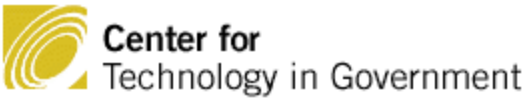

Constructing the New York State-Local Internet Gateway Prototype: A Technical View

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Introduction

Today, state and local government use of information technology is manifested in many independent systems, each supporting one business function or satisfying one particular program need. As a result, a large and growing number of individual systems for G2G (government-to-government) business relationships are employed across state and local levels. This multiplicity of systems is often a significant impediment to efficient work. It is also a financial strain because many systems require their own hardware, software, security, office space, and business rules.

In order to perform business functions on each system, local government officials must sign in and out as they use each one, requiring numerous log-ins and passwords. Usually, data entered into one system cannot be used by another. Numerous duplicate requests for information are made and fulfilled as individual organizations respond to uncoordinated requests and requirements. This situation poses a significant burden on the work processes of both state agencies and local governments and entails higher than necessary costs for everyone.

The New York State-Local Internet Gateway Prototype was built to test an alternative strategy to this current way of working. The goal of the Prototype was to identify, demonstrate, and evaluate key factors associated with a single point of contact for G2G work among state and local governments.

Toward that end, a broadly representative group of state and local officials developed a vision for an ideal State-Local Gateway. They believed an ideal State-Local Gateway would be:

- governed jointly by state and local organizations through a formal governing structure;
- driven by genuine business needs;
- affordable to all interested participants;
- designed to offset initial investments and ongoing costs through future cost reductions to all participants;
- protected from external threats and internal misuse by jointly established security features;
- characterized by high quality, accurate, and authentic data;
- modular, flexible, and versatile in design and content;
- continually evaluated for usability and improvement under a variety of local conditions and use a standard set of conventions for information and applications;
- designed to accommodate users with low technical skills;
- designed from the user point of view;
- highly reliable and available to all state and local users; and
- able to incorporate other existing efforts.

These characteristics were then adopted as principles to guide a prototyping effort to test the feasibility of a single point of contact for G2G work among state and local governments.

Prototype Design and Components

In design terms, the Prototype channeled multiple G2G business functions through a secure, single sign-on, role-based system accessible through the Internet. It was used to assess management, policy, technology, and cost implications likely to be associated with the development of a full-scale G2G system. The overarching goal was to understand what would be necessary for state, county, and municipal governments to realize greater efficiency, high quality authentic data, and more consistent and coordinated services.

The Prototype included data about 15 counties (and their associated municipalities) in New York State. This data was provided by the participating state agencies. The Prototype did not include any financial transactions associated with the applications. It operated from a secure Web site hosted on the public Internet and was available only to authorized government officials. The Prototype focused entirely on G2G relationships, it did not offer public services.

In order for the Prototype to generate enough useful results, it had to demonstrate how multiple organizations at different levels of government work together. Therefore three state agencies were selected from three different policy domains and thirteen local governments (including counties, towns, and cities, but not villages) from every region of the state and were asked to take part in the design. Local governments were selected to represent a wide variety of size, wealth, and technical sophistication.

Figure 1. New York State-Local Internet Gateway Prototype Design

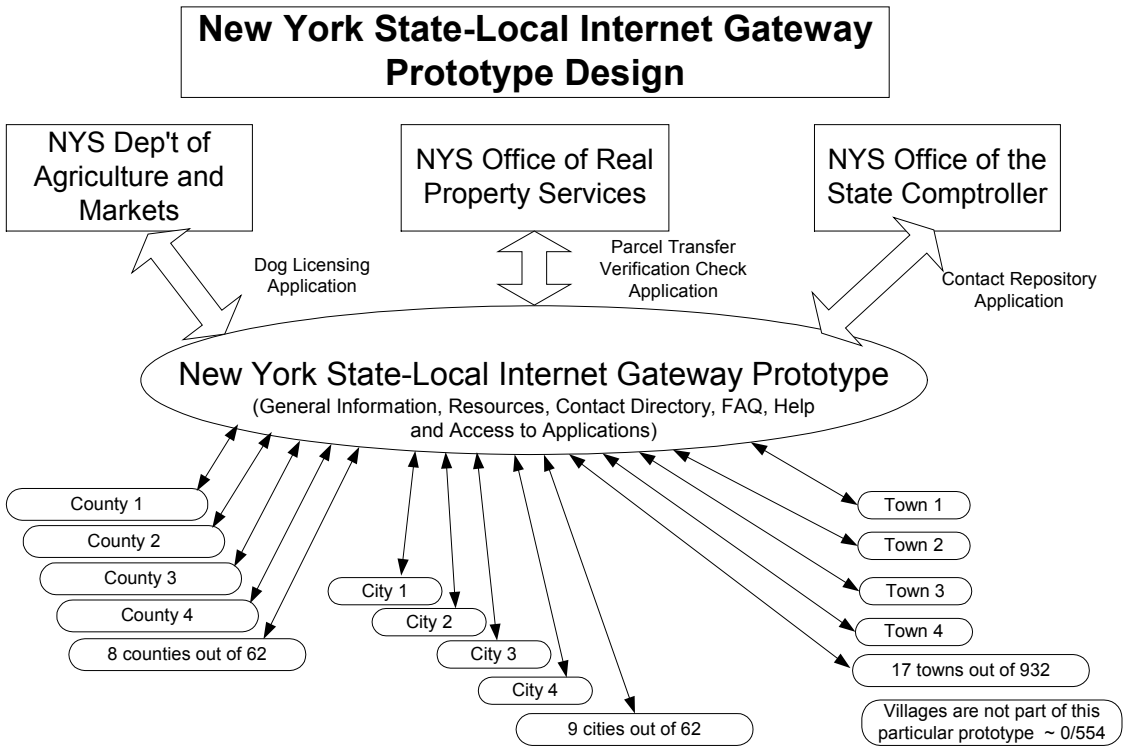


Figure 1 represents the high-level conceptual design of the Prototype. In this design, a single gateway replaces the myriad of one-to-one relationships among local governments and state agencies. It was designed to offer some features and applications to all users and to limit other applications to specific users based on their functional roles.

General Access

In the Prototype, three functions were made available to all state and local users.

- Links to Resources on information about laws and regulations, professional associations, data resources, and other helpful information selected to be of value to state and local officials.
- A searchable, unified Contact Directory of state and local government professionals. This electronic repository of contact information allowed users to identify state and local government officials and use the information for mailings and other purposes.
- User Support functions including FAQs and Help.

Role-Based Access

Under the role-based scheme, each user had access to additional functions that pertained to his or her job. Roles were assigned based on official job title with some additional adjustments made to fit special local conditions. Three role-restricted applications were selected to represent common categories of state-local business functions, so that the learning generated by the Prototype could be generalized beyond these specific cases. For example, in the Prototype, the idea of a single authentic directory of data maintained and shared by state and local governments was used with contact information (as shown by the Contact Repository Application) but other areas of government including child health and well being, education or law enforcement have data that could be maintained and shared in much the same way.

- ***Contact Repository Application***. This business process was chosen to represent an authentic shared data resource and was modeled after a similar effort at the NYS Office of the State Comptroller. The electronic repository contained contact information about state and local government officials such as title, organization, address, phone number, and job function. All contact information was updated electronically through a decentralized process that made each locality or state agency its own data owner. Users who had access to this application were designated data owners who managed their own contact information and contact information for other officials in their agency or jurisdiction.
- ***Dog Licensing Application***. This application was chosen to represent a high volume G2G transaction process. It supported transactions that take place between the NYS Department of Agriculture and Markets and city, town, and village clerks. The application included searching for registered dogs in multiple municipalities in NYS, registering a new dog, renewing a dog license, and transferring a license to a new owner. In addition, the application made it possible to create and print reports on new and delinquent or expired licenses.
- ***Parcel Transfer Verification Check Application.*** This application represented rule-based exception reporting. It performed an automated data quality check to flag possible errors that require further investigation to either adjust or validate the record. The application involved the NYS Office of Real Property Services (ORPS), county real property officials, and town and city assessors. The county forwarded property transfer records to the Prototype for checking. The application applied nine business rules to each record and flagged records that may have had errors, thus alerting assessors to review them.

The role-based access feature was built into the Gateway's sign-on function and limited access to each application based on individually assigned roles. For example, town clerks generally processed dog licenses and contact information, but not property transfer records. Therefore, when a town clerk signed on to the Prototype, she had immediate accesses to both the Contact Repository Application and the Dog Licensing Application, but not to the Parcel Transfer Verification Check Application.

Participants

Throughout the entire Prototype project, 80 individuals from all 5 regions of New York State, representing 8 state agencies, 9 counties, 9 cities, 18 towns, 2 universities, 2 professional organizations, and 4 private sector companies participated as Prototype Team Members, Advisory Committee Members, Field Testers, and Corporate Partners. These groups worked together as collaborative partners to conceptualize, design, develop, and evaluate the Prototype.

Selection of the Prototype Team
The Prototype Team, made up of state and local officials, was formed in the process of selecting specific business applications to test in the Prototype (see Appendix 1 for full list of Prototype Team Members). Each application was specific to a programmatic area and needed representation from both state and local government professionals to develop the application. In addition to the Gateway (described further on page 13), the other applications included dog licensing, a parcel transfer reporting verification check, and a repository of contact information about government officials.

After the Prototype Team was established, it was divided into subgroups to develop the selected applications. These groups consisted of people whose daily job functions included portions of the business processes to be developed. Twenty-nine state and local government professionals participated on the Prototype Team and each provided specialized knowledge and expertise over a 21 month period.

Selection of Corporate Partners
As with many CTG projects, private sector expertise was needed to design and develop the prototype. In April 2003, CTG reached out to the corporate community by placing a call for corporate partners in the State Contract Reporter and mailing the call directly to all companies that CTG had contact with in the past. The call stated that all interested vendors must attend an informational meeting to learn more about the Prototype (see Appendix 2). Representatives from eight private sector companies attended the meeting where CTG staff reviewed the goals of the project, the work accomplished thus far, the roles and resources that private sector partners might provide, and the Center's formal policies governing corporate partnerships (see Appendix 3). During the session, questions were answered and attendees were asked to consider all this information and, if interested, to submit a proposal for participation.

