# Bridging the Enterprise:
## Lessons from the New York State-Local Internet Gateway Prototype

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# Acknowledgments

The success of the New York State-Local Internet Gateway Prototype project rests on the enthusiastic support and active participation of many individuals and organizations. Together, they generously provided professional knowledge and expertise as well as technical and financial support. Representatives of eight state agencies, nine counties, twenty-seven municipalities, two professional organizations, and four private sector companies made significant contributions to the project design, execution, and evaluation. This array of organizations, skills, and interests provided all the ingredients necessary for a rigorous and realistic test of new electronic government-to-government relationships. We believe the results of this collaborative exploration will be useful far beyond the borders of New York State.

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# Executive Summary

Over the past decade, state agencies and local governments throughout New York State have increasingly used information technology to support their work. During this period, dramatic increases have occurred in the use of computing and networks for government services and internal business operations.

Today, state and local government use of information technology is manifested in many independent systems that each support one business function or satisfy 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, as well as a financial strain, because many systems require their own hardware, software, security, office space, and business rules.

To test an alternative strategy, a broadly representative group of state and local officials used their experiences and mutual desire for a better situation to envision an ideal fully functioning state-local gateway for government business in New York State. They devised a set of principles to guide the development of a prototype to test this vision. Prototyping was adopted as the best approach to a situation in which efforts to streamline, simplify, and rationalize the current situation 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. All of these issues were addressed in the Prototype effort.

## Gateway Prototype

The New York State-Local Internet Gateway Prototype was built to identify, demonstrate, and evaluate key factors associated with the design, development, and deployment of a single point of contact for G2G work among state and local governments. The Prototype development was conducted in three stages. The first focused on the refinement of the idea of a gateway and the selection of applications to be included in the Prototype. The second stage was the development of a Prototype (the Gateway and three business applications), and the final stage consisted of Prototype testing and refinement. During these three stages, the project participants were organized into specialized teams and partnered with corporate software development teams. Together, they then tested the Prototype.

In design terms, the Gateway Prototype channeled multiple G2G business functions through a secure, single sign-on, role-based system accessible through the Internet. The Prototype used selected applications to explore policies, infrastructure, data, management, and cost considerations. The Prototype structure allowed all users access to:

- links to Resources on information relevant to state and local officials,

- a searchable, unified Contact Directory of state and local professionals, and

- user support functions including Frequently Asked Questions (FAQ) and Help features.

Three role-restricted applications were selected to represent common categories of state-local business functions so that the learning from the Prototype could be generalized beyond these specific cases.

- **The Contact Repository Application** supported the directory of contact information for state and local officials. This application was chosen to represent an authentic shared data resource with decentralized data management. All contact information was updated electronically through a decentralized process that made each locality or state agency its own data owner.

- **The Dog Licensing Application** supported transactions that take place between cities, towns, and villages and the NYS Department of Agriculture and

Markets. Functionality included searching, reporting, registering a new license, and renewing or transferring a license. This application represented a high volume G2G transaction process.

■ **The Parcel Transfer Verification Check Application** performed a data quality check to flag possible errors in reports of real property transfers made by county real property officials and town and city assessors to the NYS Office of Real Property Services. The application applied nine business rules to each record and flagged records that may have had an error, thus alerting assessors to review them. This application represented rule-based G2G exception reporting.

## A vision for a better way of working

During the conceptualization, construction, and testing of the Gateway Prototype, state and local government professionals frequently commented that the entire project represented "a better way of working" compared to their current environment. This sentiment referred to both the Prototype itself and the collaborative project approach.

Two broad themes emerged from the project experience and evaluation: the importance of investing in ongoing peer-to-peer relationships and endorsement of the principles of enterprise. Relationships and enterprise thinking form the basic structure of effective state-local business relations; both are necessary, but neither alone is sufficient.

**Relationships.** Participants in the project repeatedly emphasized the importance of long term, peer-to-peer business partnerships among state and local governments. They understood how active collaboration focused on a shared goal can yield high quality results. They also emphasized the mutual respect that comes from recognizing that every participant has expertise to

contribute and needs to be considered. More specifically, the theme of relationships extends to recognizing the importance of active intergovernmental engagement and local representation as well as the importance of paying attention to state level coordination and the increasing complexity of vendor roles in intergovernmental work.

**Enterprise approach.** The second broad theme of the project strongly validates the concept of enterprise as applied to government. Enterprise thinking emphasizes the interdependencies among the different domains, organizations, and levels of government. It seeks to capitalize on the relative strengths of different players and to tie them together through the use of standards, partnerships, and shared resources. Enterprise thinking focuses on the broad purposes of government and relies on a complete understanding of the business processes that accomplish those purposes. Some elements of enterprise thinking include standard infrastructure, identity management, role-based security, and single sign-on as well as usability, data standards and quality controls, and intergovernmental information policies.

The benefits of working in a carefully thought out G2G environment are amply demonstrated by this project. The project also highlights the realistic challenges of accepting and acting upon an enterprise view of government. Consequently, the project results suggest a set of practical strategies that can be used to bind the structure together and reinforce the value of relationships and enterprise principles. These strategies include joint governance, communication, business process analysis, field work, specialized project management, training and support, and understanding the complete cost structure for these initiatives.

## Recommendations for initial future investments

Our investigation showed broad and enthusiastic support for a single point of contact for G2G work in New York State as a "better way of working." However, the demonstrated complexity of implementing this concept suggests that incremental and modular approaches make the most sense for future development. We believe the following represent the best near term opportunities for moving in this direction.

**Identify and provide coordinated access to relevant public information and resources on the Web.** The first and easiest opportunity is to create and maintain organized access to Web resources relevant to state and local professionals. The Resources section of the Prototype represents a good start. Users appreciated the opportunity to have many resources, including NYS and federal government information, professional organizations, legal resources, and data resources, all categorized and summarized for them.

**Use the Web to co-locate access to related programmatic functions.** The Gateway Prototype demonstrated how multiple job functions associated with a particular professional role or service domain could be brought together in one Web interface accessible by a single sign-on process. Although the Prototype incorporated only a few applications, the logic and appeal of this approach was evident to the participants, who could readily envision how all their own business applications could be brought together in a single interface.

**Develop a single authentic repository of contact information with decentralized data management.** The application that generated the most excitement and unanimous desire to see made functional is the Contact Directory and its associated Contact Repository Application. Although it represents a high degree of integration and complexity, the need for such a resource is pressing and self evident: no single authentic source of contact information exists, yet every state agency and local government needs this information to do its work.

## Conclusion

The New York State-Local Internet Gateway Prototype project represented goals and challenges of vital interest to every state and to any other federated system of government. The findings and lessons reveal the importance of understanding and balancing the goals of data and service integration against the related challenges of complexity and cost. The project results should be of value to many who are attempting to strike that right balance.

# Chapter One: Project Overview

## Background

Over the past decade, state agencies and local governments throughout New York State have increasingly used information technology to support their work. During this period, dramatic increases have occurred in the use of computing and networks for government services and internal business operations. Since the mid 1990s, the Internet has exerted two powerful forces for change in government use of technology. First, the Internet offers government a new and flexible platform for information-based services. Second, through the World Wide Web, both agencies and the public were introduced to the possibilities for more responsive and customized services. Together, these effects generated what we have come to call "e-government."

While the early focus of e-government has been primarily on government-to-citizen (G2C) and government-to-business (G2B) services, government-to-government (G2G) initiatives are now gaining increased attention. The sharpening G2G focus represents a broad realization that improved services to citizens and businesses, more efficient operations, greater transparency, and all the other externally-focused goals of government must rest on internal operating policies and behind-the-scenes administrative functions that are well-designed, intelligent, and interoperable.

To achieve a high quality "back office" that supports very visible public service goals, government needs more than advanced technology. It also needs new strategies, thoroughly redesigned business processes, and creative incentives and mechanisms for interagency and intergovernmental collaboration and coordination. The project reported here explored this set of require-ments through a Web-based Prototype involving state, county, and municipal governments.

This report is organized into four chapters plus appendices. This first chapter discusses the background of the project and the issue of G2G integration that it addressed. This chapter also offers a vision of an ideal G2G gateway and its benefits, as well as the barriers that stand in the way of its creation. The second chapter explains the design of the Gateway Prototype. Chapter 3 tells the story of the project itself, who participated, how the Prototype was developed, and how it was tested. Chapter 4 discusses the results of the evaluation and presents conclusions and recommendations for future G2G work. The Appendices include illustrations from the Prototype, lists of participants, and field test and evaluation information.

## Problem statement

Today, state and local government use of information technology is manifested in many independent systems that each support only one business function or satisfy one particular program need. As a result, a large and growing number of individual systems for G2G business relationships are employed across state and local levels. This multiplicity of systems is often a significant impediment to efficient work, as well as a financial strain, because many applications 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 in another. Numerous duplicate requests for information are made

and fulfilled as individual organizations respond to uncoordinated requests and requirements. Moreover, many local offices keep duplicate paper or electronic copies of information they send to the State because these state-sponsored systems are seldom interoperable or designed with local information needs or business practices in mind. 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. If current practices continue, this picture of multiplicity and duplication will worsen as more individual business functions are automated.

Figure 1 illustrates only a fraction of the current array of NYS G2G relationships and interactions by representing a portion of the electronic information systems that connect state and local governments. The figure shows a small number of each kind of government organization and does not reflect any inter-local information systems connecting county and municipal governments. If we extend this picture to include all existing information systems among all state and local entities the picture would be far more complicated, with hundreds of connections involving state agencies, counties, towns, cities, and villages.



**Figure 1. Simplified depiction of existing intergovernmental information systems**
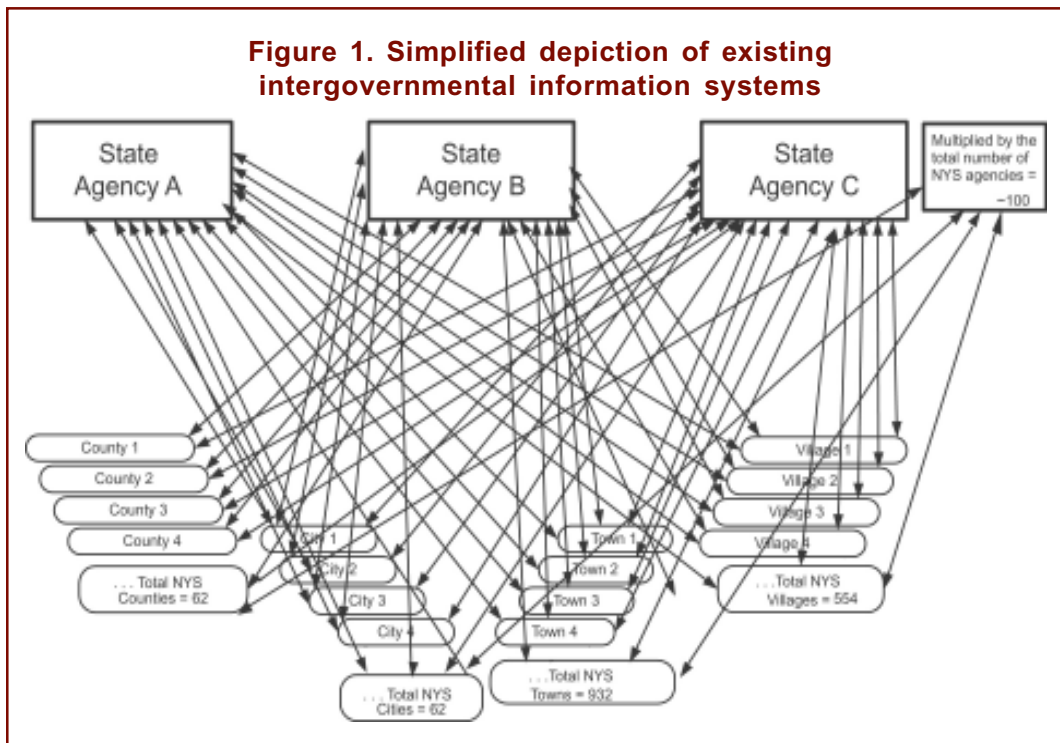
## Integrating G2G business

Efforts to streamline, simplify, and rationalize the picture of existing intergovernmental information systems in New York State are very desirable but 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. Figure 2 illustrates some of the elements that need attention. The horizontal axis of the figure represents increasing degrees of integration and notes key features of integration (common interface, single sign-on, integrated data, and integrated processes) necessary to achieve each higher level. As shown in the lower left, individual stand-alone systems represent the absence of integration.

The first true feature of integration is represented by a common Web interface that can be adopted for standard use by multiple stand-alone systems. Single sign-on, which requires identity management and role-based access, represents the next level of integration. It allows users to have secure access to some or all of the systems associated with their work by signing on once. When this feature is in place, users begin to experience the benefits of integration, but designers and system operators must accommodate higher levels of coordination and standardization.

