastly, the PATH system could be managed in-house by DCED to ensure that the site considers user feedback and responds quickly to the training needs of municipalities.

- e. *Regional Adoption Plans:* DCED could engage local governments and other relevant stakeholders in each of the 23 regions of the state to design and implement “digital adoption plans.” The regions are defined by the boundaries of Municipal Planning Organizations (MPOs) and Rural Planning Organizations (RPOs). Relevant stakeholders include local governments, non-profits, academic institutions, and intergovernmental entities (such as MPOs, RPOs, and Councils of Government). Each digital adoption plan would outline a vision for the expansion of digital governance in the region. A collaborative design process would allow for information sharing among governments, as well as the formation of public-private partnerships (PPPs). The process would allow for coordinated service provision and the identification of solutions to cross-jurisdictional problems.

SECTION 1: INTRODUCTION

Rationale

Rapid developments in technology have led to dynamic shifts in the way that people solve their day-to-day problems, making their lives simpler and more efficient. While the use of technology is becoming more expansive in the lives of individuals and the private sector, the public sector, particularly local governments, are lagging behind. As a result, local governments are missing out on numerous opportunities to utilize technology in order to increase the quality of life of their citizens and collaborate on a regional level with other governmental organizations. Through the utilization of digital governance, municipalities can experience more success in providing and interacting with their citizens through enhanced transparency and accountability. Without access to these initiatives, either through budgetary constraints or a lack of capacity, many municipalities will continue to use older and inefficient governance models leaving their citizens without access to important information and inadequate service provision.

To address these issues, this Capstone Seminar at the University of Pittsburgh Graduate School of Public and International Affairs (GSPIA) focused on Planning and Digital Governance for Pennsylvania municipalities. This Capstone was conducted to make recommendations to the Pennsylvania State Planning Board. These recommendations focus on the implementation of digital governance initiatives by first discussing the internal, external, and cross-jurisdictional benefits to municipalities, most in identified various stages of digital maturity, and thus demonstrating that digital governance is not a one-step solution. Secondly, we advocate the incorporation of social equity in digital governance solutions, by stressing the importance of accessibility in order for governments to effectively and fully represent their constituents. Lastly, we recommend that the Pennsylvania Department of Community and Economic Development (DCED) become the leader in creating opportunities for digital governance through funding, creation of statewide records policies, hosting and taking on a larger role in forums, symposiums and conferences, fostering training, and advocating regional adoption plans. Through the implementation of digital governance, local governments can reduce costs as a result of utilizing more cost-efficient methods, deliver government services more effectively, interact with citizens and regional organizations on a wider scale, and reduce the impacts of fragmentation at local levels of government.

Current Landscape of Digital Adoption

Pennsylvania is comprised of 2,561 incorporated municipalities. Of these, there are 957 boroughs, 93 first class townships, 1,454 second class townships, 56 cities, and one town (DCED website). These certainly vary in their levels of digital maturity, and the level of digital adoption varies throughout the state. In April 2016, the previous Capstone Seminar on Planning and Digital Governance at GSPIA assessed the state of digital governance across Pennsylvania. Building from MIT and Deloitte survey on digital governance, the Capstone created a survey that ranked the responded municipalities based on six critical areas of digital governance and

digital maturity: *Strategy, Leadership, Workforce development, User-focus, Culture, and Engagement.*

The municipalities that responded to the survey were categorized into three groups based on their level of digital maturity:

Figure 1A: Six Critical Areas of Digital Maturity

	Early	Developing	Maturing
Strategy	Lack of Strategy -- 7% agree their local government has a strategy to use digital technologies.	Developing -- 50% agree or strongly agree their local government has a strategy to use digital technologies.	Completed -- 98% say their government provides resources to obtain digital technologies.
Leadership	Weak interest -- Only 11% say their elected officials encourage use of digital technologies.	Digitally aware -- 68% say their elected officials encourage use of digital technologies.	Digitally sophisticated -- 98% say their elected officials encourage use of digital technologies
Workforce Development	Lack of resources -- 12% say their local governments provide staff with the resources to take advantage of digital technology.	Investing -- 62% report that their local governments provide staff with the resources to take advantage of digital technology.	Sufficient -- 96% say their local governments provide staff with the resources to take advantage of digital technology.
User focus	Almost absent -- 9% view their technology strategy is driven by residents' expectations.	Gaining traction -- 68% view their technology strategy is driven by residents' expectations.	Primary factor -- 98% view their technology strategy is driven by residents' expectations.
Digital Culture	No difference -- 5% say their local government's use of digital technology has transformed the way their staff works.	Accommodating -- 56% say their local government's use of digital technology has transformed the way their staff works.	Transformed -- 100% agree or strongly agree their local government's use of digital technology has transformed the way their staff works.
Engagement	Traditional -- Almost half (49%) have no digital communications with residents and only interact through traditional ways (walk-in, phone, fax, and postal mail). 30% use email; 16% use web and texting; 5% use social media and mobile apps.	Digitalizing -- 35% use social media and mobile apps; 45% use web and texting; 12% use emails. 9% only use traditional methods.	Highly Digital -- 91% use social media and mobile apps. 9% use web and texting.

Figure 1B: Three Categories of Digital Maturity in Pennsylvania Municipalities

1. **Early:** Approximately 18 percent of municipalities are in the early stages of digital maturity. These municipalities are spread geographically across the state. The early stage is characterized by a lack of strategy, weak interest from leadership, lack of resources to develop the workforce, there is almost no focus on the user, limited presence of a digital culture, and these municipalities rely on traditional forms of engaging with the public.
2. **Developing:** The majority, 67.1 percent of municipalities, are in the developing stage of digital maturity. Like the early stages, most of the developing municipalities are scattered throughout the state. Municipalities in this group are developing strategies, and their leadership is digitally aware. They are investing in workforce development, and their technology strategy is focused on meeting resident's expectations. Developing municipalities have an accommodating digital culture, and are gradually digitizing processes that engage with the public.
3. **Maturing:** 14.7 percent of municipalities are in the maturing stage. The municipalities in this stage are mostly geographically located near Pittsburgh and Philadelphia. They mostly possess a completed strategy and their leadership is digitally sophisticated. They sufficiently provide resources for workforce development, and prioritize the user when making technology decisions. They have transformed their digital culture, and their engagement with the public relies primarily on digital technologies.

Source: Capstone Seminar in Planning and Digital Governance. University of Pittsburgh Graduate School of Public and International Affairs (2016).

Pennsylvania has a diverse technology maturity landscape. Levels of interest and investment vary widely throughout the state. Any attempt to increase the use of digital technologies must provide a variety of options at different levels of intensity to meet the needs of the various degrees of maturity.

Theoretical Framework

The vast diversity and fragmentation of local governments precludes any individual actor's ability to unilaterally design a plan for expanded digital adoption across Pennsylvania. Instead, multiple actors must collaborate. To provide a framework for designing a plan that can succeed in a complex environment, we draw upon the literature on design thinking and change in the public sector. This literature provides four key assumptions on which to base recommendations for driving digital adoption:

1. Policies that are forced upon local governments are likely to result in resistance. Further, unilaterally designed interventions would be unresponsive to the unique needs of individual governments and their constituents (Simon 1996).
2. Diverse sets of stakeholders should be brought together to uncover shared goals. Designing and monitoring a digital adoption strategy will necessitate information sharing and mutual learning across sectors and disciplines (Van de Ven 2007, Poteete, Janssen, and Ostrom 2010, Ostrom and Hess 2007). This can be achieved through "collaborative arenas," which represent face-to-face forums for stakeholders to jointly define problems and potential solutions (Ansell and Torfing 2014).

3. Proposed societal reforms are more likely to gain momentum and succeed if they match the pre-existing incentives of key stakeholders (Kelman 2005). Therefore, identifying the challenges that are faced by local government employees, as well as the solutions that they would like to see implemented, must be considered when designing digital adoption plans. In a survey conducted last year, it was found that 100 percent of maturing municipalities agreed that digital technologies had transformed the way staff works (Capstone Seminar in Planning and Governance 2016). The key is to consider the needs and capacities of current employees, and introduce technologies that would allow them to do their jobs more effectively.
4. Strong leadership is necessary to move the needle on digital governance. In a state-wide survey conducted last year, it was found that 98 percent of digitally mature municipalities agreed that elected officials had encouraged the use of digital technologies. This is consistent with national trends. Goldsmith and Crawford (2014) suggest that strong leadership is necessary to break down vertical barriers, and make bureaucracies more responsive to need of citizens. Further, research conducted by MIT and Deloitte suggests that most digital agendas are driven by a single person or group, and digital adoption is more likely when a leader can articulate the value that new technologies can provide (Eggers and Bellman 2016, Kane et al. 2015).