In May 2003, four proposals were received. After a review and evaluation, CTG contacted all of the companies and asked each one to play a role in developing the Prototype. After these discussions, three corporate partners, CGI Information Systems & Management Consultants, Inc. (CGI), Keane, Inc. and Microsoft, decided to move ahead in the process and join the Prototype project. CGI and Keane offered to play the leading role in designing and developing the prototype.

In addition, CGI offered hardware and software and Microsoft provided additional software for use in development. Table 1 shows the resources each company provided for various aspects of the prototype development.

Table 1. Summary of Corporate Partner Resources

Development Components	CGI Information Systems & Management Consultants, Inc.	Keane, Inc.	Microsoft
Business analysis	X	X	
Server hardware + ISP	X		
Application development	X	X	
Portal (or Framework)	X		
Software			X
Development management services	X	X	
Project management	X	X	
Testing (technical analysis)	x	X	

Because CGI offered to provide the portal framework software (gBIZ) and the hardware and hosting components needed for the Prototype, they were asked to design and develop the Gateway - the entry and infrastructure of the Prototype. In addition, CGI was asked to develop the Contact Repository Application and the Parcel Transfer Verification Check Application. Keane developed the Dog Licensing Application and assisted in overall project management throughout all phases of the project.

Methodology and Timeline

The entire project was conducted in three stages over the course of 21 months starting in September 2002. The first stage focused on the refinement of the idea of a State-Local Gateway and the selection of applications to be included in the prototype. The second stage was the development of the Prototype, and the final stage consisted of prototype testing and refinement. After the prototype development, field testers across NYS were recruited to evaluate the Prototype in terms of ease of use, usefulness, convenience, and speed, and to compare it to the current method of working. The field test also elicited information about policy and management implications of developing a fully-functioning State-Local Gateway in NYS. In terms of tasks and products, the phases were organized as shown in Table 2.

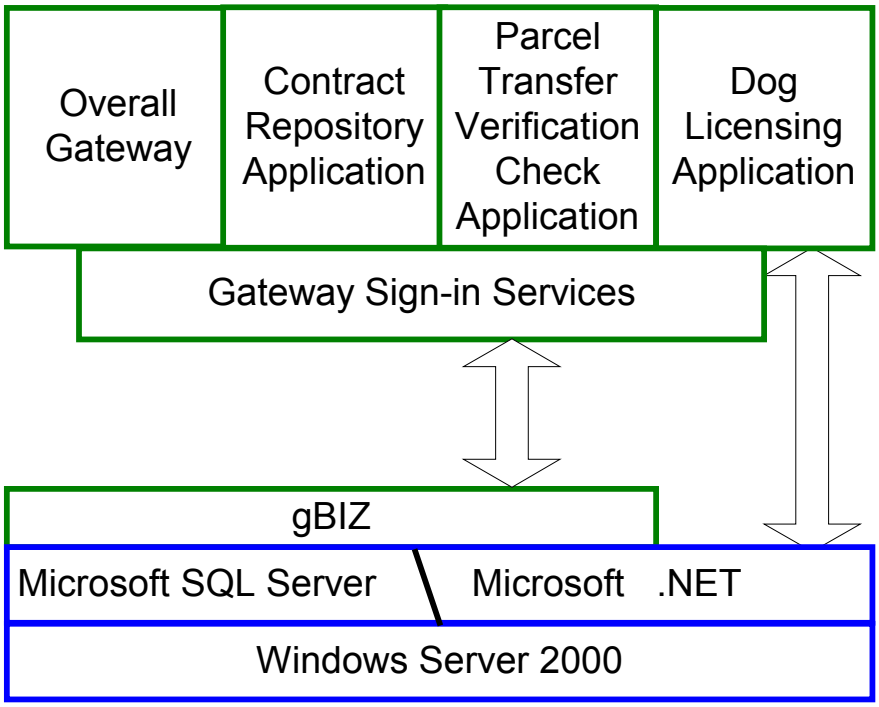
Table 2. Time Period, Participants, Actions, and Products and Results

Time Period	Participants	Actions	Products and Results
Project Exploration and Initiation			
Summer 2002	• NYS Office For Technology's Local eCommerce/ eGovernment Advisory Committee	Committee meetings and workshops	• Discussions about the growing number of individual intergovernmental information systems and ideas about pursuing single point of contact
Fall 2002	• CTG • Members of NYS OFT's Local eCommerce/ eGovernment Advisory Committee	Exploratory meetings and workshops	• Current practice research • Identification of characteristics of an ideal state-local gateway • Identification of applications for the Prototype • Recruitment of Prototype Team Members
Systems Analysis, Design, & Development			
Winter 2003	• CTG • Prototype Team members	Prototype development meetings	• Detailed end-to-end process maps • Prototype scope statements • Application-specific service objective statements
Summer 2003	• Corporate Partners • CTG • Prototype Team members	Joint Application Development (JAD) sessions	• Functional requirements • Business process rules • Data flows and requirements
Fall 2003	• Corporate Partners • CTG • Prototype Team members	• Development meetings • Writing, testing software • Code and Design review	• Web maps • Software architecture documents • Software requirement specifications • Use case realization specifications • Source data identification • Data cleansing and integration • Draft Prototype components
Testing			
Fall 2003	• Corporate Partners • CTG • Prototype Team members	• Individual application testing • Integration testing • User acceptance testing	• Refined Prototype ready for field test
Training and Prototype Evaluation			
Fall 2003	• Corporate Partners • CTG • Prototype Team members • Additional Field Testers	• Training • 2-week Field Test • Discussion groups	• Prototype Evaluation • Project Report
Prototype Decommission			
Late Fall 2003	• Corporate Partners • CTG	• Prototype debrief session • Prototype disabled	• Documented learning from Prototype development • Prototype artifacts archived

Architecture and Infrastructure

System Architecture
The Prototype was built on a Windows 2000 and .NET Platform with a SQL Server database. All three applications available in the Prototype — Dog Licensing, Contact Repository, and Parcel Transfer Verification Check — used the gBIZ framework to authenticate users and manage profiles that defined individual user access to applications and features.

Figure 2. Architecture: The New York State-Local Internet Gateway Prototype



Building the Prototype on these common Internet technologies created a system with a low barrier to access — users required only a PC with an Internet connection and a web browser. No special hardware, software, or installation was required. This level of technical infrastructure was found to be universally available and not an impediment to use.

This set of common technologies also simplified the development process by starting with the simple requirements that the system be accessible over the Internet and require no special software for access. This decision provided a starting point for restricting the scope of the Prototype to a system that could be built within the constraints of the project while providing suitable functionality for evaluating the new business processes. The guiding design principles were as follows:

- All user access should be available via a standard web browser.
- All applications should run within the Prototype system.
- The system should be self-contained and not integrate with existing production systems.

This design proved to be a good development framework to support the Prototype's features and functions while keeping the development environment manageable. However, it did not fully represent real world situations where, for example, integration with production database systems and multiple architectures working within more robust infrastructures are needed.

Security

The Prototype's user access control system increased user confidence in conducting G2G business using Internet technologies. Accounts and access rights to the Prototype and its applications were managed by a role-based access control system. Users logged into the system once using a single user name and password and were then able to access all appropriate applications. The Prototype used the roles to manage the applications available to individual users on their home pages.

While the Prototype was secure within the scope of the project, a production level State-Local Gateway would require much more attention to other areas of security such as financial transactions, data sets that have high security requirements, account maintenance, system availability, and client access. These different production level characteristics contain their own complex security requirements, which require careful planning, testing, policies, and deployment for continued ongoing operation.

Integration of Applications in a Multi-Vendor Environment

Two of the Prototype's design goals — make it easy for users to sign-in to access applications and where necessary, allow data to be shared between applications — required an integration approach to design and implementation. To keep development as simple as possible, each application made use of the common sign-in and access control system provided by gBIZ. This integration allowed users to use a single username and password to access the Prototype and its applications while reducing the amount of software that had to be developed. This made the development process more manageable within the project resource constraints.

In keeping with the project's aim to simulate a real environment for local governments and state agencies, the Prototype applications were not all developed by the same corporate partner or based on exactly the same suite of technologies. CGI and Keane Inc. used different environments to develop their respective applications, but specifications for integration were shared among the development teams to ensure smooth integration when all the applications were completed. CGI designed and developed their applications on the gBIZ framework built on the Microsoft .NET 1.0 whereas Keane used the Microsoft .NET 1.0 environment directly to develop the Dog Licensing Application, but did not use the gBIZ framework. After completion of the Dog Licensing Application, Keane integrated it into the gBIZ framework.

The Contact Repository Application, which managed contact information and made it available to all prototype users through a Contact Directory allowed some users to search and view contact information while others had rights to change and manage the information. This required that data be shared between the Contact Repository Application and the accompanying Contact Directory. This was accomplished by developing both applications to access the same database. The sharing of the same database was a simple way to integrate the applications made possible because both applications were hosted on the same server with direct connectivity to the database system.

These two approaches to application integration worked well within the scope of the Prototype. In the development of a production level State-Local Gateway there would be a different set of

constraints that affect the integration techniques and technologies used. The Prototype integration was also simplified by the fact that all software development teams used a common web application infrastructure of .NET, SQL Server 2000 and Windows 2000 Server.

The use of a single web application architecture may not be available in a production level State-Local Gateway. Applications may be developed by different companies with expertise in deploying different architectures. Preparing to develop a production level State-Local Gateway will require developing an integration architecture that defines how applications from different vendors and sources can be integrated into a State-Local Gateway.

Data Sources and Limitations

The Prototype would not have been usable without specific data sets to support each application. Since creating new data sets was unrealistic within the scope of the project, data was extracted from production systems, scrubbed, and integrated in the Prototype so its functions and features could be used in ways similar to real world uses. The data sources used were not necessarily the best authoritative source for a production system. They were chosen to provide enough appropriate data to support the Prototype.