Integrated data represents a significant increase in integration, whether that data is integrated across programs or units of a single organization or across multiple organizations. With this step, a wide variety



**Figure 2. Integration features, applications, and effects**
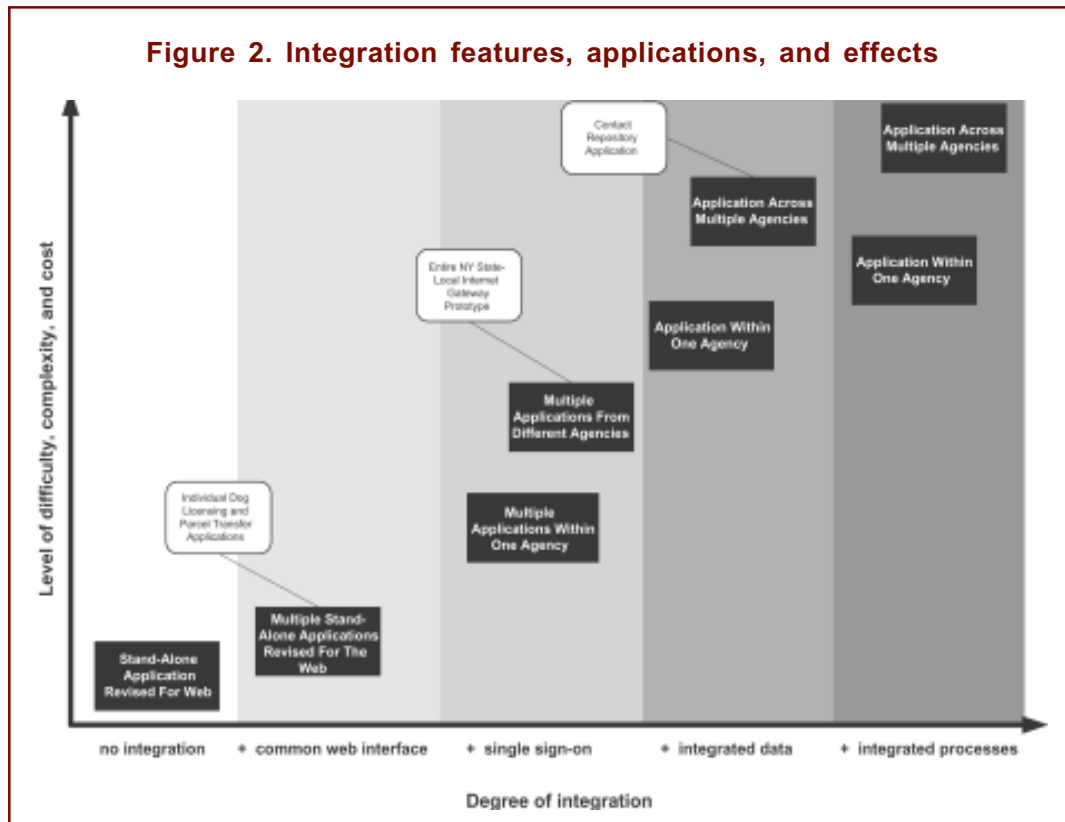
of data management challenges must be addressed. These include agreement on data standards, quality control, stewardship mechanisms, and access and change rights.

The most advanced level of integration is represented by process integration, where organizations not only share and integrate their data, but revise their work processes to accommodate and capitalize on shared work processes and business practices.

The vertical axis of the figure represents increasing difficulty, complexity, and cost. As integration initiatives move from low-level efforts to co-located independent systems through a single Web interface, to single sign-on mechanisms, to creating integrated data repositories or applications that share data, to the very demanding applications that integrate both data and business processes, the cost, complexity, and difficulty rapidly increase.

The shaded boxes in Figure 2 place selected kinds of development efforts at the intersection of degree of integration and level of difficulty, complexity, and cost. The white boxes illustrate these types with applications from this project. For example, two of the individual applications in this project (Dog Licensing Application and Parcel Transfer Verification Check Application) were adaptations of existing non-Web applications. By revising them for the Web, the developers adopted a common Web interface. By contrast, the Contact Repository Application represented a new application that integrated data from multiple organizations into a single authoritative new source. This application was much more difficult and expensive to build. In the third example, the single sign-on feature of the Gateway Prototype allowed these different applications to be brought together in a single interface accessible with role-based identity mechanisms. This represents a middle-level of integration and resource investment. All of these examples are more fully discussed in Chapter 2.



# An ideal state-local gateway

Taken together, Figures 1 and 2 illustrate why New York State and local government officials sought to carefully explore and prototype the idea of a single point of contact for G2G work. The current situation is inefficient, complex, and expensive, but alternative approaches present some daunting challenges for which there is little practical experience. Thus, the idea of a prototype project was adopted as a useful way to understand the feasibility of moving from the current state to a more integrated future.

## *Characteristics of an ideal state-local gateway*

Working with a broadly representative project Advisory Committee, the project planners used their experiences and mutual desire for a better situation to envision an ideal fully functioning state-local gateway for government business in New York State. They conceptualized the gateway as a single secure place on the Internet which would channel all G2G work. They called the idea a "gateway" rather than a "portal" to avoid confusion with the common use of portals to offer services to the public.

The participants elaborated on their ideal by specifying a number of desirable characteristics.

**Joint governance.** The ideal gateway would be governed jointly by state and local organizations through a formal governing structure. This structure would include fair representation of state, county, and municipal stakeholders. It would also include open communication, and joint problem-solving and decision-making mechanisms.

**Gateway design driven by genuine business needs.** Each application would address information and management needs associated with a particular business function that is relevant to both state and local organizations. Each application would provide business value right from the start, even with less than full participation of all state and local agencies.

**Affordability to all interested participants.** The costs associated with adopting and using the gateway would not be prohibitive to any state agency, county, or municipality.

**Financial solvency.** The gateway would be designed to offset initial investments and ongoing costs through future cost reductions to all participants.

**Protection from threats and misuse.** The gateway would be protected from external threats and internal misuse by jointly established security features and policies. Access would be limited to authorized personnel assigned roles associated with specific functional requirements. Standard security measures would be in place to protect the infrastructure, transactions, and data.

**High quality, accurate, and authentic data.** Data sources and associated metadata used in the gateway would be assessed for "fitness for use" and authenticity. Data quality and usability would rely on designated data owners and clear processes for additions, corrections, and updates. Data cleansing and analysis tools and data management services would be available to users.

**Modular, flexible, and versatile in design and content.** Envisioned in its entirety, the gateway would be built in a gradual fashion, according to current needs and available resources, delivering both near- and long-term benefits. Its modular nature would not require immediate full participation of all state and local agencies for successful initial performance. The gateway would also follow an evolutionary development strategy where ongoing evaluation leads to continual improvement. Information and applications would use a standard set of conventions and continually be evaluated for usability and improvement under a variety of local conditions. New business-driven information resources and applications would be added regularly.

**Accommodation of users with varying levels of skill.** The gateway would be designed to accommodate users with low technical skills. It would be intuitive, transparent, and simple to use with a common vocabulary, and a single sign-on. Issues of accessibility would be addressed appropriately. The gateway would be accompanied by solid user support mechanisms and training programs.

**Responsiveness to the needs of users.** Applications would be designed from the user point of view. Online help would be readily available, as well as immediate real-time confirmation of processed transactions.

**High reliability and availability to all state and local users.** Appropriate connectivity would be available to all participants including adequate basic infrastructure from desktop equipment and software to network speed and bandwidth.

**Capability to incorporate other existing efforts.** To take advantage of existing investments, useful characteristics of existing projects and applications that address shared processes and business needs would be incorporated into the gateway.

## Potential benefits

The project planners also sought specific categories of benefits from an ideal gateway.

**Efficiency.** The ideal gateway would save time and money by reducing the manual workload and duplication of tasks, as well as achieving economies of scale. It would allow creative and efficient use of existing funds, systems, and infrastructure already in place at all levels of government. It would also promote quicker and more reliable and complete communication among all levels of government.

**Improved coordination and consistency.** Shared processes, common data definitions, and more logical programmatic connections would yield better coordination between the state and local levels, and more consistent program designs and internal operations thus leading to better quality services.

**Data quality and access.** Re-use of well-defined, consistent, complete, and accurate data would allow the same information to satisfy multiple demands and support greater data integration and utility for multiple users. Improved intergovernmental data management would reduce costs and promote wider responsibility for information stewardship across government.

## Potential barriers

The foregoing characteristics and potential benefits of an ideal gateway would not emerge without significant effort to overcome key barriers. The project planners described these barriers.

**Cost.** Concerns were expressed about the initial and ongoing costs of a gateway, as well as concerns about the distribution of costs across levels and units of government with different budget cycles, spending priorities, and revenue capacities.

**Complexity.** Multiple and conflicting state business rules and practices often prevent needed coordination among agencies and programs at both state and local levels. This problem is often tied to the fact that many programs are federally defined and funded so that rules and practices are not always within the state's authority to change. Furthermore, the diversity of local governments adds to the complexity. Local capabilities and practices are far from uniform from place to place because they are locally devised to accommodate community-level demographics, economies, infrastructures, and needs. Finally, any effort to create a common gateway must recognize the many legacy systems supporting established programs that cannot be replaced or significantly changed in the near future.

**Politics.** Political support for a state-local gateway will compete with many other governmental priorities and there will be difficulty maintaining political support across the election cycles of so many jurisdictions. Concerns about control and management of the overall effort stem from questions about who will have authority to do what. In addition, some agencies and local governments may resist opening their data to new uses or users.

# Chapter Two: The New York State-Local Internet Gateway Prototype Design

Prototypes are used to represent, test, and revise design concepts. Their purpose is to test certain aspects or characteristics of a desired system without incurring the cost or time of actually building a full system. Prototypes include just enough functionality, data, and presentation features to build mutual understanding between designers and users and to test key elements of the design. They are not developed into a final product, but inform its later development through iterative testing, discussion, and evaluation. Prototypes can range from paper and pencil sketches to partial systems, depending on the complexity of the design to be tested.

The New York State-Local Internet Gateway Prototype was a partial system built to identify, demonstrate, and evaluate key factors associated with the design, development, and deployment of a single point of contact for G2G work among state and local governments. In design terms, the Prototype channels 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.



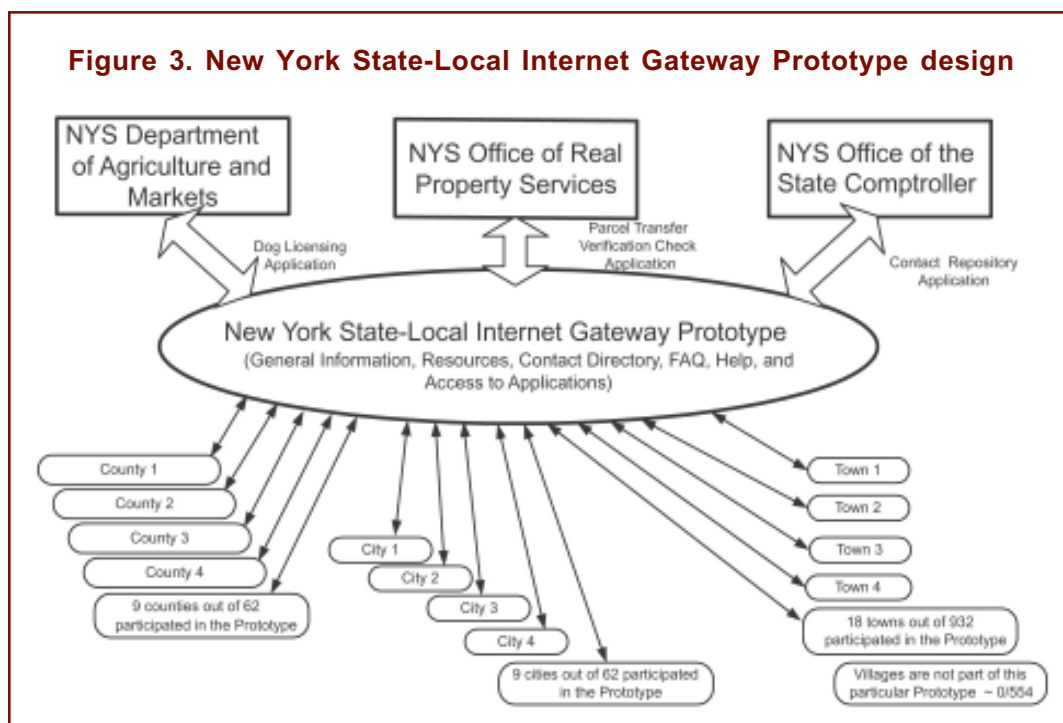**Figure 3. New York State-Local Internet Gateway Prototype design**

Figure 3 represents the high-level conceptual design of the Gateway Prototype. It included applications from three state agencies, plus general information features. It used data about 15 (of 62) counties and their associated municipalities. 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 to authorized government officials. The Prototype focused entirely on G2G relationships: it did not offer public services.

