

Identity Management: Are We All On The Same Page?

Prepared by the NECCC Identity Management Work Group



NATIONAL ELECTRONIC COMMERCE COORDINATING COUNCIL

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NECCC is a national think tank of public and private sector leaders
working to identify and develop best practices for e-government.

Alliance partners are:

National Association of State Auditors, Comptrollers and Treasurers
National Association of Secretaries of State
National Institute of Governmental Purchasing

NECCC also works in partnership with these affiliate organizations:

Association of Government Accountants
Information Technology Association of America
National Automated Clearing House Association
National Association of Government Archives and Records Administrators
National Association of State Treasurers

Table of Contents

Introduction	1
Justification	3
Cost Reduction	3
Administrative Simplification	4
Health Information Portability and Accountability Act (HIPAA)	4
Gramm-Leach-Bliley Act (GLBA)	4
Security and Privacy	5
Narratives and Case Studies: E-Authentication Infrastructures	7
Case Study: U.S. Office of Management and Budget	11
Case Study: General Services Administration	13
Narrative: Electronic Real Estate Recording Task Force	15
Case Study: Minnesota County Recordors Association	22
Case Study: Minnesota Historical Society	26
Narratives and Case Studies: Elections	29
Implementation of the Help America Vote Act	29
Case Study: Arkansas Geographic Information Office	30
Case Study: Department of Elections, Delaware Office of the Commissioner and Department of Elections for New Castle County, Delaware	35
Case Study: Discovering Montana, e-Government Service Provider and Office of the Secretary of State, Montana	44
Case Study: Drivers License Information Systems—Department of Public Safety, Driver and Vehicle Services and State of Minnesota	46
Findings, Analysis and Recommendations	49
Appendix A: References	53
Appendix B: Contributors	55

Introduction

What Is NECCC and the Objective of this Work Group?

The National Electronic Commerce Coordinating Council is a national think tank of public and private sector leaders and practitioners, working to identify and develop best practices for electronic government. The alliance is comprised of the National Association of State Auditors, Comptrollers and Treasurers (NASACT), the National Association of Secretaries of State (NASS), the National Institute of Governmental Purchasing, Inc. (NIGP), the Association of Government Accountants (AGA), the Information Technology Association of America (ITAA), the National Automated Clearing House Association (NACHA), the National Association of Government Archive and Records Administrators (NAGARA) and the National Association of State Treasurers (NAST).

Each year at an annual planning meeting, the NECCC Executive Board selects several topics of current interest on which to focus. A work group is then organized around each topic, with work group members coming from both government and the private sector. Each group is charged with researching its topic to identify promising applications and best practices in order to produce an issue paper, which is presented at NECCC's annual conference. This year "identity management" was again chosen as an important topic, and this work group was formed to discuss identity management and provide some real life illustrations.

Why Did We Put This Paper Together?

The NECCC as a whole felt it was important to document the role identity management is playing in the government sector and display the progress it has made in everyday organizational roles. Therefore, we identified a number of areas where we saw the direct impact of identity management on government and in some cases, on the private sector as well.

First, we will discuss how NECCC has defined the impacts on different business units by the role of identity management and then showcase a number of case studies from the public sector. Let's define identity management.

What Is Identity Management In the Eyes of NECCC?

Identity management can include securely managing identities from identity theft, managing the dormant and orphaned accounts that may be still open/available for misuse in an organization, improving organizational efficiency by introducing administrative simplification, meeting regulatory and auditing requirements, and managing routine growth and constraints that may occur in the government sector.

Within the different government sectors of service and business reside identities and their interactions. Having a broad group of leaders with different backgrounds, experiences and goals allows NECCC to analyze and assess real life scenarios where identity management has affected the government sector. We, as a group, identified and decided upon three areas of importance for further exploration.

- E-Authentication Infrastructures
- Elections and the Help America Vote Act
- Driver's License Information Systems

Federal, state, and local governments are striving for ways to reinvent themselves and efficiently and effectively manage the way they do business amongst themselves and with their partners and suppliers in the private sector. Electronic authentication, also referred to as e-authentication, is key to allowing secure, reduced sign-on authentication for each of the parties involved to their respective trusted circles of businesses.

A critical function of government that requires highly reliable identification of individuals is elections. The public's trust in democracy relies heavily on the perception of fairness and uniformity in the conduct of elections. For that reason we focus on how governments are leveraging technology and identity management to augment traditional processes and provide the thought process around the implementation of secure identity management practices when deploying new technology for elections.

Following elections, driver's license information systems were identified as an important facet of identity management and specifically e-authentication.

Justification

This paper builds on NECCC identity management white papers from the past several years. In 2002, a white paper titled *Identity Management* was published which defined the electronic identity landscape and its relevance to state government. In 2003, a paper titled *Enterprise Identity and Access Management: the Rights and Wrongs of Process, Privacy and Technology* was published which was very prescriptive on the procedures and policies required for the implementation of an identity management system that addresses the needs of states, particularly in the area of inter-agency and inter-government interoperability.

For this paper, we are focusing on the progress of defined and/or deployed identity management projects and learning from their successes and failures. We also want to clearly understand and present where the biggest challenges were, and how they were addressed. Return on investment in the form of cost savings, clearly demonstrating improvement in government functions and delivery of services, complying with regulations, and having a convincing story for security and privacy serve as a justification for implementing a successful identity management system.

Cost Reduction

Reducing costs seems like an obvious justification for deploying electronic government applications and supporting them with an interoperable identity management system, but showing the return on investment. There are many items that need be considered and measured. For example, consider an electronic application deployed to make the reporting of real estate transaction from county government to state government (as does one of the case studies used in this white paper). First, you save money on raw materials and manual services, such as paper form costs and mailing charges. You then have savings in the area of error correction because Web forms can contain business rules checking that do not let the user enter in faulty information. All of know the drop down list for two-letter state abbreviations. We are not given the opportunity PN for Pennsylvania. Next you save on storage. Hard drives and tapes are smaller and cheaper than physical storage cabinets. Finally, your biggest saving may come in the form of fewer workers needed because the user is doing their own data entry.

However, you need to contrast these areas of saving with new areas of cost, such as computers, software telecommunication charges, and well trained support personnel. Additionally, State government agencies often are stovepipes that are reluctant to give up turf and budgeted dollars to a centralized enterprise management agency.

Administrative Simplification

Electronic government applications are often justified by demonstrating how well they simplify delivering a given service. For example, a very popular application in the State of Minnesota is the on-line license tab renewal service. No longer does one have to take time off of their busy schedules to wait in line to hand over a written form to a clerk (along with a check) to get the annual sticker for your vehicle. The administrative simplification story here is easily measured by how much of the population uses it. This application has one notable advantage over other applications: because the services require payments, it can leverage the identity management systems of the credit card industry when it comes to authentication. The challenge for all online government services is to make the authentication process at least as easy as the credit card model.

Health Information Portability and Accountability Act (HIPAA)

Identity management is especially important for state applications in the area of healthcare. The Health Information Portability and Accountability Act (HIPAA) is the governing federal law concerning the use of healthcare information. Well-managed identity management systems will support compliance with HIPAA, state data practices, and other regulations covering information privacy and security.

For example, as of April 2005, all access to patient information needs to be authenticated and logged. This means that an agency, such as the Department of Health for disease reporting, or Medicaid for state paid insurance claims would benefit from secure identity management systems. Identity management makes it easier to meet those requirements with consistency and uniformity of electronic identities. State government has a variety of venues in which this must be implemented to maintain public trust in health care, from nursing homes, to public health, to immunization programs, etc.

Gramm-Leach-Bliley Act (GLBA)

On November 12, 1999, President Clinton signed the Gramm-Leach-Bliley Act of 1999, Pub. L. No. 106-102, 106th Cong., 1st Sess. (GLBA). GLBA recognizes the essential regulatory interests of the states by approving functional regulation of financial institution activities by those regulatory agencies, both state and federal, that are most knowledgeable regarding the public policies underlying regulation of a specific activity.

The act subjects financial institutions to extensive privacy regulation, providing financial institution consumers clear, comprehensive, and precise privacy protections. There are four fundamental privacy protections to financial institution consumers. Each financial institution must:

1. Disclose to consumers—at least once each year—its policies for collecting and sharing the consumers' nonpublic personal information.
2. Give consumers the right to “opt out” of disclosures of their nonpublic personal information to non-affiliated third parties, with limited exceptions.
3. Not disclose account access information of consumers to third party marketers
4. Abide by new regulatory standards to protect the security and confidentiality of its consumers' nonpublic personal information.

The policy of the Congress declares that each financial institution has a continuing obligation to respect the privacy of its customers and to protect the security and confidentiality of those customers' nonpublic personal information. The law requires the financial institution regulators to establish standards for financial institutions that:

- Ensure the security and confidentiality of customer records and information.
- Protect against any anticipated threats or hazards to the security or integrity of such records.
- Protect against unauthorized access to such records that could result in substantial harm or inconvenience to the customer.

Security and Privacy

The public's use of any electronic government service is dependant on how much confidence they have in the trustworthiness of the system. This is usually the first question asked when an application is proposed. While regulations such as GLBA and HIPAA provide prescriptive requirements for access to certain types of information and transactions, all other applications will have security and privacy implications as well. For example, not just anyone should be able to log onto the State retirees web site and look up the pensions of any individual.

Deploying an enterprise identity management goes a long way in supporting everyone's needs for security and privacy. This is why the federal government has been so aggressive in the past few years in developing the e-authentication infrastructure. This approach to having a common, interoperable solution dramatically reduces the level of confusion the public may have when thinking about using e-gov applications, such as, “I trust the system from the Department of Revenue, but certainly not the one used by Department of Transportation.”

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Narratives and Case Studies : E-Authentication Infrastructures

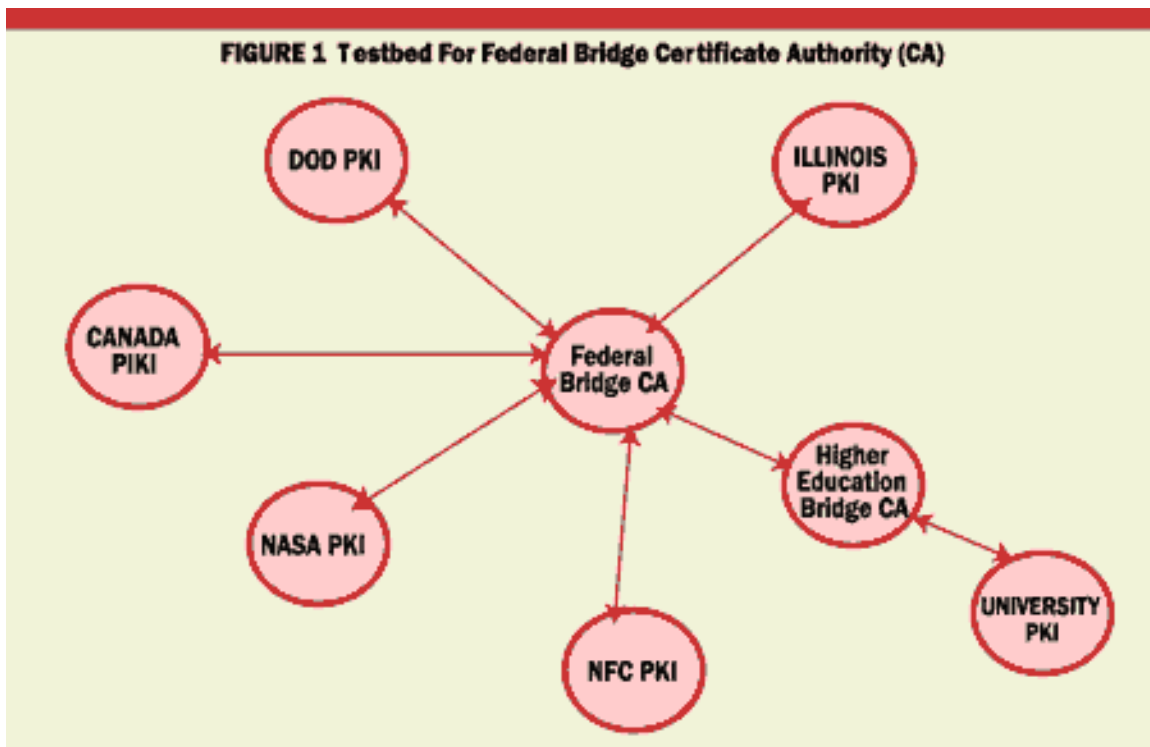
This section discusses the federal government's e-authentication initiative and the evolutionary phases that got it to its current incarnation. These phases include the Federal Bridge Certification Authority (FBCA), the initial gateway architecture, the current federated architecture, and finally the governance introduced with the Electronic Authentication Partnership.

The Initial Phase

Before the e-government agenda of the current Bush administration was launched, the federal government recognized the need for a common interoperable authentication infrastructure. The agencies of the federal government had a classic isolated silo environment that needed to be transformed in such a way that the credentials issued by one agency could be consumed and validated by other agencies. This resulted in the creation of the Federal Bridge Certification Authority (FBCA), a project in which a number of public key infrastructure (PKI) vendors and MitreTek Systems, a systems integrator, played key roles. This is generally recognized as the first phase of true electronic identity management of the federal government.