Since the scope of the Prototype could not support data for the entire state, each application was populated with data about county and municipal governments from the following 15 NYS Counties: Monroe, Niagara, Ontario, Broome, Cayuga, Cortland, Jefferson, Clinton, Essex, Albany, Saratoga, Schenectady, Washington, Ulster, Westchester. Data about three NYS agencies (NYS Department of Agriculture and Markets, NYS Office of the State Comptroller, and NYS Office of Real Property Services) was also included. All data in the Prototype was specific to one or more of the applications. Applications and corresponding data sources are shown in Table 3.

Table 3. Data Sources by Application

Application	Data Source	Notes
Overall Gateway	• CTG • CGI • Keane	• All user role information was provided and validated by CTG • Links for the resources section was gathered, categorized, and summarized by CTG • Frequently Asked Questions were developed by CTG • Help was written by CGI Information Systems & Management Consultants, Inc. and Keane, Inc.
Contact Repository Application	• NYS Department of Agriculture and Markets • NYS Office of the State Comptroller • NYS Office of Real Property Services	• Contact information for local jurisdictions were obtained from the three state agencies. Not every official from each of the jurisdictions was populated in the Prototype. • Contact information for state government officials was obtained by the NYS Office of the State Comptroller. • All contact information is the most updated version.
Dog Licensing Application	• NYS Department of Agriculture and Markets	• There are approximately 150 records for each municipality within 15 counties in NYS. • All records were randomly chosen from the years 1999 to October 2003.

Parcel Transfer Verification Check Application	• NYS Office of Real Property Services	• Only Counties that use SalesNet were eligible to have data run through the Prototype. Of those Counties, four were chosen: Clinton, Niagara, Cortland, Broome. • The data was supplied by the NYS Office of Real Property Services for these four municipalities within the time range of March 1, 2003 and August 31, 2003. • There were approximately 300- 500 records per County populated in the Prototype. • SalesNet extracts for the dates between September 1, 2003 and October 31, 2003 were sent to the Prototype from the counties during the field test.

To be usable by the Prototype, all the data sets needed to go through at least one of four transitions:

- *migration* – one-time move from one system to another,
- *integration* – of multiple data sources into a single set,
- *cleaned* – scrubbed for inconsistencies. or
- *re-creation* – new data set created with new business rules

As suggested in the transitions listed above, data sets are not neutral. They contain attributes and qualities that affect their validity and value. Therefore, in preparing the data sets for use in the Prototype, the development team needed to ask some fundamental questions of the data providers:

- How was the data collected?
- How was it managed?
- What do each of the data fields mean and how do they relate to one another?

Once the answers to these questions were understood, a new set of questions arose:

- How will the data be used in the prototype?
- How can the existing data fields be mapped into the new structure?

From here, solutions were developed that took the existing data sets and transformed them into a format and structure directly usable by the Prototype databases (migration, integration, improvement, re-creation).

As seen in the steps above, the Prototype Team and the Corporate Partners addressed all the traditional data issues such as:

- "dirty data," (e.g. inaccurate, duplicated, conflicting, or improperly defined),
- moving data from several sources into a centralized, relational structure,
- accounting for historical features and tracking over time, and
- incorporating new data fields that are not in the current sources but extend the usefulness of the data (e.g., email addresses for dog licenses).

Application Scope Statements, Role Designations, and Functional and Data Requirements

In developing the applications (Overall Gateway, Dog Licensing, Parcel Transfer Verification Check, and the Contract Repository) the Prototype Team performed business process analysis to map the process as it currently exists (see process maps in Appendices A, B, C). Through documenting the process from end-to-end, the Prototype Team created a shared understanding of information flows and responsible parties at each step. From these maps, the team collectively defined a scope statement and developed a set of functional and data requirements for each application. This information was then used to develop the prototype.
Below are each application's requirements as developed by the Prototype Team.

Overall Gateway Application

Scope Statement. The purpose of the Overall Gateway was to pull several different G2G business functions from different state and local agencies through one common place on the Internet. Functions of the overall gateway include:

- single sign-on,
- centralized identification and authorization of users,
- access to the look up feature of the Contact Directory with ability to do predefined sorts and queries,
- access to role-appropriate business functions (e. g. dog licensing, parcel transfer data verification check, contact repository),
- access to general information resources, and
- access to Help and FAQs.

Role Designations. Each Prototype user was assigned a role based on his or her daily job functions. A user name and password was used to authenticate individuals to their roles. User names and passwords were issued and validated by the Gateway Administrator at CTG.

- All users were assigned to the role of General User. A General User had access to all links to resources, a searchable, unified Contact Directory of state and local government professionals, and user support functions including FAQs and Help features.
- Those who held the responsibility of transacting dog licensing functions within their local government or state agency were given access rights to the Dog Licensing Application.
- Those who held the responsibility of reviewing and assessing parcel transfer records within their local government or state agency were given access rights to the Parcel Transfer Verification Check Application.
- Those who held the responsibility of submitting and updating contact information for officials within their local government or state agency were given access rights to the Contact Repository Application.

Functional Requirements. The basic functional requirements included the ability of the application to:

- Perform the functions listed in the Overall Gateway Scope Statement.
- Provide all appropriate users access to the application via a standard web browser.
- Run within the Prototype system.
- Remain self-contained and not integrate with existing production systems.

More specifically, the most important function of the Overall Gateway was the single sign-on to multiple applications where each user's role was identified and matched to a specific application. This allowed all three applications to be channeled through the Prototype and allowed access to an application only if the user had the correct credentials.

Data Requirements. All data entered into the Prototype was identified and prioritized by the Prototype Team.

- The links to Resources on information about laws and regulations, professional associations, data resources, and other helpful information was selected by the participating state and local officials.
- Information for the Frequently Asked Questions.
- Help information was developed by the corporate partners for the applications that they each developed.
- Information about each user's role (and subsequent access to applications) was collected and validated.

Contact Repository Application

Scope Statement. This application, modeled after the Office of the State Comptroller's MACROS system, provided access, input, and updating capabilities to a single repository of contact information for state and local government officials. This application included:

- a decentralized data management process in which each state agency or local government was the owner of its respective contact information,
- role-based assignment of data owners and data entry operators,
- ability for the data owner to change, delete or add data,
- ability for all users to search, view, and export contact information, and
- ability for all users to propose a change to any record for the approval of the record's data owner.

Role Designations. Individuals given access to the Contact Repository Application were responsible for updating contact information for people within their jurisdiction. Within the Contact Repository Application, two additional user roles were defined to support multiple security levels within the application. The roles are described below.

- A General User had the ability to search, view, and export contact information, and propose a change to any record for the approval of the record's Data Owner.
- A Data Owner is the person within the organization responsible for the correct contact

information for officials and professionals within the organization. This person could change, add or delete contact information for officials within that jurisdiction. A data owner also had all the rights of the General User.

- The Data Entry Operator was the person who completes the forms or enters data but is not the final check for the accuracy of the data within an organization. A Data Entry Operator also has the rights of the General User.

Functional Requirements. This application was created to provide a single, authentic directory of contact information about state and local government officials where the data could be monitored for accuracy by permitting each entity to be responsible for it's own data. The basic functional requirements included the ability of the application to:

- Perform the functions listed in the Contact Repository Application Scope Statement.
- Provide all appropriate users access to the application via a standard web browser.
- Run within the Prototype system.
- Remain self-contained and not integrate with existing production systems.

More specifically, the most important aspect of the functional design was that all records of contact information had to be tied to a Data Owner. Each Data Owner was responsible for adding, changing, and deleting contact information for officials within their own jurisdiction.

Data Requirements. All data requirements in the Contact Repository Application were identified by the Prototype Team. The Team defined "public fields" that were accessible to General Users and then "private fields" available only to Data Owners and Data Entry Operators (See Tables 4 and 5).

Table 4. "Public" Data Fields Available to General Users

Field Name	Required	Comment
Last Name	Yes	Last Name of the Contact
First Name	Yes	First Name of the Contact
MI	No	Middle initial of the Contact
Salutation	Yes	Preferred greeting for the contact to use in correspondence, (Mr., Ms., Dr., Hon., etc.)
Suffix	No	Suffix to follow the last name of the contact (e.g., Jr., Sr., Esq., etc.)
Organization	Yes	Agency or municipality to which the contact belongs.
Title	Yes	Official title for the contact. One and only one is permitted. (See Job Function for recording additional job responsibilities).
Address 1 Line # 1	Yes	1st line of the primary address
Address 1 Line # 2	No	2nd line of the primary address
City 1	Yes	City of the primary address
State 1	Yes	State of the primary address
Zip 1	Yes	Zip Code of the primary address
Phone 1	Yes	Phone Number at the primary address
Fax 1	No	Fax Number at the primary address
Cell Phone # 1	No	Primary cell phone number for the contact

Field Name	Required	Comment
Email # 1	No	Primary e-mail address for the contact
Year End	No	Fiscal Year End
Legislative District 1	No	Legislative district served by the contact
Legislative District 2	No	Legislative district served by the contact
Legislative District 3	No	Legislative district served by the contact
Legislative District 4	No	Legislative district served by the contact
County	Yes	County served by the contact
Country	No	Country

Table 5. "Private" Data Fields Available to Data Owners and Data Entry Operators (in addition to all "public" data fields)

Field Name	Required	Comment
Address 2 Line # 1	No	1st line of the secondary address
Address 2 Line # 2	No	2nd line of the secondary address
City 2	No	City of the secondary address
State 2	No	State of the secondary address
Zip 2	No	Zip Code of the secondary address
Phone 2	No	Phone Number at the secondary address
Fax 2	No	Fax Number at the secondary address
Email # 2	No	Secondary e-mail address for the contact
Muni Code	Yes	Unique code that identifies the municipality
Owner	Yes	Owner of the data. Source for the most accurate up to date information for the contact.
Custodian	Yes	Custodian of the data. Authorized to make modifications to the contact data, including updates.
Office Expiration Date	No	Date that Term of Office Ends
Cell Phone # 2	No	Secondary cell phone number for the contact

Dog Licensing Application

Scope Statement. This application represented a high volume transaction process involving the NYS Department of Agriculture and Markets and cities, towns, and villages throughout New York State. The Dog Licensing Application provided:

- data as required in the existing DL1 Form,
- input into a repository of new dogs and owner information, producing generic recording of licenses for non-purebred dogs,
- renewal of licenses (excluding mailing renewal notices to owners), transfer of ownership, and local reporting functions.

