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Digital Government: Government to Government (G to G)
New Jersey Mapping Assistance Partnership Program (NJMapp)

Executive Summary

In the days immediately following September 11, 2001, a call went out from the NJ State Police Office of Emergency Management to all state agencies. The request was for maps and data about the state's infrastructure, including locations of airports, hospitals, nuclear facilities, dams, and reservoirs. The data, as received over the next two to three weeks, arrived in multiple formats, scales, and degrees of accuracy. It was not very useful and was difficult to integrate.

Geographic information systems (GIS) have long been acknowledged as an integrating technology that can bring highly disparate data into a common map display. There is widespread recognition that the geographic data layers and tables in most GIS implementations come from multiple sources. Many of New Jersey's most accurate and detailed framework spatial data sets and critical infrastructure data sets are being acquired and maintained by county and municipal governments. In order for the data to be most useful for emergency response situations as well as other government operations, this county and municipal data must be easily shared, well-described, cataloged, and adherent to common standards.

The New Jersey Mapping Assistance Partnership Program (NJMapp) and the New Jersey Geographic Information Network (NJGIN) were designed to provide solutions to the state's data acquisition and sharing dilemma, which confronts users of geographic information in other states as well. Through NJMapp, the New Jersey Office of Information Technology's Office of GIS provides participating county governments with the hardware, software, and training to enable each county to establish a node on the NJGIN data-sharing network. In return, each county agrees to publish and maintain its data (using an agreed-upon set of standards) and work to establish data partnerships with its municipal governments.

The ultimate goal of NJMapp is to provide an opportunity for each of New Jersey's 21 counties to establish a spatial data node on the statewide New Jersey Geographic Information Network. NJMapp creates intergovernmental partnerships at the municipal, county, and state levels to build NJGIN, which in turn functions as a vital component of the National Spatial Data Infrastructure.

Description of project

NJMapp is an innovative collaboration between state and local government. Launched in the fall of 2001, the program provides a technical infrastructure on which local governments build, maintain, and share their digital geographic data, leveraging state data resources to support homeland security, smart growth, and other state priorities. A statewide data-sharing network, the New Jersey Geographic Information Network (NJGIN), will be used to support public health and safety decisions at all levels of government.

New Jersey's most accurate and detailed spatial and critical infrastructure data is being acquired and maintained at local levels. NJMapp establishes a statewide geographic information system (GIS) infrastructure that uses the Internet to keep information current. At the same time, the program creates two-way sharing partnerships with local governments and requires the use of a single set of standards, thereby creating consistency across state and local government enterprises.

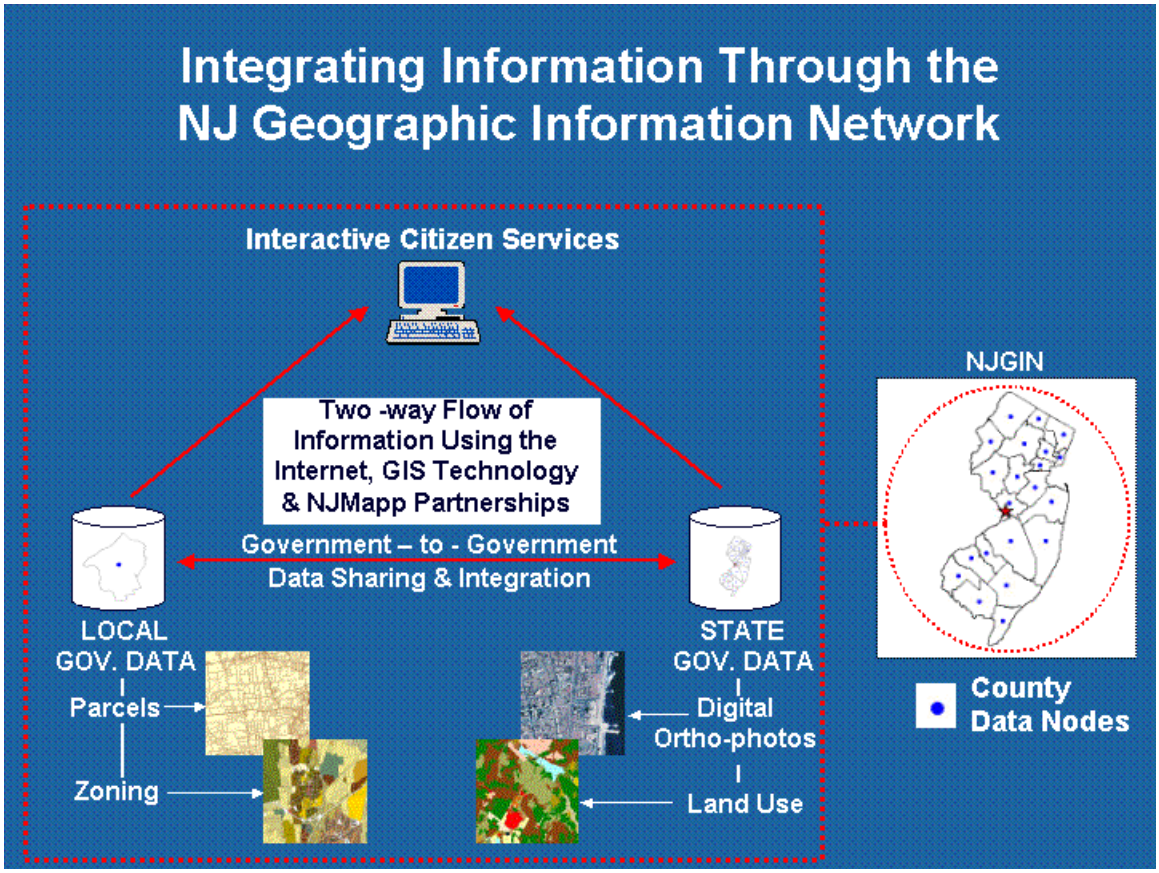
Each county that agrees to participate in the program receives GIS training, hardware, and software. The bundled hardware and software establish a county node on the statewide system. In return for the state's assistance, each participating county agrees to maintain its data utilizing an agreed-upon set of standards and share it on NJGIN, using the Internet as the communication mechanism.

