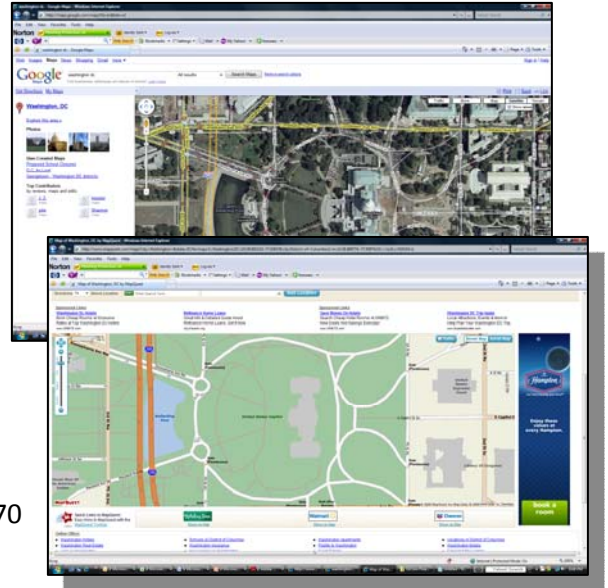




A Stimulating Technology

Americans rely on a wide range of location-based technologies that make our lives easier and keep the world in a context that can be easily understood by the masses. We are able to do this because of the \$30 billion per year geospatial technology industry, which is a major IT growth sector. According to the Department of Labor, geospatial is one of the three technology areas that will create the most jobs in the coming decade. Companies like MapQuest[™] and Google[™] (products shown at right) are almost universally known. What is less well known is that this thriving industry owes its very existence to enlightened policy decisions by the United States government over the past 30 years.



Street Map Data Evolution & Government Role

- U.S. Census Bureau develops the Geographic Base File using Dual Independent Map Encoding (DIME) in 1967 in preparation for the 1970 Census. For the 1990 Census, DIME is supplanted by a more comprehensive digital map product known as TIGER developed in cooperation with the United States Geological Survey. In addition to developing the first nationwide digital street maps, **Census has the foresight to put both DIME and TIGER in the public domain.**
- Geographic Data Technology, Inc. is founded in 1980 by a Census Bureau cartographer who helped create the DIME files. The company is acquired by TeleAtlas[™], a Dutch mapping company, in 2005. In 2008, TeleAtlas[™] becomes a wholly-owned subsidiary of TomTom[™], a manufacturer of automotive navigation systems, through a €2.9 billion acquisition (>\$4 billion US dollars).
- Navteq[™] is launched in 1985. The company improves TIGER, optimizing the data for navigation. NavTeq is sold in 2007 to Nokia for \$8.1 billion, providing a clear signal that mapping will be an integral part of mobile applications.

Geographic Information System (GIS) Software Evolution & Government Role

- In addition to launching the GIS data industry, the DIME and TIGER products also gave a significant boost to GIS software firms in the 1980s and '90s. If GIS software were a car, mapping data would be gasoline. One is useless without the other. The United States has data and not coincidentally becomes the world leader in mapping software with companies including Intergraph[™], MapInfo[™] and ESRI[™].
- After starting life in a Central Intelligence Agency incubator, Google Earth[™] is launched in 2005 and immediately begins to reshape public thinking about location-based services due to its ease of use and features. Google reports over 400 million downloads of the application.

Global Positioning Evolution & Government Role

- The U.S. Air Force launched the 24th Navstar satellite into orbit, completing the Global Positioning System (GPS) in 1993.
- President Clinton announces in 1996 that a higher level of GPS accuracy will be publicly available and that the practice of degrading the public signal will be phased out within a decade.
- Today, GPS is a multi-billion dollar industry with devices on the dashboard of cars, in cell phones, and even on dog collars.

Current Opportunities & Government Role

America's ability to confront major issues like global warming, crumbling infrastructure, affordable healthcare, homeland security, global pandemics, foreign oil dependence, and the mortgage crisis depend in part on our ability to map, understand and act on information using geospatial techniques. Three suggestions that can provide almost immediate assistance are identified on the following pages.



