A Proposal for National Economic Recovery
An Investment in Geospatial Information Infrastructure
Building a National GIS

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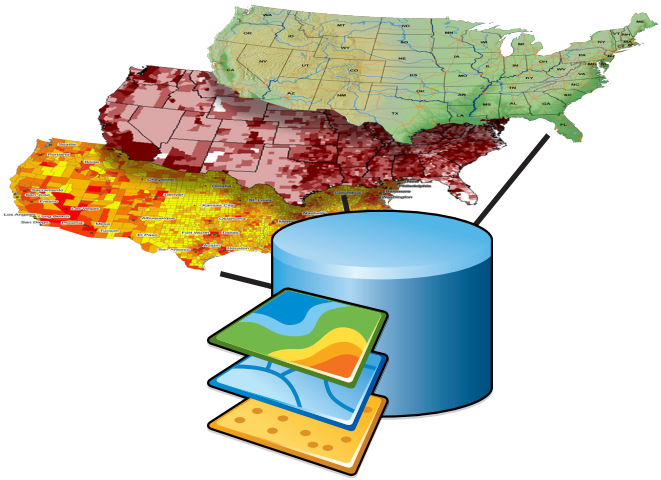
Summary

America's financial crisis, the worst since the end of World War II, will force difficult actions and decisions. Large expenditures of taxpayer money must be designed to yield products of long-term benefit to the country. America has an information economy, and a robust geospatial infrastructure (system of digital maps and tools) is just as vital to its continued development as was the physical infrastructure to the industrial economy. A National GIS, properly designed and effectively implemented, providing public access and using best technologies, will speed economic recovery by producing jobs and putting shovels in the ground more quickly. It will also leave the country with a public utility, a modern geospatial information system, that itself can become a foundation for new generations of industries and technologies in the future.



Proposal

The Stimulus Plan being developed by Congress and the incoming Obama Administration is an enormous undertaking to revive the American economy. Potentially, it will involve thousands of infrastructure and other projects intended to create jobs and restart economic growth while producing things of lasting value to American taxpayers. The challenge to properly manage and execute this effort will be daunting, requiring unprecedented access to data and information at all levels of government and the private sector.

This is the moment for America to build a national Geographic Information System (GIS), that is, a unified, up-to-date, publicly-accessible national digital map, enriched with data from all available sources, and supported by GIS technology. This system can be built quickly, immediately creating high tech jobs, and will serve as a public resource for project planners to support transportation infrastructure, water resource management, alternative energy research, and project siting. It will also provide a foundation for monitoring the US economic recovery across our communities, allowing activities to get underway as soon as possible and leaving a legacy for the future.

The benefits of a national GIS are universal. The Western Governor's Association declared GIS a key component of our national critical infrastructure. The National Association of State CIOs (NASCIO) has consistently rated GIS as a mission critical component at the state level and along with the National States Geographic Information Council (NSGIC) which values this technology as an opportunity to foster federal, state and local partnerships and collaboration. The National Geospatial Advisory Committee (NGAC) adopted a set of transition recommendations for the new Administration in October 2008. The NGAC recommendations represent a broad consensus among the key public and private stakeholders in the geospatial technology field, and form a principal basis for this proposal.

Why a National GIS

Agencies have been laying the foundation for national GIS for years. It falls within umbrella terms like Imagery for the Nation, The National Map, the National Spatial Data Infrastructure, and the pioneering work of the U.S. Geological Survey, Census Bureau, National Oceanic and Atmospheric Administration, and the Departments of Homeland Security, Agriculture, and Interior, among others. It is supported by technical studies from the National Geospatial Advisory Committee (NGAC), the National Research Council, the Federal Geographic Data Committee (FGDC), and the National States Geographic Information Council (NSGIC). Now is the time to pull them together.

GIS technology is uniquely capable of providing unity to the complex Stimulus Plan. GIS can integrate data from agencies across all levels of government, providing decision makers a powerful tool to marshal knowledge on items as diverse as personnel, finance, economics, infrastructure, and resources, all organized within maps or images showing geographic basics such as topography, roads, parcels, buildings, utility networks, landmarks, soil types, and political and physical land divisions. It brings together all key national datasets to support action – which is why it is considered a "must" for emergency response organizations across the country. A national GIS will place at our fingertips a comprehensive description of our nation's assets, resources and operations, all linked geographically. Once completed, it will be a priceless national resource and an indispensable tool for planners and business alike.

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A national GIS can be built immediately, engaging hundreds of private firms. It will speed the start of job-rich infrastructure projects. Its biggest impact will be on projects critical to energy development, water resources, homeland security, defense, climate change, health care delivery, telecommunications, transportation, and the environment. Without national GIS as a management tool, efforts will be haphazard and project planners will be hamstrung. A National GIS must be a cornerstone program funded by the Stimulus Plan, a fulcrum to wring the greatest result for each dollar spent.