Goals of this Report

In considering the current landscape of local government fragmentation and digital maturity, along with current knowledge on enacting change in the public sector, we have identified three critical barriers to digital adoption in Pennsylvania:

1. Local governments will not adopt digital tools unless local officials understand concretely how these tools can help them solve problems more effectively or complete everyday tasks more efficiently. With this in mind, **Section 2** outlines digital governance solutions that can address challenges in a number of policy areas, and draws on case studies of governments of varying sizes and capabilities that have successfully deployed these tools.
2. Local governments must ensure that all digital tools are accessible to residents, regardless of age, socioeconomic status, or disability. **Section 3** offers recommendations to establish equity during the adoption of digital governance solutions.
3. The adoption of digital tools and collaboration across jurisdictions requires coordination between local governments. Leadership is necessary to drive this coordination, while technical expertise and sufficient funding is necessary to navigate the complexity and cost of digital systems. **Section 4** offers recommendations on how the state can support the adoption of digital technologies by leveraging existing collaborative arenas, encouraging public-private-partnerships, fostering digital leadership, and incentivizing investment in technology.

SECTION 2: TECHNOLOGICAL SOLUTIONS

As we saw above, Pennsylvania’s municipalities experience different levels of maturity in digital governance. Municipalities can employ a variety of methods to increase their level of digital governance and, ultimately, to increase efficiency of operations and service delivery. At each stage of digital maturity, methods exist to improve digital governance. This chapter will demonstrate a variety of applications of digital governance for municipalities at different levels of digital maturity.

We examine these for internal operations, external operations, and for cross-jurisdictional areas by stage of digital maturity, as laid out by the Capstone Seminar report in 2016. The matrix below provides applications by state of digital maturity that can be adopted by Pennsylvania municipalities.

Figure 2A: Technological improvements for government based on technology maturity level.

Digital maturity*	Operations	Existing Use of Technology	Applications to Increase Maturity	Additional Applications
Early**	Internal	Paper records Rudimentary data backup Wifi	Decrease use of paper through policy directives, scanning and digital copies Use of basic cloud storage systems	Mobile technology i.e. tablets, smart phones
	External	Email domains Website	Website- accesibility, mobile platform	Social media: Facebook, Twitter, Instagram
	Cross-Jurisdictional	No digital strategy	Leadership development and training Shared Chief Data Officer	
Developing**	Internal	Digital records Data backup Application development Mobile technology i.e. tablets, etc Wifi	Full utilization of cloud storage systems Microsoft Office Suite, Microsoft 365, etc Mobile Wifi hot spots	GIS specialist IT support technician Staff development/training programs
	External	Social Media Website Emails	Mobile apps such as 311 Website accessibility	
	Cross-Jurisdictional	Case by case data sharing	Leadership development Shared Chief Data Officer	
Maturing	Internal	Staff trainings Chief Data Officer Defined digital strategies Within department applications GIS specialist IT support technician Staff development and training programs	Within department applications Leadership development and training Digital strategy development	
	External	Responsive technologies based on community needs Social Media Website(s) Emails Mobile apps such as 311	Predictive technologies Chief Data Officer	Advanced Analytics
	Cross-Jurisdictional	Limited coordination Case by case data sharing Leadership development Shared Chief Data Officer	Open data	Housing of large scale, governmental digital technology

*From The State of Digital Governance, 2016 GSPIA capstone class

**There is no linear path towards digital governance maturity. Early and developing municipalities can capitalize on the existing technologies that have already been developed. They can pick and choose the technologies that meet the needs of the community. Those in the early stages can skip over advancements, save significant amounts of money, and easily catch up to more digitally mature municipalities.

Internal

To improve government efficiency through digital governance, we first examine aspects of digital governance through the internal operations of municipal governments. We focus on:

1. Digitizing Paper Records
2. Employing Cloud-Based Operations
3. Developing Within Department Apps

Digitizing Paper Records

For municipalities who are in the early stages of digital maturity, digitizing paper records is a basic step towards becoming more digitally advanced. As shown in last year’s Capstone report and survey, we see that document retention is important to nearly all municipalities, regardless of stage of digital maturity. However, how successful their current strategy would be in the event of a disaster or other unexpected circumstances shows wide variation along the lines of digital maturities. While 83 percent of “Early Stage” municipalities reported that having a document retention strategy, only 12 percent of these municipalities could electronically reproduce those documents in the event of a disaster. We find that many municipalities, particularly those in the early and developing stages, are not prepared for such occurrences.

In one of the fundamental means of improving digital governance, we recommend that DCED standardize document retention by requiring municipalities to digitize their records.

Figure 2B: Document Retention Policy & Digitization Strategy by Level of Digital Maturity

Stages of Digital Maturity	Question 21: My local government has a document retention policy.		Question 22: My local government has a strategy to electronically reproduce documents and other data in the event of a disaster.	
	Yes	No	Yes	No
Early	83%	17%	12%	88%
Developing	87%	13%	42%	58%
Maturing	93%	7%	78%	22%

Through a data storage and digitization strategy, municipalities will enjoy benefits such as easier data and record tracking, quicker response to audits, and enhanced transparency, among other benefits, included in Figure 2C. Requiring digital standards for documents retention and records-keeping allows for easy access, cost-savings, and security. Digital or scanned documents are accessible by authorized persons and allow for quicker disbursement of information and significant costs savings through staff time and physical office space dedicated to storing paper documents.

**Figure 2C: Advantages of a Digital Record Retention Strategy:
Digitizing Records May Be the First Step in Moving to Digital Governance**

1. **Share and track records easily** – Office staff and residents have easier distribution of records that can reduce the costs normally associated with mailing and reproduction. Digital documents also apply certain formats and create indexes that improve information organization. Perhaps most importantly, it quickly disseminates information
2. **Prepare for disasters** – Digital records significantly reduce risk and provide valuable copies to important paper documents that may otherwise be lost or damaged beyond recognition
3. **Respond to audits and discoveries** – There are times where time is valuable, and you need to quickly access documents. Digital records can be quickly searched for through the navigation of databases rather than sorting through file cabinets and stacks of paper. Scanning can help local governments comply with these requests and may prevent them from accruing fines or negative publicity due to an “unorganized” system.
4. **Salvage damaged records** – If records have not been scanned and were damaged in the event of a fire or other natural disaster, the Federal Records Center is available for assistance in remediating any damage and retrieving any additional information that may have been lost.
5. **Protect aging paper originals** – By scanning documents, paper records will be handled less, reducing physical wear and tear. Therefore, there is less risk of damage to original paper copies when the documents are scanned and then stored away.
6. **Save money and free up office space** – Valuable office space can be repurposed for other uses. Digitized records also allow for reduced costs as certain requests may not need to be filed in order to have copies made from the original.
7. **Be more open and transparent** – Perhaps most importantly, digitizing paper records may be the first step in allowing citizens to have access to information and starting a culture of open data. By allowing documents to be searched for, e-mailed, printed, and dispersed, local municipalities could see improvements in community engagement and trust.

Employing Cloud-Based Operations

Just as governments have been making the transition from copying and storing paper records in cabinets and rooms to maintaining records digitally, there has been a switch to managing information and operations through virtual, cloud-based technology. Utilization of the “Cloud”

means that local governments do not have to rely on -- and pay for -- costly hardware that requires physical space and costly upgrades.

The Commonwealth of Pennsylvania has engaged in an ambitious government cloud-computing center. Through a 2014 contract, all executive branches of the government, including seven data centers, now fall under a new IT secured cloud-based services. At the state level, Pennsylvania has already demonstrated its commitment to advanced digital governance.

With this forward thinking in implementing cloud-based IT over physical servers, Pennsylvania can extend these benefits to municipal governments and help to build the stepladder that they need to advance their digital governance.

Local governments should follow the state's lead in transitioning to cloud-based storage systems. Cloud-based storage is an affordable and flexible solution to traditional storage systems that require large, expensive hardware and constant maintenance.

Developing Within Department Applications

Digitizing paper records and moving to cloud-based technology are not the only improvements local municipalities can make in their digital governance.

Digital governance is also a culture change in many municipal offices. As last year's Capstone survey reported, respondents in later stages of digital maturity valued working in municipalities that promote digital technology (Capstone Seminar in Planning and Governance 2016). Thus software applications designed to connect government employees within and between different agencies are a critical component of moving an office culture towards digital responsiveness (Goldsmith and Crawford 2014). Technology, in the form of applications that focus on efficiency and improve the traditional paper based workflow system are especially beneficial. Most apps are designed to be used on smartphones or tablets, and mimic apps that have been designed for use in everyday life. There are a number of mobile applications that have been designed for different aspects of internal government processing.

These apps take on a number of different forms including:

1. Analytics that track the status of particular jobs and measure productivity.
2. Scheduling apps that create schedules, routes, and support onsite inspections.
3. Permitting apps that allow different agencies to work on the same application simultaneously.
4. Code Enforcement Apps that help to manage cases in the field (Goldsmith and Crawford 2014).