The FBCA was conceptualized as a PKI hub that would provide an efficient way to link agencies' CAs, which were originally designed for intra-agency applications. By cross-certifying Certificate Authorities (CAs) through the FBCA, which acts as a trusted third party, an agency that needs to accept a certificate from another federal, state or local agency to conduct an electronic transaction will know that the certificate can be trusted.

In one test, as shown in Figure 1, six different PKI domains, using five different CA products and five different X.500 directories, were successfully cross-certified. The FBCA uses an X.500 directory framework with chaining between directories and client access using LDAP (Lightweight Directory Access Protocol). For more information on the FBCA, visit www.cio.gov/fpkisc or www.csrc.nist.gov/pki.



The FBCA model holds the promise of overcoming the technical problems inherent in the other two methods when it comes to securing communications beyond one organization. The FBCA framework also includes guidelines for resolving issues of policy compatibility, e.g., on how participating CAs should keep their directories secure and up to date.

Evolving the System

The next phase of identity management for the federal government came about with the kick-off of the 24 e-government presidential initiatives, which includes the E-Authentication Initiative. This initiative recognized that while PKI was appropriate for some applications, other types of credentials and authentication solutions needed to be supported for certain other agency applications.

The measures of success of the e-authentication infrastructure are:

- Cost avoidance from a coordinated and streamlined approach.
- Minimum number of different credentials required to do business with the government.
- Number of accredited credential providers.
- Number of interoperable authentication products.
- Percentage of citizens trusting transactions with the government.

The initial architecture was centered on the notion of a gateway. This gateway served the role of broker or middleman between application owners and application users. This supported multiple

levels of assurance for the applications and allowed for single sign-on where security rules allowed it. This architecture also included a portal that served as a front door for users accessing agency applications.

However, in October 2003 the federal government's GAO scrutinized the gateway architecture and challenged its fundamental design. The main concern of the GAO was that the government should not be in a position to be able to see and log every transaction of citizens using federal government e-government applications. This is because this model could allow the government to log every transaction and monitor the activities of users whether they are citizens, government, or private businesses. Additionally, this model introduced a single point of failure into the system. And finally, the vendor community had no OTS products to support this architecture.

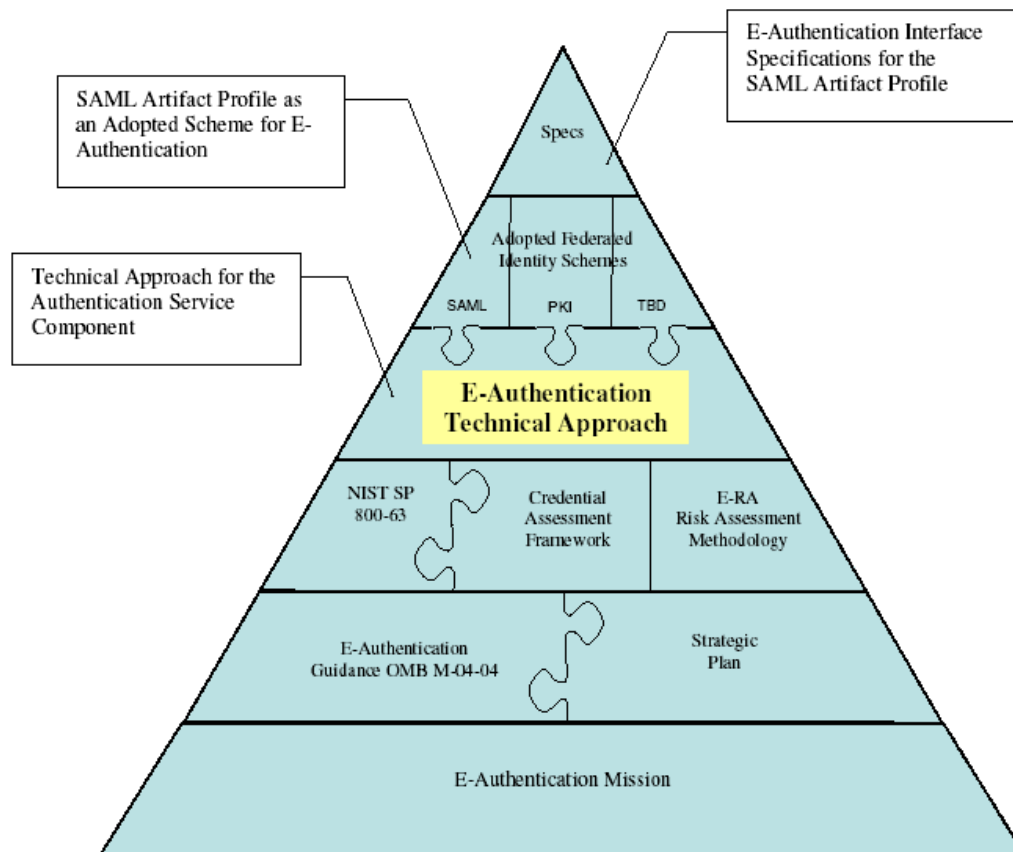
In order to address the concerns of the GAO, the E-Authentication Initiative staff regrouped to define a new architecture. They created a task force of outside experts from eBay, Microsoft, Verisign, Sun Microsystems, and Entrust. This task force recommended abandoning the gateway architecture and replace it with an architecture based on federated domains. In this way, the concerns that "Big Brother is watching you" were minimized. This meant that the role of the E-Authentication Initiative was changed from that of a service provider to one of standards definition and enforcement.

The initial architecture was released in June 2004 in a publication entitled *Technical Approach for the Authentication Service Component*.

The executive summary reads as follows:

As part of the President's Management Agenda, the E-Authentication Initiative has been established to enable trust and confidence in E-Government transactions via the establishment of integrated policy and technical infrastructure for electronic authentication. After careful analysis and proofs-of concept, the E-Authentication Program Management Office (PMO) decided to implement E-Authentication infrastructure as a federated architecture called the Authentication Service Component (ASC). The ASC leverages credentials from multiple credential providers through certifications, guidelines, standards adoption and policies. The ASC accommodates assertion-based authentication (i.e., authentication of PIN and Password credentials) and certificate-based authentication (i.e., Public Key Infrastructure (PKI) digital certificates) within the same environment. Over time, the ASC will support multiple schemes such as the Security Assertion Markup Language (SAML) and Liberty Alliance, and therefore is not built around a single scheme or commercial product. In this light, the ASC is more precisely defined as an architectural framework. The ASC is targeted for incorporation into the Federal Enterprise Architecture (FEA), as its government-wide authentication component.

Its basic components are shown here. The current pilot applications are using this new architecture.



Current Status Report

Here is a status of the measurable objectives as of publication time:

- Cost avoidance from a coordinated and streamlined approach (Measure: Not Available)
- Minimum # of different credentials required to do business with the government
- Number of accredited credential providers (Measure: 14 as of 7/29/04)
- Number of interoperable authentication products (Measure: 6 as of 7/29/04)
- Percentage of citizens trusting transactions with the government (Measure: 24% of Americans are "high trusters" according to a Pew survey in April, 2002)

The Emergence of the EAP (Electronic Authentication Partnership)

The e-authentication initiative has always wanted its architecture to support public/private partnership and go beyond being simply a solution for the federal agencies.

In December 2003, the creation of the Electronic Authentication Partnership was announced. One of the key drivers of this initiative is the federal government.

The stated goal of the EAP is:

To provide organizations a straightforward means of relying on digital credentials issued by a variety of e-authentication systems. The EAP is not going to duplicate the work of other organizations in the e-authentication world nor does it seek to replace individual industry-wide authentication protocols.

Instead, the EAP will build on the groundbreaking work of others by:

- Creating a voluntary partnership for governance of digital authentication among stakeholders from all levels of government, the private sector and public interest groups.
- Eliminating the need for individual parties to have bilateral agreements with each other party upon whose authentication processes they wish to rely. Instead, any party operating under EAP rules agrees to follow those rules, resulting in multilateral trust among all participants.
- Establishing and maintaining common policies and practices for credentials, credential providers and credential processors that will facilitate trust, interoperability and the easy evaluation and acceptance of credentials issued by other parties.
- Developing an evaluation process for credentials, and setting standard approaches and minimum requirements for identity management.
- Building on and complementing existing credential mechanisms for operating rules and associated processes.
- Working cooperatively with other nations' identity systems.

Conclusion

Substantial work has been done to keep evolving identity management and security services that will support applications deployed by the agencies of the federal government, and ultimately extend to state and local governments as well as to private businesses.

Case Study: U.S. Office of Management and Budget

As part of the effort to show the development in e-authentication infrastructures, a number of government sector participants were kind enough to share with us for publication some real life scenarios. Please note: participants without their contact information listed requested their information not be published.

Questions

- **Date of interview:** 07/30/04
- **Name of interviewer:** Pete Palmer and Annette Hagood
- **Organization:** Parkweb Associates LLC, Computer Associates International
- **E-mail address:** ppalmer@parkweb.com, Annette.Hagood@ca.com
- **Phone number:** Pete: 612-598-4444, Annette: 703-708-3000 x 84919

- **Name of interviewee:** Jeanette Thornton
- **Title:** E-Authentication Program Manager
- **Agency:** Office of Management and Budget
- **Jurisdiction:** United States Federal Government
- **E-mail address:** Jeanette.I.Thornton@omb.eop.gov
- **Phone number:** (202) 395-3562
- **Subject area of application:** Infrastructure

- **Describe business problem identified.**
There isn't a consistent approach for electronic authentication across agencies. There is a need to reduce the burden on the public, for example the multiple logins for different services that must take place, when dealing electronically with the government. A single sign on solution in a services oriented architecture would be the best approach.

- **Summarize solution.**
The E-Authentication initiative using SAML defines a common, standard authentication solution for all the agencies and supports their applications through GSA's First Government Web portal.

- **Identify key stakeholders.**
All federal agencies, information technology industry, Industry privacy advocates, Credential Service Providers, and standards bodies. The GSA is the managing partner and the executive board provides oversight.

- **Were there standards that had to be followed and/or are being developed? If so, please describe.**
SAML and PKI.

See <http://cio.gov/eauthentication/TechSuite.htm>

These standards are approved by the e-Government Executive Board, which represents 22 Partner Agencies. The General Services Administration is the managing partner.

- **Are there other jurisdictions and departments that share information in this project/system?**
Designed for use by all agencies. Currently being used by 5 agencies in pilot projects. These projects are scheduled to end by the end of August, when five more agencies have already signed on to participate.

See <http://www.whitehouse.gov/omb/egov/>

- **Are there other jurisdictions and departments that rely upon information from this project/system?**

Not at this time, but there will in the future. However, the GSA and Executive board are watching these trials very closely

- **Did this solution result in, or require, the creation of a virtual agency or new entity?**
No.

- **Methods and measurements of success.**
 - Cost avoidance
 - Streamlined approach
 - Minimum number of credentials required for users

- Number of Participating CSPs
- Number of Interoperable Products
- Percentage of citizens trusting the application
- Percentage of citizens using applications

- **What have been the results and outcomes of your project/system so far?**
Still in pilot, so there are none so far. The results will be made available before the close of 2004.
- **Lessons learned.**
Getting pilot participants to identify and sign agreements was more challenging than expected. There was a challenge in getting the eGrants program to accept electronic credentials from the National Science Foundation. In addition, issuing certificates as part of the validation for PKI conversions to SAML assertions. We therefore, use a SAML assertions translator for converting PKI to SAML assertions.
- **Have you made any changes in implementation of your project/system as a result of lessons learned?**
No. This was easily resolved by Trust
- **Do you have any advice for other states/jurisdictions facing this issue?**
No.
- **What are your next steps?**
Collecting data from the agencies and move into production by the end of the year.
- **Additional comments.**
Money has been allocated for the full implementation of all the pilot and new agencies to adopt this strategy.

Case Study: General Services Administration

Questions

- **Date of interview:** July 22, 2004
- **Name of interviewer:** Pete Palmer
- **Organization:** Parkweb Associates LLC
- **E-mail address:** ppalmer@parkweb.com
- **Phone number:** (612) 598-4444
- **Name of interviewee:** David Temoshok
- **Title:** Director of Cross Government Identity Management
- **Agency:** General Services Administration
- **Jurisdiction:** United States Federal Government
- **E-mail address:** david.temoshok@gsa.gov
- **Phone number:** (202) 208-7655
- **Subject area of application :** eGov Infrastructure
- **Describe business problem identified.**
The agencies of the federal government are moving from a paper environment to an electronic environment. These agencies cannot deploy applications unless they have an authentication system to leverage.