Technical fundamentals of a National GIS

A GIS system integrates information from many sources and authors using standardized protocols so that information can be harmonized and incorporated into a consistent framework to support multiple missions at all levels of government and private business. It can be built and maintained largely using on-going business processes such as The National Map initiative of Interior Department's Geological Survey (USGS), and it can rely heavily on existing software, hardware, and networks, integrated by a lead organization setting standards and protocols. Existing modern GIS server technology, together with open standards and Services Oriented Architecture (SOA), can provide enabling components for a national GIS immediately. This architecture maximizes collaboration among government and private entities. Guarantees of privacy, confidentiality, protection of proprietary financial data, and similar concerns can be built in at the foundation and at every level. This national system will result in the following:

- A series of standard geographic datasets (framework layers described below);
- A series of workflows that transactionally maintain (update) these datasets;
- A system for data management responsibility (FGDC governance);
- A suite of tailored applications;
- A designated Federal entity to oversee the effort;
- The necessary technology to support a National GIS system.

Leadership and cost for a National GIS

Both the National Geospatial Advisory Committee (NGAC) and the Department of Interior have developed detailed recommendations on how to build a National GIS. A key first step is to implement fully the Imagery for the Nation initiative, an intergovernmental plan to create a full Federal-level GIS based on nationwide aerial imaging and mapping, participation by agencies across the Federal landscape, and technological consistency.

Next, a comprehensive national updating of mapping and topographical information is essential to create a complete current portrait of America – what is referred to as The National Map. This step, along with outreach to incorporate key additional databases maintained by state and local governments and the private sector, and elements such as Parcels, Transportation, Hydro, Elevation, Critical Habitat and Boundaries, will be needed to make the system most effective for project decision-makers and infrastructure planners. (See attachment A) We anticipate the total cost to be approximately 1.2 billion, spread over three years. We can provide detailed cost breakdowns upon request.

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Interagency plans, contracts, and management systems are already in place today to implement this initiative. Overall management could be provided by the Secretary of the Interior, who chairs the Federal Geographic Data Committee, with significant involvement from USDA, DOC and DHS/FEMA. In addition, program funding can be leveraged through cooperative efforts with partners in State and local government and the private sector. The National Geospatial Advisory Committee can provide ongoing strategy and recommendations for program design and implementation.

Conclusion

But the key is to get it done now. Crisis always brings with it opportunities. A National GIS, properly designed and effectively implemented, providing public access and using best technologies, will speed economic recovery by producing jobs and putting shovels in the ground more quickly. It will also leave the country with a public utility, a modern geospatial information system, that itself can become a foundation for new generations of industries and technologies in the future.

Attachment A:

A National GIS: Key Framework Data and System Technology Recent studies by the National Academies of Science and multiple public and private stakeholders have focused on the need to develop and integrate four key digital maps: Imagery, Parcel Data, Elevation, and Wildlife Habitat.

Imagery

Imagery for the Nation (IFTN) is an intergovernmental initiative to address the nation's basic business needs for aerial images. Imagery is used for countless applications in all levels of government and the private sector, embraced by the public through online tools such as Google Earth and Microsoft Virtual Earth. Partnerships between levels of government to acquire imagery data have lowered costs, reduced duplication, and allowed greater data standardization. IFTN will maximize the impact of taxpayer investments through a coordinated national acquisition program. The IFTN initiative was originated by the National States Geographic Information Council, been endorsed by the FGDC and the NGAC, and involves a heavy investment from the US Department of Agriculture (approximate cost $140 million).

Parcel Data

Based on the National Academies of Science, National Research Council (NRC) recent report "National Land Parcel Data: A Vision for the Future," the land parcel data layer (also known as cadastral data) is used by governments to make decisions on land development, business activities, regulatory compliance, emergency response, and law enforcement. The NRC report concludes that nationally-integrated land parcel data is necessary, feasible, and affordable. Development of a national land parcel system would also provide an invaluable analytical tool to help manage the mortgage crisis. The NGAC endorsed the recommendations in the NRC report in October (approximate cost $200 million).

Elevation

Today, high density digital elevation models are produced by a technology called LiDAR and IfSAR, an aerial mapping technology that provides highly accurate mapping of ground elevations. FEMA currently uses LiDAR data for flood mapping whenever such data are available. LiDAR data are also being utilized extensively in natural resource management, and new uses are being demonstrated for emergency response and homeland security purposes. An investment in a national Elevation initiative would produce consistent elevation dataset encompassing the entire country (approximate cost $300 million).

Wildlife Corridor / Crucial Habitat

The pressure for rapid economic development and increased energy production threatens our natural resources. The Western Governors' Association has recommended a Wildlife Corridor and Crucial Habitat Decision Support System. This system will support informed decisions on community growth, alternative energy expansion, biodiversity preservation, and resolving water resource issues. This effort will produce a consistent nationwide wildlife map and GIS management system (approximate cost $110 million).

National System and Data Integration

In order to create a national GIS it is necessary to update and integrate the many currently-existing individual agency map layers into a consistent, integrated whole. USGS would lead this effort and combine information into a consistent geospatial foundation (approximate cost $450 million).