Even in this limited form, however, the Prototype was designed to represent key features of governmental structure and dynamics in New York State. Toward that end, key working assumptions were adopted that guided participation, design, and testing. First, state and local agencies were all defined as both customers and suppliers of information and services to the Gateway Prototype; neither level was exclusively the customer of the other.

Second, in order for the Prototype to generate enough useful results, it had to demonstrate how multiple organizations at different levels of government work together. We therefore selected three state agencies from three different policy domains and thirteen local governments (including counties, towns, and cities, but not villages) from every region of the state to take part in the design. We refer to cities and towns collectively as "municipalities." Local governments were selected to represent a wide variety of size, wealth, and technical sophistication. Together with the Center for Technology in Government (CTG) staff and corporate partners, these state and local representatives constituted the Prototype Team.

Third, part of the Gateway Prototype's purpose was to identify the value proposition for all participants. Consequently, both benefits and major cost categories were documented for all types of participants. This data lays a foundation for establishing cost structures for any future effort.

## The Prototype design

The Gateway Prototype was designed to offer some features and applications to all users and to limit other applications to specific users based on their functional roles. 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 features.

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.

■ **Contact Repository Application.** This 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. This business process was chosen to represent an authentic shared data resource and was modeled after a similar effort at the New York State Office of the State Comptroller.

■ **Dog Licensing Application.** This application 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. This application was chosen to represent a high volume G2G transaction process.

■ **Parcel Transfer Verification Check Application.** This application 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 New York State Office of Real Property Services (ORPS), county real property officials, and town and city assessors. The county forwarded property transfer records to the Gateway 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. This application represented rule-based exception reporting.

The role-based access feature was built into the 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 Gateway Prototype she had immediate access to both the Contact Repository Application and the Dog Licensing Applications, but not to the Parcel Transfer Verification Check Application.

# New York State-Local Internet Gateway Prototype Scope Statements

The Prototype consisted of several components, including the Gateway Prototype, a Dog Licensing Application, Parcel Transfer Verification Check Application, and Contact Repository Application.

## Gateway

The purpose of the Gateway Prototype was to pull several different G2G business functions from different state and local agencies through one common place on the Internet. The Gateway Prototype included:

- 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 (dog licensing, parcel transfer data verification check, contact repository),

- access to general information resources, and

- access to Help and FAQs.

## Dog Licensing Application

This intergovernmental application represented a high volume transaction process. It involves the NYS Department of Agriculture and Markets and cities, towns, and villages throughout the state. The Dog Licensing Application provided:

- data as required in the existing DL1 Form,

- input into a repository of new dog 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.

## Parcel Transfer Verification Check Application

This application supported an exception reporting process that involves ORPS, county real property officials, and town and city assessors. It was 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:

- validation of data input from the required RP 5217 form,

- alerts to assessors, county real property tax service officers, and ORPS staff about potential data conflicts or abnormalities,

- simplified verification and correction steps for data quality, and

- more accurate recording of parcel transfer data in the initial stages of reporting.

## Contact Repository Application

This application, modeled after the Office of the State Comptroller's MACROS system, provided access to a 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.

# Chapter Three:
# The Project Approach

As with all projects conducted at the Center for Technology in Government, this one followed a collaborative analytical process involving all key stakeholders. The first step was to identify and engage a broadly representative group of state, county, and municipal officials interested in improving G2G business relationships. Assembled at first as an Advisory Committee, these individuals worked with CTG to define their mutual goals for a G2G investigation. This resulted in the statement of ideal characteristics for a G2G gateway plus expected benefits and barriers. The group also adopted a set of working assumptions that governed how the team would work together.

In the next stage, CTG conducted current practice research to explore other efforts in New York and in other states that would give the project the benefit of others' experiences. The Prototype Team, made up of state and local officials, was formed in the process of selecting specific applications to test in the Prototype. This Team worked as a whole and in subgroups to conduct detailed process analysis and to specify modest, moderate, and elaborate versions of the Prototype applications. From this analysis, specific scope statements were developed. Corporate partners then worked with the Prototype Team to elaborate the process maps and further define user requirements. From these specifications, corporate partners developed the Prototype which was then tested several times by CTG staff, by the Prototype Team members, and by additional state and local officials recruited specifically for a field test. The test made use of baseline data about current operations and user assessments of 34 specific tasks. Further, evaluation data was collected in a survey and in focus group discussions with the testers.

Figure 4 presents the timeline for the entire 21-month project. Major categories of work included concept exploration, Prototype Team and corporate partner recruitment, Prototype design and development, Prototype testing and refinement, current practice research and literature reviews, field testing, data analysis, and product development.



**Figure 4. New York State-Local Internet Gateway Prototype Project Timeline**
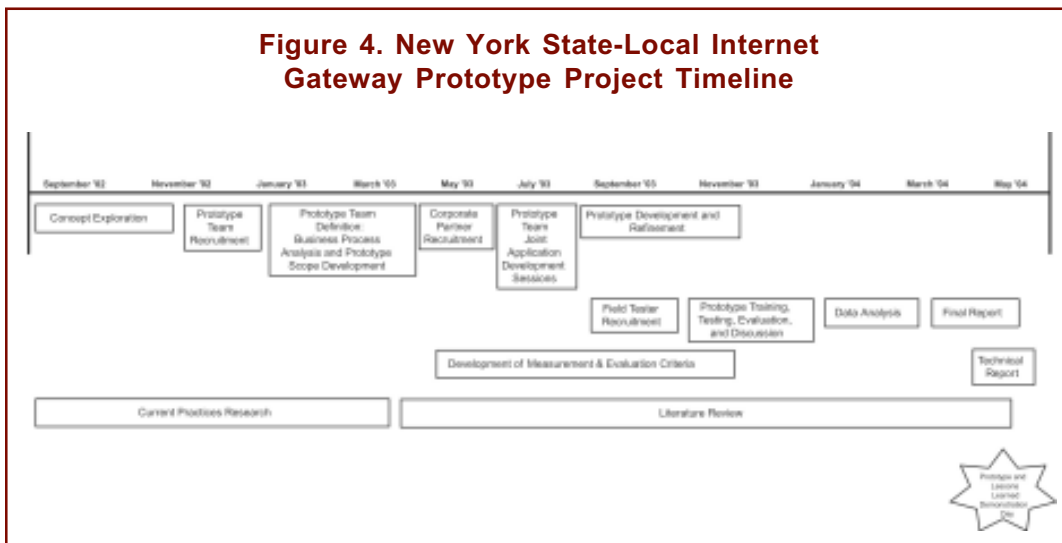
## Participants

The Advisory Committee emerged from the Local Government Advisory Committee established to advise the NYS Office for Technology on its eCommerce/eGovernment initiative. It provided overall direction, initial planning, and feedback at various points during development. The Prototype Team worked with CTG and corporate partners (CGI Information Systems & Management Consultants, Inc. and Keane, Inc.) on Prototype planning, design, and development. CTG was the primary project manager and liaison between the Prototype Team and corporate partners, while corporate partners were the primary Gateway Prototype developers. Two additional corporate partners provided resources to the project. AT&T Foundation made a grant award of $20,000 which was used to support local involvement and extended evaluation. Microsoft provided software used to build one of the Prototype applications. Eighty individuals, representing eight state agencies, nine counties, nine cities, 18 towns, two universities, two professional organizations, and two private sector companies participated as Prototype Team Members, Advisory Committee Members, and field testers. In addition, 15 individuals from the four corporate partners joined seven CTG staff in this effort. A full listing of participants is presented in Appendix B.

## Prototype development

The New York State-Local Internet Gateway Prototype development was conducted in three distinct stages: the first focused on the refinement of the idea of a gateway and the selection of applications to be included in the Prototype. The second stage was the actual development of the Prototype (comprising the overall Gateway and three business applications), and the final stage consisted of testing, refinement, and technical support for the field testers. During these three stages the project participants were organized into specialized teams,

worked with software development teams from CGI and Keane, and tested the Prototype.

### *Phase One*

The goal of Phase One was to select several business process applications and decide which features would be included as parts of the Gateway Prototype. In order to consider an application for the inclusion in the Gateway Prototype, it had to meet several criteria.

- Its business process had to encompass more than one level of government.
- It had to be small enough so that it could be built within our time frame, but it had to be comprehensive enough to answer the questions of interest.
- It had to already exist in some form.
- The data to be used in the application had to be readily available and accessible.

In order to develop the applications successfully, a prototype team of state and local professionals was established and divided into subgroups for selected applications. These groups consisted of people whose daily job functions included portions of the business process of that particular application. Members needed to be able to dedicate time to the project and provide specialized knowledge to the development process.

The groups developed scope statements for each application which reflected their understanding of the requirements for both the application and this new kind of intergovernmental work. They also developed high-level process maps and data flows for each of the applications and identified which part of the full process would be the target for the Prototype.

## Phase Two

In the second phase, conceptual work was given to corporate partner developers. They were provided with only general guidelines for software development (such as the need for the Gateway Prototype to be accessible through a standard Web browser, to be accessed via a dial-up line, to be intuitive, etc.). The actual coding standards for software development were left to corporate partners' expertise and discretion.

Corporate partner software developers held several joint application development sessions (JAD) with the Prototype Team. The purpose of the JAD sessions was to further define and clarify the components and requirements of each of the applications. During this phase, CTG staff acted as a liaison between corporate and government partners to facilitate the process and reduce the workload of the government teams. After the JAD sessions, corporate partners developed applications, reviewed them with the Prototype Team, and fine-tuned them.

## Phase Three

The third phase consisted of testing and supporting the now finished Gateway Prototype. The Prototype was subjected to two rounds of user acceptance testing before it was made available for the field test. In the first user acceptance test, the Gateway Prototype was examined and tested by the CTG staff. The second user acceptance test was conducted by both state and local members of the Prototype Team. After each test, refinements and modifications took place as necessary.



## Field test

The purpose of the field test was to evaluate the Gateway Prototype in terms of ease of use, usefulness, convenience, and speed, and to compare it to the current method of working. The test also elicited information about implications for policy and management. Field testers included members of the Prototype Team (20) and additional state and local officials who had not been involved in the development process (36). All testers participated in one of five half-day regional training sessions (in the Capital Region, Central NY, Western NY, Northern NY, and Downstate NY) where they watched a demonstration of the Prototype, received and reviewed a workbook, were assigned their roles and passwords, and reviewed instructions for completing tasks associated with their assigned roles. They tested the Prototype from their places of work, although some reported conducting the test from home due to lack of time during the work day. Testers had two weeks to conduct the field test. During that time, a full time telephone Help Desk staffed by a CTG staff member with access to corporate partner experts was available. After completing the workbook, the field testers again gathered in the regional locations for half-day discussion groups. The entire field test process took approximately one month from the first training session to the last discussion group.

# Data gathering methods

Six sources of information contributed to the project design, operation, and evaluation. Each source offered a different kind of information useful for different purposes. Together, these sources provided a comprehensive set of data to support the project activities and results.

**Current practice review.** In order to better understand the complexities of G2G work, CTG conducted current practice research by posting messages on professional listservs, searching the Web, and conducting telephone interviews with officials around NYS and in other states engaged in similar state-local initiatives. This background research uncovered some interesting limited efforts whose experiences were useful in our design. Some supported G2G information access, but not business processes. Others focused on a single program or program area such as human services. One involved state-supplied tools and standards to help localities develop their own Web services. However, no multi-agency, multi-purpose, business-driven G2G initiative was discovered.

**Baseline documents.** Field testers were asked to fill out a baseline questionnaire prior to testing the Gateway Prototype. The questionnaire documented their current practices and workload relevant to the business transactions or programmatic areas in the Prototype. This information allowed us to make comparisons between existing practices and workload and the alternatives represented by the Prototype.

**Process mapping and joint application development sessions.** Prototype Team members worked with CTG and corporate partners to map process models and develop user requirements for the applications within the Gateway Prototype. These working sessions provided a forum for the exchange of information within the Prototype Team and with the developers. In this forum, business process modeling was performed, process and workload questions were raised and answered, problems were discussed and clarified, and issues resolved. These sessions defined the applications and the manner in which they would be tested.

**Field test workbooks.** Field testers used detailed task-oriented workbooks to guide them through the Prototype testing process. All testers were assigned specific roles depending on their job duties and were asked to perform related tasks and complete questions about those tasks. They were then asked their opinions about the use of the Prototype compared to their current way of working in terms of ease of learning and use, navigation, speed, convenience, security, and other topics.

**Discussion group notes.** Upon completion of the field test, testers were brought together once again in half-day focus groups to discuss and share their experiences using the Prototype. Interview questions are presented in Appendix D. The questions focused on overall lessons, technology, knowledge and skills, data, policy, costs, and strategy. During the discussion groups, testers not only answered questions as individuals but engaged in discussions about their experiences that shed additional light on the Prototype design and the conditions in which any similar system might be deployed.