- **Summarize solution.**
These agencies can either create their own authentication solution, or work together to deploying a common system that will also allow them to interoperate. The E-Authentication initiative came into being to define and deploy a common authentication system.
- **Identify key stakeholders.**
Citizens and businesses doing business with the federal government.
- **Were there standards that had to be followed and/or are being developed? If so, please describe.**
<http://www.whitehouse.gov/omb/egov/ea.htm>
http://www.gcn.com/22_17/mgmt_edition/22596-1.html
- **Are there other jurisdictions and departments that share information in this project/system?**
Not yet.
- **Are there other jurisdictions and departments that rely upon information from this project/system?**
Again, this is infrastructure for the eGov applications.
- **Did this solution result in, or require, the creation of a virtual agency or new entity?**
It resulted in the E-Authentication initiative of the OMB.
- **Methods and measurements of success.**
In the long-term, success will be measured by adoption rates of both the application providers and users.
- **What have been the results and outcomes of your project/system so far?**
The initial pilots have not completed, but the preliminary results are positive.
- **Lessons learned.**
Bringing people together is more of a challenge than anyone anticipated. While there was a lot success with garnering initial interest in the E-Authentication initiative, getting meaningful pilots defined and deployed was more of a challenge.
- **Have you made any changes in implementation of your project/system as a result of lessons learned?**
We have certified vendor products and will continue to identify more products in the e-authentication interoperability lab.
- **Do you have any advice for other states/jurisdictions facing this issue?**
We are still learning at the federal level.
- **What are your next steps?**
We need to complete the pilots and work with the agencies to deploy more applications.
- **Do you know of any other states/jurisdictions that we should contact for this case study?**
No.

Narrative: Electronic Real Estate Recording Task Force

Everyone uses and relies on the real estate record. Home ownership is the single biggest investment of most Minnesota families. Mortgages are a critical component of the financial industry. The property tax system relies on the real estate record to determine ownership of parcels that are subject to taxation. The interests of citizens, the mainstay of the economy, and the operation of government all depend on the real estate record.

County recorders and registrars of title throughout Minnesota work very hard to operate their offices efficiently and cost-effectively, and to date they have succeeded. However, as presently equipped, Minnesota recording offices can accept only paper documents for recording. Increasingly, the real estate, lending, title insurance, and consumer communities as well as the secondary mortgage market are urging Minnesota recorders and registrars to accept and record documents electronically. State and federal laws, such as the Uniform Electronic Transactions Act and E-Sign, mandate that government prepare for electronic recording. At present, however, neither the technical infrastructure at the county level nor laws at the state level can accommodate that development.

In light of these facts, is electronic real estate recording a possibility? Or, more accurately, is it inevitable? County recording systems, as well as state real estate and other laws, must change. That evolution is unavoidable in light of improved information technology; public demand; the explosion of e-commerce; the influence of e-sign and other federal legislation; and the exponential increase in use of personal computers, the Internet, and the World Wide Web.

Given the broad constituency of the Minnesota Electronic Real Estate Recording (ERER) Task Force, it is not surprising that the ERER Task Force has generated many ideas about how best to address the introduction of electronic real estate recording in Minnesota. The ERER Task Force welcomed all of those ideas, and organized them into the Work Plan.

For purposes of this paper, an *electronic real estate recording system* means a publicly owned and managed county system, defined by statewide standards, that does not require paper or “wet” signatures, and under which real estate documents may be electronically:

- Created, executed, and authenticated.
- Delivered to and recorded with, as well as indexed, archived, and retrieved by, county recorders and registrars of title.
- Retrieved by anyone from both on- and off-site location.

At the start-up stage, the financial and temporal costs for an electronic real estate recording system will undoubtedly be high. However, once an electronic real estate recording system is in place, the following public benefits and others will greatly exceed those costs.

Benefits to Recorders and Registrars. An electronic real estate recording system will make it possible for county recorders and registrars of title to serve their customers even more effectively and efficiently than the present paper-based system allows. With electronic filing, recorders' and registrars' turnaround time for documents may be measured in minutes or hours, not days or weeks. By reducing the time they currently must spend processing documents, electronic recording may also give recorders and registrars the opportunity to improve and expand upon other services.

Uniform recording practices, an indispensable element of any electronic real estate recording system, may drastically reduce the present document rejection rate of 10-15 percent. An electronic real estate recording system may allow the capture and recapture of data for reuse in recording office indexes and other databases to enhance data integrity by reducing or eliminating spelling errors and other problems associated with paper-based systems.

With an electronic real estate recording system, it may be easier for recorders and registrars to maintain customer accounts, and for customers to pay with credit cards or on-line payment services. Reduced paper traffic may also reduce postage and stationery costs for county recorders and registrars as well as their customers.

Benefits to Customers. By providing a secure, cost-effective means of conducting and memorializing real estate transactions, an electronic real estate recording system will provide greater value for homeowners, commercial interests, and government agencies.

Other Benefits. Introduction of an electronic real estate recording system will lead to reconsideration and improvement of many aspects of the present paper-based real estate recording system. For example, the legislature may develop innovative ways to pay for electronic real estate recording systems in all counties, or conclude that the tract index rather than the grantor-grantee index should be the official state real estate index. An electronic real estate recording system could also facilitate public and private sector compliance with state and federal laws pertaining to electronic signatures and e-commerce.

Because electronic real estate recording has the potential to increase the secondary value of the information collected and recorded by a system, many citizens and organizations stand to benefit

from an electronic real estate recording system. Paper record keeping systems are usually designed to facilitate one specific function; properly designed electronic record keeping systems can facilitate many.

Geographic information systems (GIS) have demonstrated just how important different data sets can become when they are combined with other data sets in comparable formats. Because of their permanent historical value and their comprehensive reach, real estate records can be an especially important resource. In an electronic format, they can be used by many different groups of researchers, for a wide variety of purposes, from studying the economic history of a town or region to writing a family history.

Minnesota Land Record Systems

Minnesota has two separate, mutually exclusive systems of land records: The *recording system*, also referred to as the *abstract system*, and the *registration system*, also referred to as the *Torrens system*. All 87 counties in Minnesota have recording systems, and many have Torrens systems as well. Unless an owner takes affirmative steps to register land, land is *abstract property* and all records that relate to it are in the office of the *county recorder*. If the owner registers a parcel, then it is a *registered* (i.e., *Torrens*) *land* and all records relating to it are placed in the office of the *registrar of titles*.

The Recording (Abstract) System

Definition, Purpose, and Effect of Recording. *Recording* is the act of entering deeds, mortgages, easements, and other written instruments that affect title to real property into the public record. Minnesota's recording act requires that "every conveyance of real estate shall be recorded in the office of the county recorder of the county where such real estate is situated." In every Minnesota county, the county recorder's office is in effect a library of all of the conveyances and other instruments affecting title to land in the county that have been recorded since 1849, when the Minnesota Territorial Legislature first established the office of register of deeds.

In Minnesota and all other American jurisdictions, the purpose of recording is to give notice, to anyone who is interested, of the various interests that parties hold in a particular tract of land. Recording determines the legal priority of instruments that affect title to a particular tract. For example, the status of multiple lenders who hold mortgage liens on a single tract is determined by the sequence in which they record their mortgages, the first to record being the first mortgagee, the second to record being the second mortgagee, and so on. In the case of a landowner, O, who conveys the same property twice—first to A and later to B, a good-faith purchaser without notice of the O-A conveyance—recording laws determine who, as between A and B, will be regarded as

the owner of O's land. Under Minnesota's recording act, whichever party is first to record the deed from O will be regarded as the new owner of O's land.

The Mechanics of Recording. When a deed or other document is presented for recording in Minnesota, the county recorder stamps it with the date and time of presentment and assigns it a document number. The recorder then copies the document and makes an entry regarding it in the grantor-grantee index and, in those Minnesota counties that have them, the tract index. The copy of the document and both indexes are public records, so anyone who wants to know who currently owns a particular parcel of property, or wishes to trace its history of ownership, may do so by searching the indexes and then examining the documents located through the search.

The Grantor-Grantee Index. Under Minnesota law, the grantor-grantee index is the official index for abstract property. All Minnesota counties have grantor-grantee indexes. The grantor-grantee index permits a title searcher to trace the title of a particular parcel through the names of its present and past owners. The title searcher can trace title from its current owner back to the original source of title (through the grantee index), and then determine whether any owner impaired the title while holding it (through the grantor index).

The Tract Index. Minnesota law provides that counties *may* establish and maintain tract indexes, but they are not required to do so. Most, but not all, Minnesota counties have tract indexes. The tract index permits a title searcher to trace the title of a particular parcel through its legal description. The tract index, which is separate from the grantor-grantee index, contains a page for each tract of land in the county (e.g., a quarter-section, a subdivision block) on which the recorder enters every recorded instrument that affects title to the tract. A title searcher who uses the tract index can trace the title of a particular parcel by examining the single page or group of pages that pertain to that parcel.

The Registration (Torrens) System

Definition, Purpose, and Effect of Registration. The *title registration system*, or *Torrens system* as it is commonly known in Minnesota, is a system in which the district court or registrar of titles, upon a landowner's application and after conducting statutorily prescribed proceedings, directs issuance of a certificate of title that is evidence of the applicant's ownership (much like the certificate of title to a car). In contrast to the recording system, the premise of the registration system is that government should certify the current state of the title to a particular parcel of land, rather than simply maintaining a library of documents concerning it. The purpose and effect of registering title to land is to establish conclusively an indefeasible title to land, subject to just a few very limited exceptions, so that anyone may deal with that land with the assurance that the

only rights or claims of which such person must take notice are those that appear on the certificate of title.

The Mechanics of Registration. When a landowner registers title *with* judicial proceedings pursuant to Minnesota Statutes Chapter 508, the certificate is conclusive evidence of the applicant's ownership. When a landowner registers title *without* judicial proceedings pursuant to Minnesota Statutes Chapter 508A, the certificate of possessory title (CPT) represents the examiner of titles' determination regarding the status of title to the landowner's tract. The examiner's determination will become conclusive unless a party claiming an adverse interest successfully challenges it within the time period and in the manner prescribed by Chapter 508A.

Registration of Title with Court Proceedings. A landowner may change abstract property into Torrens property by initiating a lawsuit in the district court in the county in which the land is located. Mortgagees, easement holders, and anyone else with a recorded interest in the land is named and served as a defendant in the suit. The lawsuit culminates in the court adjudicating title to be in the plaintiff landowner subject to any mortgage, easement, or other interest the court finds to exist. All other claims to the land are extinguished. This adjudicated state of the title is officially registered on a conclusive certificate of title, also known as a Torrens certificate, which is stored and available for public examination in the office of the registrar of titles for the county in which the land is located.

When registered land is transferred, the registrar issues a new certificate after making a substantive review of what has happened to the title since the last certificate was issued. That information is documented on a new certificate of title in favor of the transferee, and the registrar cancels and archives the old certificate of title.

Registration of Title Without Court Proceedings. Minnesota authorized registration of title without court proceedings in 1982. Upon written recommendation of the county recorder, a county board may adopt a resolution authorizing the registration of possessory titles. Most of the metropolitan counties and several counties in greater Minnesota have authorized registration without court proceedings. If an examiner of titles reviewing a landowner's application for a certificate of possessory title (CPT) determines that the application meets all of the statutory requirements, the examiner issues a directive to the registrar of titles to issue the CPT. Anyone claiming an interest in the subject property that is not reflected on the CPT must challenge the CPT in district court within five years of the examiner's issuance of the directive to the registrar. If no such action is commenced or succeeds, the examiner directs the registrar to cancel the CPT

and issue a certificate of title (1) upon the landowner's request, or (2) after any transfer of ownership of the land described in the CPT.

The ERER Task Force

Since 1998, the Minnesota County Recordors' Association (MCRA) has focused on the effect that recent trends in land development, mortgage financing, conveyancing, and other areas are having on Minnesota's land record system, and on the opportunities that electronic real estate recording presents to address many of the challenges. At its winter 1999 conference, the MCRA passed a resolution that called for creation of a broad-based group to study and suggest means to address the increasingly complex relationship that exists among modern land transfer practices, county recording office procedures, and state real estate and recording laws. In June 1999, the MCRA forwarded its resolution to the Ventura Administration and urged it to take action.

In April 1999, a group of persons interested in Minnesota's land record system was convened to study the possibility of electronic real estate transactions. The experience of the group with information technology as well as with county recorders and registrars made the Office of the Secretary of State and Secretary Kiffmeyer uniquely qualified to organize and guide the group.

In summer 1999, a discussion group was formed and, agreed that electronic real estate transactions warranted further study. They also decided to invite more stakeholders to its future meetings. The original discussion group, expanded by the addition of other stakeholders, met to discuss the introduction of information technology in the process of filing, recording, storing, and retrieving real estate records in Minnesota's 87 county recording offices. Secretary Kiffmeyer convened and chaired the group, and its meetings were open to the public. The group included representatives from government, the real estate industry, the real estate bar, academia, and other public and private-sector interest groups, as well as legislative staff.

In late 1999, the group agreed that in order to be effective, it required formal status. The group decided to propose legislation during the 2000 session that would constitute it as an advisory task force. The group drafted legislation that defined its membership, organization, and responsibilities, and recruited chief authors for it.

The Minnesota Legislature enacted the statute that authorized creation of the Electronic Real Estate Recording (ERER) Task Force as Laws 2000, Chapter 391, with an effective date of August 1, 2000. The ERER Task Force's initial charge is to present a work plan and budget for conducting its study to the Legislature by January 15, 2001.