Municipalities can also bring in software packages, such as Microsoft Office Suite or Microsoft 365 for Government, to promote more efficient operations. Benefits include (ICMA 2014):

Figure 2D: Advantages of Government Software Packages

<p>No need to maintain local shared servers</p>	<ul style="list-style-type: none"> • Reduces hardware and software costs • Decreases dependence on skilled technicians
<p>Less need to load and maintain client software</p>	<ul style="list-style-type: none"> • If users of cloud services want the ability to work while not connected to the Internet, they still must download a client that “syncs” a copy of their files to their devices.
<p>Universal access to documents</p>	<ul style="list-style-type: none"> • Can access e-mail and other functions from outside locations or from home.
<p>Access from multiple devices</p>	<ul style="list-style-type: none"> • Allows employees the ability to record or access data from desktop, laptop, or other mobile devices. • Helpful for devices that do not traditionally support software, such as MS Office.
<p>Greater support for collaboration</p>	<ul style="list-style-type: none"> • Allows for the ability to access such cloud services from across multiple locations and settings.
<p>Less frequent version upgrades</p>	<ul style="list-style-type: none"> • e.g., moving from MS Office 2003 or 2007 to MS Office 2013. • Software upgrades can be costly in terms of both money and time.

Source: (International City/County Management Association, 2014)

Within Department Applications are designed with the processes of government in mind. In many instances they improve the process of service delivery, rather than increasing overall workload. These apps are most popular in departments that have some fieldwork component, whether public works or code enforcement. Apps that are focused internally primarily focus on the efficiency of the process, while also allowing for communication and coordination across diverse departments within the government (Accela 2017). Most applications are designed to work within existing databases and update the databases in real time, allowing for a more streamlined process of data collection.

Local governments should make use of the many existing Within Department Applications to increase efficiency and improve service delivery.

External

To improve government transparency and service delivery to residents through digital governance, we next examine aspects of digital governance that address the external operations of municipal governments. We focus on:

1. Establishing a Social Media Presence
2. Designing User-Friendly Websites

Establishing a Social Media Presence

Living in an age where technology can empower those with access to the internet, local governments simply cannot afford to not have a presence on social media. Social media is one of the easiest ways to interact with constituents.

Why don't more municipalities use social media? Many municipalities may be unsure of how to leverage social media platforms. However, today, social media use is widespread, including across age cohorts. The Pew Research Center (2016) determined that over 50 percent of ages 50-64 and over 75 percent ages 18-49 use social media platforms at least once a day. Thus, any action towards increasing the capacity of a local government's social media efforts can generally improve interaction with the community.

How can municipalities, especially those in the earlier stages of digital maturity, build or increase their social media presence? Municipalities have utilized social media applications in numerous and creative ways in order to increase efficiency and interaction externally. Social media allows municipalities to more effectively disperse information on city-wide events, town halls and council meetings, construction updates and road closings, as well as post job applications, provide emergency assistance, engage the community through contests, and present an overall positive image of the municipality.

Beyond connecting with constituents, enhanced social media applications can allow for regional collaboration between municipalities and COGs themselves. Though DCED already utilizes various social media accounts, there are opportunities to expand collaboration between municipal governments and planning organizations, through the PATH training network that will be discussed later for example. By incorporating social media with training strategies and forums, more efficient governance can take place.

DCED can use its existing network to encourage use of social media as a means of increasing the transparency and accountability of local governments. Social media is often free and user-friendly.

Supported by the findings of last year's capstone project, five key advantages of social media have been identified in regards to local governments:

Figure 2E: Advantages of Leveraging Social Media in Local Government

1. **Manage interaction and engagement:** Social media is very easy to operate. It usually requires just the creation of an account and following the specific pages that interest you.
2. **Decrease information cost:** Many social media platforms, including Facebook, Twitter, LinkedIn, etc., are free to register for and save municipalities the cost of other alternatives. Websites can link to their specific accounts and allow them to appear on the homepage as a sidebar detailing the “headlines” that are newest and relevant.
3. **Easily access information at all times:** By posting on social media, information is available until deleted. This means that more people have access to it rather than holding public meetings where people may not be able to attend or people forget what was spoken about during the meeting
4. **Increase levels of responsiveness:** social media can allow for more interaction with residents as it erases the intimidating setting that public meetings often entail. Rather than walking up to a microphone and speaking to a panel on a stage, social media offers quick interactions with the organization and allows people to pose clearly thought out questions that will result in the most helpful answers. To this point, social media may also allow for people to lend more criticism and truthful opinions to the organization as it is not a face-to-face meeting. Therefore, most social media platforms allow for blocking people who are not seriously contributing to the discussion and not working to move forward.
5. **Enhance internal collaboration:** Social media can improve the inner operations between an organization and its coworkers as people can quickly receive updates and communicate more efficiently with each other.

Designing User-Friendly Websites

Furthering the main benefits presented within social media strategies, governments must adapt in order to reach as many of their constituents to insure access to key services that people depend on every day. Government employees must recognize the importance of digital governance and strive to create an accessible, user-centric approach that is timely, efficient, and meets the needs of its residents. Unfortunately, all municipalities vary in their resources and ability to create a user-friendly website that is accommodating to its users. Website users rely on websites to look for policy information and available government services, research government data, download forms and applications, pay their taxes and utilities among several other important tasks. When the website is inadequate or difficult for users to navigate, it leads to negative perceptions about the government and its ability to efficiently operate. Therefore, by advocating the user-friendly design, municipalities can become enabled to:

1. Identify and respond to user needs through conducting user research while still meeting organizational goals
2. Produce information that is easily understood and acted upon
3. Create systems that better facilitate transactions, internally and externally
Deliver information so that it can be accessed anywhere and through various channels and technologies
4. Encourage participation by making it easy to connect with people
5. Increase productivity and efficiency with usable systems
6. Improve based upon feedback and analysis of other performance measurements

Based on specific examples of good website design, it is important to maintain simple, high-image, low-text designs that prioritize accessibility and mobility and prominently features a search function, as discussed about the Bexar County website later in the chapter on equity.

Even though many municipalities face budget constraints, at a minimum, it's important to make data accessible to residents via their websites on valuable information, including transportation statistics, annual budgets, planning and land use data, and property value information. This by itself would increase transparency and help to rebuild the trust between citizens and the government. It will act as an essential step towards upgrading to other website design strategies, such as the use of GIS displaying municipality data, and making the website compatible for mobile devices. For municipalities in the developing stages of digital maturity, however, simply connecting the website to social media accounts and making the site accessible and ADA compliant are effective ways to begin the process of becoming digitally mature.

Websites provide an opportunity to connect with residents. Websites should provide access to various forms of government information, data, and forms in a way that is easy to use.

Cross-Jurisdictional

To increase the adoption of digital governance tools, we address opportunities for cross-jurisdictional collaboration. We focus on the acquisition of a Chief Data Officer.

Chief Data Officers

In Pennsylvania, local authority is fragmented across over 5,000 governmental units. Such fragmentation poses challenges, as a fundamental mismatch exists between political boundaries and the boundaries of systems that are governed. Economies, infrastructure, and natural environments interact regionally. Yet Pennsylvania's fragmented and decentralized governance structures result in decisions that are made by local governments, which are inherently oriented towards solving problems within their own boundaries.

In absence of a statewide plan for local government collaboration, local governments have largely failed to collaborate in meaningful ways. As in many states and cities, officials operate in “vertical silos” which prohibits the free flow of ideas and information that is essential for problem-solving (Goldsmith and Crawford 2014). This has resulted in service duplication, suboptimal regional economic performance, and a lack of cross-boundary planning.

Most local governments do engage in day-to-day collaborative projects with neighboring local governments (PA State Planning Board 2016). Such activities include recycling, snow removal, and road maintenance. However, little data is recorded on day-to-day collaborations. By leveraging data-sharing technologies, governments could keep track of these collaborations. Collecting data and using it to formalize coordination could provide obvious benefits, such as eliminating duplication and inefficiency. For example, groups of municipalities may determine that a jointly owned and operated CRM system could streamline the administration of services.

Implementing digital tools to share data and streamline decision-making across jurisdictions requires deliberate coordination. Further, it requires expertise and technology that may not be present within a local government. To address the challenges of coordination and harness expertise at a regional level, we recommend a model that employs Chiefs Data Officers:

Fragmentation limits an individual municipality’s ability to implement digital governance strategies. Establishing a regional leader, in the form of a shared Chief Data Officer, allows for coordinated strategies and access to crucial information to a larger group of local governments who would otherwise have limited ability to utilize digital strategies.

A Shared Data Officer, or Chief Data Officer (CDO), have been employed by states throughout the country in recent years. Since the hiring of first Chief Data Officer in 2010, CDOs now exist in many levels of government around the country. They play a vital role in coordinating data collection and help the government use data strategically. So far, there are eight states who have hired a Chief Data Officer:

Figure 2F: Chief Data Officers across the U.S.