Opportunity

Our Nation doesn't have a comprehensive program to coordinate the acquisition of map accurate aerial and satellite imagery to meet the business needs of government (all levels). Instituting such a program will increase the availability of products to underserved areas, reduce duplication of effort, result in cost avoidance, and take advantage of large area contracting mechanisms that significantly reduce the costs for everyone. The resulting imagery will be of great benefit to the private sector and the general public who should only be required to pay for these products one time through their taxes.

A reoccurring national imagery program would serve as the base component of Virtual America. This base could be collected on a reoccurring cycle and used to visually illustrate the change in the American landscape as stimulus projects are completed. Each "shovel ready" project could be pinpointed on a web based application to allow the public to visualize the physical impact of the stimulus package.

Analysis

- Imagery is a fundamental piece of the GIS technologies that are essential for planning the infrastructure improvements, such as highways, railways, and pipelines that will compose a major portion of the Stimulus package. In the absence of readily-available data, project planners will need to create it from scratch.
- The system for obtaining high-resolution, digital, GIS-compatible imagery and distributing it efficiently over the Internet has already been built and is in active use. It is readily scalable, so the process can begin immediately with service providers already under contract and specifications already in place.
- Once in place, nationwide publicly-accessible imagery can serve as a public resource and be used repeatedly by project planners at all levels, creating great efficiencies. It will provide a unified digital map of America available to all comers for years into the future, allowing shovels going to the ground as soon as possible and a way to measure progress in the future.
- Approximately 50 aerial survey companies are involved in producing this data under existing government contracts. This is in addition to the camera suppliers, aircraft mechanics, computer producers, engine companies, aircraft companies, software companies and others who benefit from program spending.
- There are no technical issues that would delay this initiative, nor are there any issues with the capacity of the industry to create the required products.

Solution/Steps to be Taken

1. A **stable** revenue stream is critical and must be generated. Ask Congress to fund Imagery for the Nation through the *President's Budget* at the full amount needed for national coverage. "Line items" are required in the USDA/FSA and DOI/USGS budgets and statutory language is required to protect funds from being diverted to short-term agency needs, unwarranted management fees or new priorities. An annual appropriation of \$95.6 million is required, but current expenditures probably exceed \$30 million per year. Previous data calls and surveys have failed to accurately identify program expenditures.
2. Ensure the business requirements of all levels of government can be met through buy-up options that allow government agencies to procure what they need (e.g. higher resolutions, increased accuracies, or digital v. film products).
3. Provide active leadership for the Federal Geographic Data Committee (FGDC) and work with both the Executive Committee and the Steering Committee to implement IFTN and use it as a model to build the NSDI in concert with state and local governments.



Opportunity

The United States government is developing a highly accurate database of addresses. But forgetting the lesson of DIME and TIGER, a needless overreaching interpretation of Title 13 is preventing the government from sharing this national treasure with the public. If released, an accurate national map of addresses would immediately enhance a variety of government services as well as be put to use by creative businesses and individuals.

Supporting production of a shareable national address database will allow the U.S. to take another step in the evolution of geospatial technologies that may be comparable to the DIME and TIGER street centerline files. This will also dramatically improve data in rural areas to improve delivery of government and private services (i.e. broadband Internet access).

Analysis



- Currently, most internet location based systems use address ranges that are associated with a road segment such as a one block segment of a road in an urban area (see graphic on left). This allows a “reasonable person” to find the general area of the exact address they are seeking and ultimately to locate the building. While this approach works reasonably well, tremendous improvements in the technology can be realized through improved addressing.
- Government agencies must maintain precise locations for addresses to ensure timely delivery of emergency services and for a host of other applications such as taxation. Precise address points look more like the graphic on the right where the red “+” symbols represent individual structures along the street highlighted in the red oval at left.
- The following are examples of industries that are dependent on addressing information: 911 dispatch, utilities, real estate, emergency management, telecommunications, healthcare, insurance, local delivery, service providers, and marketing.
- The U.S. Census Bureau is creating an accurate master file of addresses for structures in the Nation to support the 2010 census. It will not share the map coordinates and simple address data with other government agencies or the public due to Title 13 privacy restrictions.
- Because street addresses have evolved over many decades, under the control of thousands of local jurisdictions, in many different record and database formats, and to serve many purposes, different address formats pose a number of complex geo-processing and modeling issues. As a consequence, government agencies struggle with these issues as they seek to integrate large, mission-critical files into master address repositories.