**Help Desk.** During the field test, a help desk was established at CTG. All calls were documented and summarized. This information gave us insight into specific problems that users encountered during the testing phase.

# Chapter 4: Findings, Conclusions, and Recommendations

During the conceptualization, construction, and testing of the New York State-Local Internet Gateway Prototype, state and local government professionals frequently commented that the entire project represented "a better way of working" compared to their current environment. This overall sentiment referred to both the Prototype itself and the project approach.

## A vision for a better way of working

Field testers expressed high overall satisfaction with the Gateway Prototype. Of the 34 specific tasks tested, 97% were rated easy or very easy to complete. In terms of applications, all were rated easy or very easy to learn; they were rated high or very high for convenience, usefulness, and speed, as compared to their current way of working. During the focus groups, testers confirmed that a better way to conduct their everyday business entails having all relevant information and processes readily accessible through one common electronic work area.

In terms of the project approach, many people on the Prototype Team found the group modeling, analysis, and group decision techniques used by CTG and the corporate partners to be both novel and effective. Each working session made use of

specialized techniques to foster discussion, promote exploration, achieve consensus, and ensure detailed documentation of the process and the underlying data. Most participants had never been involved as early, as deeply, or as collaboratively in previous projects. They welcomed the opportunity to participate in the project in this way and, for many, this type of engagement prompted them to think about the possibilities for more productive intergovernmental partnerships.

Similar to the Prototype Team, the field testers expressed the opinion that the Gateway Prototype represented a better way of working. We asked them during the discussion groups following the field test to pinpoint the most important lesson from the Prototype evaluation. Overwhelmingly, they commented on a sense of community and collaboration among state and local governments. One field tester concluded that "the technology is probably not the barrier; it's the management issues that surround something like the Gateway Prototype." Another went on to say that, "when you get state agency people and local government people in the same room, synergy starts to build and you get a better, more useful product at all levels. All future projects should be done this way."

Two broad themes emerged from the project experience and evaluation: the importance of investing in ongoing peer-to-peer relationships and endorsement of the principles of enterprise. As shown in Figure 5, relationships and enterprise thinking form the basic structure of effective state-local business relations. Both are necessary, but neither alone is sufficient. In addition, the project results suggest a set of practical strategies including governance, process analysis and field work that can be used to bind the structure together and reinforce the value of relationships and enterprise principles. Short descriptions of the findings are represented in Tables 1–3.

## Relationships

Participants in the project repeatedly emphasized the importance of long term, peer-to-peer business partnerships among state and local governments. They understood how active collaboration focused on a shared goal can yield high quality results. They also emphasized that mutual respect is essential and comes from recognizing that every participant has expertise to contribute and needs to be considered. Four important elements of effective relationships are discussed below.

**Engagement.** Serious engagement is a commitment to share resources, benefits, and risks in trying to reach a common goal. The entire project experience demonstrated that this kind of productive engagement is hard work. It demands more than periodic or one-way communication, attending meetings, or occasionally asking or being asked for advice. Instead, the people who participated in the project were deeply engaged with each other and with the ideas, goals, and products of the effort.

By intertwining strong commitment with the use of in-depth analysis, the Prototype Team was able to move from an idea to a robust, testable prototype representing the needs and interests of a wide range of organizations. To achieve this outcome, all team members were fully invested in the process and took active ownership of the products. They participated in 15 full-day, face-to-face, facilitated sessions, where they collectively performed business process analysis; developed modest, moderate, and elaborate alternatives for each application; generated and refined scope statements; specified system and user requirements; and reviewed work done on the Gateway Prototype and Applications.

**Local representation.** Two issues pertain to local government representation: obtaining agreement to participate and finding a way to deal with both large numbers and great diversity. With regard to participation, at the beginning of the Gateway Prototype project, the Advisory Committee agreed that at least six local governments and



### Figure 5. A vision for a better way of working
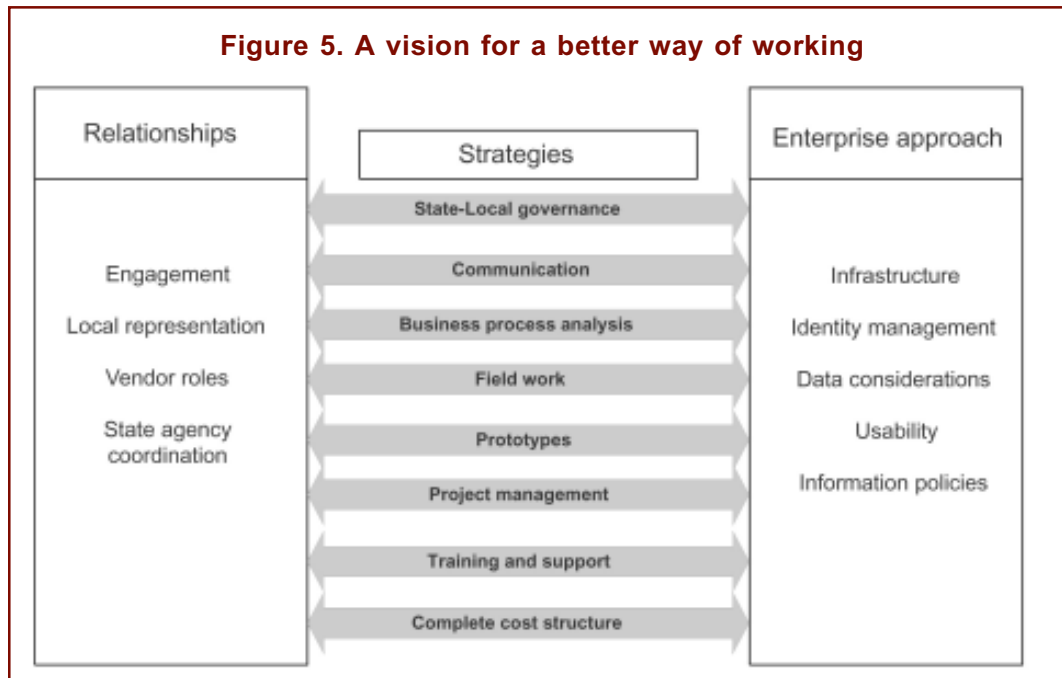
three state agencies should be included in the Prototype Team. The Advisory Committee was fully aware that the diversity of local governments is a crucial consideration, and particular attention needed to be paid to ensure selection of participants that roughly mirror that diversity. As the project became more fully defined and the Prototype Team was put together, we began to expand the initial target number. To capture more local diversity, the Prototype Team actually included representatives from 13 localities rather than the minimum number of six. During the field testing phase, the number of local governments was expanded again, and an additional 21 local governments and five state agencies joined.

Because one of the goals of the project was to determine whether there was, in fact, a size threshold for participation in e-government, we made a special effort to recruit smaller and more rural jurisdictions.

We found that many people from smaller jurisdictions incorrectly assumed they needed special technical skills to be able to participate in the project. While some were simply not interested, we also encountered very enthusiastic people such as the clerk of a small city who said to us, "When someone asks you to be a part of the process, you need to seize the opportunity. If you are not a part of the development and refinement, you can't complain about the final product." All considered, obtaining the agreement of this many local governments to participate was a daunting task in which literally hundreds of phone calls and emails were exchanged between CTG staff and potential participants.

The second issue was dealing with both the large number of local governments and their diversity. In New York State, local governments vary dramatically in size, wealth, capacity, and responsibilities.

| Table 1. Findings — Relationships | | |
|---|---|---|
| **Relationship** | **Necessary elements** | **Current issues** |
| Engagement | ■ Long-term peer-to-peer business relationships<br><br>■ Joint ownership of process and results<br><br>■ Analytical tools necessary to elicit, evaluate, and use pertinent information | ■ Effective models are in use but not yet institutionalized |
| Local representation | ■ A fair and realistic representational scheme for local engagement in G2G efforts | ■ Number and diversity of local jurisdictions<br><br>■ Reluctance of local officials to speak for each other |
| Vendor roles | ■ Rationalization and coordination of multiple vendor roles in state, local, and intergovernmental systems | ■ Multiple vendors playing multiple roles in the state-local environ-ment add substantive and administrative complexity to any effort to streamline or coordinate |
| State agency coordination | ■ Coordination of applications, standards, implementation schedules, and infrastructure requirements across state agencies<br><br>■ A method for cost sharing | ■ Separate legal authority and funding for different programs<br><br>■ Lack of regular communication among state agency initiatives that involve local governments |

They range from a small town government which consists of, perhaps, one part-time town clerk who performs a variety of tasks, to an office with many specialized professionals working in a highly sophisticated technological environment and serving a community of several hundred thousand individuals. Building an intergovernmental information system that accounts for such diverse needs is clearly challenging. Because of their sheer number, direct involvement of all localities in the development of an intergovernmental system is not feasible. Even if all localities could be accommodated in a project, the very limited staff and resources of many does not allow them to attend numerous meetings or extensive design sessions. At the same time, however, local government officials often emphasize their reluctance to speak for each other. This reluctance makes it difficult to work through a representative model.

Nevertheless, the project revealed an essential need to develop an acceptable representational scheme. The one-to-one, personalized communication and relationship building efforts used by the CTG staff worked for the Prototype, but would be unrealistic in a full system effort. The broad local representation achieved for this project, and the positive reactions of field testers who had not themselves participated in design, both indicate that carefully constructed local representation can work. Working together, local and state officials must develop a realistic method for adequate representation in intergovernmental initiatives. This requires local governments to accept the idea of representation and will require careful criteria for selecting which local governments will represent others. Local government professional associations may be especially helpful in achieving this goal.

**Vendor roles.** Baseline data gathered from state and local governments clearly indicate the importance of understanding vendor relationships in G2G work. In building the

Gateway Prototype, a conscious decision was made to engage two corporate partners to develop separate pieces of the Prototype and then integrate them together. This was done to simulate a real world environment in which multiple vendors are engaged in developing systems and adding new elements at various points in time.

As state and local governments move toward a more coordinated way of working, they will be affected by the many ways in which different vendors support both infrastructure and applications. Furthermore, if more standardized and coordinated G2G work becomes the norm, the nature of government relationships with vendors will likely change. One-to-one relationships may be replaced by a myriad of interconnected relationships across the public and private sectors. Current relationships include the following.

- Vendors are contracted separately by state and local governments to build, maintain, and support both applications and infrastructure.

- Vendors are contracted by local governments to develop applications for strictly local programs and for use in their transactions with the state government.

- Several vendors may work with one state agency or large local government.

- Individual vendors work simultaneously with a number of agencies—as well as with local governments.

- Wide variability exists in the degree to which local governments depend on and are satisfied with their vendors' products and services.

Any movement toward a more coordinated G2G strategy for New York State needs to be cognizant of this multiplicity of vendor arrangements and interdependencies.

**State agency coordination.** The Prototype Team and Advisory Committee recognized and promoted the need for intergovernmental governance, standards, and coordination. However, both state and local participants agreed that state-level coordination of applications, standards, implementation schedules, and infrastructure requirements is needed for any robust G2G program to succeed. In the focus groups, many people cited the difficulties of working with multiple state agencies following separate development agendas and funding strategies**.**

While a certain amount of difficulty is inevitable given separate legal authority and funding for different programs, a more concerted effort to identify and coordinate state initiatives would benefit everyone. For example, the town-level computing infrastructure made possible by DECALS, the hunting and fishing license system deployed by the NYS Department of Environmental Conservation in August 2002, offers a platform for more state-wide applications. This infrastructure could be reused for additional applications for other state programs that link to town clerks. However, doing this would also entail agreement and coordination among state agencies regarding implementation, upgrades, training cycles, maintenance, and other aspects of operations, as well as the introduction of a mechanism for sharing costs.

Finding the right kind and degree of coordination will not be easy. Even though it would be desirable from a local perspective to package state initiatives into regular and predictable activities, many state programs are constrained by separate legal mandates and time tables. On the other hand, by adhering more closely to the enterprise concepts discussed next, coordination can be improved over the current situation in which each state agency often acts on its own, without knowledge about the others and their collective impact at the local level.

## *Enterprise approach*

The second broad theme of the project is the concept of enterprise as applied to government. Enterprise thinking emphasizes the interdependencies among the different domains, organizations, and levels of government. It seeks to capitalize on the relative strengths of different players and to tie them together through the use of standards, partnerships, and shared resources. Enterprise thinking focuses on the broad purposes of government and relies on a complete understanding of the business processes that accomplish those purposes. An enterprise approach focuses on coordinating the design, development, implementation, and operation of multiple functions regardless of where any particular activity or task takes place. Often functions or applications are grouped by programmatic area, such as human services or financial management. The Prototype experience demonstrated that an enterprise approach must include intergovernmental governance as well as joint design, development, implementation, and operation.