State	Chief Data Officer	Date Hired	Bio of CDO	Open Data Score	Notes
Alabama	Rick Boyce	Feb. 2016	Boyce used to be a Y2K coordinator and served at Office of Information Tech in 2014.	37%	
California	Zachary Townsend	Jun. 2016	Townsend was a tech executive in Silicon Valley.	42%	Leads the development of statewide data sharing policies
Colorado	Jon Gottsegen	Apr. 2016	Gottsegen used to be a state GIS coordinator	57%	Developed open data strategy Promoted interoperability of data assets among state entities
Connecticut	Tyler Kleykamp	Feb. 2014	Kleykamp worked on GIS databases	84%	Standardized and manages data assets
New Jersey	Liz Rowe	Mar. 2015	Codified the CDO position into state law	43%	Developed a dataset format standard across all agencies Monitors and ensure compliance
New York	Todd Harbour	Nov. 2016	Harbour was a senior federal government official based in D.C.	74%	Developed data governance strategy Unified information architecture Coordinates data sharing Maintains master data
North Carolina	John Correllus	Apr. 2016	Correllus served as director of NC government Data Analytics Center	56%	Manages master data, governance, standards and data architectures.
Tennessee	Jeffrey Kriseman	Nov. 2015	Kriseman was chief public health informatics officer in TN Dep't of Public Health.	51%	

Sources: (Government Technology 2017, US Open Data 2017)

Based on the descriptions of existing Chief Data Officer responsibilities, CDOs throughout Pennsylvania could be responsible for:

1. **Developing a dataset format standard:** It is important to set a standard for datasets so they are able to be used and accessed by different agencies or municipalities who rely on the information. CDOs can also set standards for accessing data through a municipality's website. CDOs should ensure the data can be accessible in a non-proprietary, machine-readable format that is compliant with State accessibility rules.
2. **Coordinating and collecting data:** One of the most important jobs of a CDO is to coordinate between the various governments or agencies that fall under their jurisdiction. Collaboration between different agencies or municipalities allows for efficient data collection.
3. **Managing master data:** A CDO provides management and technical assistance that will ensure access to open data platforms or any datasets available to public. Data is not just for collection, storage, or distribution, raw data should not be public, and we need to use data to develop actionable recommendations, so a CDO would have a responsibility to deal with the raw data to make them useful.
4. **Visualizing Data:** CDOs can impact policy by providing opportunities to display data in easy-to read formats known as visualization. Maps and other tools can be used to help identify causes and solutions to problems in an accessible way.
5. **Monitoring and managing risk:** CDOs should monitor and ensure that data is available, reliable, consistent, accessible, secure, and timely to support the mission and activities of government.

Regional Chief Data Officers in Pennsylvania

Regional CDOs in Pennsylvania can be appointed at the COG level, which could provide services such as the ones mentioned above. The CDO could be appointed from COG staff. The following are benefits of appointing regional CDOs in PA:

1. **Operational efficiency:** One of the most salient benefits of a CDO is improving operation efficiency. Fragmented municipalities reduce overall government efficiency. A regional CDO at the COG level, provides multiple municipalities within a region access to valuable information and assistance regarding digital governance in an efficient manner.
2. **Improved collaboration:** A CDO can play a role as a coordinator. There are 5,000 governmental units in Pennsylvania, which result in political boundaries between them. CDOs can help to coordinate between local authorities and make cross-boundary planning.”
3. **Financial savings:** Hiring or appointing a CDO can save money. In one example, the mayor of New Orleans was able to cut blight by 15,000 units due to the work of a CDO. The salary of one individual led to an improved tax base overall for the city.

Case Study 2.1: PennDOT Bike Pedestrian Coordinator Model

Regional representation to address specific statewide goals is already present within Pennsylvania. The PennDOT Bike Pedestrian Coordinator provides an example that can inform the design of a Chief Data Officer at the COG level (PA Department of Transportation 2017b). The Commonwealth of Pennsylvania took initiative to prioritize bicycle and pedestrian access. Each of PennDOT's 12 districts has a part-time Bike/Pedestrian Coordinator. They are appointed from existing staff with the primary responsibility of addressing bicycle/pedestrian questions for district projects. Their job description includes reviewing projects to insure compliance with checklist (link included below), recommending modifications, and monitoring progress during development. They are also responsible for reviewing maintenance paving plans for opportunities to accommodate bike lanes, wider shoulders, sidewalks, or safer intersections. Within their designated district, they are seen as the point person for any number of grant-funded Bike/Ped projects. Bike Ped Coordinators also assist with plan development, planning studies, and community outreach. They are seen as the clearinghouse for Bike/Ped information at the district level.

In 2014, PennDOT also hired a Bike/Ped coordinator for its central office in Harrisburg. . Initially, a statewide bicycle coordinator was established with the Transportation Equity Act of the 21st Century. Originally, the position did not have much financial or political support. With the passage of Act 89, which created a Multimodal Deputy and the Bike/Ped Coordinator was transferred to the new Deputy and given full funding through the gas tax. This position, which is full-time, primarily works to set the goals and procedures to increase Bike/Ped access and continue to prioritize projects throughout the state. The coordinator reports directly to the Deputy Secretary (PA Department of Transportation 2017a). As of 2016, there has been a renewed effort to organize with district coordinators to provide more specific job descriptions and determine statewide priorities. They are also working to update the Bike/Ped Master Plan, which has not been updated since 2007.

The PennDOT Bike-Pedestrian Coordinator provides a model that can be applied to digital governance. A regional Chief Data Officer (CDO), who works at the COG level, could provide a clearinghouse of information and guidance to members. They can provide training, advice and oversee implementation of state and federal regulations, provide insight on vendors, and oversee the further consumption of digital technologies for local governments. This position could also assist local governments in identifying funding opportunities to achieve digital governance goals. Like the PennDOT model, this position could be appointed from existing COG staff. The DCED, or other state agencies, could eventually provide a state-level position to coordinate initiatives with COG level Chief Data Officers to share information and best practices statewide.

SECTION 3: IMPROVING EQUITY THROUGH DIGITAL GOVERNANCE

In order for Pennsylvania to make steps in regards to digital governance, the concept of digital equity needs to be at the forefront of the discussion. Digital inclusion encompasses both web accessibility as well as access to broadband internet. The World Wide Web Consortium (WC3) is the basis for much research on website accessibility and the institution that provides the guidelines for website accessibility for governments. They discuss how websites were fundamentally made for everyone no matter location, culture, and hardware or software.

“Thus the impact of disability is radically changed on the Web because the Web removes barriers to communication and interaction that many people face in the physical world. However, when websites, web technologies, or web tools are badly designed, they can create barriers that exclude people from using the Web (W3C 2017).”

Therefore, it is important, specifically for governments, to make sure their websites are accessible. Website accessibility pertains not only to people with disabilities, but also older individuals and people in rural locations. This fact affects governmental entities when considering digital governance and digital inequity. Allegheny County is one of the oldest counties in the nation, however, the current older demographic in Allegheny County use the internet at high rates and are also older workforce employees (University Center for Social and Urban Research 2014). Therefore, these are individuals who regularly use the internet to connect with their government, and as they age will still want to do so. This section will therefore examine digital governance in relation to equity, by examining website accessibility requirements in relation to the ADA and broadband internet requirements.

“Digital Equity is a condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy and economy. Digital Equity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services (National Digital Inclusion Alliance 2017).”

Rationale

With the many ways citizens are now interacting with their governments digitally, there is an even greater need to make sure that all citizens have access to their government at all levels. The U.S. Department of Justice Civil Rights Division issued a document regarding website accessibility in 2003. This was when website accessibility was first mentioned as a consideration for being a part of ADA compliance. These standards included the most basic ideas regarding website accessibility such as renewing driver’s licenses and providing information about government services (US Department of Justice Civil Rights Division 2003). The DOJ has not released another statement about website accessibility since 2003, and digital governance has definitely changed since this time.

All of the recommendations that come from WC3 are not only important for citizen engagement, but they are also required due to the American with Disabilities Act (ADA) and Section 508 of the Rehabilitation Act of 1973.

ADA: What Does Accessibility Mean to Digital Governance Today?

The U.S. Access Board is a federal agency promoting equality for people with disabilities. They develop accessibility guidelines and standards for a variety of areas, including Communications and IT. They monitor accessibility of government websites in regards to both The American's with Disabilities Act (ADA) that was passed in 1990 and also Section 508 of the Rehabilitation Act which requires federal employees to have access to technologies as well as citizens. In January 2017, the Access Board saw the need to refresh these standards and ensure consistency in accessibility, as well as taking into consideration the implementation costs of this change (US Access Board 2017b). Section 508 applies to all government entities and the entirety of their public facing content including websites, documents and media, blog posts, and social media sites. These refreshed standards require:

1. Enhancing accessibility to Information and Communication Technology (ICT) for people with disabilities.
2. Making the requirements easier to understand and follow.
3. Updating the requirements so that they stay abreast of the ever-changing nature of the technologies covered.
4. Harmonizing the requirements with other standards in the US and abroad.