Role Designations. Individuals given access to the Dog Licensing Application were responsible for processing dog licensing applications within their municipality. Within the Dog Licensing Application two roles were assigned:

- Dog-Licensing Agents (DLA) could perform all the functions that are part of processing dog licenses. This includes new registrations, renewals, and transfers. In addition, this role had the capability to run reports and search for specific dog licenses.
- Agriculture and Markets Staff were able to review state-wide data and produce reports. In addition they had access to an administrative function that allows this role to update information requirements about dog licensing.

Functional Requirements. The basic functional requirements included the ability of the application to:

- Perform the functions listed in the Dog Licensing Application Scope Statement.
- Provide all appropriate users access to the application via a standard web browser.
- Run within the Prototype system.
- Remain self-contained and not integrate with existing production systems.

More specifically, the major functional requirement of the application was to provide all Dog Licensing users with a database of new dog licenses, which allows them to input, edit and access data, so that there is a single repository of license data, the data exchange process is simplified, and that better quality data is online more quickly for all users. In addition, the application was designed to perform these five major business processes:

- Research request for dog license application
- Process initial dog license and renewals
- Process transfer of dog ownership
- Update information about the dog or owner
- Process Queries and Reports

Data Requirements: Specific fields that capture data about a dog license was taken directly from the DL1 Form and data requirements were selected by the Prototype Team to support the functional requirements of the application. The selected data fields to support the dog licensing application are in shown in Table 6.

Table 6. Selected Data Fields for the Dog Licensing Application

Data Item(s)	Requirement
Owner Name and Address	Accommodate for multiple addresses (mailing and location addresses)
Owner E-mail	New data item outside of DL-1 form
Dog Address	Some dogs may be harbored in a location other than the owner's
Dog Birth Date	There are different business rules for registration based on dog's age
Dog Breed, Color, Mix Designation	For tracking, identification and reporting purposes
Dog Municipality	Where the dog itself resides. DLAs are responsible for the registrations within their municipality.
Dog Spayed, Neutered	There are different business rules for registration based on dog's status
Dog Gender, Dangerous Designation, Identifying Marks	For tracking, identification and reporting purposes
Dog License Number	Exists for the life of the dog
TCV (Town, City, Village)	Track history of where dog has been registered, for the life of the dog Municipality designation (location of licensing agent) which came from Ag. & Mkts data source
Look Up Tables	Colors, Breeds, Mixes, Registration Types, Vaccination Types extracted from DL1 form (list of standard category items for each data type)
Security Tables	Maintain role based security to grant/deny access to dog application specific functionality
Registration Date	The Start Date is calculated by looking at all of the transactions for this dog and taking the latest end date and adding one day The End Date is calculated by adding two years to the Start Date The Start Date and End Date are overrideable, but the Start Date must occur before the End Date
License Type	If birth month is supplied, dog birthday is rounded to the first of the month for purposes of subsequent calculations If birth month is not supplied, birthday is rounded to first of year for purposes of subsequent calculations If dog is female and spayed, default to "Female, spayed" type If dog is female and unspayed, default to "Female, unsprayed (xxx)" type with the under/over four months calculated from birthday and current date. If birthday is not supplied, default to "Female, unsprayed (under 4 mos.)" If dog is male and neutered, default to "Male, neutered" type If dog is male and unneutered, default to "Male, unneutered (xxx)" type with the under/over four months calculated from birthday and current date. If birthday is not supplied, default to "Male, unneutered (under 4 mos.)"

Parcel Transfer Verification Check Application

Scope Statement. This application involved the NYS Office of Real Property Services, county real property officials, and town and city assessors. It consisted of a data quality check on the status of

parcel transfers in localities throughout New York State. The application applied nine business rules that identified potential data problems. The application provided:

- a validation of data input from the required RP5217 form,
- an alert to assessors, county real property tax service officers, and ORPS staff about potential data conflicts or abnormalities,
- a simplified verification and more accurate recording of parcel transfer data in the initial stages of reporting.

Role Designations. Three roles assigned within the application were as follows:

- The Assessor had the ability to review flagged records for his or her municipality and make a change in the status of the record.
- The County Real Property Tax Services (RPTS) Official had the ability to review flagged records for all municipalities within their county. In addition, the County RPTS person was responsible for sending the electronic county data to the Prototype system for review.
- The NYS ORPS staff had the ability to review flagged records for the entire state.

Functional Requirements. The basic functional requirements included the ability of each application to:

- Perform the functions listed in the Parcel Transfer Verification Check Application Scope Statement.
- Provide all appropriate users access to the application via a standard web browser.
- Run within the Prototype system.
- Remain self-contained and not integrate with existing production systems.

More specifically, the aim of the parcel transfer process in the Prototype was to reduce or eliminate the errors that currently exist in identifying incorrect tax roll information. In many instances the current process of identifying incorrect data is a manual effort. The Prototype reduced or eliminated the manual process by accepting, at regular intervals, an extract file of the RP5217 data in the existing SalesNet database. SalesNet is an application developed by the NYS Office of Real Property Services that facilitates county entry of RP5217 real property transfer information and allows verification of assessment roll data for transferred parcels.

The Prototype validates each record in this file, based on edit checks of "key word" searches, cross validation of existing data and monitoring of the variance of the sales price to the equalized value of the parcel. When any of records fails one or more of the Prototype edits it gets "flagged" and an automated email is sent to the appropriate assessors, indicating property information, and the reason for the notification. Flags did not mean that a record is indeed inaccurate. Only the assessor could definitely determine if the record was in need of adjustment. Furthermore, the benefit of passing each of the records through the validation was three fold:

- all records were assessed for validity rather than a random sample of records
- more data errors were identified and adjusted earlier
- it was easier for the assessor to catch possible data errors.

Data Requirements. Table 6 shows a list of fields within the RP5217 (real property transfer document) that are likely to have an error, the conditions that make the information erroneous, and

potential solutions to the error. Table 7 lists the business rules programmed into the Gateway Prototype. The RP5217 column represents the section of the RP5217 form which contains the data being checked. The issue column represents the business rule applied to that data. The resolution explains why a record was flagged for this check and suggests what to do to resolve it. This information appears on the detailed summary screen for each flagged record. A flag does not necessarily mean that the record is invalid, it is simply an alert that the record appears to be unusual and may need investigation.

Table 7. Data Validation Rules for Checking Parcel Records

RP-5217 Field Description	Condition/Issue	Resolution
Full Sale Price	• Full sale price is >$999,999.	• Please verify that sale price is correct.
Full Sale Price	• Full sale price is <101 and there is no condition associated with the sale.	• Full sale price is <101 and there is no transfer condition associated with the sale. Please verify that the sale price is correct and identify transfer condition, if appropriate.
New Construction on Vacant Land	• New construction on vacant land is checked but condition code is not.	• New construction on vacant land is checked but transfer condition code is not. If new construction has occurred since last final roll available at time of sale, then 15G (significant change) needs to be checked.
New Construction on Vacant Land	• If Item No. 9 is checked then Item No. 7 cannot be equal to C, D, or L.	• If new construction then property use cannot be vacant land or forest land.
Conditions of Sale	• Condition Code J is checked or no condition code is checked with entry in memo field.	• (Transfer condition codes) Condition Code J is checked, or no condition code is checked but there is an entry in memo field. Based on entry in memo field determine whether a transfer condition code (other than J) should be indicated.
Buyer Name Seller Name	• Keyword Search Error	• Keyword search validation has identified this transfer as failing one or more of the Keyword criteria. Verify this transactions buyer and seller names for such things as Agency, Bank, Credit, County, Exec, NYS, Referee, Trust.
Sale Contract Date	• Sale Contract Date is not earlier than or equal to date of sale.	• Please verify that sale dates are correct.
Buyer Name	• Buyer's last name is the same as the sellers last name and condition code <>A or C.	• Buyer's last name is the same as the seller's last name and transfer condition code A (sale between relatives) or C (one of the buyers is also the seller) is not checked. Please verify whether transfer condition code should be indicated.
Number of Parcels	• Number of parcels – 1 and parcel box is not checked (See calculations of Equalization rates).	• The ratio of the equalized full value to the sale price is <.6 or >1.4. Please verify the sale price and transfer condition code, if appropriate.

Prototyping Lessons Learned

Invest in Business Process Analysis

The Prototype applications were selected from existing business processes that involved multiple levels of government. Each Prototype Development Team was made up of government professionals who performed or held responsibility for tasks along these business processes. Among these team members were professionals from state and local governments with a wide range of job titles and areas of responsibility. A key component of the software development process was an end-to-end business process analysis conducted by teams of people who actually did the work as part of their job functions, such as the town, village, and county clerks, assessors, and information and technology officers from all levels of government. These teams participated in workshops where they mapped out the details of every step in their business process spanning all levels of government.

As a result of this in-depth analysis, each team member gained an understanding of the whole process and how their portion fit into the larger process. In addition, they acquired a better appreciation of why and how the process is carried out. The business process analysis contributed to a better group understanding of the process and its problems.

Within this framework, the results of the business process analyses were focused on reducing complexity and solving problems that could be solved within the scope of the project. The teams developed scope statements for each Prototype application that described its function and purpose and specified its attributes. They defined goals and objectives that clearly stated the purpose of the application, the intended customers, and the subsequent benefits. These process maps and accompanying statements served as a way to communicate among the team members and also served as a documentation guide for the software development team.

The business process analysis also created a learning time for the software development team to build a relationship with the business process owners and develop a joint understanding. The process maps informed the technical specifications which together helped to define the overall scope of the Prototype. Avenues and mechanisms were established for the software developers to communicate their understanding of the business process back to the users and to describe the software that would support those processes.