The NYS Office for Technology recently adopted an enterprise policy for state government that encourages state agencies to include local needs in their IT planning and operations. Although the policy was not available to guide this particular project, it confirms the key principles that were used. These principles address the cost effectiveness of IT efforts, reduction in the complexity of the state's IT environment, information sharing, data standardization, business process reengineering, interoperability and integration across applications, modular design, and scalability. These key elements of an intergovernmental enterprise framework, together with the Prototype experience, highlight both benefits and challenges for infrastructure, identity management, data management, usability, and information policies. These key elements are summarized in Table 2.

| Table 2. Findings — Enterprise approach | | |
|---|---|---|
| **Enterprise approach** | **Necessary elements** | **Current issues** |
| Infrastructure | ■ Statewide existence of basic hardware, software and networking capabilities at the local level | ■ Basic local infrastructure exists, but telecommunications capabilities rely on the public Internet rather than the state's preferred internal network |
| Identity management, role-based security, and single sign-on | ■ Distributed identity management and role-based assignments with centralized authentication of users and access to applications | ■ Effective models are emerging and need to be evaluated and regularized |
| Data considerations | ■ Policies and standards regarding data content, quality, ownership, management, and integration<br>■ Distributed data management using uniform policies and procedures | ■ Lack of standards for defining common data elements<br>■ Lack of quality control for many data sets<br>■ Need data ownership strategies and rules<br>■ Lack of a coordinating entity |
| Usability | ■ Familiarity with browsers and office applications<br>■ Help features and support for learning<br>■ Accessibility features | ■ Lack of baseline user knowledge of standard technology in some localities<br>■ Custom applications need sophisticated Help features |
| Information policies | ■ Policies for stewardship, access, security, and use | ■ Need to review and refine information policies for an intergovernmental context |

**Infrastructure.** The Gateway Prototype led to one extremely important finding regarding infrastructure—New York State local governments (regardless of size, location, or type) have the computing and telecommunications capacity to use the public Internet for secure G2G information, communication, and applications. This is a significant change from just five years ago when local technology infrastructure was highly variable and prevented many smaller jurisdictions from participating in standardized intergovernmental systems.

Two factors account for the change. First, the burgeoning use of the Web in all sectors of society has introduced many local governments to email and the Web. This is not to say that all local governments are now capable of offering their own Web-based services. The human resources and technical investments needed to do this are still beyond the reach of many jurisdictions. However, during the field test, all sites were capable of conducting intergovernmental business over the Web, although slow connections existed in places without broadband services.

Second, statewide applications (notably DECALS) placed computers and dial-up services in town clerks' offices all over the state. This effort brought both computing and telecommunications to places unlikely to obtain them on their own. For this reason, basic computing and communications capabilities are already in place nearly everywhere in the state.

The implications are significant. Because the IT and Internet infrastructure is already in place, it is possible for all or nearly all government entities to participate in electronic G2G business. The focus of future planning for G2G work over the Web could now shift to issues of governance and policy, as well as organizational and operational factors influencing intergovernmental work. However, it is important to note that most local governments are not connected to New York State's private Intranet, the NYeNET, which is the State's preferred network for electronic intergovernmental communications. Consequently, the relative roles of NYeNET and the Internet need further consideration as G2G efforts unfold in the future.

**Identity management, role-based security, and single sign-on.** The Prototype offered substantial lessons about the importance, and pointed out some of the difficulties, of identity management as the basis for secure role-based access to diverse applications. The current practice review revealed that other states faced significant identity management problems associated with people changing jobs or leaving agencies. Lack of uniform procedures to change or terminate user rights of access caused directories to quickly become inaccurate. In these cases, users had access only to information resources and email, not to applications. In an environment in which secure applications are involved, managing identity and role changes is even more important. The most challenging parts of identity management appear to be the initial design and deployment of a standardized framework and the subsequent management of changes in user roles.

Once identity and roles are in place for users, one of the most visible enterprise framework benefits becomes possible— single sign-on. A major attraction of the Gateway Prototype was the promise of a single sign-on for all the applications users need to do their jobs. Field testers explained the frustration of continually signing in and out of applications managed by different state agencies during the course of the day. An additional source of aggravation was the requirement to have multiple user names and passwords. Baseline data collected during the project show that most participants sign on one to four times per day, with some signing on up to 15 times per day. By contrast, during the field test they gained access to the applications with only one sign-on. Testers readily understood the process and experienced very few support issues related to user names and passwords. Although the Prototype encompassed a small number of applications, users could readily envision how this feature could be deployed to all the applications they use and were enthusiastic about the potential simplicity and efficiency.

For the purposes of the Gateway Prototype, identity management, authentication, and role assignments were handled as completely centralized activities. Users were identified and their roles were assigned and maintained through a single user management function. Even with only 56 testers, this was a large and complex task, one that clearly cannot be handled in a centralized manner in a real operation. A realistic alternative is a system with distributed identity management and role-based assignments with centralized authentication of users and access to applications.

The approach taken by New York State's CentraPort, is a good model for distributed identity management. CentraPort is a portal which co-locates access to related human services applications on a single Web site. It represents a logical step along the way to comprehensive integration. Each individual's rights are assigned and managed by that person's employer and all participating organizations use the same rules and procedures. CentraPort co-locates both Web-based and older legacy systems. Users still need to sign on separately to the legacy systems, but they do not have to leave CentraPort to use them.

**Data considerations.** In each of the three applications in the Prototype, data was shared in new ways which revealed issues with standardization, quality, integration, and ownership.

In the Dog Licensing Application, local officials reported information to the state agency and had full access to the statewide data base. For the first time, they were able to see not only their own data as it was represented in the state files, but they were able to look across jurisdictions to check for duplicate records or locate owners of lost animals. The Parcel Transfer Verification Check Application allowed county officials to see all the data for the towns within their borders and allowed ORPS to look at data for the entire state. While this aspect was not new, the Application gave state, county, and town officials the new benefit of electronic edit checks that applied uniform business rules to the data. The Application provided assessors with feedback on which transactions needed further checking to verify accuracy or correct errors. Moreover, when the town clerks saw the parcel application during testing, they immediately understood how edit checks could be useful in the Dog Licensing Application and began to discuss how better data quality would assist them in other activities.

The Contact Directory is the most instructive with regard to data issues. Although directories exist in many places, the idea of a *single* authoritative directory was entirely

new. All agencies and local governments in the project cooperated in the creation and maintenance of this shared data resource. The process began by integrating contact data files from the three state agencies to create a single unduplicated database. This process revealed that each agency had its own standards for some of the most fundamental information about government. The three state agencies in the Prototype use three different coding schemes to identify local jurisdictions. In addition, different conventions are used all over the state for names, addresses, and phone numbers. Accuracy was an important additional problem partly because so many directories are compiled by different organizations.

In the baseline data, local officials identified more than 30 different organizations that ask them to supply rosters of contact information. These rosters of local officials are submitted at different times of the year in a variety of formats including paper, fax, and electronic submissions, with paper being the most common. The overwhelming majority of project participants also keep their own files of this information, again most often on paper. Consequently, there is no single trusted source of statewide contact information for state and local officials. Each person appears to have his or her own favorite, usually a paper directory published by a professional association which is marked up by hand as new information and changes become known.

The Prototype design addressed these issues by using a distributed data ownership model in which each state organization or local government was responsible for the accuracy and completeness of its own contact information using a standard data format. This distributed approach to data ownership placed the responsibility for accuracy in the hands of those who have the greatest stake in data quality and are most likely to give it the appropriate level of attention. This approach to management of data content helped assure that the best quality and most timely information was

available about each agency and jurisdiction. Centralized maintenance and management of the shared database complemented distributed data ownership, taking advantage of both technical and financial economies of scale.

**Usability.** Through the Prototype field test, we learned about four important aspects of usability: familiarity with standard office applications, user-oriented and content-specific help, adaptation associated with changing existing applications, and accessibility.

In terms of familiarity, the Prototype used standard browser technology as the user interface. Most aspects of the Prototype applications followed normal conventions for Web navigation, and testers were quick to point out frustration with the few instances where the Prototype departed from these norms. For example, the "back" button did not work as they expected in both the Dog Licensing and Contact Repository Applications. Rather than use "back" to return to a previous page, users were instructed to use the navigation within the page they were working on. While this is not unusual in Web applications, it was a surprise to some, and many disliked it. In another instance, one highly rated aspect of the Contact Repository Application was the ability to generate a mailing list from the database. However, this required an understanding of spreadsheets and familiarity with Microsoft Excel®, which was not the case for some users. The Help feature provided advice regarding this capability, but not everyone found it or found it useful. These two experiences highlight the need to adhere as much as possible to standard features of well-known software and to make certain that users are familiar with standard office applications that may be embedded in a Web-based service. For those who could not use Excel, or understand the Help associated with it, one of the most useful features of the Prototype was unavailable. And while the developers paid considerable attention to Help features, their ability to be comprehensive was limited by time and staff resources. A fully functional

system would need more extensive, context sensitive help features.

We also observed that entirely new applications were easier to learn and more satisfactory to users than applications that changed familiar ways of working. This is not surprising since a process of "unlearning" has to take place as users adapt to a different version of an application they are already using. In the Dog Licensing Application, for example, some users wanted the screen to look like the paper form they use for this function. This need to adapt a familiar way of working for a new environment is an important consideration for training and support, as well as for gaining acceptance of the application. This concern is further complicated by the fact that many local governments have implemented different home-grown or vendor-supplied versions of the same application.

Finally, the Prototype was constructed using existing platforms and development tools. We made no special effort to build in accessibility features, but we did ask experts to review the Prototype and comment on its compliance with accessibility guidelines. They told us it met most basic requirements but was not fully accessible. For example, the Contact Repository Application and the Dog Licensing Application used color to highlight required data elements. In a fully



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accessible application some other cue would be needed to communicate this requirement to those who are blind or cannot see color. Full compliance with all accessibility standards would be necessary in a live system and would require additional development and testing.

**Information policies.** As with many technological applications, new policy questions arise because information becomes more readily available and accessible. While these core information policy components of an enterprise framework—stewardship, access, security, and use—were recognized as important by the Prototype Team and Advisory Committee, they were not developed in full detail for the Prototype. These issues would need explicit attention in any future G2G initiative.

The three Prototype Applications were selected because they represented local diversity, and the complex nature of state-local business processes. The fact that data sets were readily available to support them also played a role in the selection of the applications. During development, when issues concerning information policies arose, compromises were reached among the Prototype Team members that allowed the project to move forward. The compromises balanced the fact that the effort was a Prototype with the desire to provide the users with standard guidance for their activities. So, for example, we decided that certain data elements in the Contact Repository Application (such as cell phone numbers for elected officials) would be available only to the assigned data owners, not to other users. In addition, some information policy topics were not addressed at all. For example, records management was not addressed—in a real system decisions would need to be made about what constitutes an official record of a transaction, which organization should be accountable for it, and how it should be accessed and preserved.

During the focus group discussions, one past policy issue was raised that deserves mention. During the implementation of DECALS, town clerks were asked to deny hunting and fishing licenses to applicants who were behind on child support payments. Because the information in the State's child support system could be matched to license applicants, child support payment arrears could be used to deny the license. Working through their professional association, the clerks refused to accept this responsibility, noting that they are not law enforcement officers and have neither the standing, the skills, nor the authority to act in this way. Instead, DECALS now prints a notice to the applicant that a license cannot be issued and gives a phone number for the applicant to call to resolve the problem. Because there are several reasons why a license might not be issued, the clerks simply direct the applicant to call the number. This experience underscores the importance of anticipating and understanding both the opportunities and the policy issues that can arise when information systems become more uniform and integrated.

## *Strategies*

The benefits of working in a carefully thought out G2G environment are amply demonstrated by this project. Moreover, the project highlights the realistic challenges of accepting and acting upon an enterprise view of government. These challenges include the need for joint governance, standard infrastructure, authentic identification and management of users, data quality and integration, usability, and some level of government-wide operational coordination. In this section, we offer some strategies that hold promise for addressing the challenges and reaping the benefits of this "better way of working."

**State-local governance.** Governance comprises the structures and processes by which policies are adopted and decisions made. For information systems and strategies to work well in a G2G environment, governance must include formal representation of the interests and needs of state, county, and municipal governments and active participation of both state and local officials. A key to successful joint governance is an acknowledgment that the participants are peers. Although their resources and responsibilities vary, each level of government and kind of organization must give and receive equal consideration to needs and capabilities of others. The existing Intergovernmental Communications Subcommittee of the State CIO Council, established in 2003, offers a suitable venue for pursuing joint governance.

**Communication.** Communication is one of the most important aspects of any collaboration, and the success or failure of a project may ultimately depend on how well a group communicates. Good communication practices ensure that all stakeholders (both those actively involved and those who will eventually be affected) are continuously and adequately informed. Just as important are good working relationships that encourage stakeholders to participate actively in giving and receiving information. Many techniques may be used to establish and maintain effective communication among project participants: status meetings, distribution of printed and electronic project materials, and formal presentations are just a few. Often one technique works better for certain audiences or project stages and quite frequently multiple methods need to be used simultaneously. It is equally important to communicate with a more general audience to keep the full community of state and local organizations apprised of developments that may eventually affect them in some way.