It is required for all government entities federal, state, and local to implement these website accessibility strategies. And though the implementation can be complicated, there are a variety of resources for government entities. Though a government can work around their legal requirements by having a staffed phone line for different inquires, the Department of Justice release, mentioned above, encourages governments to not just use a staffed phone line, but take advances in digital governance.

Implementation

All of these standards and strategies can be confusing and may be difficult to implement. The United States Access Board has a variety of resources to help with implementation. Key resources are the Local Government Toolbox and Checklist, the United States Access Board: ICT Resources, and the Section 508 website: Webinars and Implementation Resource. Some of these webinars could eventually be included on PATH.

Figure 3A: Categories of Resources Available from Section 508



Furthermore, the refresh is based on the standards developed by the World Wide Web Consortium (W3C) WCAG 2.0 standards. There are 3 levels: A, AA, and AAA, and the law was developed with levels A and AA in mind (W3C 2017). Therefore the W3C website also had additional resources about the law, Frequently Asked Questions, and about how to implement these standards. It seems that each site: 508.gov, The Access Board, and the ADA have not coordinated on all of these items, and finding specific items and regulations can be difficult to track down, as a lay person, therefore training and guidance from advisors would be key.

What does Compliance Mean? Result from Informal Interviews

We spoke with three ADA coordinators and each had a different take on what it means to be ADA website compliant. All acknowledged the Section 508 Standards, but each had a different response to what it means to be compliant. We asked each the following and all three had similar answers (Mobile County ADA Coordinator 2017, Allegheny County Employee 2017, City of Pittsburgh Employee 2017):

Figure 3B: Interview Responses on Digital Compliance from ADA Coordinators

Question	Answer
What do you know about specific legislation regarding government website’s accessibility?	Referenced the 508 Standards, and two mentioned the refresh.
Do you think municipalities could get money to follow the ADA requirements?	Did not believe so. One said “The ADA is Civil Rights Law, not a government program. Municipalities are required to find the money out of available resources.”
Do you know of any specific grants local governments could receive for help with website accessibility?	None of the three ADA coordinators knew of any grants/funding.

In speaking with a lawyer who specializes in disability law, he confirmed that since 2003 everyone agreed that ADA covered state and local government websites. He stated that this is not just a recommendation, and that governments have been sued for failure to make websites accessible (Union Lawyers 2017).

Implementing Strategies: Case Studies and Role Models

Pennsylvania can look to other entities for good accessibility standards. Bexar County, TX has been held up as an example of not only a county that is promoting digital governance, but also one that is concentrating on accessibility, and has earned national attention for its success.

Figure 3C: Bexar County Website Header



In speaking with Bexar County's Information Services and e-Government Developer we asked if there was specific legislation pushing their drive for accessibility, and if not, what drove this feature on their website? Their answers provide a model for accessibility for all government websites. They not only explained about the 508 refresh and different standards, but also stated:

"We do our best to meet all A and AA standards on our websites and have since before the refresh. While complying with the law is important to us, we also made it a priority because we want to be accessible to as many people as possible since we are government. It's an ongoing process and we are continually looking for ways to make our content more accessible (Bexar County e-Government Division Employee 2017)."

What does it mean for Bexar County to comply with A, and AA levels? The three levels are outlined in four areas and each area has guidelines that are listed at one of three levels (WebAim 2016):

1. **Perceivable:** Web Content is made available to the senses- sight, hearing, and/or touch
2. **Operable:** Interface forms, controls, and navigation are operable
3. **Understandable:** Content and interface are understandable
4. **Robust:** Content can be used reliable by a wide variety of user agents, including assistive technologies

Bexar County implements these different levels of accessibility in different ways, but makes sure they follow all A and AA levels. As seen above, their accessibility button is a part of their header. If you click on accessibility button it takes you to the Technical Advisory Committee for Persons with Disabilities. This page has information about the committee, what to do if any of the accessibility functions are not working, and links to different documents of interest.

Figure 3D: Bexar County Website Footer



The Bexar County’s footer for “Website Accessibility” takes you to a page with information on:

1. Issues with Assistive Technology
2. Accessibility Design Guidelines
3. Browser Accessibility Information
4. Additional Plug-Ins
5. Supported Assistive Technology

Bexar County truly is a leader in not only e-governance, but also government website accessibility. They are a leader in the field and a partner for those who have questions about accessibility guidelines.

The City of Philadelphia is another role model to turn to for accessibility standards. Philadelphia has been recognized as a digital accessibility leader by the National Digital Inclusion Alliance (NDIA). The NDIA is an important partner for government website accessibility:

“The National Digital Inclusion Alliance is a unified voice for home broadband access, public broadband access, personal devices and local technology training and support programs. We work collaboratively to craft, identify and disseminate financial and operational resources for digital inclusion programs while serving as a bridge to policymakers and the general public (National Digital Inclusion Alliance 2017).”

The NDIA has a program called Digital Inclusion Trailblazers, which is an effort to build the first public inventory of local government initiatives to promote digital literacy and broadband

access to underserved residents. They created this program as an advocacy tool for national digital inclusion leadership at all government levels, and as a database of examples and contacts for communities interested in taking further steps.

Digital Inclusion Trailblazers hold up communities that promote digital access and literacy. They have Eight Key Indicators of Digital Access and Literacy and we recommend that Pennsylvania local governments strive to become a Digital Inclusion Trailblazers. The Eight Key Indicators are

Figure 3E: Eight Key Indicators of Digital Access and Literacy

1. Has a full-time Digital Inclusion Staff (including at least one fulltime-equivalent staff dedicated to digital inclusion policy and programs, and supported by the municipality's own revenue rather than third-party grant funding)
2. Leads a community Digital Inclusion Planning process
3. Is active in a local Digital Inclusion coalition.
4. Researches its own residents' internet and access use
5. Funds community Digital Inclusion programs
6. Funds public access computer labs
7. Supports a community wireless network for residential areas
8. Provides discount internet service for low income households

as follows (Keyspot 2017):

The City of Philadelphia is held up as a "Digital Trailblazer." They meet 5 of the 8 indicators. They have full-time digital inclusion staff, including a Deputy CIO for innovation management, Andrew Buss. Furthermore, Philadelphia's website "Keyspot" is leading the way in digital inclusion.

"In the digital age, a computer and Internet access is a necessity, yet 41 percent of Philadelphians do not have access. Formed to tackle this problem, KEYSLOT represents a citywide coalition of community-based groups committed to bringing Internet access, training and technology to all Philadelphia communities (Keyspot 2017)."

The City of Philadelphia is another leader that Pennsylvania can turn to for digital inclusion and equity in government. Their Office of Innovation and Technology would be a partner and a role model for accessibility.

Certainly, not assuaging the slow pace of implementing access to broadband, one of the Pennsylvania DCED programs, the Broadband Outreach and Aggregation Fund (BOAF) Program, aimed to “provide communities with resources to overcome challenges in securing Broadband access for individuals and businesses residing in the rural and underserved areas of Pennsylvania.” BOAF previously had a fund that was meant to provide assistance to implement outreach about the benefits, use and procurement of broadband service; however this fund expired in June of 2016 (PA DCED 2017a). Despite providing a list of broadband providers for residents on the DCED website, the lack of funding through the state in a state that has gaps in access and the insufficient amount of information otherwise, the status of solving this issue at the state level looks faint.

This is not to say that the issue of Internet access has been lost on others. The Southern Alleghenies Planning and Development Commission has recognized that the counties that it promotes (Bedford, Blair, Cambria, Somerset, Fulton, and Huntingdon counties) have fallen behind when it comes to access. According to a final draft document of the Southern Alleghenies Region Comprehensive Economic Development Strategy: 2015-2019, the SAP&DC recognizes that inconsistent wireless and broadband service presents itself as a weakness and a regional disadvantage when it comes to economic competitiveness (Southern Alleghenies Planning and Development Commission 2015). The strategy also mentions the realization that telecommunications is just as vital form of infrastructure as roadways, water utilities, and sewer systems. In reference to the goal of maintaining and modernizing infrastructure, one strategy entails the conduction and analysis of broadband service gaps in the six county region, and implementing a plan to expand service.

The availability and quality of broadband present in a municipality or county can affect where they fall concerning the measures of digital maturity, whether it be the limits that it can place on the strategies that they can employ or the accessibility of services they could be able to provide, as mentioned previously in this report; however, looking at this issue in regards to equity and how inconsistent coverage of broadband service across the Commonwealth as being an issue of accessibility to residents should be kept in mind when planning for the implementation of digital strategies.