Take a User Perspective

For many of the team members, this project was their first exposure to any form of software development. Many had not used a prototype previously. CTG's prototypes are systems that are meant for learning by simulating a real system. They have a very short development cycle, that identifies only enough of the business requirements necessary to build a limited system to support the evaluation of an idea. The selection of software and system architecture is based on available resources and their ability to produce fast results. Usually, the software from these prototypes is not further developed into complete systems; rather it is used as a practice system to inform the possible future development of a production system.

Some participants in the project initially found it difficult to accept that a prototype itself would not expand into a full system. However, after becoming more familiar with the software development process, terminology, and prototype concept, they understood the value of this approach and were

able to participate fully in the development process. When the prototype development process was completed, the teams were quite excited to see the system they helped design operating with data they knew and understood.

The users also saw considerable benefit in using real data in the Prototype. Even though it makes prototype development more complex and time consuming, using real data is worth the extra effort. It gives the participants a familiar and specific perspective on the data issues that need to be addressed when planning for the design, development, and deployment of a production system.

Using real data also made it easier to train field test users on the use of the Prototype. There was less to learn from their perspective. They knew the business process. They understood the data. The field test was therefore a matter of understanding how the Prototype supported the business process. Identifying errors (which resulted from the data migration or integration) was quick and easy for those familiar with the data.

The willingness of the team members to participate in the development of the Prototype demonstrates that state and local governments are open to new relationships and new software systems that would enable the sharing of data even if the result would mean less individual control over business applications, as long as the development process considers all aspects of the process and the roles that various organizations and users play.

Incorporate User Acceptance Testing – Even in a Prototype

Although user acceptance testing is not normally part of Prototype development, this Prototype required it because it was needed to be evaluated in a simulated business environment as part of the learning process. Testing to ensure that the applications supported the required business functions needed to be performed by members of the prototype team before the application was rolled out to the field testers who had never seen it before.

Provide Field Testing Training and Support – It Pays Off

The corporate partners and CTG staff provided training and support to field testers. Each field tester was required to attend one of five three-hour regional training sessions prior to beginning the field test evaluation. During these training sessions field testers were given an overview of the project and its goals and then a demonstration of each application. Each user was assigned a user name and password and shown the role(s) that he or she would have during the test. A workbook consisting of 34 tasks and an opinion survey was distributed and explained. The only hands-on component of the training was practice to make sure testers could sign-in to the Prototype using their user name and password.

The test was conducted from each person's place of work although a few later reported testing from home for lack of time during the workday. Support was provided for the field tester by phone and email during normal business hours. The support team was able to guide users through any difficulty using the Prototype and was prepared to involve software development teams as needed. However, no issues required the involvement of the software development teams. Online help and Frequently Asked Questions (FAQ) were also built in to the Prototype to assist users in answering questions on their own, although it does not appear that these features were used extensively.

For the majority of users this training and support model worked well enough considering the very limited resources available to conduct them. A few users needed more help than the support model

could accommodate. From these few users, the support team identified the portions of the Prototype design that caused the most issues and the need for more training in basic Windows and Internet skills. Both of these issues resulted from the limited resources available in the Prototype project. A production level State-Local Gateway would have gone through more than one refinement process, fixed the design issues, and given more time and resources for users to receive additional training.

Limitations of the Prototype Compared to a Production System

As mentioned throughout this report, the Prototype was developed to meet specified service objectives within accepted constraints defined by the scope of the project. As such, the Prototype exhibited limitations that would not be evident or even desirable in a fully functioning production system. Table 8 summarizes some of the Prototype characteristics and constraints and compares them to what would need to be addressed in a production-quality system.

Table 8. Comparison of Prototype Features to Production Requirements

Category / Feature	Status in Prototype	Status in Production System
Infrastructure		
Incorporate full application functionality	Prototype included functionality within applications that satisfied its scope. For example, it allowed viewing of possible errors on parcel transfers, but not error correction.	Full functionality of all applications would be required. For example, would need capability to correct possible errors on parcel transfer, not just view them.
Reliability of access	Handled on a case-by-case basis within Prototype.	Would need to address issues of providing reliable service while running important business tasks over the public Internet.
Financial Processing	Outside the scope of the Prototype.	Necessary part of some transactions.
Email Functionality	Not available in the Prototype.	Would include enhanced email features such as automatic email notification when proposed entries have been addressed.
Identity Management		
Account management	The Prototype used centralized management of user identities and role-based assignments and did not address ongoing issues of people leaving, new arrivals, and transfers.	Would require a combination of centralized and decentralized management of identities and role-based assignments, plus a policy, process, and mechanism for handling changes.
Data Considerations		
One Data Set Shared by All Users	Did not address policy issues that might arise such as how to handle dog license transfers when each municipality can see data from others. Prototype had no built-in mechanism to ensure a user could register dogs only in her own municipality.	Programming constraints need to be developed that reflect all business rules and policy issues.

Category / Feature	Status in Prototype	Status in Production System
Data integration from multiple sources	One-time data integration from 3 sources, "cleansed" enough to support Prototype applications.	Would need to integrate from additional data sources, perform more high-quality data cleansing, and provide for ongoing data management and maintenance.
Complete data sets	Prototype used a partial data set that was adequate for its scope.	Would require complete and up-to-date data sets.
Ability to load and unload bulk data in a batch mode	Not provided in the Prototype.	Would include functionality to upload and download batches of data to and from applications such as the Contact Repository.
Data integration into applications and systems outside the Prototype	Not addressed in Prototype, which was developed as self-contained within scope of the Prototype applications.	Required component to handle key transactions such as licensing fees, state and local fees, that would be integrated with financial systems.
Information Policies		
Governance	The informal Advisory Committee provided governance for development, testing, and evaluation of the Prototype.	A formal intergovernmental structure would set direction, adopt policies, etc.
Shared code	Not addressed in Prototype, which had separate applications running in the Prototype.	Would develop ways to enhance re-use of code and collapse common or similar web development tasks into one.
Usability		
Ease of Use	Some usability issues could be tolerated within Prototype environment.	User interface would be refined through successive user acceptance testing, field tests, and focus groups until all usability issues are addressed
Context-sensitive help	Prototype provided only general help screens.	Help information would be specific to functions and events within the system so users would find help where and when they need it.
Personalization of resources section based on User's Role	Prototype provided a generic Resources sections that was available and identical for all users.	Would provide ability for individual users to customize their Resources section based on their role and interests.

Conclusion

Efforts to streamline, simplify, and rationalize the picture of existing intergovernmental information systems in New York State are very desirable but, as the Prototype demonstrated, they present their own complexities and challenges. Any transition to a more integrated and coordinated way of working adds new demands for planning, management, design, operations, and resource allocation.

The technologies used in the Prototype are all commercially available and well-tested. They were brought together in novel ways in this project by a private sector development team that was itself a working partnership. The most demanding aspects of the entire Prototype effort was the engagement of over 80 state and local government individuals in designing and testing the

Prototype. They handled numerous issues with data, management, and policy implications. For example, it was difficult and expensive to bring so many local representatives together often enough to assure both rapid and accurate application development. Some policy issues (such as standards selection) could be avoided in a prototype effort, but in a real development effort would demand up-front decisions and ongoing monitoring and evaluation. Data identification, integration, and cleansing were resource-intensive tasks even in this small environment. They will be much more important and demanding in an effort to build a real system, especially if that system requires data that is more sensitive than the public information used in the prototype applications.

Overall, the New York State-Local Internet Gateway Prototype demonstrated that the technologies for G2G business relationships exist and can be put to use to improve state-local interactions. It also showed the importance of deep and continuous involvement of all types of users representing the range of local conditions around the state. Finally, the prototype effort identified and explored the many kinds of technical, managerial, and policy issues that will be encountered as State and local governments move toward a more unified and interdependent enterprise.

Appendices

Appendix 1. Prototype Team Members and Corporate Partners
Appendix 2. Call for Corporate Partners
Appendix 3. CTG Project Policies
Appendix 4. Dog Licensing Application Process Map
Appendix 5. Contact Directory and Repository Application Process Map
Appendix 6. Parcel Transfer Verification Check Application Process Map

Appendix 1. Prototype Team Members and Corporate Partners

State Government

Mary Lou Acheson, Senior Computer Operator, NYS Department of Agriculture and Markets
Patricia Arthur, Clerk, NYS Department of Agriculture and Markets
Colleen Benson, Real Property Analyst, NYS Office of Real Property Services
Roberta Brooks, Principal Clerk, Companion Animal Unit, NYS Department of Agriculture and Markets
Sally Cooney, Real Property Analyst, NYS Office of Real Property Services
Joan Darcy, Associate Programmer, Division of Information Systems, NYS Office of the State Comptroller
Carole Francis, Statewide Applied Technology Advisor, NYS Office of the State Comptroller
Michele Hasso, Manager, MACROS Strategic Services, NYS Office of the State Comptroller
Jeffry Huse, Assistant Director, Division of Animal Industry, NYS Department of Agriculture and Markets
Tom Rutnik, Associate Computer Programmer Analyst, NYS Office of Real Property Services
Bruce Sauter, Chief Information Officer and Chief Valuation Strategist, NYS Office of Real Property Services
Wendy Scheening, Manager, Information Systems, NYS Department of Agriculture and Markets
Gregory Smith, Chief Information Officer, Division of Local Government Services, NYS Office of the State Comptroller

County Government

Tim Bortree, Chief Information Officer, Monroe County
Barbara Fiala, County Clerk, Broome County
Ed Hemminger, Chief Information Officer, Ontario County
Robert Lilly, Information Technology Director (retired), Essex County
Kim McKinney, Chief Information Officer, Broome County
Susan Pufky, Assistant Director, Real Property Tax Service, Broome County

Municipal Government

Richard Brown, Director of Development and Planning, City of Canandaigua
Carolee Conklin, City Clerk, City of Rochester
Diane Conroy-LaCivita, Deputy Town Clerk, Town of Colonie
Bonnie Drake, Town Clerk, Town of Canadice
John McDonald, Assessor, Town of Union
Anne McPherson, Deputy City Clerk, City of White Plains
Michelle Mosher, Town Clerk, Town of Gardiner
Kathleen Newkirk, Town Clerk, Town of Bethlehem
Laura Kay Wharmby, City Clerk, City of Canandaigua
Judy Zurenda, Town Clerk, Town of Binghamton

Corporate Partners

AT&T Corporation

Karen Prescott, Data Sales and IP Specialist

CGI Information Systems and Management Consultants, Inc.