The NJGIN node foundational technology consists of data storage, Web application servers, and data presentation/application logic Web servers. For data storage, Oracle or SQL servers are used as the relational database management system (RDBMS), storing data and providing low-level data administration. An Environmental Systems Research Institute (ESRI) Arc Spatial Data Server (ArcSDE) runs on top of RDBMS. ArcSDE communicates with the RDBMS using a TCP connection. ArcSDE also stores metadata about each spatial dataset in compliance with Federal Geographic Data Committee (FGDC) standards.

The Web application server, ESRI ArcIMS, processes data from the RDBMS through ArcSDE using a TCP connection. ArcIMS performs any requested spatial operations and creates a response in the form of XML and a graphic map image or feature streaming. The ArcIMS application architecture offers internal load balancing for multiple servers.

The Data Presentation/Application Logic Web Server accepts and passes requests from clients to the ArcIMS application server using XML. The server forwards responses from ArcIMS to the client and hosts scripting for data viewers using HTML/JavaScript, Java Server Pages (JSP), or Active Server Pages (ASP).

The chart below demonstrates how information is integrated through the NJ Geographic Information Network.



Significance to the improvement of the operation of government

NJMapp enables the state to access accurate, locally maintained critical infrastructure and asset information while avoiding the costs of developing infrastructure and local spatial data.

The development of the technical infrastructure to support the sharing of data will allow data to be collected once and used many times in support of multiple government objectives. Like the nation's highways, which are built and then used for many transportation purposes, this infrastructure will allow the sharing of spatial information in support of many governmental decisions.

In the event of an emergency, first responders at all levels of government will have access to consistent information. In addition to improving public safety, a statewide GIS network will prove valuable for smart growth planning. Decisions on where growth and preservation occur in New Jersey often rely on detailed data at the community level. In fact, many of the issues state agencies face will benefit from access to local data that can be analyzed and displayed using GIS technology.

Benefits realized by service recipients, taxpayers, agency or state

Through NJMapp, taxpayers pay for development and maintenance of data only once. Local expenditures are leveraged in the construction of framework layers for New Jersey's part of the National Spatial Data Infrastructure. These framework layers are fundamental to GIS in government, non-profit, and private sectors.

All geographic data users have easy access to non-sensitive data sets without service intervention by state or local government staff. Additionally, sensitive information can be made shareable, so that it is easily used by those who need to know.

Return on investment, short-term/long-term payback

Cost effectiveness is a key element of this program. In FY02, the New Jersey Office of Information Technology invested $200,000 in the NJMapp Pilot Project, providing hardware, software, and technical support to Atlantic, Cape May, Mercer, and Somerset counties. In return, the state gained access to approximately $2.3 million in local data (critical facilities, parcels, aerial photos) supporting homeland security (as well as other functions), all of which can be accessed through the NJGIN and seamlessly integrated with state agency data. We estimate that the expansion of the program to the remaining seventeen counties will cost approximately $1.5 million, resulting in access to local data worth over $10 million.