Case Study 3.1: Access for Rural Pennsylvanians

As previously mentioned in this report, the current standards for broadband speeds have definitely outpaced what the PA Act 183 of 2004 had envisioned when they set their goal for 100 percent deployment of access by 2015, with speeds exponentially greater than the then-goal of 1.544 Mbps down/ 0.128 Mbps up. With the more rural counties of the state having less access to fast, reliable Internet than their more populated neighbors, this reality has not gone unnoticed.

PA State Representative Pam Snyder of Beaver County introduced a bill in 2016 to address the divide in Internet access for rural residents by requiring improving download and upload speeds. As an update to the Act 183 standards, she is proposing a minimum of 10 Mbps down/1 Mbps up (Prose 2016). Snyder expressed that such an upgrade is crucial to advancing rural regions' development.

The York Daily Record also called for an upgrade to the Act 183 in a recent editorial (Mason 2017). They argued that the issue of Internet access is equity issue, specifically for students in rural school districts who find themselves at a disadvantage compared to students in more-densely populated regions.

According to the U.S. Census Bureau, the state of Pennsylvania has the third-largest rural population with 2,711,092 residents living in rural areas (US Census Bureau 2012). As people 65 and older are projected to outnumber the people who are 20 and under in Pennsylvania's rural counties, it is crucial that they have access to such an equalizer, especially as more and more services and information concerning their local municipality become available online.

SECTION 4: OPPORTUNITIES FOR DIGITAL ADOPTION

Adoption of the digital tools outlined in Sections 2 and 3 can be costly. Further, some municipalities may not have the expertise to install and operate some of these technologies. To overcome these challenges, in this section we recommend three forms of partnering that can advance digital adoption at the *regional* level. First, we discuss opportunities presented by existing intergovernmental institutions. Second, we highlight the potential for public-private partnerships to expedite adoption. Third, we highlight the opportunity for leadership at the state level, and recommend that DCED unite stakeholders to design regional adoption plans, create forums to foster digital leadership, and provide financial incentives for the investment in technology.

Existing Institutions for Intergovernmental Collaboration

Article IX of the PA Constitution provides legal pathways for intergovernmental cooperation. Section 5 allows municipalities to cooperate with local, state, and federal government in the provision of any service by an act of their governing body or citizen referendum. The legislature granted this power through the Intergovernmental Cooperation Law (Act 180 of 1972) which allows local governments to cooperate in the provision of any service that the governments have the authority to do alone.

There are two fundamental types of institutions that have emerged under Act 180 to support intergovernmental collaboration. The first is contracts, which are signed directly between municipalities for the joint provision of services. Contracts are usually applied for a single purpose, such as road repair or waste removal. The use of contracts could also be leveraged to co-manage the implementation of digital technologies and embrace data-sharing. For example, two or more neighboring municipalities could sign a contract to co-fund the development and management of a database that stores information on roads within their borders. The database could include information on road conditions, as well as past and scheduled repairs. All municipalities that participate would benefit by sharing the cost of software and maintenance. In addition, the information that would be made available across jurisdictions could help coordinate road repairs to maximize the impact of each individual project, as well as minimize traffic disruptions.

Intergovernmental entities represent the second type of institution that has emerged to support collaboration. As these entities are already engaged in planning and coordination across jurisdictions and service areas, they represent auspicious arenas for digital collaboration. There are three main types of intergovernmental entities. The first two are Metropolitan Planning Organizations (MPOs) and Rural Planning Organizations (RPOs), which are governed by local and state officials. MPOs and RPOs primarily focus on transportation planning and improvements, though some have a broader scope and are active in providing services and technical assistance to local governments. In addition, Councils of Governments (COGs) are voluntary organizations made up of local governments. COGs provide a forum for elected officials and administrators to discuss regional issues and solutions. A small number of COGs in the state are beginning to support their members in the realm of digital governance. For the

following reasons, MPOs, RPOs, and COGs may be well suited to drive the adoption of digital tools:

Figure 4A: Four Reasons Why Intergovernmental Organizations (MPOs, RPOs, and COGs) are Well Suited to Drive Digital Adoption

1. Pooling resources within intergovernmental entities can open the door for the adoption of technologies that may be too costly for an individual government.
2. Individuals with technical expertise employed within intergovernmental entities can help local governments setup and maintain digital tools, and train local government employees to use new technology.
3. Intergovernmental entities serve as a nexus for partnerships with external stakeholders, such as higher levels of government, non-profits, and academic institutions. The support of these stakeholders can provide additional funding and expertise to drive digital adoption.
4. Intergovernmental entities represent forums where local governments discuss cross-jurisdictional problems. The introduction of digital tools into these discussions may help uncover new collaborative solutions to existing problems.

Case Studies 4.1 and 4.2 (below) highlight two examples of COGs in Pennsylvania that have successfully applied strategies to support digital adoption and use technologies to find solutions to cross-jurisdictional challenges. The case studies suggest that, similar to the Shared Data Officer model, shared IT support technicians or software experts can be employed at a regional level through intergovernmental entities.

Case Study 4.1: Shared IT Services at Mercer County Regional COG

The Mercer County Regional COG (MCRCOG) employs an IT Director to provide services for municipalities in the county. The IT Director possesses technical expertise that local government employees may lack. For a fee, municipalities can subscribe to unlimited support services through an annual contract. Alternatively, municipalities can choose to pay for each unique service request. As the COG is co-funded through membership dues, as well as state and federal funding, fees for IT services are less expensive than those provided by private vendors.

The adoption of new technologies not only entails upfront investment in hardware and software, it also requires a skilled practitioner to setup and maintain these systems. Therefore, MCRCOG offers services related to installations, software upgrades, hardware repairs, and networking services. In addition, in the past MRCOG has provided training classes to teach local government employees to operate and maintain new technology.

MRCOG has also assisted local governments by developing websites that are hosted at the COG's office. The COG also hosts email domain names for local governments that were previously using third-party domains. Website development and hosting is often costly, and local governments have experienced significant cost savings by taking advantage of these service.

Case Study 4.2: Data-Driven Decision Making at Steel Rivers COG

The Steel Rivers COG (SRCOG) serves 20 municipalities in the Mon Valley region of Allegheny County. The COG aims to combine resources to develop solutions to regional challenges that go beyond the capacity of any individual member. In their efforts to address blight, a critical problem-facing member and neighboring municipalities, SRCOG deployed digital technologies to allow for data-driven decision making. The process that SRCOG went through to apply data-driven thinking provides three key lessons for COGs looking to apply digital tools to regional challenges.

First, pooling resources and expertise at the COG level can open the door for the adoption of technologies that may not be possible within each municipality. In most municipalities, the cost of technology is a barrier. In addition, municipal offices are often understaffed, and employees typically do not have the time to learn new technologies and apply them to policy issues. SRCOG pooled the resources of members to purchase GIS software, and its staff possesses advanced GIS skills.

Second, COGs can serve as a nexus to leverage external partnerships and build support among members. The Pennsylvania Housing Alliance, a statewide coalition that advocates for access to safe and affordable housing, has been conducting research on the causes, impacts, and solutions to blight for over a decade. The Housing Alliance drove a legislative agenda to address blight in Pennsylvania, and led to DCED's hosting of the PA Blight Library, a website that includes research and handbooks to address blight in the state. SRCOG was engaged with both the Housing Alliance and DCED as its members considered how to address blight in their region. These conversations, along with the circulation of relevant research that outlined the costs of blight in the state, were critical in building the necessary support of members to take further action. In 2013, SRCOG, in collaboration with the Turtle Creek Valley and Twin River COGs, conducted a study to understand the cost of blight in a region of 41 municipalities. The study relied heavily on GIS software and expertise within the COGs. It was co-funded by member governments, DCED, and local foundations.

Third, data-driven decision making can lead to support for policy innovation. The work of the Housing Alliance was integral in the creation of the Land Bank Act of 2012, which authorizes counties and municipalities to establish land banks. At the COG level, the results of the blight study, made possible by digital tools, solidified the support of municipal officials in addressing blight. Armed with new data, local officials took a risk by providing political and financial support for a land banking initiative in the region. Along with the Turtle Creek Valley COG, SRCOG is currently laying the foundation for the implementation of land banking, and has gained the commitment of 21 municipalities, 6 school districts, and Allegheny County.

Forming Public-Private Partnerships

Public-private partnerships (PPPs) are collaborations between government entities, along with stakeholders in private, non-profit, and academic communities. Modern advancements in digital technologies have primarily been driven by the private sector. Further, movements towards open data have commenced within non-profit and academic institutions. By partnering across-sectors, local governments can gain new technology, skills, or data that can make them more effective in their delivery of services. **Case Study 4.3** outlines an example of PPPs that have led to the adoption of new digital practices by local governments in Pennsylvania.