In summer 2000, Secretary Kiffmeyer solicited applications for appointment to the new ERE Task Force. She made the appointments in August 2000. The ERE Task Force membership, which is larger and more diverse than that of the original study group. Many of its members also belong to one or more of these three subcommittees.

- The Framework Committee, which has provided the structure for this report.
- The Legal Committee, which has identified legal issues to be examined during the study.
- The Technology Committee, which has studied the operational aspects of electronic real estate transactions.

ERER Project Schedule

The time line for the ERE Task Force defines the critical path that the project must follow to be successful. It has four primary phases:

1. Analysis of the current environment: The Task Force will survey current practices and technologies in Minnesota county recorders' offices; evaluate electronic real estate recording systems in other jurisdictions; and develop a high-level model of public and private real estate recording processes in Minnesota.

2. Determination of appropriate features and standards: The Task Force will establish the business rules for an electronic real estate recording system, with a definition of the legal, technological, operational, and functional context for making a system work.

3. Testing the system: The Task Force will translate the business rules into a working pilot project.

4. Final evaluation: The Task Force will review the pilot project and finalize its definition of the necessary features and standards for electronic real estate recording systems in Minnesota.

At the end of phases 2 and 4, the Task Force produced and submitted progress reports to the Legislature. Those reports describe the work done on the project and recommended further actions necessary for the project.

ERER Task Force Work Plan

The Work Plan requires the Electronic Real Estate Recording (ERER) Task Force:

- To consider what process the ERE Task Force should follow in developing its recommendations.
- To consider what features are important for any electronic recording technology that it recommends.
- To consider what statewide standards, if any, to recommend for electronic real estate record indexes.
- To consider what statewide standards, if any, to recommend for the content and format of electronic real estate records.

- To consider what statewide standards, if any, to recommend for authenticating, securing, and determining the recording priority of instruments that are recorded electronically.
- To consider ways to pay for any electronic real estate recording initiatives that the ERER Task Force recommends.

Case Study: Minnesota County Recorders Association

Questions

- **Date of interview:** 28 July 2004
- **Name of interviewer:** Mr. Pete Palmer; Ms. LeAnn Castillo
- **Organization:** Parkweb Associates; New Leaf Business Development
- **E-mail address:** ppalmer@parkweb.com leann.castillo@newleafbusdev.com
- **Phone number:** 612-598-4444; 651-983-9389
- **Name of interviewee:** Ms. Mary Kiffmeyer
- **Title:** Secretary of State
- **Agency:** Minnesota County Recorders' Association (MCRA)
- **Jurisdiction:** Minnesota
- **E-mail address:** secretary.state@state.mn.us
- **Phone number:** (651) 296-2079
- **Subject area of application:** Administration
- **Describe business problem identified.**
County recorders and registrars of title throughout Minnesota work very hard to operate their offices efficiently and cost-effectively, and to date they have succeeded. However, as presently equipped, most Minnesota recording offices can accept only paper documents for recording. The paper-based system that is currently in place in Minnesota's county land record offices, itself a vestige of colonial recording practices that are almost 400 years old, simply cannot keep pace with twenty-first century developments.

Increasingly, the real estate, lending, title insurance, and consumer communities as well as the secondary mortgage market are urging Minnesota recorders and registrars to accept and record documents electronically. State and federal laws, such as the Uniform Electronic Transactions Act and E-Sign, mandate that government prepare for electronic recording. At present, however, neither the technical infrastructure at the county level nor laws at the state level can accommodate that development.
- **Summarize solution.**
The cornerstone to electronic real estate recording in the State of Minnesota is the Electronic Recording Standards. The standards assure the private sector and the Minnesota counties that there is a uniform approach for sending and receiving documents electronically. With potentially 87 counties and hundreds of private organizations participating in electronic recording, the Electronic Recording Standards are absolutely necessary.

Substantial research has gone into the development of Electronic Recording Standards. All Minnesota counties were visited on-site or interviewed by phone to gain background on the current state of real estate recording and discuss how electronic recording could fit within the county offices. Several private entities were interviewed to assess sources and uses of recording information. Best practices were collected via interviews with several out-of-state counties that have already implemented electronic recording. Additionally, vendors and industry organizations were researched to better understand future direction of current

initiatives. Collectively this information was used to develop the initial electronic recording standards and additional considerations.

The next step in developing the standards was to conduct a pilot to test the standards. Five pilot counties were chosen. These counties were of varying size and location throughout the state of Minnesota. After the pilots were completed, the standards will be revised based on the pilot experience.

It is expected that the electronic recording standards will evolve over time as needs from private and public sectors change. The standards will also need to evolve as technologies change and new technologies are introduced.

▪ **Identify key stakeholders.**

The Minnesota Legislature enacted the statute that authorized creation of the Electronic Real Estate Recording (ERER) Task Force as Laws 2000, Chapter 391, with an effective date of August 1, 2000. The Task Force is a joint venture of public and private sector real estate stakeholders. Represented groups include: County Recorders, Auditors and Treasurers, members of the Senate and House, the State Planning Office, City Assessors, Fannie Mae, Builders Association of Minnesota, title companies, real estate attorneys, County Surveyors, the Realtors Association, the Land Management Information Center, the Department of Transportation, the Minnesota Historical Society, the American Society of Auditors, technology vendors, the Bankers Association, Department of Revenue, and faculty from Minnesota Law Schools.

▪ **Were there standards that had to be followed and/or are being developed? If so, please describe.**

<http://www.commissions.leg.state.mn.us/lcc/standardsdoc1.htm>

The ERERTF v.1.0 standards include the business rules for e-recording and definitions of the legal, technological, operational, and functional context for making such an e-government system work. This is probably the most far-reaching and economically significant e-government initiatives now underway in the state. ERERTF Standards v1.0 were unanimously adopted by the Task Force membership at the June 13, 2002 ERER Task Force meeting.

Extensible Markup Language (XML) is an open standard embraced by everyone from bankers to webmasters. It enables the sharing of data between entities that are completely unrelated. As an open standard, XML is not tied to any single company, software, or hardware. It can store and organize most any kind of information and can be tailored to fit the needs of your specific organization. Because of the open structure of XML, this language is very fitting for the electronic recording processes in Minnesota. By using XML, counties and trusted submitters have the ability to use independent vendors, software programs, etc. While XML deals with data only, style sheets determine the format and layout of the XML data. The Minnesota standards address XML only. Style sheets will be developed and agreed upon by trusted submitters and recorders at each county. Some counties may choose to utilize a standard style sheet for all XML data.

▪ **Are there other jurisdictions and departments that rely upon information from this project/system?**

Virtually everyone uses and relies on the real estate record. Home ownership is the single biggest investment of most Minnesota families. Mortgages are a critical component of the financial industry. The property tax system relies on the real estate record to determine ownership of parcels that are subject to taxation. The interests of citizens, the mainstay of the economy, and the operation of government all depend on the real estate record.

- **Did this solution result in, or require, the creation of a virtual agency or new entity?**
No.

- **Methods and measurements of success.**

The ERER Task Force determined 37 considerations can be found at:

<http://www.commissions.leg.state.mn.us/lcc/planningtasks.pdf>

The benefits from e-recording to all stakeholders on the ERERTF are being assessed throughout the pilot testing. The use of electronic recording standards will benefit new homeowners who can more quickly file documents with their county. Government agencies will benefit as they can more quickly and with less error search for property information that is necessary to their agencies' function. Other benefits that standards bring include:

- **Establishing a level playing field for all counties to participate in electronic real estate recording.** Standards provide a means of communication that does not differentiate between small counties or large. Standards assure efficient, secure and consistent filing between any submitter and any county.
- **Providing an infrastructure independent standard that allows all participants to select the technology best suited to their needs.** Standards allow both the public and private sector to enhance existing technology or purchase new technology if desired for e-recording. Minnesota standards do not recommend or promote any single application or vendor.
- **Reflecting the combined needs of all stakeholders in real estate recording for Minnesota.** Standards were developed with combined input that included all 87 Minnesota counties, private sector lenders and filers, realtors, real estate attorneys, national standards groups and counties in other states that are involved in electronic real estate recording. This ensures that all interests and concerns are considered when developing and testing standards.
- **Allowing counties and Trusted Submitters to begin e-recording more quickly.** Standards establish a clear understanding of what is necessary when sending a document and what is necessary when receiving that document. The complexities of what information is required, what is necessary to ensure a legal and accurate recording, and what format is to be used are all managed through standards. Having completed the process of developing and testing standards the ERERTF frees stakeholders from the expense and time commitment necessary to successfully accomplish these tasks.
- **Providing paper and time savings in origination, closing, delivery and recordation of documents.** Electronic documents facilitate the Closing process through the use of electronic signatures, automated transfer between parties and standards which ensure information is accurate, consistent and secure. Delivery is enhanced through secure electronic transmission to county offices. Electronic recordation using standards ensures the accuracy of information and reduces the number of times manual intervention is required during the recording of documents at the county. Significant time savings are experienced throughout the electronic recording process.
- **Reducing number of document errors resulting from the ability to technologically manage and ensure recording requirements are met.** Document filings that had previously contained errors and were sent back to submitters for correction are dramatically reduced using electronic recording. Information accuracy is enhanced through the use of standards. Much of the validation work to ensure documents contain all the necessary information required by Minnesota counties is facilitated through the use of standards.
- **Allowing stakeholders to keep pace with ever-increasing document volumes and document complexities.** Standards for e-recording provide a tool for counties and private sector preparers to manage documents in less time and with fewer rejections. E-recording standards facilitate and expedite the process by ensuring secure transactions

are conducted and information requirements are being met. This reduces the amount of manual intervention necessary in both document preparation and document recording.

▪ **What have been the results and outcomes of your project/system so far?**

The ERERTF has been authorized to establish statewide standards to be used as the foundation for electronic real estate recording in Minnesota. Since its inception in 2001 the Task Force has completed development efforts for e-recording standards. ERERTF is working to develop standards that will assure efficient, secure and consistent filing between any submitter and any county.

Standards were authorized by the Task Force in June of 2002 and soon after pilot counties were selected. Following pilot county selection, planning, development and testing efforts were underway. Pilot testing was broken into two phases in order to manage the technical complexities of filing between multiple technologies. Phase I pilot tests the e-recording of Satisfactions of Mortgage and Certificates of Release documents which are electronically recorded in the county Recorder's office. Phase II will include recording of the Mortgage, Deed, Certificate of Real Estate Value (CRV), Well Certificate and Assignment of Mortgage. These documents are filed at the Auditor, Treasurer and Recorder's offices that dramatically increases the complexity of this work. More specifically, the CRV will be filed electronically between the County and the Department of Revenue and the Well Certificate between the County and the Department of Health. Since October 2003 Satisfactions of Mortgage and Certificates of Release documents have been electronically recorded in pilot counties using Minnesota's ERERTF standards. Over 1,800 have been recorded to-date.

As reported by Joel Beckman, Property Records Director at Dakota County, "Dakota County currently has 10 staff people involved in processing a single document through various steps, and 30 days or more elapse between receipt of the document and filing in the county's database. A totally automated process will require minimal staff and the time to record a document will be reduced to less than one minute." Members of the public and private sector in real estate, as well as real estate consumers all benefit from the enhanced efficiency of this process.

As pilot activity progresses the Task Force is analyzing results in order to document best practices and lessons learned that will benefit other counties. Pilot testing will result in statewide standards that are of the highest usability and effectiveness.

▪ **Lessons learned.**

Much work has been accomplished to-date in planning and development at pilot counties for Phase I testing. The time initially estimated to begin testing was significantly shorter than what proved necessary. It has taken six, and in some counties close to eleven months longer to be ready to test Phase I documents. This time differential is due in part to new technology not being available as quickly as was earlier believed. The implementation of technology, in compliance with the ERER standards, has also proven to entail much more work than initially estimated.

But time savings and cost reductions already evident in initial testing demonstrate one example of how standards are helping Minnesota counties keep pace with increased document filings and increased complexity of real estate filings. Much has been learned from the current phase's work that sheds light on the next phase of testing. However, until there are more counties electronically filing a significant volume from multiple submitters it is too early to determine how well standards are working and where they could to be modified to enhance their abilities. In reviewing the original Task Force work plan; the Task Force has determined that a complete testing is needed before any determination can be made on many of these issues. Results to-date are encouraging but are inconclusive until more work has been completed.

- **Do you have any advice for other states/jurisdictions facing this issue?**
In my opinion, forming a small leadership group made up of knowledgeable people in the industry on both public and private side who make the decisions would help the process move along easier. This group should be made up of those people who do not have a conflict of interest issue with the implementation areas. Then have many smaller work groups (subcommittees) who give advice but have no vote on the implementation. The leadership people need to know how to process a project and rely on the subcommittees for the content. That way you keep input, but also keep separation from the conflicts that can occur when implementing.