**Business process analysis.** Intergovernmental information systems are electronic applications that support processes shared across state and local levels. One important step in the development of such systems is the mapping, analysis, and improvement of business process by those who actually perform the tasks. Participants' own operations and program knowledge should describe the entire process. This is particularly important if the business process crosses several levels of government or departments within a government. During the project, application design clearly moved more smoothly and swiftly when a shared understanding of the business process was created.

While working through the early design sessions, the Prototype Team engaged in thorough business process analysis. Before embarking on discussions about technology, the people associated with each application collectively mapped their detailed processes from end to end (i.e., from state to local levels and back, including the roles and tasks of all significant organizational units). Drawing the detailed business process across both organizational and jurisdictional lines provided a visual confirmation and understanding of the intergovernmental information and work flows. The team members sometimes marveled at the amount of information sharing that took place during these mapping sessions. Many people learned something new about their everyday processes and understood more clearly why things were done as they were and why certain problems existed.

While mapping out the process as it touched several organizations, the Prototype Team determined whether all those who needed to be involved in the process had been invited to participate in development. If a process included a government, department, or organization not represented on the team, more recruiting was done to bring that missing perspective to the table. By engaging in this laborious but necessary work, all participants came to better understand their roles in the larger process.

## Table 3. Findings — Strategies

| Strategies | Necessary elements | Current issues |
|---|---|---|
| State-local governance | ■ Formal representation of the interests and needs of state, county, and municipal governments<br><br>■ Active intergovernmental participation in planning and decision making | ■ Emerging governance frame works need to be institutionalized |
| Communication | ■ Multiple forms of two-way communication | ■ Good practices need to be institutionalized |
| Business process analysis | ■ End-to-end mapping, analysis, and improvement of intergovernmental business processes by those who do the work | ■ Need to adopt group-oriented process analysis activities and tools as part of all intergovern-mental initiatives |
| Field work | ■ Joint state-local fact finding missions to gain an understanding of the wide variety of local operating conditions | ■ Local officials need support for travel costs for this and other design and development activities that take them away from their own offices<br><br>■ Need standard protocols for conducting field visits |
| Prototypes | ■ Realistic, iterative mock-ups of processes and systems as aids to design and understanding | ■ Need more ubiquitous proto-typing and related evaluation skills |
| Project management | ■ Specialized project managers who create an environment for collaboration and use group-oriented analytical tools | ■ More project managers need specialized training, tools, and support for these kinds of projects |
| Training and support | ■ Initial basic training followed by in-depth ongoing user support services | ■ Current practices tends to emphasize training over support |
| Complete cost structure | ■ G2G projects need cost structures that identify all costs to all participants including project management, communication, design, development, testing, training, implementation, adaptation, operation,and ongoing support | ■ "Soft" costs of project manage-ment, relationship management, and communication are high, but often not included in budgets<br><br>■ Adaptation of local practices can be a substantial cost, not included in financial or time estimates<br><br>■ Hidden costs occur when standardized state systems replace some high-performing existing local systems<br><br>■ Revisions of existing applications can have additional "unlearning" and "relearning" costs |

**Field work.** Any G2G effort, whether at the enterprise level or within the confines of a single program area, should include joint state-local fact-finding field visits to a representative set of local organizations. These fact-finding missions are invaluable for gaining an understanding of the wide variety of local operating conditions. They are not simply meetings where people make statements or presentations to each other. Rather, field visits may take several days and entail following and documenting work-in-progress, interviewing front-line workers and supervisors, and gathering documents that illustrate and govern activities and decisions. Where possible, field teams should include both state and local participants. One key purpose is to understand and assess local practices and capabilities. The teams should also become familiar enough with both local and state needs to make recommendations about aspects of system design where uniformity is essential and where a local option is a sensible alternative. Field work is especially difficult for local officials to participate in because of the travel costs. While generally small, the costs still exceed local budgets.

**Prototype.** As with field work, prototyping presents the opportunity to gather realistic information about a process or system. An ideal prototype conveys essential functionality and solidifies mutual understanding. Its testing and use reveal differences in expectations, and suggest improvements in architecture and applications. Prototypes take a variety of forms. The Prototype in this project was quite elaborate compared to most because it was designed to illustrate and test several kinds of complexity. Sometimes a prototype is no more than a story board; usually it is somewhere in between with some parts actually programmed and others merely described. In all cases, a prototype entails testing an idea or theory rather than trying to build a "killer app." In the New York State-Local Internet Gateway Prototype, the applications were mostly functional, but more importantly, the process uncovered key factors in designing and developing G2G initiatives.

The Gateway Prototype project produced not only a technical prototype. In a sense, it also prototyped an approach to project management and joint decision making and communication.

**Project management.** Many participants attributed project success partly to the fact that it was managed and supported by people with specialized skills and a set of well-suited analytical tools. We believe a similarly organized concentrated effort, focused on the "seams" that hold a collaboration together, will be necessary to sustain any future G2G initiatives. More specifically, this means having several individuals broker the communication and relationships among all the stakeholders including state and local government representatives, vendors, and advisory groups throughout the life of the project. The New York State Project Management Mentoring Program might incorporate special attention to the unique needs of these kinds of projects as it trains the next generation of IT project managers.

**Training and support.** Comprehensive user training attuned to actual business activities is a good start in preparing users for a new way of working. However, ongoing support services appeared to have a more positive effect on user acceptance. According to the focus group discussions, it was more important to couple a basic level of training with very strong support than to have comprehensive training with limited support. While training is useful and effective, most learning comes after one starts using an application regularly. Access to user support resources reinforces participants' willingness to learn and use applications.

**Complete cost structure.** Intergovernmental initiatives impose both one-time and ongoing costs at both the state and local levels. In an effort that moves from concept to full implementation, the majority of state-level costs would be attributed to design and development. Local-level costs would be centered on implementation and changes in existing business processes. Clearly, local officials must participate in the development of applications but, much more than state officials, they must often change the way they conduct their daily work in order to take advantage of new applications. In many cases, these adaptations are improvements over current processes, but in some cases existing local operations are more sophisticated and offer more value than a new statewide application. In these instances, it is important to explore ways to retain superior local performance while still adopting enterprise strategies. Without attention to this situation, some of the best-performing localities will suffer the hidden costs of reduced performance. Moreover, local participation in Prototype design and development required local officials to travel to Albany or regional sites. When necessary to allow local representatives to participate, CTG supported their travel expenses through the AT&T Foundation award.

| | Table 4. Estimated direct costs of the Gateway Prototype by cost category and type of participant | | | | |
|---|---|---|---|---|---|
| Cost categories[2] | CTG[1] | State and local partners | Corporate partners | Category subtotal | Percent of total |
| Project management | $ 79,000 | $ - | $ 54,000 | $ 133,000 | 14 |
| Relationship management | $ 74,000 | $ - | - | $ 74,000 | 8 |
| Hardware/software | $ 400 | $ - | $ 78,000 | $ 78,400 | 8 |
| Prototype design, development and evaluation | $ 195,000 | $ 142,000 | $ 215,000 | $ 552,000 | 58 |
| Information dissemination | $ 115,000 | $ - | - | $ 115,000 | 12 |
| Participant subtotal | $ 463,400 | $ 142,000 | $ 347,000 | $ 952,400 | 100 |
| Percent of total | 49 | 15 | 36 | 100 | |

[1] includes AT&T Foundation grant of $20,000
[2] includes both cash and in-kind costs

Table 4 presents the Gateway Prototype cost estimates that we were able to document. In all, the project cost about $950,000 in cash and in-kind resources. As the table shows, the costs of hardware and software (8 percent) were dwarfed by the "soft" costs of project management (14 percent), relationship management (8 percent), and Prototype design, development, and evaluation (58 percent). The cost of information dissemination (12 percent) is in addition to the communication costs embedded in project management. Project management responsibilities were shared by CTG, CGI, and Keane. The category of relationship management was mostly comprised of initial and ongoing engagement of local participants by CTG staff. User testing, field testing, and subsequent data analysis are all included in the evaluation portion of the Prototype design, development and evaluation. Information dissemination includes the preparation of reports, state and national presentations of project results, and preservation of the Prototype. Most of the state and local partner costs are attributable to local participants. In a regular project, the CTG share of total costs would most likely be borne by a lead state agency.

The distribution of costs documented in this project can serve as a guide for any future G2G initiative regarding the relative concentration of costs during design, development, and testing. The Gateway Prototype project ended with evaluation, so it does *not* include estimates related to refinement, implementation, or operation.

## Recommendations for initial future investments

Our investigation showed broad and enthusiastic support for a single point of contact for G2G work in New York State as a "better way of working." However, the demonstrated complexity of implementing this concept suggests that incremental and modular approaches make the most sense for future development. We believe the

following ideas represent the best near term opportunities for moving in this direction.

### *Identify and provide coordinated access to relevant public information and resources on the Web*

The first and easiest opportunity is to create and maintain organized access to Web resources relevant to state and local professionals. The Resources section of the Prototype represents a good start. Users appreciated the opportunity to have many resources— including NYS and federal government information, professional organizations, legal resources, and data resources— categorized and summarized for them. These resources were easy to access, relevant, and timely. Users liked the selection and arrangement of topics and made useful suggestions for description, searching, and customization. This kind of resource does not need special security and could be associated with the New York State Home Page in the absence of a specific G2G portal.

### *Use the Web to co-locate access to related programmatic functions*

The Gateway Prototype demonstrated how multiple job functions associated with a particular professional role could be brought together in one Web interface accessible by a single sign-on process. Although the Prototype incorporated only a few applications, the logic and appeal of this approach was evident to the participants, who could readily envision how all their own business applications could be brought together in a single interface. The next logical extension of this idea is not to try to develop a G2G Gateway that encompasses every possible function, but to begin by co-locating access to programmatically related functions through a single Web interface. New York's CentraPort project is already doing this for county-level

access to social services programs. Doing the same for all town clerk functions, all real property management functions, all public health functions, etc., promises an incremental progresssion toward a substantial G2G enterprise, with each increment bringing its own benefits to a sizable policy domain. After related applications are co-located, careful consideration of more integrated applications can follow.

### *Develop a single authentic repository of contact information with decentralized data management*

The application which generated the most excitement and unanimous desire to be made fully functional was the Contact Directory and its associated Contact Repository Application. The need for such a resource is pressing and evident: no single, authentic source of contact information exists, yet every state agency and local government needs this information to do its work. The development of this resource would have several benefits: (1) it would replace an uncoordinated, duplicative, expensive, and largely manual workload with a streamlined and standardized electronic resource, (2) it would provide the opportunity to test data ownership and stewardship rules across the entire G2G spectrum, and (3) it would provide a realistically limited opportunity to test single sign-on and role-based identity. Access to the data management application would need to be controlled, but access to the directory information could be provided without user authentication. Note, however, that this application represented a high degree of data integration and therefore poses much more significant challenges in terms of difficulty, complexity, and cost than either of our other recommendations.

## Conclusion

The New York State-Local Internet Gateway Prototype project represents goals and challenges of vital interest to every state and to any other federated system of government. The findings and lessons reveal the importance of understanding and balancing the goals of data and service integration against the related challenges of complexity and cost. Thanks to the contributions of many experts across the intergovernmental landscape, these project results should be of value in New York State and in the many other governments that are attempting to strike that balance.