Case Study 4.3: Public-Private Partnerships for Open Data in Pittsburgh and Philadelphia

PPPs were a key driver of the open data policies adopted in both Pittsburgh and Philadelphia. In Pittsburgh, stakeholders in the non-profit and academic sectors were pivotal in starting the Pittsburgh Neighborhood and Community Information System (PNCIS), with the intention of helping community organizations acquire better data to inform the provision of social services (Gradeck 2014). This led first to the development of a temporary data-sharing agreement with the City of Pittsburgh. Seeing the value of data-sharing, by 2014 leaders within the city government adopted a formal open data policy.

Similarly, Philadelphia adopted a formal open data policy in 2012, which was championed by the Southeastern Pennsylvania Transportation Authority (SEPTA) (Headd 2014). SEPTA began to see value in open data after civic hackers began to scrape their website and create applications that displayed transit information to passengers. The City now partners with Temple's Center for Public Interest Journalism, which manages the online open-database.

In both cities, partnerships were crucial for advancing digital governance. In considering digital adoption strategies, key stakeholders outside of government could be identified and invited to participate in discussions, with the intent of bringing a wider range of technical expertise to the table.

Statewide Policies to Encourage Adoption

To expedite the adoption of digital governance tools in Pennsylvania, it is imperative that DCED leads the charge. Though some municipalities have made technological advancements without state support, not all municipalities have the resources or expertise to adopt technologies without significant support. To establish a supportive environment for digital governance, we recommend that DCED adopt or update statewide policies and programs in the following areas:

1. **Funding:** In recognizing that funding is limited, the state of Pennsylvania can leverage current financial resources and promote collaborative opportunities for digital governance implementation. We recommend that DCED utilize existing programs,

explore innovative partnerships within the private and public sectors, and provide incentives within COGs.

The Municipal Assistance Program (MAP), currently administered by the DCED, provides funding assistance to local governments to plan and implement shared services and community planning (PA DCED 2017). Funding for shared service activities can provide incentives for municipalities to collaborate on equipment, technology acquisition and support services. In addition, the COSTARS program, currently administered by the Department of General Services, is the cooperative purchasing program that encourages municipalities to enter cost effective contracts for IT hardware, software and other electronics (Department of General Services 2017).

DCED can also explore innovative, nontraditional approaches to funding. There is an opportunity for partnerships with both private sector companies specializing in IT software, communications and other digital technology and nonprofit sector organizations with a stake in community development, economic development and innovative growth. Pennsylvania has a high concentration of philanthropic funding sources, and many foundations promote citizen engagement, collaborative governance and technological advancement. The DCED could explore multi-sector partnerships to provide financial support for digital governance initiatives, such as locally-sourced innovation awards or broadband grants. Due to Pennsylvania's fragmented government structure, the provision of new state funding sources to local governments will be most effectively implemented at the collaborative regional level.

Regardless of the funding sources that are leveraged, we recommend that DCED provide incentives to adopt digital solutions within COGs, where applicable. As outlined above, COGs often possess greater levels of complementary funding, as well as the human resources and expertise to implement advanced technological tools. Providing financial incentives for digital adoption at this level would also encourage coordination and data-sharing between member governments. Further, purchasing digital tools at the COG level could provide cost savings through bulk ordering and software sharing (as in the case of a shared GIS Specialist).

Direct financial incentives could be provided through COGs, for the adoption of digital tools that allow for coordination and data-sharing between member governments.

2. **Statewide Data and Records Storage Policy:** Our research suggests that many municipalities store records on vast amounts of paper. To avoid confusion surrounding record storage, DCED could lead an effort to design and implement a statewide policy that sets a timetable for digital storage of all records that are required by state agencies (such as financial records or grant records). A comprehensive analysis of the current state of records storage across municipalities should precede the implementation of the

policy, which would help determine a feasible timeline. The policy could be coupled with financial incentives to support cloud-based storage initiatives at the municipal level to increase transparency.

Currently, DCED has a contract with Open Gov (a company specializing in cloud solutions for governmental financial tracking) that will provide financially distressed municipalities in Pennsylvania (Act 47 communities) with advanced digital budgeting tools that allow both better tracking and transparency (PA Department of Community and Economic Development Employee 2017). This is an example of an inward facing intervention where digital governance can provide solutions to complex problems, in this case financial tracking for a financially distressed community. This service is currently offered to all ACT 47 communities. However, given its recent implementation, it has only been adopted by the Cities of Pittsburgh and Altoona. This system is an ideal opportunity for DCED and those they serve to see the impact of a digital governance strategy. The delivery and deployment of the Open Gov could serve as a pilot case from which the roll out of other digital technologies could follow.

DCED could lead an effort to design and implement a statewide policy for digital storage of all records required by state agencies. The policy could be coupled with financial incentives to support cloud-based storage initiatives at the municipal level.

- 3. Forums and Symposiums:** Local governments will not adopt digital tools unless they understand how technology can help solve the challenges they face every day. Therefore, we recommend that by holding and taking on a greater role in forums and symposiums, DCED, through the Center for Local Government Services, can help create demand for digital tools. At conferences, municipalities can be convened to disseminate best practices in digital governance, and share success stories helping stakeholders better understand the value that new technologies can provide. Additionally, DCED could hold free proprietary forums at the regional level. For example, symposiums could target local elected officials, aimed at helping them understand which tools would allow governments to solve problems more efficiently. Similarly, forums could be held for staff members of local governments, aimed at providing an arena to discuss their needs and capacities helping uncover and build consensus on the technologies that would allow staff members to do their jobs more effectively.

For example, DCED's current Partnerships for Regional Economic Performance (PREP) program "consists of hundreds of trained and experienced experts who can offer assistance and resources. PREP's one-on-one counseling, specialized workshops, online training and financial incentives make it one of the most coordinated and respected networks in the nation designed specifically to meet the needs of our job creators — the men and women who start and grow our businesses" (PA Department of Community and Economic Development 2017b). Though focused primarily on start-ups and

businesses, the program could contribute to a statewide strategy by informing local business and business owners of the benefits that digital practices have on communities. Additionally, digital practices can increase the capacity of the current PREP program by offering training to employers, determining where to locate a business, and finding financing to get off the ground.

In addition to holding proprietary forums specifically for and by local government bodies, representatives from DCED could also participate in existing events to articulate the value of digital governance opportunities. A primary example of this is the annual Pennsylvania Digital Government Summit. Held by *Government Technology*, the agenda is comprised of speakers brought in from both the public and private sectors by an advisory board made up of Pennsylvania state leaders and leaders of the technology industry. Through keynote speeches, discussions, networking, and other information sessions, participants gain valuable knowledge on various topics that concern digital governance, such as digital government trends, data and analytics, mobility and citizen engagement among others that can help advance the goals and objectives of their organizations. Another example forum is the Annual Educational Conference and Trade Show held by the Pennsylvania State Association of Township Supervisors (PSATS). This conference regularly includes presentations on digital governance and technology, and represents an auspicious forum for DCED to disseminate information on funding opportunities and relevant policy changes

DCED could create demand for digital tools by convening free proprietary forums at the regional level, with the aim of convening municipalities to disseminate best practices in digital governance and sharing success stories. In this manner, officials would be informed on the value that new technologies can create, and which tools would help them solve problems more efficiently.

4. **Training:** By facilitating access to free technology training, DCED could begin to develop the expertise at the municipal level that is necessary for the widespread adoption of digital governance tools. To do so, we recommend that DCED update and revise the existing PA Training Hub for Municipal Learning (PATH) system. DCED currently contracts with the Pennsylvania Municipal League to host PATH (PA Municipal League 2017). The PATH homepage claims that “Our training keeps municipal officials current on new laws and legislative requirements and enhances their ability to govern more effectively” (PA Municipal League 2017).

In this learning hub, members can take classes on various subjects, including: Excel for Beginners, Intermediate Accounting, and Capital Budgeting. The majority of these classes are based around financial issues and all of them have a monetary cost. For example, if someone were to take the Excel for Beginners course, it would cost them \$25. This creates an unnecessary barrier to the usage of the PATH system considering

most of the videos and their content can be found for free online on sites such as YouTube.

Despite being an online training hub, this site lacks many functions that are commonplace on most commercial websites. Notably, payments for the classes cannot be done on the site. Payment information must be physically written on a printed form and then mailed or faxed in. This not only slows down the process, but also puts another barrier to quick and easy learning opportunities. In addition, of the nine course categories (Community and Economic Development, Environmental, Finance, Local Government Administration, Planning, Public Safety, Public Works, Recreation, and Tax Collector) only three categories have courses listed. Presumably, these courses are still being created, but this lack of resources leaves users to find alternative, and often free, options to meet their needs.