But, we are really quite pleased with how we did it. When you start something so new, it is really hard to anticipate all the future areas. That is why we called it a pilot and allowed for thorough work as we went. A little slow, but certainly worth it.
- **What are your next steps?**
The legislation establishing and authorizing the Electronic Real Estate Recording Task Force expired June 30, 2004. This means all of the pilot contracts expired according to their terms, and also that the law authorizing the filing of electronic documents as part of pilot projects became null and void. All filing of electronic real estate documents ended. All documents in Minnesota will return to the prior status, under which all documents must be filed on paper. The next step is to secure the necessary funding during the next legislative session.
- **Please reconfirm that we can publish your interview in the NECCC white paper.**
 Yes
- **May I contact you at a later date, once the Identity Management Work group begins compiling the final white paper, for additional clarification?**
 Yes

Case Study: Minnesota Historical Society

Questions

- **Date of interview:** July 8, 2004
- **Name of interviewer:** Michael P. Ryan
- **Organization:** State of Minnesota, Office of Technology
- **E-mail address:** mike.ryan@state.mn.us
- **Phone number:** (651) 556-8024
- **Name of interviewee:** Anonymous
- **Agency:** Minnesota Historical Society
- **Jurisdiction:** Minnesota
- **Subject area of application:** Electronic Real Estate Recording -- Authentication
- **Describe business problem identified.**
Highly automated operations linked by paper exchange of information
- **Summarize solution.**
Develop standards to electronically transfer the information without identifying proprietary solution. Very good use of XML and designed a schema for each process. For authentication, the pilots used trusted submitters and wrapped the submissions in digital signatures. Probably was over-kill.

- **Identify key stakeholders.**
Secretary of State, counties, state agencies, mortgage and secondary mortgages, real estate lawyers, title companies, real estate agencies.
- **If there are key stakeholders whose input is crucial, ask to interview the partner(s) and go through the above with the partner(s).**
Secretary of State and the county recorders
- **Were there standards that had to be followed and/or are being developed? If so, please describe.**
<http://www.commissions.leg.state.mn.us/lcc/schemastandards.htm>
- **Are there other jurisdictions and departments that share information in this project/system?**
Yes – many.
- **Are there other jurisdictions and departments that rely upon information from this project/system?**
Dept. of Revenue, Dept. of Transportation, Dept of Administration.
- **Did this solution result in, or require, the creation of a virtual agency or new entity?**
No
- **Methods and measurements of success.**
Did not survive – legislature did not reauthorize the project. Metrics focused on speed and accuracy of recording and rate of adoption of electronic recording.
- **What have been the results and outcomes of your project/system so far.**
Did not survive – a lot of satisfaction and projected cost savings to the trusted vendors.
- **Lessons learned.**
The technology is easy but the people were difficult. Because this was a volunteer process re-engineering was very difficult to achieve.
- **Have you made any changes in implementation of your project/system as a result of lessons learned?**
Never finished pilots so we did not get to that point. We fully expected changes as we gained more experience.
- **Do you have any advice for other states/jurisdictions facing this issue?**
The technical part is done. Need to combine some authority with collaboration. Organizing the team is very important. A viable product or demo a lot sooner would have been helpful. Some sort of trusted technological source for advice.
- **What are your next steps?**
Pray for resurrection. We expect the legislature will re-authorize the project in the next session.
- **Did you look at any similar systems before implementation and, if so, what did you learn from them?**
Looked at a number of other counties in other states that had implemented ERER systems and there were National Bodies that had white papers and standards. We learned what the choices were but no one was far enough a long to provide a compelling model.

- **Do you know of any other states/jurisdictions that we should contact for this case study (name, contact information)?**
Florida, Wisconsin, Washington, Utah and Arizona.
- **Additional comments.**
Need someone to understand the technology.
- **Reconfirm that you can publish their interview in the report and ask if you can contact them at a later date once work group begins compiling final report and indicate that we may have a few questions on one or more of their answers.**
Publish.

Narratives and Case Studies: Elections

Implementation of the Help America Vote Act

The next group of case studies profile how three states have addressed the challenge of implementing major procedural and structural reforms dictated by the Help America Vote Act (HAVA), passed by the U.S. Congress in 2002.

HAVA represents perhaps the most significant change in voting and voting rights since the reforms of the 1960s that expanded the franchise to 18-year-olds and helped guarantee the rights of minorities.

The proximate cause of HAVA's passage was the series of missteps in Florida during the 2000 presidential election. Disputed vote counts and ballot formats in several jurisdictions escalated to a Supreme Court challenge for the states' Electoral College votes. This series of events drew attention to local disparities in voter qualification, antiquated voting machines and legitimate voter confusion.

According to the Election Assistance Commission Web site, the goals of HAVA include:

- Replace punch card voting systems.
- To establish the Election Assistance Commission to assist in the administration of Federal elections and to otherwise provide assistance with the administration of certain Federal election laws and programs.
- To establish minimum election administration standards for states and units of local government with responsibility for the administration of federal elections.

HAVA is intended to address these and other issues by expanding federal funding for voter education and new voting technologies while strengthening mandates to protect the franchise. HAVA is particularly concerned with maximizing the ease of voting while minimizing the risk of fraud, which makes identity management a cornerstone to effective HAVA implementation. While there are minimum standards to be met to secure monies, there is a great deal of state and local discretion in applying HAVA's provisions. Here we explore what two states are doing to meet the challenge of HAVA, and what a third state had initiated in advance of the federal mandates.

Case Study: Implementation of the Help America Vote Act – Arkansas Geographic Information Office

Questions:

- **Date of interview:** 12 July 2004
- **Name of interviewer:** Ms. Paula C. Swaim
- **Organization:** Office of the Arkansas Executive Chief Information Officer (ECIO)
- **E-mail address:** paula.swaim@arkansas.gov
- **Phone number:** (501) 682-4303
- **Name of interviewee:** Mr. Shelby Johnson
- **Title:** State Geographic Information Coordinator
- **Agency:** Arkansas Geographic Information Office (AGIO)
- **Jurisdiction:** Arkansas
- **E-mail address:** shelby.johnson@arkansas.gov
- **Phone number:** (501) 682-2767
- **Subject Area of Application:** Administration
- **Describe business problem identified.**

The Arkansas Geographic Information Office (AGIO), in partnership with the Secretary of State Office (SoS) Election Division, sought to test how Geographic Information Systems (GIS) technology could help the State to meet the Help America Vote Act (HAVA) mandates by identifying errors in Voter Registration (VR) records to improve the accuracy and quality of voter information.
- **Summarize solution.**

A pilot project was conducted in two Arkansas counties using GIS technology to quickly identify typographical and administrative errors contained in VR records. Extending the use of this technology would allow County Clerks across Arkansas to improve the accuracy and quality of voter information. GIS data can also support improved data entry for registering new voters and can assist location verification on the spot. Finally, if implemented, the technology could assist County Clerks in explaining the eccentricities that occur in the various voting districts by literally showing citizens map information on the screen. Both County Clerks who participated in the pilot study believed that this capability would improve citizen confidence in the administration and reporting accuracy of public elections.

The pilot study was very successful, and the lessons learned can be used in other counties in the State and to develop a Request for Proposal (RFP) for a new statewide centralized Voter Registration (VR) System. The major stumbling block to having this capability statewide is the lack of high quality road centerlines in all the counties of Arkansas.
- **Identify key stakeholders.**

Many County Clerk Offices in Arkansas are interested in employing GIS technology to help meet HAVA Voter Registration Systems requirements and to better serve the citizens of the State.

The Arkansas Secretary of State Office (SoS) Elections Division is seeking to acquire a statewide centralized Voter Registration (VR) System.

- **If there are key stakeholders whose input is crucial, ask to interview the partner(s) and go through the above with the partner(s).**

A request was made to Arkansas Secretary of State Office personnel involved with the purchase of the VR System; however, no interview was obtained.

- **Were there standards that had to be followed and/or are being developed? If so, please describe.**

In order to successfully conduct the pilot, the team discovered that the input address data needed to be standardized to consistently match against the road centerline file. As a result, the Elections Division worked with the Geographic Information Office to include a standardized address data model in their Request for Proposal for new Voter Registration software. By verifying the input address records match the centerlines, the geocoding match rates are projected to approach 100%.

The Arkansas Centerline File (ACF) Standard was followed:

<http://www.gis.state.ar.us/Documents/ACFstan.pdf>.

These standards specifically speak to methodologies for creating a seamless statewide Arkansas Centerline File (ACF) with address ranges that are shareable, geocodable, and have a horizontal accuracy better than 10 meters. The ACF is a GIS data set that contains road networks, road name and address range information, and various other elements to enable address matching and geocoding. Geocoding compares an address record to a Road Centerline Database, and interprets a coordinate location for the address record based upon where the record should be located along a road network.

After identifying a number of sources (at all levels of government) creating centerlines, the AGIO, in an effort to coordinate this activity and reduce duplication of effort, developed the ACF Program. The ACF program is designed to compile a standardized statewide road centerline GIS map data layer that can be used by all levels of government, the private sector, and individuals. The ACF Program is unique in that the entire dataset is built from many different local source (city and county) datasets using a common standard. Another unique aspect of the ACF Program is the technology transfer that allows data maintenance to be done at the local level. The State of Arkansas does not create or develop any data. The State simply integrates the various local sources into a common format in a standardized and consistent manner across jurisdictional boundaries. The ACF Standard is a State Rule and Regulation.

County Emergency-911 Offices and other local government entities are the main source for the compiled data. The AGIO helps local government agencies with many of the technical facets of developing the data or having the data developed by a contractor. The ACF database is available through Arkansas's GIS data clearinghouse, GeoStor, for no fee to Internet users.

- **Are there other jurisdictions and departments that share information in this project/system?**

Although all counties of Arkansas could benefit from using the ACF data to identify errors in Voter Registration records, the major obstacle to statewide use is the lack of high quality road centerlines in all the counties of Arkansas.

- **Are there other jurisdictions and departments that rely upon information from this project/system?**

Various jurisdictions and departments in the State rely on Arkansas Centerline File data.

- **Did this solution result in, or require, the creation of a virtual agency or new entity?**
No.

▪ **Methods and measurements of success.**

The Arkansas Geographic Information Office (AGIO), in partnership with the Secretary of State Office (SoS) Elections Division, sought to test GIS capability in the Arkansas County Clerk Offices to determine how GIS technology could be used to assist the Clerks and the SoS Elections Division in meeting HAVA requirements. Initial considerations were to choose counties for the pilot projects based upon the following optimal criteria:

- *County total voter list was not excessively long so that processing and testing could take place quickly;*
- *County Emergency-911 System had completed a State Certified Road Centerline Database following the Arkansas Centerline File standard;*
- *County Clerk had completed entry of voter address records based upon the voter's E-911 physical addresses;*
- *County Clerk was willing to devote the necessary time to the pilot project.*

Madison County, with 7,460 active and inactive Voter Registrations (VRs), and Monroe County, with 5,535 active and inactive VRs, were selected by the SoS Elections Division as pilot counties. The initial pilot activity involved processing the voter address records through geocoding. After the records were geocoded, a series of maps could be created using other fields of information contained in the VR system. For example, maps of voters by precinct or other districts could be quickly prepared. The pilot activity for Monroe County took place on February 26-27, 2004, and for Madison County, occurred in the following week, March 3-4, 2004.

Project Methods

Identical procedures for this project were followed for both Madison and Monroe Counties. Personnel from the SoS Elections Division, performed an extraction of data for both pilot counties from backups of the Statewide VR Database. The extracted data was shipped to the AGIO. When the data was received, the AGIO conducted an initial evaluation of the VR Database address records, and prepared the data for each of the selected counties. The SoS Elections Division staff telephoned the two pilot County Clerks to brief them on their proposed activities, and to confirm that they understood their role in the project.

Dates for the pilot activities were set, and the local Clerks were advised to provide desk space and electrical outlets for power for the AGIO computer equipment that would be used onsite. When the SoS Elections Division and AGIO staff arrived onsite, they stepped through the preliminary procedures with the local Clerks. These steps included:

- *making a copy of the County VR Database;*
- *deleting all sensitive information from the copy of the VR Database (for example, Driver License, Social Security, and telephone numbers; signatures; maiden names; and application sources); and*
- *transferring the copy of the VR Database from the local computer to the AGIO computer.*

After the VR data was transferred to the AGIO computer, the address records were stepped through a series of processes that standardized the record formats to allow each address to be processed by the geocoding engine. Essentially, the input address records needed to be consistent. A series of steps identified and corrected typographical errors in the data. The most common errors identified were:

- *Spaces or blanks in the House Number field, for example, [_123];*
- *Special characters in the House Number field, for example, [123_A] or [505 ½] or [#123].*

After each series of inconsistencies was identified, a report was created to detail each type of error. These reports were saved and printed, so that the County Clerk Office staff could standardize the data in their local County VR address records in the same manner. The reports were also delivered to the SoS Elections Division staff for use in designing an RFP for the new Statewide VR system.