# Appendix A: Illustrations of the Gateway Prototype

The following pages present a selection of Web screens of the actual Prototype. Our goal is to provide readers with images of what the Prototype Team members and the field testers encountered as they were working with this G2G resource. These screen shot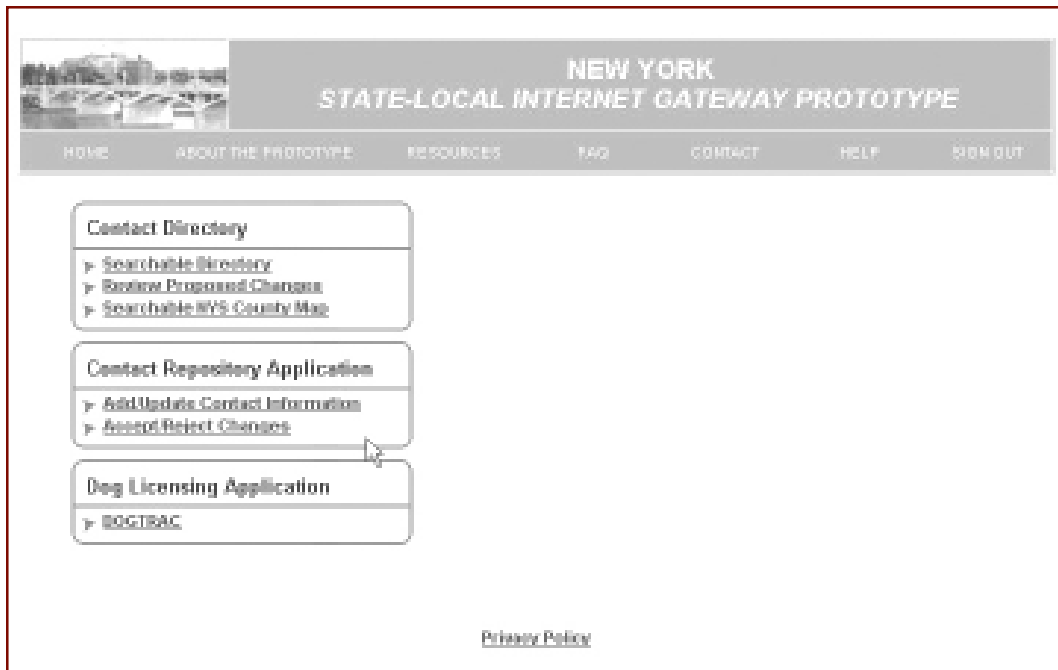s are illustrations—selected to show highlights of what users would see when they entered and used the Gateway Prototype. A more complete and detailed rendition of the Prototype is available on the CTG Web site at www.ctg.albany.edu/ publications/reports/state_local_ gateway_demo

## Sign-On Page
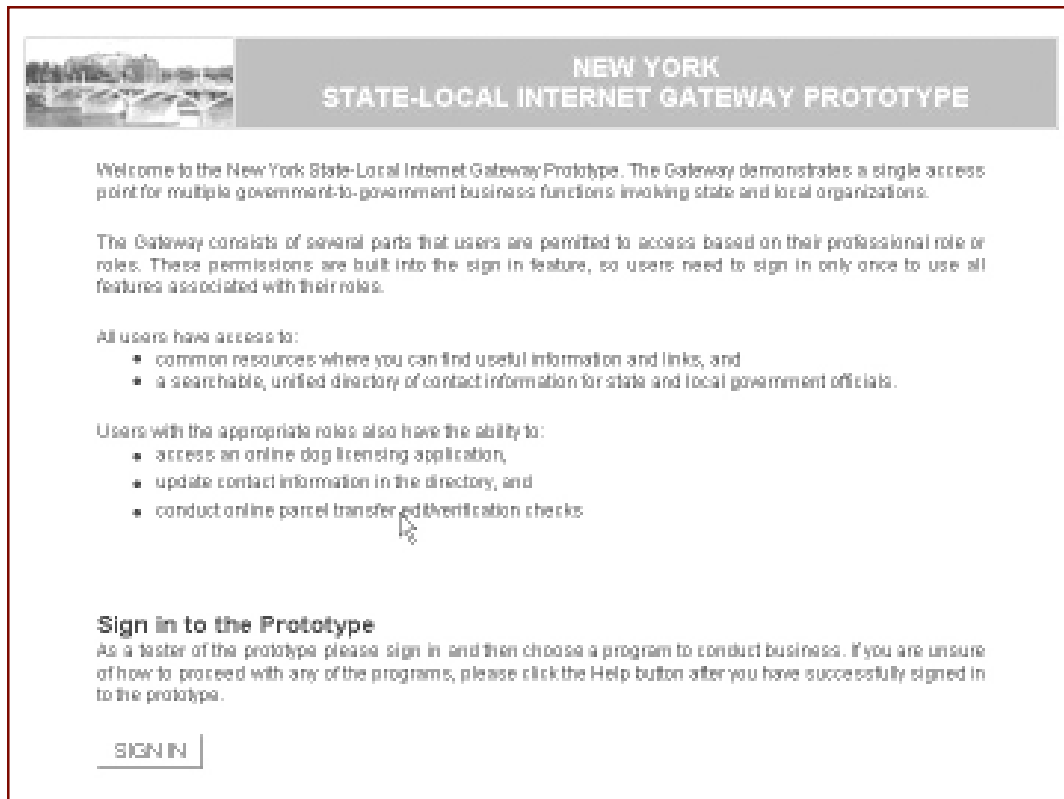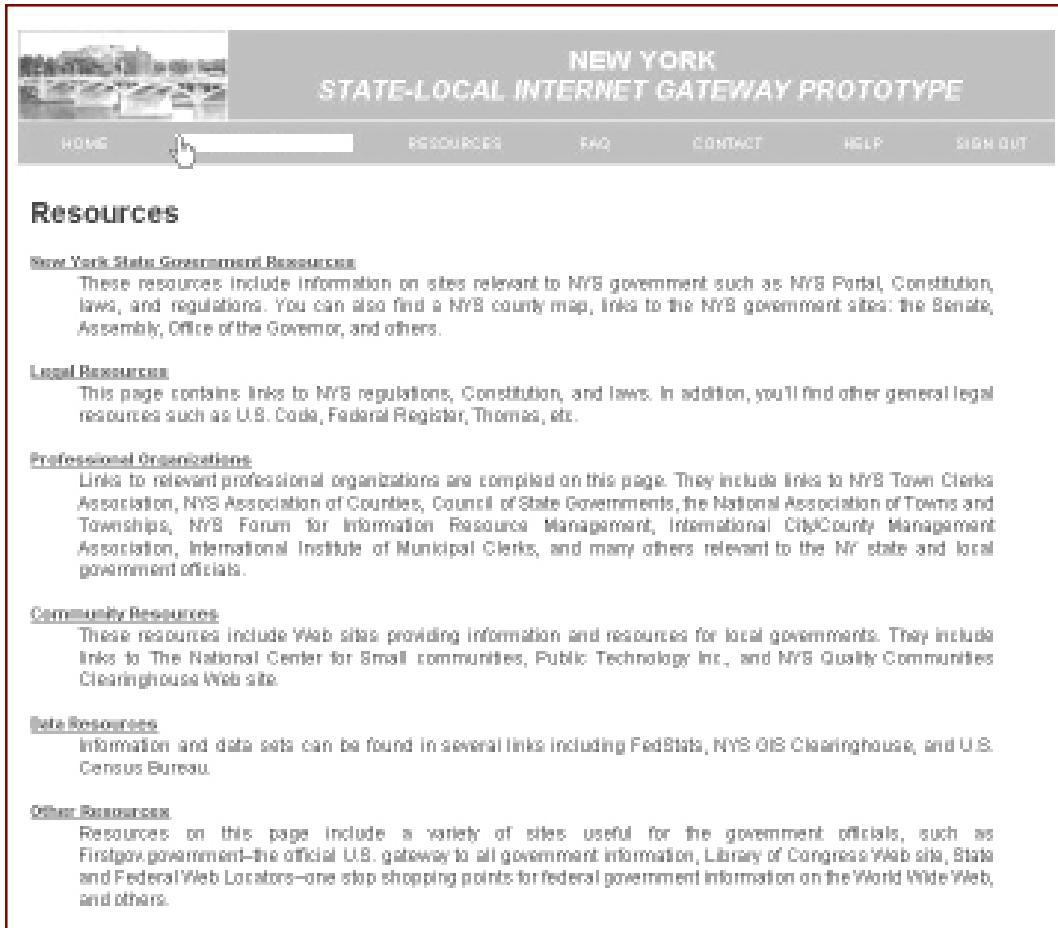


The New York State State-Local Internet Gateway Prototype was a closed G2G system, available only to authorized state and local government officials conducting specific transactions. Users accessed the Prototype through this sign-on page.

## Home Page



NEW YORK
STATE-LOCAL INTERNET GATEWAY PROTOTYPE

HOME     ABOUT THE PROTOTYPE     RESOURCES     FAQ     CONTACT     HELP     SIGN OUT

Contact Directory
▶ Searchable Directory
▶ Review Proposed Changes
▶ Searchable NYS County Map

Contact Repository Application
▶ Add/Update Contact Information
▶ Accept/Reject Changes

Dog Licensing Application
▶ DOGTRAC

Privacy Policy

After signing on with a user name and password, a user saw a personal home page. The home page illustrated here was for a town clerk who had access to the Contact Repository Application and the Dog Licensing Application. The banner at the top of the page was accessible to all users. There, Help and FAQ features provided information about the Prototype project, and a Resources feature offered links to other Web sites. All users also had access to the Contact Directory.

## Resources



All users had access to the Resources page. There were links to government, legal, community, and data resources, as well as New York State and national professional organizations.
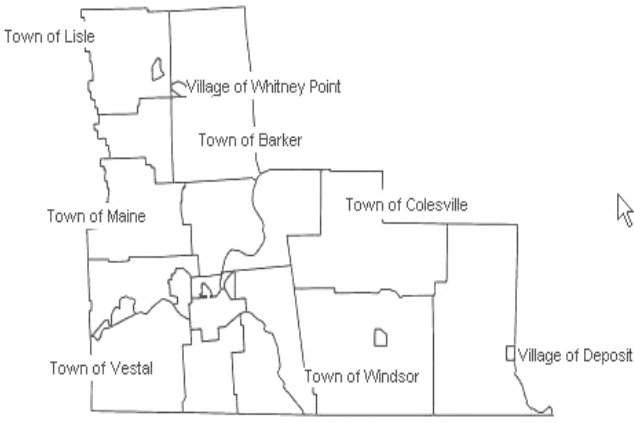
## Contact Directory



All users could search for contact information pertaining to state and local officials either by filling out search fields on forms or by using a clickable map shown here. After selecting a county from the searchable New York State map, users, could click on a municipality and get the contact information for all officials within that jurisdiction. In the Prototype, the only functional map was for Broome County.

## Contact Repository Application



After searching the Contact Directory, users whose role was to update contact information (data owners) had the ability to add, change, or delete contact information about officials within their own jurisdiction.

## Dog Licensing Application



Registration | Reports | Administration — DOGTRAC – Digital Online Guidance To Register All Canines

Renew License Completed Successfully

Date: 4/13/2004

User Name: DJsraga

User Type: Ag. & Mkts.

**New License**

**Transfer License**

**Renew License**

**Search Dog**

**Search Owner**

**Help**

**Back to State-Local Gateway**

**Owner**

| | |
|---|---|
| Name: | DINO CARLAVARIS |
| Address 1: | ROUTE 9W |
| Address 2: | |
| City State Zip: | GLENMONT, NY 12077 |
| Phone: | (555) 555-5555 |

**Dog**

| | |
|---|---|
| Name: | MILLIE |
| Birthday: | 1990 |
| Address 1: | ROUTE 9W |
| Address 2: | |
| City State Zip: | GLENMONT, NY 12077 |
| Spayed Neutered: | N |
| Gender: | F |

**License**

| | |
|---|---|
| Start Date: | 2/11/2004 |
| End Date: | 2/10/2005 |
| CHIP #: | |
| License Type: | 5 |
| State Fee: | $7.50 |
| Local Fee: | $2.00 |
| Total: | $9.50 |

Users who were assigned access to the Dog Licensing Application, DOGTRAC, performed a number of transactions ranging from issuing or renewing dog licenses to transferring ownership. They could also perform reporting and administrative functions. In this illustration, a dog license was being renewed.

## Parcel Transfer Verification Check Application



The Prototype included an application for use by assessors, county real property tax service officers, and the NYS Office of Real Property Services (ORPS). In this illustration, an ORPS official searched specific dates and counties to see the status of selected parcel transfer records that had been flagged as potentially having errors.