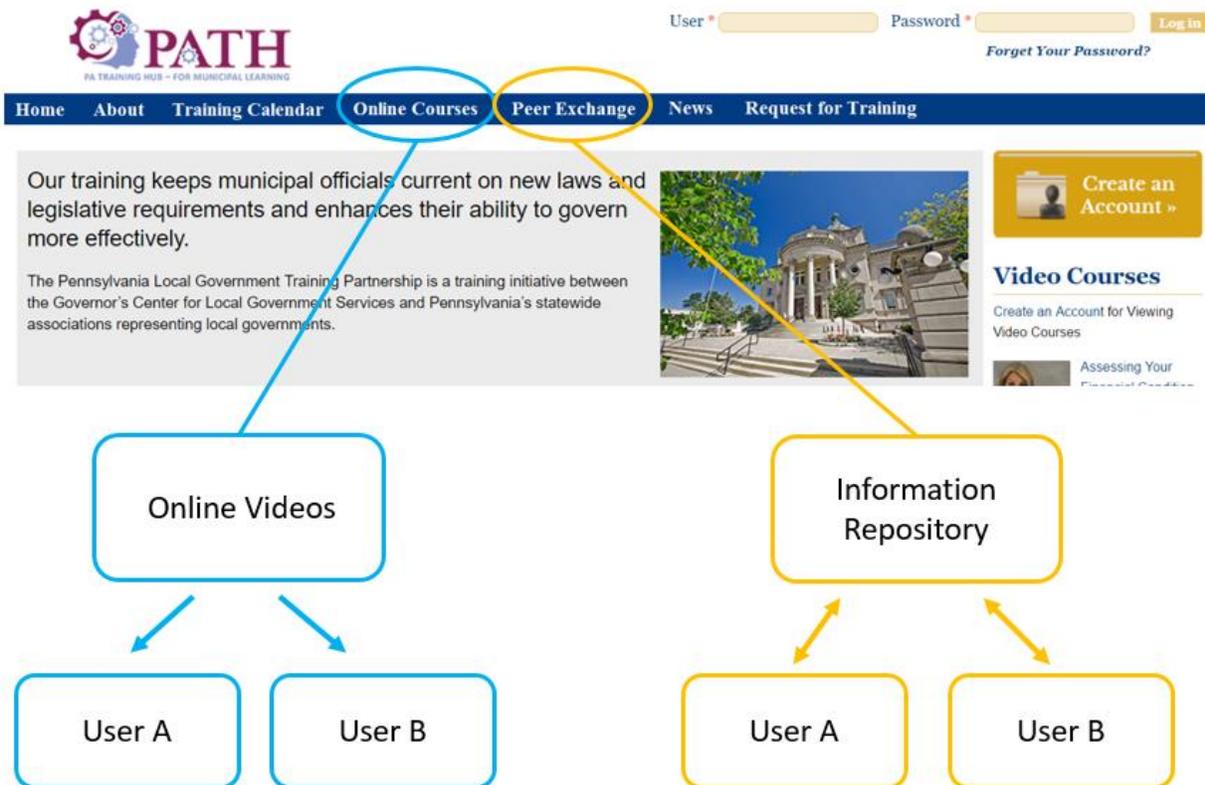
DCED's initial contract for the PATH system cost \$2 million dollars (PA Department of Community and Economic Development Employee 2017). Despite this investment and sub-contracting to other companies, such as Zelenkofske Axelrod LLC, the site does not appear to be capable of keeping municipal officials current on new laws and legislative requirements and enhances their ability to govern more effectively as the mission statement proclaims (PA Governor's Center for Local Government Services 2017). To fulfill the mission statement, a number of improvements need to take place:

- With much of the information available for free online on alternative platforms, PATH courses should be free and easily accessed. This will allow DCED to provide its users with timely and accurate information instead of leaving users to find less costly and unverified sources of material.
- Allowing municipalities and COGs to post PDFs, videos, or other content will provide field tested experiences to others who might be interested. A peer to peer information exchange could simply be added as another tab to the PATH system and would increase the amount of content available with little financial investment (see [Figure 4A](#)).
- DCED could run the PATH system in-house. With the \$2 million investment, DCED could host the website and manage it as deemed fit. Experts from municipalities, COGs, municipal organizations, or even DCED could be paid to make high quality videos that directly relate to the user's needs. By running the system internally, DCED can quickly add classes as its constituents ask for them, rather than working with a third party that further contracts out for content creation.

The PATH platform is an ideal central repository for educational information pertaining to digital governance adoption and the general needs of local municipalities. However, in its current form, it creates many barriers to access and appears to struggle in meeting its goals. With change, this site could become a robust learning platform that would enhance the knowledge and service capacity of local municipalities.

By facilitating access to free technology training, DCED could begin to develop the expertise at the municipal level that is necessary for the widespread adoption of digital governance tools. To do so, we recommend that DCED update and revise the existing PA Training Hub for Municipal Learning (PATH) system.

Figure 4B: Proposed Model for PATH



We recommend that DCED engage local governments and other relevant stakeholders at the regional level to design and implement “digital adoption plans,”

5. **Regional Adoption Plans:** Policies that are forced upon local governments are likely to result in resistance. Therefore, we recommend that DCED engage local governments and other relevant stakeholders at the regional level to design and implement digital adoption plans. The vast diversity and fragmentation of local governments precludes any individual actor's ability to unilaterally design a plan for expanded digital adoption across Pennsylvania. Instead, multiple actors must collaborate. In each of the 23 regions of the state (defined by MPO and RPO boundaries) DCED should lead a process to bring stakeholders together to uncover shared goals. These stakeholders include local governments, intergovernmental entities (MPOs, RPOs, COGs), as well as relevant non-profits and academic institutions (see **Case Study 4.4**). These stakeholders could be encouraged to design "digital adoption plans" that would outline a vision for the use of technology within local governments. By bringing stakeholders together, information would be shared regarding each actor's capabilities, available data, and services.

Sharing this information would reveal opportunities for collaboration through intergovernmental entities and PPPs. A collaborative process of design would function as a positive feedback loop: stakeholders across disciplines and jurisdictions would create strategies to drive digital adoption, which in turn would open forums and create data-sharing opportunities for further collaborative problem-solving. Leadership is necessary to drive this coordination, while technical expertise and sufficient funding is necessary to navigate the complexity and cost of digital systems. As part of the process to create regional plans, DCED could provide specific funding for the adoption of digital tools that allow for the coordination of services between local governments.

Case Study 4.4: Turtle Creek Valley COG

Turtle Creek Valley COG currently contains 20 member municipalities and serves more than 170,000 people in Allegheny County. The COG's website is easy to navigate and provides members with a variety of services including management of Community Development Block Grants, land banking, and utility billing, to name a few (TCVCOG website).

TCVCOG was contacted to gauge their interest in digital governance strategies. Many of the services that TCVCOG runs could be enhanced through digital governance upgrades. Notably, the COG expressed their desire for the capacity of Geographic Information Systems. The COG had an intern that provided GIS expertise, but this capacity was lost as soon as the intern left. When asked if a COG level Chief Data Officer would be wanted, the COG said that such a position would aid in the provision of services to their member municipalities (Kozub).

However, two key barriers have kept digital governance improvements from being made at TCVCOG: funding and proficiency. State level support could be directed to COGs such as TCVCOG where digital governance capacity is wanted and has already been used to improve service provision.

SECTION 5: CONCLUSION

While digital governance has numerous benefits in increasing the efficiency of municipalities and promotes civic participation by encouraging stakeholder engagement, there are limitations to these methods. Funding and lack of knowledge are the primary reasons why digital governance is not as widespread as it could be. Due to strict budgets, municipalities may not wish to spend on technological resources when other services could be provided for. Second, because of a lack information about the usefulness of digital governance, many local governing bodies may feel that it is unnecessary. In other words, they “don’t know what they don’t know.” Without experiencing the strategies first-hand or seeing them in action, they may never be convinced of their success and implementation. Though these can be alleviated through proactive leadership and the support of municipalities and COGs who are already utilizing these tools, the threats remain a deterrent to becoming a modern, technologically powered government.

However, the recommendations for the adoption of digital governance strategies in regards to technology, equity, and State level leadership can alleviate many of the concerns posed above. With the ability of these interventions to take place internally, externally, and cross jurisdictionally; municipalities can improve all aspects of their operations. These strategies can be as simple as digitizing paper records or creating a CDO for a multi-municipal region. No matter the intervention, digital governance strategies have the benefit of being scalable to the needs of a community.

With its many benefits, it is our belief that the digital governance recommendations proposed above provide a path forward for both individual municipalities and the State of Pennsylvania as a whole. DCED is uniquely positioned to encourage digital adoption and serve as a leader through education and outreach. With increased collaboration and communication at all levels, digital governance can serve as a vital tool to increasing the quality, equity, and efficiency of governments operating in the Commonwealth of Pennsylvania.

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