After trapping inconsistencies in the House Number column of the VR Database address records, a second series of steps was taken to verify consistencies in the Road Name field. For example, an address along a State or U.S. Highway is commonly stored as [105 Hwy 23]; however, within the State Centerline Road Standard, the given name of the road must be [AR 23] where [AR] denotes a State Highway and [Hwy] is simply a suffix designating the road type. Culturally, Arkansans are predisposed to say, "I live on Highway 23." However, this is an incorrect description. For example, in Little Rock, Interstate 630 is also designated as [Wilbur Mills Expressway]. When referring to this roadway, residents would not say "Expressway Wilbur Mills." An example of this syntax being used correctly was found in Madison County. A local roadway is named [Clifty Highway], and residents normally state, "I live on Clifty Highway." But, when records for numbered Highways are entered into the VR Database, this is reversed, [Highway Clifty]. This issue requires more study; and additional coordination with the Postal Service may be necessary in order for the State VR Database records to be entered correctly. For the purpose of the pilot project, however, the data was simply changed to match the Road Centerline Standard.

The next step in the pilot involved narrowing the record list that would be processed by the geocoding engine. Little would be gained by attempting to geocode bad records, so, where possible, these were removed. Records with no physical House Number or no Street Name could not be geocoded, so these records were removed as well. Often, these were records that contained old Rural Route or PO BOX style addresses, where the County Clerk had been unable to find new, matching E-911 addresses. VRs that were designated as canceled were also removed from the list, since this category represented deceased voters, voters who no longer resided in the County or State, or citizens who had simply stopped voting.

The final activity in preprocessing the data for the geocoding function involved concatenating each sanitized address record into one field that would be fed into the geocoding process. A temporary column was added to the Database named [Address]. This column stored the following update query: [UPDATE tblGEOCODE SET tblGEOCODE.Address = tblGEOCODE!HouseNum+" "+tblGEOCODE!StreetName]. This query combined House Number information with Street information. After the data preprocessing was complete, the final step could be taken, data could be processed with the geocoding engine.

The geocoding engine compared the VR data with the Road Centerline data that had been prepared for the County Emergency-911 System. Once a matching road name was identified, the system interpolated a location along the road segment based upon the House Number of the address.

▪ **What have been the results and outcomes of your project/system so far?**

The actual time required to geocode Monroe County data was less than three minutes, and a similar time requirement was observed for Madison County. As a last step, the geocoding engine generated a report of the results for each County.

The GIS software assigned a score of VR data that matched with the Road Centerline data, and tallied the total matches. Madison County VR data had an impressive result of 99% of the records with a match score between 80 and 100. Only 98 records could not be geocoded. Very successful results were produced in Monroe County as well, with 96% of the VR data

being geocoded, and with only 205 records that could not be matched. Overall, the geocoding match rates from both Counties were outstanding. This can be directly attributed to the strong leadership of the County Clerks and to the diligence of their staff.

The AGIO identified the following best practices, in place in both Monroe and Madison Counties, contributing to the high match rates:

- *Total commitment to capture E-911 addresses in the VR data;*
- *Very close E-911 and County Clerk Coordination;*
- *Sustained effort by County Clerk staff to verify that addresses were correct; and*
- *Meticulous attention to the data entry of the addresses.*

The pilot activities, described to this point, took approximately half a day's time in both counties. The remaining one and one-half days were spent in analyzing the results and in performing a simple comparative analysis of the various categories or fields in the VR data. For the Clerks and their staff, this was the fun part!

For their remaining time in the local Offices, the AGIO staff displayed the geocoded VR information on maps, and changed symbols and colors of the VR points to see differences among the data. The most useful activity was to visually perform quality control checks on the data. These quality control procedures were recorded, so the County Clerk staff could use the procedures to correct new information, as it was added to the VR database.

For the pilot study in each County, maps were symbolized for the following:

- *Precinct*
- *JP District*
- *School District*

Since both Monroe and Madison Counties were completely within one State House and one State Senate District, the AGIO did not create a symbolized map of voter assignment to House and Senate Districts. However, this type of map would prove very useful for counties split by State House and Senate Districts.

▪ **Lessons learned.**

The AGIO learned about specific geocoding issues: the geocoding software failed if there were spaces or special characters in the column headings of a database table that was being geocoded; the geocoding software failed if the signature field was included; and the binary large object type (BLOB) was not understood by the software.

Geocoding mismatches were common where there were common Street Names across multiple jurisdictions. For example, Monroe County has an [Oak Street] in Brinkley, Clarendon, Holly Grove, and in the County. The geocoding software failed to properly locate addresses along these roads.

Geocoding mismatches were also common for out of range addresses. For example, an address range along a street might begin at the 700 block; however, the VR data might contain an address on the 600 block. In this case, the 600 block address could not be located.

Another common problem that was uncovered concerned voters with addresses based upon an E-911 Service coming from another County. In these cases, the E-911 address might be in the neighboring County, because the road entered the subject County from that neighboring County. This challenge could be overcome by using the Road Centerline File for the subject County, as well as for neighboring Counties, during the geocoding process.

In both pilot counties, by using the physical address from the VR data, the AGIO was able to identify real errors within the Road Centerline data produced by the E-911 System. In those cases, the AGIO reported the errors to the E-911 Service, so they could be corrected.

A major lesson learned was that the County Clerks could use the visual display of the VR data for a variety of purposes. Their primary purpose was for quality control of the original data entry. The Clerks found that they could also use the display to show precinct boundary locations to voters. They could use the maps to explain things to voters that could not be explained with the aid of printed reports. Both Clerks felt as though “one picture was worth a thousand words,” and that this technique would serve to build increased confidence among the voters in their counties.

A final observation was that counties that lack well developed, standardized Road Centerline mapping, can not perform meaningful geocoding. Good Road Centerline data is necessary for the geocoding process to produce useful results. A challenge for the State Executive CIO is to find incentives and resources for counties across the State to complete and maintain their Road Centerline data.

- **Have you made any changes in implementation of your project/system as a result of lessons learned?**

The significant change to note is that the Elections Division will now require the new centralized Voter Registration software to store the physical address record in a manner that is consistent with the centerline file. By doing this, the geocoding process can be quickly and easily automated.

- **Do you have any advice for other states/jurisdictions facing this issue?**

Based upon the outcome, it is clear that the road centerline file is a key building block that facilitates election administrators in checking, verifying, and validating that voter records are correctly located. Other states can determine the status of road centerline development in their state by contacting the state GIS coordinator. A contact list is provided by the National States Geographic Information Council located at <http://www.nsgic.org/>.

- **What are your next steps?**

The next step is to continue geocoding VR data for Arkansas counties that have Road Centerline data. There is a particular need for the AGIO to assist Counties with School Districts to be consolidated (with an accompanying 2004 deadline to convert to zone elections) and Counties with School Districts to be annexed (with an accompanying 2005 deadline to convert to zone elections).

HAVA also requires the Secretary of State to enter into an agreement with the Department of Motor Vehicles (DMV) to match information in the statewide list to DMV information. It further requires that the DMV enter into an agreement with the Social Security Administration to help with the match of those numbers with information in Voter Registration lists. Geocoding such lists would improve the quality of information in the State.

Case Study: Implementation of the Help America Vote Act

- **Department of Elections, Office of the Commissioner, Delaware**
- **Department of Elections for New Castle County, Delaware**

Background Information

The State of Delaware has four entities responsible for the management and administration of Elections: the Office of the Commissioner of Elections, and 3 offices that manage the administration of elections on behalf of each of the three counties. It is important to note that the three county offices are not local entities but sovereign state entities. The three Departments of

Elections (one for each county) each reports to a Boards of Elections (one for each county) whose members are appointed by the Governor and confirmed by the State Senate. The departments conduct elections and register voters in accordance with State Law. The Commissioner of Elections has responsibilities that include maintaining a uniform statewide election process and managing the statewide Election Management System that includes the statewide Voter Registration List. The three Departments and the Commissioner of Elections collaborate to make sure that elections are conducted in a fair, impartial and uniform manner.

Questions

Interviewee 1

- **Date of interview:** July 9, 2004
- **Name of interviewer:** Dr. George Hadjiyiannis
- **Organization:** Systems Engineering Inc.
- **E-mail address:** ghadjiyiannis@sengi.com
- **Phone number:** (781) 736-9100 x257
- **Name of interviewee:** Virginia E. Lane
- **Title:** Support Services Administrator
- **Agency:** Department of Elections, Office of the Commissioner
- **E-mail address:** Virginia.Lane@state.de.us
- **Phone number:** (302) 739-4277
- **What is your role in this project?**
Member of the Planning Committee, Maintenance of the System
- **Subject area of application.**
*Phased out lever machines, purchased electronic machines
Statewide voting system.
Reliability, Manageable, voters had confidence in
Voter Registration list – was required by legislature.
Counties had their own – Office of commissioner maintained the master record.*
- **Describe business problem identified.**
Maintaining the separate lists was a nightmare; candidates were getting lists from various places. The business need was the driver for the consolidation of voter registration lists between the 4 list keepers. A statewide official list was already in place with the Commissioner's office as required by Title 15. This is not a HAVA issue.
- **Summarize solution.**
*More data fields were added to ensure each voter was correctly identified.
This was an easier way to apply vote history to voter.
It was necessary to print a bar code on the signature card, and scan the barcode for provisional votes.
Maintain centralized database: the counties and Commissioner's office all operate on the same data. (In the 1990 file merge we identifies additional data fields to collect or to extend our capacity to collect complete information. Some of the suggestions were to use bar codes to identify materials associated with voters.*
- **Identify key stakeholders.**
*Commissioner of Elections
Agencies for the three counties
(The Department of Elections and those persons listed on the HAVA advisory committee including representative of groups representing persons with disabilities.)*

- **If there are Key Stakeholders whose input is crucial, ask to interview the partner(s) and go through the above with the partner(s).**
None (The Chief State Election Officer and the Governor)
- **Were there standards that had to be followed and/or are being developed? If so, please describe.**
*Usual HAVA provisions (ballot definition, provisional voting)
State has standard data systems and all agencies must comply.*
- **Are there other jurisdictions and departments that share information in this project/system?**
*Vitals, Department of Justice for verification of felon.
Department of labor not big – no formal agreement.*
- **Are there other jurisdictions and departments that rely upon information from this project/system?**
*No sharing of data – would take legislative action to make it happen.
Upload blind information to court for juror listings. No other state agencies browse files.*
- **Did this solution result in, or require, the creation of a virtual agency or new entity?**
No virtual agency. Everything centralized under Commissioner. No additional audit groups.
- **Methods and measurements of success.**
State plan for HAVA. Meeting determined goals in the plan. Most program were measured right out of HAVA. Logs of what was done, who did it, when they did it were tracked.
- **What have been the results and outcomes of your project/system so far (including costs, customer satisfaction, other tangible results as applicable)?**
They don't even know we are going through it right now. In progress. Very few provisional voters. No complaints. Failsafe and then provisional.(This summarizes multiple questions.)
- **Lessons learned.**
*Stay ahead of the curve.
Huge undertaking. More inclusive than we have ever been before.
Explain in depth to the legislature in many levels.
Had to know everything about it and explain it to all the decision makers.
Process open to anyone who might be interested.*
- **Have you made any changes in implementation of your project/system as a result of lessons learned?**
If we had to start over again, get all the different groups together and decision makers before we started. Started with trying to write a plan and then doing measures.
- **Do you have any advice for other states/jurisdictions facing this issue?**
*They have such a huge problem – I've already talked to them
Provide statewide leadership, get the right people to reach a consensus.
If you have to, hire someone do it.
The decision making process did not work well at all.
Spoke with Rhode Island and they faced legislature problems.
People need help overcoming differences and reaching a consensus.*
- **What are your next steps?**
*Looking at a future system and things that need to be even further streamlined.
Also some financial security (put some money in place) (Establish a funding account). (This refers to future action concerning HAVA. We are looking at many things for future inclusion*

*toward streaming lining our system but we are putting our wish list on hold until after 2006 when the requirements will be completed.)
Wait until 2006 (and definitely after 2004). Wish-listing on hold.*

- **Did you look at any similar systems before implementation and, if so, what did you learn from them?**
(This refers to HAVA systems and none we in place to review. We worked hard to develop a system for us.)

No such systems in place. Worked hard at it.

- **Do you know of any other states/jurisdictions that we should contact for this case study (name, contact information)?**
City of Philadelphia (very good machines).
- **Additional comments.**
Glad it is over. It was a long hard process.
- **Reconfirm that you can publish their interview in the report and ask if you can contact them at a later date once work group begins compiling final report and indicate that we may have a few questions on one or more of their answers.**
Confirmed.

Interviewee 2

- **Date of interview:** July 9, 2004
- **Name of interviewer:** Dr. George Hadjiyiannis
- **Organization:** Systems Engineering Inc.
- **E-mail address:** ghadjiyiannis@sengi.com
- **Phone number:** (781) 736-9100 x257
- **Name of interviewee:** Howard Sholl
- **Title:** Deputy Administrative Director
- **Agency:** Dept of Elections for New Castle County
- **Jurisdiction:** New Castle County
- **E-mail address:** Howard.Sholl@state.de.us
- **Phone number:** (302) 577-3464
- **What is your role in this project?**
One of the two administrators for the Department of Elections for New Castle County Planning. Participated in the original discussions for the HAVA
- **Subject area of application.**
Application to assist in the operation and management of Elections in the State of Delaware.
- **Describe business problem identified.**
According to State legislation, the three counties and the Office of the Commissioner are required to maintain voter registration lists. Before the current system was put in place, each of the county offices maintained its own list for the county, and the Office of the Commissioner maintained a separate centralized list (generally, the aggregate of the three county lists). This resulted in numerous problems:
 - *Duplicate records in the various lists (especially in the case where voters moved from one county to another)*

- No uniform way of linking to DMV data and Vitals data.
- Candidates and parties were getting voter information from multiple sources.
- Maintenance of the lists was complicated
- Voter confidence was reduced

In addition, voter history, absentee ballots and provisional ballots were not easy to operate and maintain, and voters that had moved from one county to another could not vote until they applied to register to vote in the other county and their records were transferred to the other county. When the State implemented the National Voter Registration Act of 1993, it included a provision that permitted a person who moved from one county to another and who did not change his/her address with the Department of Elections to vote in the new county by completing a Voter Registration Application at the polling place for his/her new address. There are procedures in place that verify that the person is a registered voter before the person is permitted to vote.