Solution/Steps to be taken

1. Ask Congress to remove addresses and address point locations from Title 13 restrictions and to instruct the U.S. Census Bureau and other federal agencies (e.g. Post Office) to work together to develop a common file and to make them publicly available.
2. Give the U.S. Census Bureau funds and granting authority to work with state and local governments to create and maintain a national address file.
3. Address/coordinate data should be updated by local address authorities as soon as a building permit is issued, thereby including construction sites. Data should be developed locally, with local and state custodians acting as regional integrators that merge local data into region-wide databases.



Opportunity

Production of geospatial data and technologies has shifted from the federal government to the private sector and to state and local government. However, the United States is still using a federal centric governance model for the National Spatial Data Infrastructure (NSDI). We can't build the NSDI without eliminating the "silos" and duplication of effort in Federal government, and implementing an inclusive governance model. This requires strong leadership that is independent of the agencies and has the authority to regulate their budgets. It's time to form an inclusive partnership in which all participants are empowered to define the NSDI, and to determine the best options for building it and measuring its success.

Analysis

- The Federal Geographic Data Committee (FGDC) and its participating agencies understand the role of state and local governments and the private sector in building the NSDI, but since there is no clear definition of the NSDI (finite & measurable), or effective business plans to build it, they focus on self-serving Federal business needs instead of identifying national objectives.
- In large part, this is because only those agencies with missions clearly tied to geospatial data are effective in getting budget appropriations and they are very protective of their own efforts. The FGDC has no authority or power to interfere with the budget process in these agencies. In addition, Congressional committees are often more protective of the agency budgets and frown on efforts that involve multiple federal agencies that are then beyond their span of control.
- The NSDI is very complex and efforts to effectively describe it or its significance to decision makers often fail. It must also be understood by policy makers that the vision of the NSDI can't be achieved until local government data (i.e. parcel maps at local scales) are fully integrated to meet Federal business needs.
- The FGDC does not allow the private sector or state and local governments to have an effective voice, because 1) they believe that they are the ultimate authority for the NSDI, and 2) they work under the common principles that it is inappropriate to have non-federal entities potentially involved in any budget-related discussions, or advising Federal agencies. This is contrary to the new vision of a more open and transparent government.
- No one is willing to acknowledge the true cost of building an effective NSDI and its value is unknown. NSGIC believes that the price tag is over \$8 billion with an annualized cost of approximately \$2.5 billion. The largest part of this expenditure is born by state and local governments and there are no effective incentives from the Federal government to cause them to conform to national standards or spend additional money to share their data. A large portion of the initial \$8 billion has already been expended.
- No Congressional committee has oversight for Federal/National geospatial activities or the NSDI.

Solution/Steps to be taken

1. Immediately create a Federal Geographic Information Officer (GIO) position in OMB with funding and the staff required to investigate and understand Federal agency expenditures. Give this individual the authority to require that agencies work to define and develop an effective NSDI.
2. Fund and task the GIO to develop a credible research report within 18 months that details the value of geospatial technologies and a shared NSDI to the nation, including all levels of government, the private sector and the public.
3. Ask Congress to establish an oversight committee that deals with geospatial activities to ensure a point of contact in Congress with a clear understanding of the issues that can take appropriate action. Focusing on the failure of E.O. 12906 and OMB Circular A-16 would be a good start.
4. Build a governance structure for the NSDI that includes equal representation by the private sector (service providers and consumers); Federal, state and local government; academia; utilities; and the general public. The FGDC should focus on Federal agency coordination working with the GIO.