# Appendix B: Project Participants

## Prototype Team members

### 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**, 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 and Economic Development, 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

## Advisory Committee members

### State government

**Carmella Carnevale**, Customer Relations, NYS Office for Technology

**Dolores Dybas**, Director, Information Systems, NYS Department of Agriculture and Markets

**Carole Francis**, Applied Technology Advisor, Division of Local Govt. Services, NYS Office of the State Comptroller

**Michele Hasso**, Manager, Macros Strategic Services, NYS Office of the State Comptroller

**Geof Huth**, Manager, Records Service, NYS Archives and Records Administration

**Alan Kowlowitz**, Public Technology Analyst, NYS Office for Technology

**Julie Leeper**, Assistant Director of Strategic Policies, Acquisitions and E-Commerce, NYS Office for Technology

**Charlie Murphy**, Assistant Secretary of State for Community Development, NYS Department of State

**Gene Pezdek**, Director of Information Services, NYS Department of Environmental Conservation

**Thomas Ruller**, Associate Programmer Analyst, NYS Department of Education

**Bruce Sauter**, Chief Information Officer and Chief Valuation Strategist, NYS Office of Real Property Services

**Laurie Savage**, Assistant to the First Deputy Secretary of State, NYS Department of State

**Wendy Scheening**, Manager, Information Systems, NYS Department of Agriculture and Markets

**Gregory Smith**, Chief Information Officer, Division of Local Government Services and Economic Development, NYS Office of the State Comptroller

### County government

**Tim Bortree**, Chief Information Officer, Monroe County

**Ed Hemminger**, Chief Information Officer, Ontario County

**Robert Lilly**, Information Technology Director (retired), Essex County

**Kim McKinney**, Chief Information Officer, Broome County

**John Woodward,** County Clerk, Schenectady County

### Municipal government

**Patricia Favreau**, Town Clerk, Town of Berne

**Julie Holcomb**, City Clerk, City of Ithaca

**Kathleen Newkirk**, Town Clerk, Town of Bethlehem

### Private sector organizations

**Joe Aiello**, Vice President, Northern Publishing, Inc., Digital Towpath Program

**Carolyn May**, Manager, Community Development, Niagara Mohawk, Digital Towpath Program

### Professional associations

**Gregory Benson**, Executive Director, NYS Forum for Information Resource Management

**Thomas R. Bodden**, Manager, Research and Information, New York State Association of Towns

### University participants

**Sydney Cresswell**, Director, Intergovernmental Solutions Program, Rockefeller College, University at Albany

**David Landsbergen**, Assistant Professor, School of Public Policy and Management, Ohio State University

## Field testers

### 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**, Applied Technology Advisor, NYS Office of the State Comptroller

**Michele Hasso**, Manager, MACROS Strategic Services, NYS Office of the State Comptroller

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**Deborah Olds**, Customer Relations Manager, Local Government, NYS Office for Technology

**Kathy Ravida**, Director, Technology Academy, NYS Office for Technology

**Laurie Savage**, Assistant to the First Deputy Secretary of State, NYS Department of State

**Wendy Scheening**, Manager, Information Systems, NYS Department of Agriculture and Markets

**Gregory Smith**, Chief Information Officer, Division of Local Government Services and Economic Development, NYS Office of the State Comptroller

### County government

**Tim Bortree**, Chief Information Officer, Monroe County

**William Budde**, Director, Real Property Tax Service, Niagara County

**William Cinquanti,** Director, Cortland County Real Property Tax Service

**Thomas Clingan**, County Clerk, Albany County

**Karen DeMay**, Clerk to the Board, Ontario County Board of Supervisors

**Tracy Farrell**, Real Property Information Clerk, Niagara County Real Property Tax Service

**Laura Fox**, Administrative Aide, Cortland County Real Property Tax Service

**Sandy Garrow**, Assessment Control Examiner, Clinton County Real Property Office

**James Gonyo**, Director, Clinton County Real Property Tax Service Agency

**Susan Gruttadaro**, Principal Recording Clerk, Monroe County

**Jerry Helfer**, Assistant Deputy Town Clerk, Monroe County

**Ed Hemminger**, Chief Information Officer, Ontario County

**Robert Lilly,** Information Technology Director (retired), Essex County

## Municipal government

**Patricia Ayer**, Assessor, Town of Champlain
**Betty Barry**, Deputy Town Clerk and Network Administrator, Town of Victor
**David Briggs,** Assessor, City of Cortland
**Richard Brown**, Director, Development and Planning, City of Canandaigua
**Rosemary Centi**, Town Clerk, Town of Guilderland
**Diane Conroy-LaCivita**, Deputy Town Clerk, Town of Colonie
**Lisa Copeland**, City Clerk, City of Mount Vernon
**Debra Denz**, Town Clerk, Town of Victor
**Diane Deschenes**, Town Clerk, Town of New Scotland
**Bonnie Drake**, Town Clerk, Town of Canadice
**Patricia Favreau**, Town Clerk, Town of Berne
**Martine Gonyo**, Assessor, Town of Clinton
**Julia Guerrieri**, Town Clerk, Town of Geneva
**Keith Herkalo**, City Clerk, City of Plattsburgh
**Anita Jebbett**, Town Clerk, Town of Homer
**Sandra Kline**, Typist, City of Cortland

**Barbara Kunzi**, Town Clerk, Town of Essex
**Ellen Stein,** Associate Commissioner, Department of Information Technology & Telecommunications, City of New York
**Lisa Lugo**, Assistant Commissioner, Department of Information Technology & Telecommunications, City of New York
**Deb McCormick**, City Clerk, City of Auburn
**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
**Pat Scova**, Town Clerk, Town of Mount Pleasant
**Anne Stanley**, Town Clerk, Town of Plattsburgh
**Dorothy Sullivan**, Clerk, City of Rochester
**Effa Sullivan**, Assessor, Town of Plattsburgh
**Joan Walsh**, Town Clerk, Town of Harrison
**Laura Kay Wharmby**, City Clerk, City of Canandaigua

## 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
**Bill 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 C:
# Field Test Data Summaries

## Project participants by type of organization and type of contribution

(80 participants contributed to the overall project. Some served in more than one capacity.)

| Organization type | Advisory Committee | Prototype Team | Field testers | Corporate partners |
|---|---|---|---|---|
| State | 14 | 13 | 14 | |
| County | 5 | 6 | 13 | |
| Municipality | 3 | 10 | 29 | |
| University | 2 | | | |
| Professional association | 2 | | | |
| Private sector | 2 | | | 15 |
| Total | 28 | 29 | 56 | 15 |

## Prototype functions and percentage of field testers with access to each

| Prototype function | Percent of field testers whose role gave access to this function |
|---|---|
| Gateway and Contact Directory | 100% |
| Contact Repository Application — data owner | 49% |
| Contact Repository Application — data entry operator | 26% |
| Dog Licensing Application — agent | 39% |
| Dog Licensing Application — NYS Dept. Agriculture and Markets | 7% |
| Parcel Transfer Verification Check Application — local assessor | 7% |
| Parcel Transfer Verification Check Application — county RPTS | 9% |
| Parcel Transfer Verification Check Application — NYS ORPS | 6% |

## Ease of use ratings for specific Prototype functions

(1= very easy, 5= very difficult)

| Function | Composite mean rating |
|---|---|
| Sign-on / Sign out | 1.18 |
| Resources — Locate items | 2.28 |
| Contact Directory — Using searchable map | 1.85 |
| Contact Directory — Using custom search and export | 2.14 |
| Contact Repository Application — Performing data management tasks | 2.03 |
| Dog Licensing Application — Performing transactions and reports | 2.07 |
| Parcel Transfer Verification Check Application — Update and review records | 1.22 |

## General satisfaction with the Gateway Prototype

(1= very negative opinion, 7= very positive opinion)

| Questions | Composite mean rating |
|---|---|
| Confidence in the security of the Gateway Prototype | 5.13 |
| Ease of learning the functions in the Gateway Prototype | 5.75 |
| Convenience of the Gateway Prototype compared to current way of working | 5.28 |
| Usefulness of the Gateway Prototype compared to current ways of working | 5.28 |
| Speed of the Gateway Prototype compared to current way of working | 5.17 |
| Severity of data quality problems (reverse coded) | 4.07 |
| Usefulness of help options (online Help, online FAQs, and Help Desk) | 5.19 |

## Technology problems encountered

(1= never encountered, 7= encountered very often)

| Questions | Mean rating |
|---|---|
| Gateway Prototype was down when I wanted to use it | 1.48 |
| Lacked ready access to the internet from my desk | 1.36 |
| Lacked online access to a printer from my desk | 1.40 |
| Telecommunications speed at my desk was too slow | 1.82 |

# Appendix D: New York State-Local Internet Gateway Prototype Interview Protocol

## Opening question

How did each of you approach the testing process? Was our time estimate accurate?

**Probes:** Did you do it all at once, spread over several sessions, etc. Did you work at the office or at home? Did you bring in anyone else in your office to work with you?

## Technology

### Main Prototype question:
Did your organization have the necessary hardware, software, and Internet access to fully participate in the Prototype test? Do you have a computer connected to the Internet in your own workspace Internet?

**Probes:** Did people work from home because office technology was inadequate in some way? Is their technology too old to work well in a Web environment? Ask for specific examples.

### Main question about the future:
If a fully developed G2G portal were built, does your organization have the hardware, software and Internet access necessary for all relevant employees to use it?

**Probes:** If no, what kind and how much new technology would be needed? Ask for specific examples.

### Main future development question:
To what extent are the technological aspects of a fully developed G2G portal already in place in New York State and local government (e.g. architecture, standards, infrastructure)? What elements are strong, weak, missing?

Which technology elements or key functions should be standardized and which could be flexible?

**Probes:** Haves and have nots, large vs. small organizations, agency-based vs. statewide IT strategies and architectures, state-level strategies vs. local-level strategies.

## Knowledge and skills

### Main Prototype question:
Do you feel you and the others in your organization who tested the Prototype had the right skills for working with people, organizations, and computers to use it effectively? What are the most important skills for working in this way?

**Probes:** By skills, I mean not just technology skills, but also management, communication, knowledge about service programs and how they work, etc. What skills were missing, if any? How did you compensate for them? Ask for specific examples.

### Main questions about the future:
If all G2G work moved to this kind of portal environment, what kind of skills and how much training would the people in your organization need to use it effectively? How long do you think it would take to train everyone fully? What kind of user support would be needed for the short and long term?

**Probes:** What would stop people from using it? Are there people who just won't be able to work in this way, no matter what?

**Main future development question:**
What skills will be needed by state and local personnel who would *design, develop and manage* a future G2G portal and its applications?

**Probes:** Which skills are most important? To what extent do you think these skills are already well developed? Ask for specifics (e.g., analytical, technical, communication, negotiation, project management, etc.).

## Data

**Main Prototype question:**
What data issues did you encounter when you tested the Prototype?

**Probes:** accuracy, timelines, compatibility across different applications, standard definitions and codes (metadata), data ownership, data sharing with other state and local organizations. Are these problems with other people's data or your data? Ask for specific examples.

**Main questions about the future:**
How severe do you think these problems would be in a fully developed G2G portal? What could be done to overcome them? Would any particular data issues affect your willingness or ability to use a fully developed G2G portal?

**Probes:** Ask for examples

**Main future development question:**
Data quality was a significant challenge in the Prototype development process. What approaches would you recommend to improve data quality in future development?

**Probes:** Up front data cleansing activities, improve data as part of updates and maintenance, review and re-enter existing data, etc.

## Policy

**Main Prototype question:**
Did you encounter information or technology policy issues?

**Probes:** Confidentiality, security, accountability (e.g. audit trail, records management), internal organizational policies, government wide technical standards, data sharing across multiple state and local organizations. Ask for specific examples.

**Main questions about the future:**
What policies might need to be developed or changed to support a fully developed G2G portal? Would state or local laws need to change? Standards are policies – what aspects of a G2G portal or application should be standardized and what parts should be left optional?

**Probes:** Same

**Main future development question:**
What policies (in the Big P and small p sense) should govern the design, development, and operation of any future G2G portal? How should new or revised policies be developed?

**Probes:** Who should be involved, how should they be selected, what weight should be given to the various players, how should information be gathered, what decision making process makes sense. Should policies be developed incrementally or should a comprehensive set be created at one time?

## Costs

### Main Prototype question:
What were the main costs for you to participate in testing the Prototype?

**Probes:** Time, travel, organizational disruption. Did you have to buy any new equipment or software to participate in the Prototype? Internet access? If yes to any of these or others, ask for specific examples.

### Main questions about the future:
If New York had a fully developed G2G portal for all state-local applications, would your organization be able to adapt to it within your existing budgets? If no, what would the expenses be?

**Probes:** Ask for specifics (not just "new technology" but what kind, for whom, etc).

### Main future development question:
If New York initiated a fully developed G2G portal for all state-local applications, how might the development, infrastructure, training, and support be financed? What financing barriers would have to be removed?

**Probes:** Funding stovepipes; capital spending; long-term vs year by year, etc.

## Strategy

### Main Prototype questions:
There is an explicit strategy behind this project—to test a new (and we hope, better) way of working across the levels of government. Did your experience bear this out—was it different? Was it better? In what ways? Do you feel the parts of the Prototype you used were designed by people who understand your business and business practices? Did you feel communication about the project and your part in it was effective? Was it clear, well timed, responsive to your needs?

**Probes:** Ask for specific examples.

### Main questions about the future:
Can you imagine a fully developed system like this meshing well with your usual way of working? Or would you have to make a lot changes or workarounds? (NOTE: A fully developed system would have all the functions and systems you need to do your job available any time you sign in to a single computer, and information would be shared across all organizations who need it.) What would be the strategic benefits to your organization of working in this way for all G2G systems? What would be the negative impacts on your organization?

**Probes:** What could be done that can't be done at all today? What efficiencies would be possible? What would you not be able to do that you can do today? What additional work or complexity would be added? Ask for specific examples.

### Main future development question:
Now that you've seen the Prototype in action and been part of its development, what would you change about the overall approach that would make it more strategically valuable to state and local governments? What would you keep the same?

**Probes:** How can myriad local players be represented? How can multiple state agencies be coordinated?

## Overall summary question

What is the most important lesson state and local officials should take away from this experience?

## Final question

Is there anything you want to say about this experience or about a possible future that we have not asked about?