Finally, the Help America Vote Act of 2002 required that the State offer Provisional Voting to those persons who would not be permitted to vote in the Polling Place but who insisted that they were at the right Polling Place. Delaware only permits Federal Offices on Provisional Ballots. Election Officers (poll workers) make every effort to verify a person's eligibility to vote before offering them a Provisional Ballot.

Additional business problems were identified regarding the operation of polling stations and the general administration of elections, and facilities to serve these were included in the final application, although the core is the voter registration list.

▪ **Summarize solution.**

In the late 1980s (long before HAVA legislation was put in place) and as a result of State Legislation regarding the creation, maintenance, and operation of a centralized voter registration list, the Office of the Commissioner and the three county offices decided to create a centralized electronic voter registration list. This list was to hold voter registration records for all voters in the State and be maintained by the Office of the Commissioner. The list was to be the authoritative source of voter registration information as well as the operational system which would be used to manage and administer elections in the State of Delaware. The Office of the Commissioner and all county offices use the same system and have access to the same information. This information was made available to all poll workers during the administration of Elections. The system went into operation in the early 1990s.

The Voter Registration Act of 1993 led to additional modifications to allow the system to be linked to the Department of Motor Vehicles and to make use of DMV records as they became available. Currently, as the DMV creates new records, these are transmitted on a one-way link to the centralized voter registration list. A paper copy is also sent by the DMV to the Office of the Commissioner, and is used to verify and update the voter Registration list records as necessary (currently a manual process but with plans to update to an automated process). If a record is accepted, then no additional validation of the identity is performed (the DMV record is considered sufficient validation). If a record is created through means other than the DMV records, then additional identity validation information is required.

The Departments use data from other agencies and jurisdictions and the Commissioner's Office to maintain the Voter Registration List. This includes: a monthly list reporting deaths from the Bureau of Vital Statistics, Address Verification cards mailed by the Departments and the Commissioner's Office, and reports from other states that persons registered to vote in Delaware have registered to vote in another states. Also, each update to the Voter Registration List includes a search of the Criminal Justice Information System data base to determine whether or not an applicant is a felon. If there is a hit, Commissioner's Office conducts additional research to determine whether or not the applicant is registered to vote.

When the HAVA legislation was enacted, further modifications were made to the system to:

- *Include additional fields to ensure each voter was correctly identified*
- *Added the capability to track whether or not voters who registered to vote by mail submitted a required form of identification with the application and to mark the Poll List and the person's Signature Card (documents used in the Polling Place) if he/she did not.*
- *Added free access systems (WEB and Voice XML) that permit a person who voted by Provisional Ballot to determine whether or not his/her ballot was counted and if not, the reason that it was not counted.*

As a result of the current system:

- *There is a single centralized voter registration list available to the Office of the Commissioner and the three County offices. This reduces the number of duplicate records and facilitates the management of the list.*
- *Election Officers have access via telephone with the Department of Elections in their county to the List of Registered Voters, and as a result they are not forced to resort to provisional ballots unnecessarily. If a voter is registered anywhere in the State then his/her record will be available upon request at the polling station. Each Polling Place only has records (Signature Cards and a Poll List) for the persons registered to vote at that Polling Place.*
- *The task of managing voter registration data from DMV increased efficiency and reduced errors. Scheduled improvements will further increase efficiency by eliminating paper records in the DMV process, adding the capability to manage the Address Verification process within the Election Management System, and possibly automating the deceased voter process.*
- *The Commissioner's Office and the Departments have used extracts from the Election Management System to create data bases, mail merge documents and other tools that permit them to do their jobs more efficiently and effectively.*
- *Candidates and parties get information from a single authoritative source.*
- *Tracking voter history is simplified.*
- *Tracking and administering provisional ballots is easier.*
- *Voter confidence is increased as they are not forced to use provisional ballots unnecessarily.*

Also note that that the system contains components unrelated to the operation and maintenance of the electronic voter registration list in order to streamline the operational aspects of administering elections (management of poll-workers, management of poll-stations, management of ballots, etc...).

▪ **Identify key stakeholders.**

*Commissioner of Elections
Offices for the three counties*

▪ **If there are key stakeholders whose input is crucial, ask to interview the partner(s) and go through the above with the partner(s).**

None other than the above.

▪ **Were there standards that had to be followed and/or are being developed? If so, please describe (reference legislation or documentation – URLs, if possible).**

There were no rigorous standards specifically applicable to this system. However:

- *The State has technical implementation standards that all agencies must abide by.*
- *Applicable State legislation has affected the requirements of the system.*

- The HAVA legislation has affect the design of the system. The current implementation of the system is mostly compliant with HAVA legislation – the State Implementation Plan can be located at:
<http://www.state.de.us/hava/stateplan/StatePlan.PDF>
- **Are there other jurisdictions and departments that share information in this project/system?**
DMV: The system receives records from the DMV as new DMV records are created. This is a one-way link.

Department of Justice: Through the system, queries can be sent to the Department of Justice to establish the felon status of a voter corresponding to a particular record.

Vitals: Vitals records are used to established when a registered voter is deceased (the electronic voter registration list is then updated as a result).

Department Of Labor: No formal agreement but Department of Labor records are sometimes used.

Other States: Data from other states are sometimes used to establish when a voter has left the State.
- **Are there other jurisdictions and departments that rely upon information from this project/system?**
 There is no sharing of data in the system – it would take legislative action to make that happen. Also, the particular fields of various records and access to the system itself is strongly controlled to ensure that only persons who need to have access to the appropriate information are allowed to obtain it. No other state agencies are allowed to browse the listings.

 However, a blind upload (with minimal information) is made to courts to create juror listings. Also, voter information is provided to candidates and parties. Finally, a quarterly extract of people that moved to the State is shared with other states.
- **Did this solution result in, or require, the creation of a virtual agency or new entity?**
 The key stakeholders are the Office of the Commissioner and the three Departments of Elections (one for each county). As a result of this unique organizational structure, no virtual entity was necessary – the overall management of the Election Management System is the responsibility of the Commissioner of Elections. The Departments of Elections meet frequently to review and prioritize changes to the system. .

 The ties to other agencies are either enforced by legislation (DMV) or informal and not critical to the system mission (Department of Justice, Department of Labor) so the corresponding agencies do not hold the status of key stakeholders.
- **Methods and measurements of success.**
 The measures of success can be divided into two types:
 - **Implementation and Project Management measures:** These are measures regarding how the implementation process itself was performed. They consist mainly of requirements coverage metrics, and Project Management metrics (accuracy of estimates, implementation time, forecast vs. actual schedule, forecast vs. actual budget, etc.). Almost exclusively, these measures came out to of the HAVA State Implementation Plan for the current version of the system.

- **Operational Performance measures:** *These are measures relating to how well the system performs and addresses the original business issues it was intended to solve. No rigorous metrics were proposed but by far the most important ones are:*
 - *The requirement for provisional ballots indicating that a record that should have been available was not*
 - *The percentage of duplicate records*
- **What have been the results and outcomes of your project/system so far:**
 - **Requirements Coverage:** *The current system is well on its way towards meeting all HAVA requirements (see State Implementation Plan). The State of Delaware is probably ahead of most if not all States in terms of satisfying HAVA requirements.*
 - **Disruption of Operations:** *The users saw minimal if any disruption and are not even aware of how drastically the system has changed or is changing now.*
 - **Costs:** *Costs for the specific components of the system were not readily available – most of the money covered by HAVA legislation is actually being used to purchase/upgrade voting machines.*
 - **Voter Satisfaction:** *Since the system was put in place there were “very few provisional voters”¹. There appear to be “no complaints”². Voter satisfaction is very high.*
 - **Duplicate Record Count:** *There are very few duplicate records on the Voter Registration List. There are “some duplicate records”³ because of the lack of Social Security Numbers for some records. No strict measure is available.*
- **Lessons learned.**
 - *By far the most difficult process appears to have been the process of getting consensus between the decision makers, despite the fact that the State of Delaware has a centralized organizational structure for the key stakeholders. It is important to streamline the process as much as possible.*
 - *The project was a huge undertaking for the resources of the group.*
 - *Explain the issues in depth to the legislature at many levels (various aspects of the implementation required legislative action).*
 - *Have to know everything about the issues and explain it all to the decision makers.*
 - *Process should be open to anyone that might be interested.*
 - *Make sure the system is flexible enough to allow the operators to work around various problems – the system should not be too rigid but should instead support the operators instead of restricting them.*
- **Have you made any changes in implementation of your project/system as a result of lessons learned?**
 - *“If we had to start over again, get all the different groups together and decision makers before we started”⁴.*
 - *Some changes in implementation to conform to HAVA*
- **Do you have any advice for other states/jurisdictions facing this issue?**
 - *This is a huge problem (do not underestimate it).*
 - *“Stay ahead of the curve”⁵.*
 - *“Provide a statewide leadership and get the right people to reach a consensus”⁶.*
 - *“If you have to, hire someone to do it”⁷.*
 - *“Make the system as robust as possible. Do not take away from people their ability to do their work. Don’t force them to separate official data and the data they operate on. Bring*

¹ Virginia E. Lane

² Virginia E. Lane

³ Howard Sholl

⁴ Virginia E. Lane

⁵ Virginia E. Lane

⁶ Virginia E. Lane

⁷ Virginia E. Lane

*in all the services necessary to run the election – be flexible in providing these services so that you can get the job done”.*⁸

▪ **What are your next steps?**

A number of additional items are planned to further streamline the system and bring it within HAVA compliance:

- *VoiceXML lookup to allow provisional voters to find out if their ballot was counted by phone*
- *Connecting the results from the current mainframe to the Web Site*
- *Allow the use of barcodes to track absentee ballots*
- *Automatic handling of DMV records*
- *Automate the Address Verification process*

However, in general the wish-list items are moving forward. The Voice XML capability will be available for the November, 2004 election, the results update issue has been resolved, the use of bar codes to facilitate management of Absentee Ballots is in its final stages of implementation, the project to create a paperless DMV process is moving forward with a projected implementation date of mid-2005, and the automation of the Address Verification process is moving forward should also be implemented in mid-2005.

▪ **Did you look at any similar systems before implementation and, if so, what did you learn from them?**

Given the early start of the core system, there were no existing projects to examine at the time the system was being planned and implemented.

▪ **Do you know of any other states/jurisdictions that we should contact for this case study (name, contact information)?**

- *City of Philadelphia (very good machines).*
- *Pennsylvania is in the process now.*
- *Maryland (had tremendous problems – counties view themselves as relatively sovereign).*
- *North Carolina (pretty far along).*

▪ **Additional comments.**

*Glad it is over. It was a long hard process.*⁹

▪ **Reconfirm that you can publish their interview in the report and ask if you can contact them at a later date once work group begins compiling final report and indicate that we may have a few questions on one or more of their answers.**

Confirmed by both interviewees.

⁸ Howard Sholl

⁹ Virginia E. Lane

Case Study: Implementation of the Help America Vote Act

- **Discovering Montana, eGovernment Service Provider**
- **Office of the Secretary of State, Montana**

Questions

Interviewee 1

- **Date of interview:** 7/29/04
- **Name of interviewer:** Kara LaPierre
- **Organization:** Delegata
- **E-mail address:** klapierre@delegata.com
- **Phone number:** (916) 609-5434
- **Name of interviewee:** Fred Sargeson
- **Title:** Director of Marketing
- **Agency:** Discovering Montana
- **Jurisdiction:** State Portal Operator
- **E-mail address:** fred@discoveringmontana.com
- **Phone number:** (406)449-3468 X222
- **What is your role in this project?** *Project Manager*

Interviewee 2

- **Date of interview:** 7/29/04
- **Name of interviewer:** Kara LaPierre
- **Organization:** Delegata
- **E-mail address:** klapierre@delegata.com
- **Phone number:** (916) 609-5434
- **Name of interviewee:** Elaine Graveley
- **Title:** Elections Deputy
- **Agency:** Secretary of State's Office
- **Jurisdiction:** Montana
- **E-mail address:** EGraveley@state.mt.us
- **Phone number:** (406) 444-5376
- **What is your role in this project?** *Project Sponsor*
- **Subject area of application.** *HAVA implementation*
- **Describe business problem identified.**
The state of Montana estimated that 1/3 of voters in a given elections are either voting for the first time or have moved/transferred from the address where they were most recently registered. In an effort avoid discrimination, the state decided to require identification of all voters at the polling place. In a geographically large but lightly populated state, it was important that individuals who made the effort to go to the polls, but did not have their state-issued drivers' license or identification card with them, have a means of casting a ballot.