Ashish Advani, Consultant
Duane Benson, Technical Architect
William Cunningham, Business Development Director
Lorna Ganong, Director of Consulting Services
Ed McGinley, Consultant
Anish Mody, Consultant
Afzal Mohammed, Senior Consultant
Brian Peek, Senior Consultant
Mandy Prezioso, Senior Consultant

Keane, Inc.
Bob Bush, Senior Consultant
Christopher Desany, Technical Architect
Joann Dunham, NYS Program Manager
Teresa Gillooley, Project Officer

Microsoft Corporation
Bill Branch, Client Executive, NYS

Center for Technology in Government
Meghan Cook, Program Manager
James Costello, Lead Programmer Analyst
Sharon Dawes, Center Director
Dubravka Juraga, Program Associate
Christina Pagano, Program Associate
Benjamin Schwartz, Graduate Assistant
Derek Werthmuller, Director of Technology Services

Appendix 2. Call for Corporate Partners

Center for Technology in Government

University at Albany / SUNY

April 7, 2003

Invitation for Corporate Partnership

The Center for Technology in Government (CTG) is seeking Corporate Partners to participate in a project that will build, test, and evaluate a *State–Local Internet Gateway* prototype. The prototype will use Internet technologies to channel three separate government to government (G2G) business processes involving state agencies and a number of local governments through one common access point. The purpose of the Gateway is to test and evaluate mechanisms for G2G business relationships including selected communications, reference services, information exchanges, and business transactions among state and local government organizations in New York.

Corporate partners bring technical and other expertise to CTG projects by loaning or donating hardware, software, communications technologies, or professional services to the Center. For this project we expect most development work will take place in Albany and be completed during Summer 2003. A field test and evaluation will deploy the prototype around the state and take place in Fall 2003. Please review the detailed information about the project on our web site at www.ctg.albany.edu/projects/lg2/lg2desc.html. Please also review our policies regarding New York State projects and corporate participation at www.ctg.albany.edu/aboutctg/op_pol.html.

The Gateway prototype will be designed to test whether a portal providing access to information and services will offer state, county, and municipal governments greater efficiency, high quality authentic data, and more consistent and coordinated services. It will also help identify the policies, infrastructure, and applications necessary for doing business in this way.

The project consists of two phases. Phase One included the formation of an Advisory Committee and Prototype Teams of state and local governments. These groups defined information and transaction content to be included in the prototype and outlined a structure or architecture for the Gateway. This phase has been completed.

Phase Two of the project moves into prototype design and development, followed by limited state-wide testing and evaluation. The prototype development effort includes not only the overall portal,

but also web versions of three different business processes from three different government domains. This phase of the project provides an opportunity for corporate partners to play a role in activities ranging from demonstrations of specific technologies, to involvement in business process and system analysis, as well as system design, development, and support activities. During Phase Two, we will also deploy the prototype in the field, and conduct a formal evaluation to identify the cost, management, policy, and technology factors related to doing business in this new way.

A **mandatory informational meeting** will be held for interested companies on April 28 at 1:00 PM in the Standish Room of the University at Albany Science Library. Directions may be found at http://www.ctg.albany.edu/projects/lg2/lg2directions.html. **Those interested in participating in the project need to register for and attend the informational meeting.** Please register by contacting CTG by email at slgateway@ctg.albany.edu or fax to (518) 442-3886 by 5:00 p.m. on April 23, 2003. Please include in your registration information your company name and address, name of contact person, phone number,

e-mail address and names of persons attending the meeting.

CTG will select a Corporate Partner(s) for this project in early May.

To obtain more information about the project, visit the CTG Web site at:
www.ctg.albany.edu/projects/lg2/lg2desc.html

For information on CTG policies regarding corporate partnerships see
www.ctg.albany.edu/aboutctg/op_pol.html

The Center for Technology in Government *is an applied research unit at the University at Albany/SUNY. CTG works with government to develop information strategies that foster innovation and enhance the quality and coordination of public services. The Center periodically seeks corporate partners to support our technology laboratory and projects through contributions or loans of hardware, software, and consulting services.*

Appendix 3. CTG Project Policies

Characteristics of CTG's New York State Projects

- CTG provides a neutral environment for innovative public sector projects. With its location in the university, the Center offers government agencies, faculty, and corporate participants a neutral environment for mutual learning and experimentation. The Center is open to all federal, state and local agencies, and related nonprofit organizations, as well as any university faculty and private sector companies.

- CTG projects are partnerships. Each CTG project is carried out through an interorganizational partnership. Project teams usually consist of government agency staff, corporate representatives, and university faculty and students. Each partner should expect to make a significant contribution to the project and each should experience direct benefits from its participation.

- CTG projects are conducted according to mutually developed project objectives.The public, corporate, and academic partners in a project work together with a professional CTG project manager and staff to plan and carry out their objectives. The partners share responsibility for a joint project plan that guides their work throughout the project.

- IT applications in CTG projects are prototypes. Prototyping is a hallmark of many CTG projects. Prototypes focus on those areas within a larger system that have the potential for highest benefit, learning, or leverage. Through the prototyping process, project teams learn about how to use and combine technical tools appropriate to a particular business problem. The prototype and prototyping process give agencies critical experience and information to help them plan and build production-quality systems after they leave CTG. Prototypes are not production quality systems.

- CTG projects are limited in scope and duration. Each project is limited in scope to those elements which appear to have the greatest impact on government programs or operations. As a rule of thumb, projects should be completed in six to twelve months. Project resources from all partners combined generally fall between $250,000 and $750,000 in total value.

- CTG supports projects with a variety of resources. The Center provides a range of resources to each project. These include project planning; best and current practice research; management, modeling, and group facilitation services; hardware, software, and consulting services; use of the CTG Laboratory; access to corporate partners; and faculty and student involvement. CTG does not make cash awards.

- CTG projects are conducted in the public domain. The Center's main purpose is to provide a research and demonstration capacity that benefits the public sector. For that reason, all projects are conducted openly, fully documented, and presented to many audiences in detailed demonstrations and reports. Extensive information is made available through the Center's World Wide Web site.

Roles and Responsibilities of Partners in New York State Projects

All partners have important roles in the Center's program. The roles and responsibilities of project partners are briefly outlined below.

State and local government and nonprofit agencies

- Propose projects either independently or in response to calls for proposals.
- Provide baseline costs and other data to support project selection and evaluation processes.
- Support projects with contributions of staff and other resources.
- Take an active role in project operations and management, including participation in the development of project work plans, reports, and demonstrations.
- Recommend programs or policies that enhance the participation of public sector organizations in the Center.

Corporate contributors

- Suggest potential project topics and respond to specific project proposals.
- Donate or loan technology to the Center's infrastructure or to support specific projects.
- Provide for training and technical assistance appropriate to the products loaned or donated.
- Donate technical, management, or consulting services to the Center or to specific projects.
- Participate in the development of project work plans and reports and serve as members of a project team.
- Recommend programs or policies that enhance corporate participation in the Center.

University faculty

- Suggest potential project topics and respond to specific project proposals.
- Design, conduct, or advise on project research and evaluation activities.
- Recommend and supervise graduate students who work on research and evaluation activities.
- Participate in the development of project work plans, articles, and reports.
- Work actively as members of a project team.
- Recommend programs or policies that enhance academic participation in the Center.

NYS Forum for Information Resource Management

- Maintain a Standing Committee on CTG Operations, which advises the Center on questions related to project proposals, participants, or processes as they relate to state and local government needs and operations.
- Co-sponsor informational and education programs to disseminate project results.

The Center

- Manage the project solicitation and selection processes.
- Provide project coordination and administrative services to support each project.
- Recruit faculty and students to Center projects. Help agencies build working relationships with faculty that will result in effective project teams.
- Invite corporate responses to project proposals, arrange for briefings and other information for interested firms, and select firms to participate in projects.
- Organize project teams to include agency staff, faculty and students, Center staff, and corporate partners.

- Provide a technical environment for project prototypes, including computing platforms, networks, and software tools.
- Provide working space and laboratory infrastructure for projects.
- Evaluate and document project results and produce and disseminate project reports, briefings, and demonstrations.

Criteria for Corporate Partner Participation in New York State Projects

Information technology vendors and other corporate partners are an integral part of many Center projects. Whenever a project could be furthered by the participation of private sector participants, CTG reaches out to the corporate community to invite involvement. This is typically done by posting a call for corporate partners notice in the State Contract Reporter and by sending direct mailings to companies in our database. This is usually followed by an open informational meeting and then by discussions with companies which offer to participate.

CTG staff members review all corporate proposals for individual projects and select proposals that best support the specific project objectives and meet the following general requirements:

- The company can deliver proposed technologies or consulting services to the Center for effective use within the time constraints of the project.
- The company is willing to cooperate with other companies whose products or services are a part of the project.
- The company will provide or help secure adequate training and technical assistance for Center and/or agency staff working on the project.
- The proposed technologies can be integrated with other technologies to be installed as part of the overall project.
- The company will provide complete user and technical documentation for the products proposed.
- Since a primary objective of Center projects is experimentation, the company agrees that donated or loaned equipment and software may be connected to a live environment in the agency and/or to other equipment or systems available in the Center. Additional software may be installed on the company's hardware, and the company's software may be installed onto other Center platforms.
- The company is not subject to any New York State government disciplinary proceedings.

CTG preferences for corporate involvement

Although not required, the Center gives preference to the following situations:

- Ideally, the technical results of a project (e.g., a prototype) should be retained in the Center after the project itself is formally completed. This allows additional agencies the opportunity to work with and learn from the prototype. For this reason, technology donations are preferred over time-limited loans.
- Since most of the Center's work is performed in Albany, the Center prefers to work with companies that have consulting or technical support staff readily available in the Capital District.
- The Center expects that most government systems will operate in a complex, heterogeneous, networked environment. Interoperability, openness, communication, and portability will be

important characteristics that we wish to demonstrate in our prototypes. Technologies that operate in an open systems architecture are therefore preferred over closed systems.