- **Summarize solution.**
*The state portal's experience with the driver record lookup service, driven by DMV records, was leveraged to build a new application allowing the 56 County elections administrators to verify the identity of voters online. . Voters without their identification were directed to a resolutions table at the polling place, where they provided their first and last name, date of birth, and driver license number or the last 4 digits of their Social Security number. The information was phoned in to the County elections administrators, who logged on to a secure website, entered the data, and were able to verify the voter.**
- **Identify key stakeholders.**
Secretary of State, Department of Justice (DMV), Elections Task Force and County Elections Administrators
- **Were there standards that had to be followed and/or are being developed? If so, please describe.**
*Section 508 (website standards)
Terms & Conditions of State Portal (administered by a private contractor, Montana Interactive/NIC)
Drivers Privacy Protection Act
Montana House Bill #190 of 2003*
- **Are there other jurisdictions and departments that share information in this project/system?**
Secretary of State, Department of Justice (DMV), Elections Task Force and County Elections Administrators
- **Are there other jurisdictions and departments that rely upon information from this project/system?**
Secretary of State, Department of Justice (DMV), Elections Task Force and County Elections Administrators
- **Did this solution result in, or require, the creation of a virtual agency or new entity?**
No.
- **Methods and measurements of success.**
While a vast majority of voters brought their identification with them (the result of a successful outreach campaign), 600 individuals who did not do so were able to cast official ballots because they were authenticated by the web lookup.
- **What have been the results and outcomes of your project/system so far?**
The SOS conducted a customer satisfaction survey among the County users, and found that they were very pleased with the system (no hard data). The cost of developing the system is estimated at \$25,500 (because of the self-funded business model of the state portal, the service was developed and provided at no cost to the SOS and County users).
- **Lessons learned.**
–“Look at this as a good opportunity for partnership with another state agency and with your local government users. It is very important to get input from all the stakeholders.”¹⁰
- **Have you made any changes in implementation of your project/system as a result of lessons learned?**
No.

¹⁰ Elaine Graveley

- **Do you have any advice for other states/jurisdictions facing this issue?**
It's a fast, easy, effective way to accomplish the authentication of voters. A few other states have contacted Montana and are considering this type of solution to make HAVA easy for voters.
- **What are your next steps?**
While not immediate, other HAVA implementation-related projects include: state voter file development, ability to capture change of address provided to Counties at polling place back to DMV, getting accurate SSNs for DOJ/DMV from SSA.

Once the statewide voter registration database is in place, there has been discussion of adding a call to that database as well, so the name and address information from both data sources could be compared on screen.
- **Did you look at any similar systems before implementation and, if so, what did you learn from them?**
Montana pioneered this solution.

** If there was not an exact match of information – for instance, if there is a discrepancy between the address on the DMV record and the voter roll – the individual could cast a provisional ballot and provide proof of identity to the County by the close of business the next day.*

Case Study: Drivers License Information Systems – Department of Public Safety, Driver and Vehicle Services, State of Minnesota

Questions

- **Date of interview:** 7/7/2004
- **Name of interviewer:** Michael Ryan
- **Organization:** Minnesota Office of Technology
- **E-mail address:** mike.ryan@state.mn.us
- **Phone number:** (651) 556-8024
- **Name of interviewee:** Dan Southwick
- **Title:** DVS Regional Supervisor
- **Agency:** Department of Public Safety, Driver and Vehicle Services
- **Jurisdiction:** State of Minnesota
- **E-mail address:** dan.southwick@state.mn.us
- **Phone number:** (507) 389-5238
- **What is your role in this project?** *Project Manager*
- **Subject area of application.** *Customer self-service via the Internet.*
- **Describe business problem identified.**
Citizens were required to wait in line or on hold for long periods in order to conduct business or receive answers to questions. Many transactions could be done self-service. Many of the questions could be answered if the citizen had access to their records. The problem was to have a secure means to identify the citizen to avoid identity theft or distribution of confidential data.

- **Summarize solution.**
Our solution was to issue a PIN (personal identification number) to citizens to allow them to conduct secure transactions via the Internet. A PIN is only issued in person to an applicant who presents the same identity documents as required for an application for a driver's license or ID card. If the applicant loses their PIN they are required to return to one of our offices to get a replacement. We currently allow access to the following services with a PIN: View their driving record, view their reinstatement requirements if driving privileges are under revocation or suspension, view their motor vehicle record, order a certified copy of their driving or motor vehicle record, order a duplicate driver license or ID card to change address or replace a lost or stolen card, schedule their road test appointment, and pay any reinstatement fee they owe.
- **Identify key stakeholders.**
Minnesota citizens, law enforcement agencies, business partners, and other state agencies.
- **Were there standards that had to be followed and/or are being developed? If so, please describe.**
Minnesota statute 171 and Minnesota rule 7410, DPS Internet policies.
- **Are there other jurisdictions and departments that share information in this project/system?**
Not at this time.
- **Are there other jurisdictions and departments that rely upon information from this project/system?**
Not at this time. However, this project would allow any department such as revenue or DNR to use the driver services number and PIN to authenticate whom they are conducting transactions with.
- **Did this solution result in, or require, the creation of a virtual agency or new entity?**
No, www.mndriveinfo.org was already in existence. We just added a secure area to this site to conduct PIN transactions.
- **Methods and measurements of success.**
We track how many PINS are issued and how many transactions are being conducted.
- **What have been the results and outcomes of your project/system so far?**
We issued 2766 PINs in 2003 and so far in 2004 we have issued 28,817 PIN's. Of the 28,817 PINs issued 25,465 citizens have logged onto the website. 676 citizens have applied for a duplicate driver license or ID card and 625 have paid reinstatement fees. We have collected \$743,652.00 in fees. 1878 road tests appointments have been made. Most comments by citizens are asking for additional services. Cost has been minimal other than for programming, which has been done in house.
- **Lessons learned.**
Currently the only payment method is ACH from a checking or saving account. Citizens are asking for the ability to pay for transactions with a credit card.
- **Have you made any changes in implementation of your project/system as a result of lessons learned?**
The credit card module should be completed by the fall of 2004.

- **Do you have any advice for other states/jurisdictions facing this issue?**
Bring together a team from all areas affected by your project. Look at your business practices to reduce manual input of data. The greatest savings come from not having to manually enter any data from the Internet transactions.
- **What are your next steps?**
We are working on developing a module to renew driver's licenses and ID cards. We are also leveraging our current PIN into the IMDLIS (Improved Minnesota Driver's License Information System) project.
- **Did you look at any similar systems before implementation and, if so, what did you learn from them?**
We researched what was being done by other states when we started the project. At that time very few states were conducting business via the Internet other than vehicle registration, which did not require secure transactions.
- **Do you know of any other states/jurisdictions that we should contact for this case study?**
District of Columbia, Florida, Georgia, Illinois, Indiana, Louisiana, Massachusetts, Mississippi, Nevada, New York, Pennsylvania, South Carolina, Tennessee, Texas, Utah, Virginia, and New Brunswick are all renewing driver licenses or ID cards via the Internet.
- **Additional comments.**
Be patient and expect delays as you change business practices. Especially if you are working with multiple work groups. We found that in many areas that business practices had been established so long ago that no one remembered why that practice was instituted. Many business practices were streamlined to accommodate electronic transactions and reduce manual data input.

Findings, Analysis and Recommendations

Identity management in e-government has been an evolutionary process. The case studies reviewed in this paper were authorized through acts of legislation either at the federal or state level. They were initiated in an effort to improve the way government provides services to citizens and how identity management has made a positive impact to government.

Federal Government Electronic Authentication Initiative

The Government Paperwork Reduction Act (GPRA) and Health Insurance Portability and Accountability Act (HIPAA) were factors prompting initial Federal Government efforts in PKI technology research.

The federal government, through the Federal Bridge Certificate Authority (FBCA) and subsequently through their funding and support of the new the Electronic Authentication Partnership (EAP), should be recognized as the pioneer of authentication processes within government.

The recent efforts of the Office of Management and Budget (OMB) and the General Services Administration (GSA) have resulted in the E-Authentication Initiative that builds upon the groundbreaking work of others and establishes guidelines that compliment other national and international authentication systems. This initiative has had the understanding that interoperability between systems and organizations must be supported from the very start.

Success is measured by the following metrics:

- Cost avoidance
- A minimum number of credentials issued
- Number of credential providers participating
- Number of interoperable authentication products
- Percentage of citizens trusting the authentication
- Percentage of citizens using the authentication process
- As statistics become available, the measurement of success will be by the adoption rate of both application providers and users

Voter Registration in Arkansas, Delaware and Montana

The Help America Vote Act (HAVA) of 2002 served as a catalyst in both the Arkansas Geographic Information Office, the Delaware Department of Elections Voter Registration, and Discovery Montana Voter Registration projects.

While all efforts were successful, they were sponsored by different governmental entities. The Geographic Information Office initiated Arkansas' Voter Registration effort with support from the secretary of state, and the state and county departments of elections addressed the Delaware project, and the secretary of state initiated the Montana project.

This project provided the Delaware Department of Elections an opportunity to automate centralized voter registration that had been initiated well in advance of HAVA. It brought to attention the fact that, although voter information was already centralized, the inconsistencies in how the information was managed from county to county.

The ability to leverage technologies already in place, such as the Arkansas County Centerline Database and County Emergency e-911 state certified road records, coupled with the pilot county clerks offices dedication to the quality of the existing voter registration data helped the AGIS achieve high quality results in a minimum amount of time.

The positive results can be used as justification for expansion of the Arkansas GIS Centerline Database to other counties. The additional tools provided to the participating counties through the Voter Registration project was seen as a valuable byproduct of this project.

Montana addressed the project at the polls. Identity of voters was confirmed at the polling site. Voters were required to prove identification of all voters at the polling place. In cases where voters did not have their state issued drivers' license of identification card with them, county election administrators had access to the state portal's driver record lookup service through the Montana Department of Motor Vehicles.

This low cost solution leveraged existing portals and technology by partnering with another state agency and local government users.

While not immediate, other HAVA implementation projects are planned to expand the project to capture additional voter information for voter file development.

Minnesota County Recorder's Association

The Electronic Real Estate Recording Project (ERERTF) proved to be a major undertaking that was initiated by the legislature through funding of a task force and pilot.

The primary purpose of the task force was to study the current paper based system and the feasibility of an electronic mode of real estate recording and the development of the Minnesota Electronic Real Estate Recording Standards v.1.0, which were unanimously adopted by the task force in June of 2002. These standards include the business rules for e-recording and a definition of the legal, technological, operational, and functional context for making such an e-government system work. Those standards were tested and revised, as needed, through the pilot projects conducted in Dakota County.

Success is measured by successful development of standards that address acceptance of e-recording of real estate transactions, improved data integrity, an independent infrastructure, cost savings through reduced use of paper documents, and establishing a level playing field for all counties to participate in electronic real estate recording.

The legislation establishing and authorizing the ERER Task Force expired on June 30, 2004. Effort is underway to secure necessary funding during the next legislative session to fund continued efforts on this project.

The Minnesota Drivers License Information Systems

This case study provided the state of Minnesota an opportunity to physically authenticate the identity of citizens and provide a secure means to identify the citizen when accessing services or confidential data over the Internet.

Citizens are issued personal identification numbers (PINs) when renewing driver's licenses. In time, those PIN's would allow any department, such as revenue or DNR to use the driver services number and PIN to authenticate whom they are conducting transactions with. Success of this was measured through PIN issuance and transaction statistics.

Those statistics include:

- 2,766 PINs issued in 2003
- 28,817 PINs issued in 2004 to date
- 25,465 citizens have logged on to the system
- 676 citizens have applied for duplicate driver licenses or ID cards

625 citizens have paid reinstatement fees
\$743,652 has been collected in other fees
1,878 Road Test applications have been filed

This project provided an opportunity to evaluate and streamline business practices. Cost of deployment was minimal. Most comments by citizens are asking for additional services.

In Conclusion

In general, the lessons learned and challenges faced through these project efforts were not technology related. These are long-term efforts that continue to evolve. Bringing people together and getting meaningful projects defined is difficult. In the case of e-Authentication, establishing trust between participants in accepting common credentials was challenging.

Projects need to be sensitive to perception issues concerning the appropriate role of government. Project teams underestimated the size of the undertaking and the time that it would take to implement technologies to support the pilots. Having the right group of decision makers to keep the project moving forward is very important. The ability to combine authority with collaboration to avoid conflict of interest issues that slowed progress would have helped efforts.

Identifying appropriate pilot applications and making sure that the participants are diligent in their efforts to achieve success is crucial. Take advantage of the contribution solution providers can make as partners in the effort. Future success depends upon continued funding of these and related projects through the legislature and business sponsors.

Appendix A: References

1. Case studies from federal, state, and local governments.
2. www.cio.gov for e-authentication content and information.

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Appendix B: Contributors

Thanks to the following people for helping put this paper together:

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