Relationship between the CTG and the New York State procurement process

Center projects involve the study, use, prototyping, and demonstration of new and emerging information technologies that are of interest to government. These technologies represent tools for crafting new services and for improving the productivity of government operations. The hands-on experience and documented results of Center projects will greatly increase the amount and availability of reliable empirical information about these technologies.

Any agency may participate in any Center project, with one exception. No agency that has an open RFP for a technology solution that is the subject of a Center project may be a member of that particular project team. No project will be undertaken by the Center unless government agency staff members are also committed to work directly on the project. This requirement ensures that participating agencies have a strong interest in the technology and a reasonable expectation that the technology can be applied to a real business problem.

Although there is no connection between any particular Center project and any particular procurement, the information generated by projects can improve the technology procurement process in the following ways:

- Agencies become more aware of and better understand how technology can contribute to the achievement of agency missions and goals.
- Agencies become more knowledgeable about particular technologies and about the different approaches that can be adopted in applying them to their organizations' needs.
- Requests for Proposals and other procurement vehicles will be developed by better informed individuals. Specifications will be more fully developed and more explicitly defined. Evaluation criteria will be more appropriately structured and applied.

The productivity value of technology solutions demonstrated in the Center will strengthen agency proposals for purposes of internal review and oversight processes where cost savings, cost avoidance, quality improvements, and productivity enhancements are important evaluation criteria.

Staff relationships with corporate partners

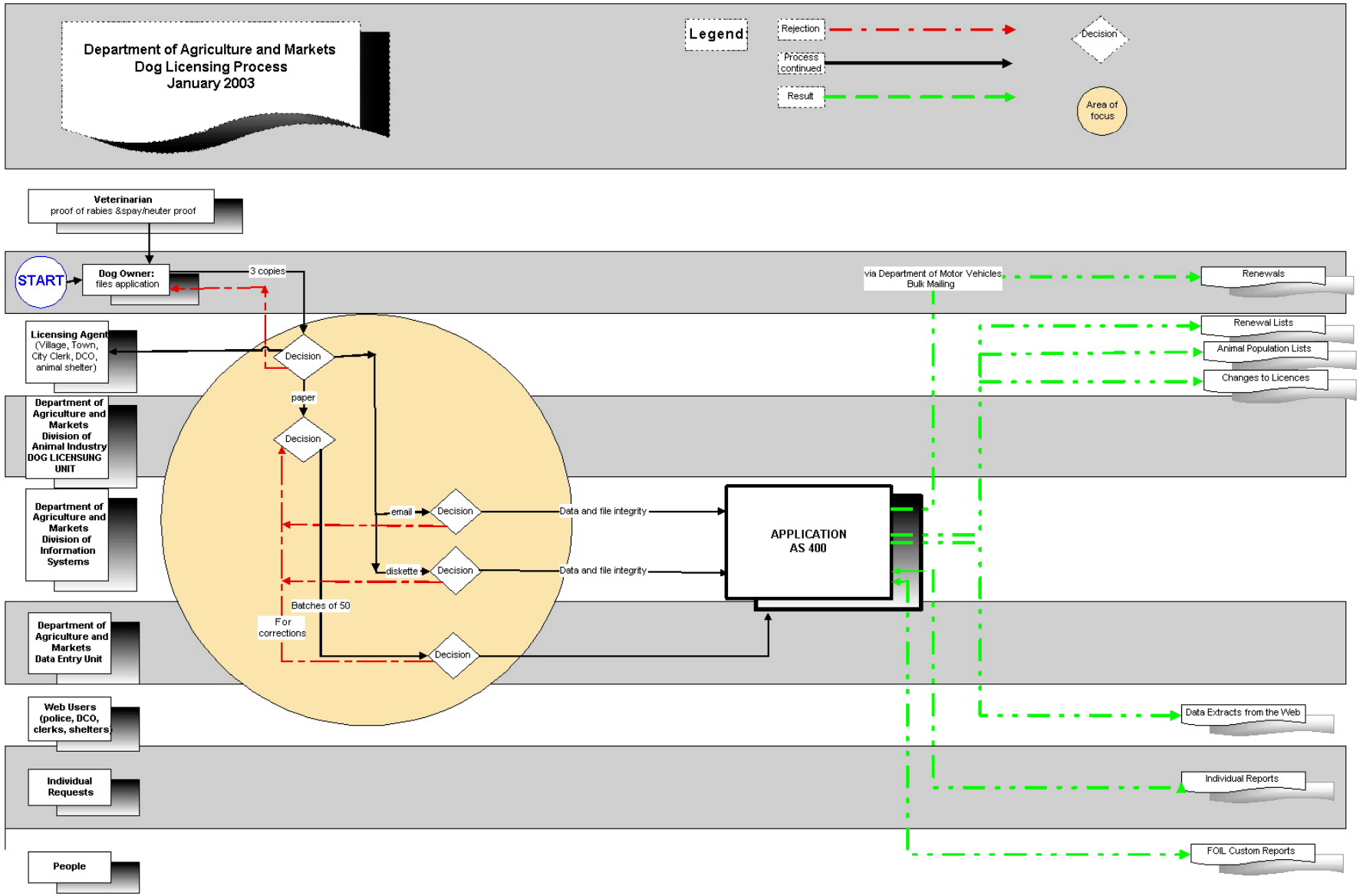
CTG staff, (including regular and temporary professional staff, support staff, Research Foundation staff, faculty, and students) all come in frequent contact with companies that are current or potential CTG Corporate Partners. The relationships that staff establish with these companies will affect the success of CTG as an organization in several respects:

- our reputation for integrity,
- our reputation for public service,
- our reputation for customer service, and
- our reputation for competence.

Our policy regarding corporate relationships is as follows:

- The provisions of the NYS Ethics Law, advisory opinions of the NYS Ethics Commission, and the University ethics policy will be provided and explained to all staff when they begin work at CTG. Staff disclosure statements will be filed as required by University and NYS policy.
- No member of the staff shall accept any thing of value for personal use from any corporate partner or any potential corporate partner.
- Corporate partners are our customers and participate in our program voluntarily. All partners will be treated with courtesy and respect and we will strive to meet their needs and expectations.
- All hardware and software loaned to CTG will be used in accordance with agreements that the contributor and the Center jointly specify.
- Every staff member is expected to be familiar with CTG's corporate policies and procedures and with agreements governing the use of loaned or donated hardware and software.
- Supervisors and team leaders are responsible for training and advising their staff and team members. All questions should be referred to supervisors, team leaders, or the Center Director. In complicated cases, we will seek advice from the campus Office of Human Resources, or from SUNY Counsel, or the NYS Ethics Commission. All staff are expected to report and seek guidance from supervisors or team leaders on any matters which might be construed as a conflict of interest.

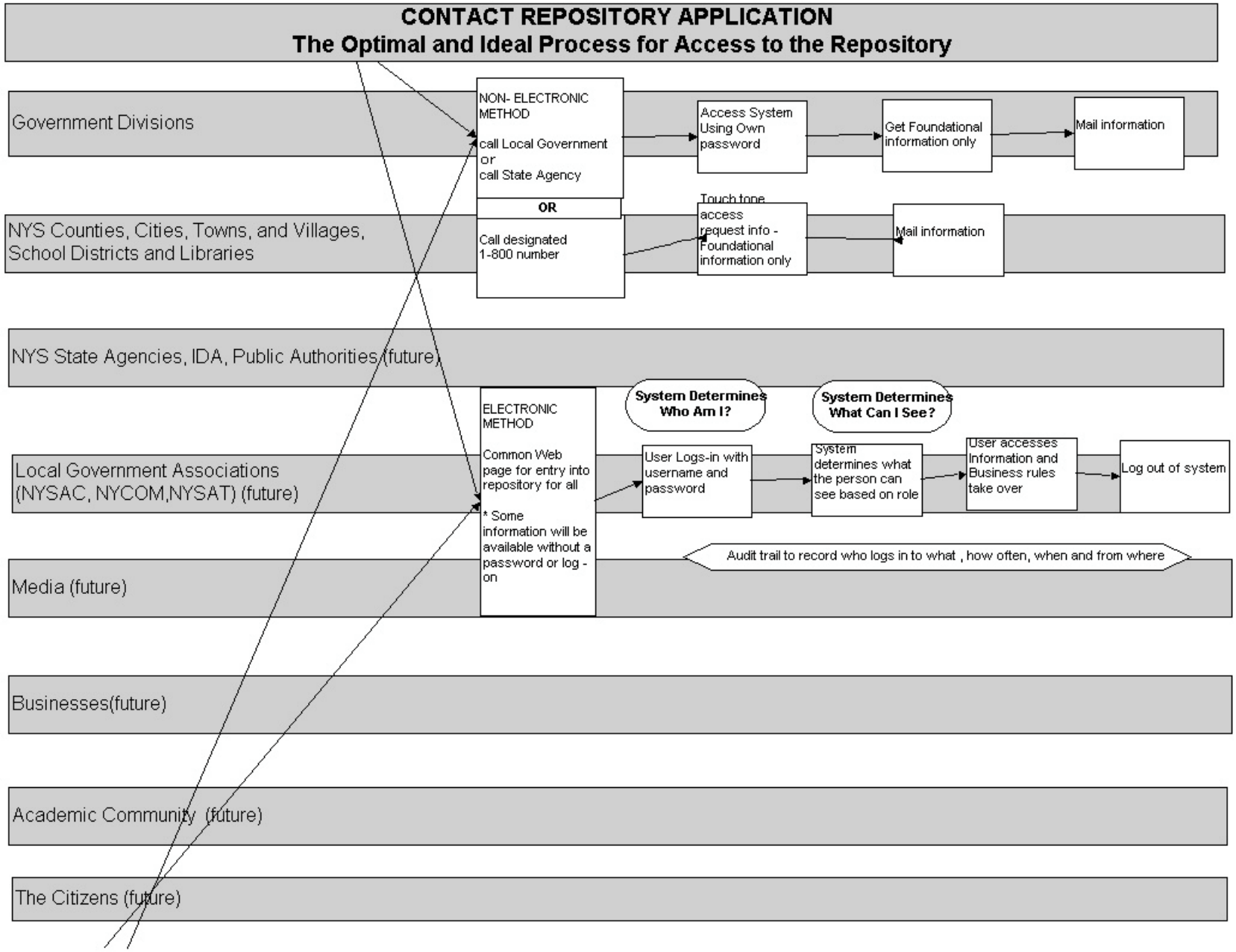
Appendix 4. Dog Licensing Application Process Map

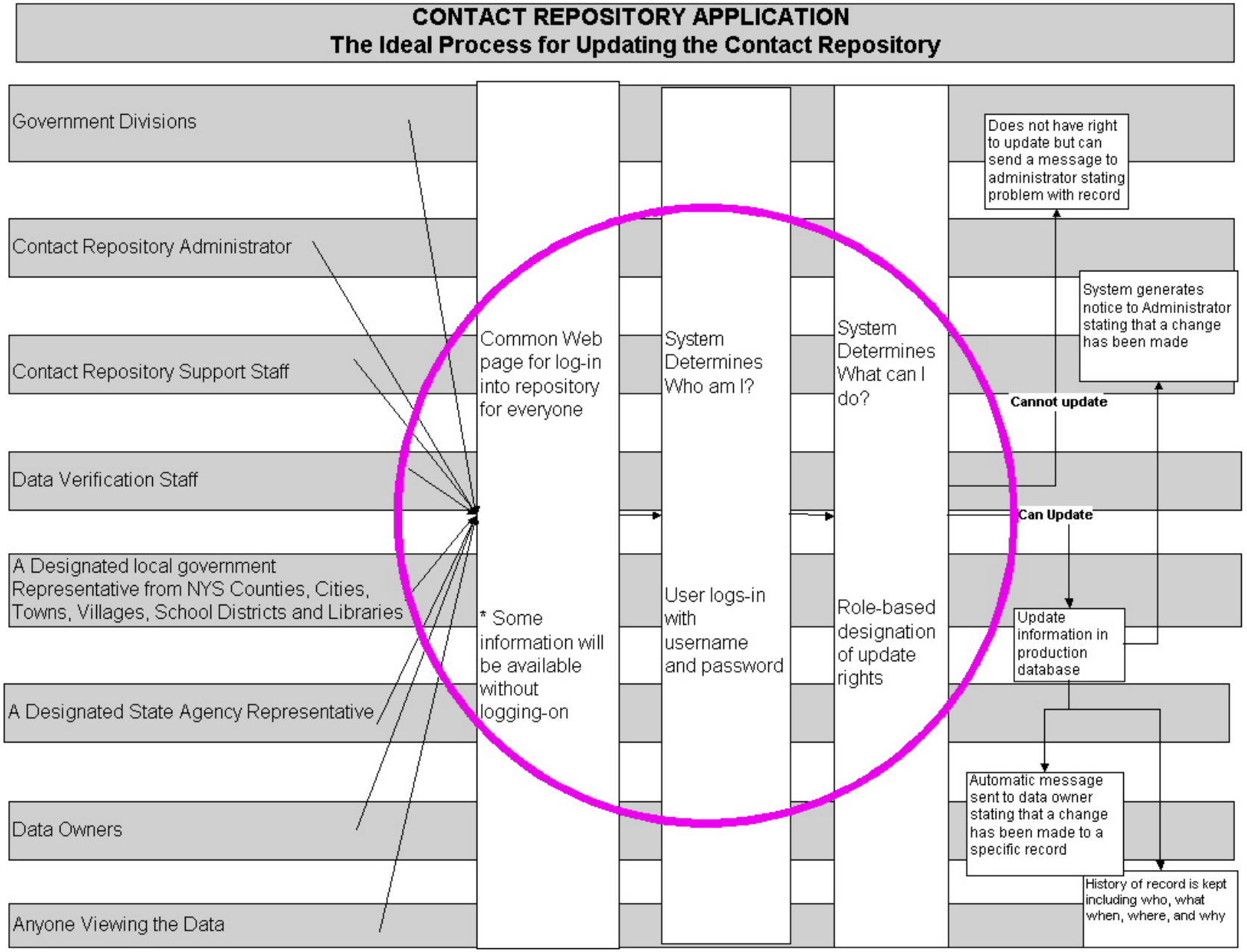
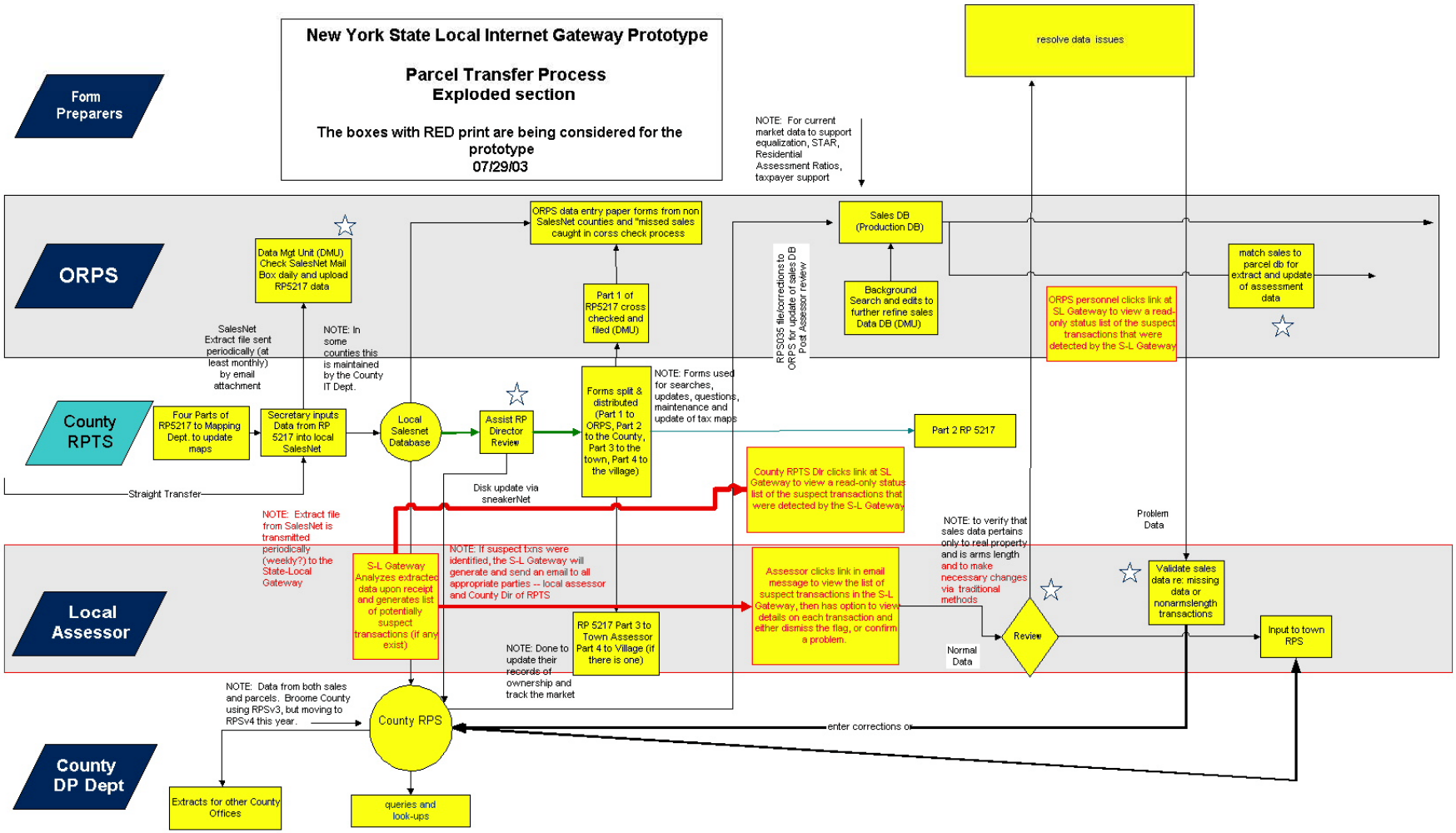


Appendix 5. Contact Directory and Repository Application Process Maps

Two Process Maps on the next two pages:

- The Optimal and Ideal Process for Access to the Repository
- The Ideal Process for Updating the Contact Repository


CONTACT REPOSITORY APPLICATION
The Optimal and Ideal Process for Access to the Repository
Government Divisions
NYS Counties, Cities, Towns, and Villages, School Districts and Libraries
NYS State Agencies, IDA, Public Authorities (future)
Local Government Associations (NYSAC, NYCOM,NYSAT) (future)
Media (future)
Businesses(future)
Academic Community (future)
The Citizens (future)
NON- ELECTRONIC METHOD
call Local Government or call State Agency
OR
Call designated 1-800 number
Access System Using Own password
Get Foundational information only
Mail information
Touch tone access request info - Foundational information only
Mail information
ELECTRONIC METHOD
Common Web page for entry into repository for all
* Some information will be available without a password or log - on
System Determines Who Am I?
System Determines What Can I See?
User Logs-in with username and password
System determines what the person can see based on role
User accesses Information and Business rules take over
Log out of system
Audit trail to record who logs in to what , how often, when and from where


CONTACT REPOSITORY APPLICATION
The Ideal Process for Updating the Contact Repository
Government Divisions
Contact Repository Administrator
Contact Repository Support Staff
Data Verification Staff
A Designated local government Representative from NYS Counties, Cities, Towns, Villages, School Districts and Libraries
A Designated State Agency Representative
Data Owners
Anyone Viewing the Data
Common Web page for log-in into repository for everyone
* Some information will be available without logging-on
System Determines Who am I?
User logs-in with username and password
System Determines What can I do?
Role-based designation of update rights
Does not have right to update but can send a message to administrator stating problem with record
System generates notice to Administrator stating that a change has been made
Cannot update
Can Update
Update information in production database
Automatic message sent to data owner stating that a change has been made to a specific record
History of record is kept including who, what when, where, and why

Appendix 6. Parcel Transfer Verification Check Application Process Map