

## 3.0 INTRODUCTION AND BACKGROUND

### 3.1 NSDI Defined

The National Spatial Data Infrastructure (NSDI) was established by President Clinton's Executive Order 12906 on April 11, 1994 to implement the recommendations of the National Performance Review published by his Administration in the Fall of 1993.

The Executive Order described the need for a National Spatial Data Infrastructure as follows:

“Geographic Information is critical to promote economic development, improve our stewardship of natural resources, and protect the environment. Modern technology now permits improved acquisition, distribution, and utilization of geographic (or geospatial) data and mapping. The National Performance Review has recommended that the Executive Branch develop, in cooperation with state, local, tribal governments, and the **private sector**, a coordinated National Spatial Data Infrastructure to support public and private sector applications of geospatial data in such areas as transportation, community development, agriculture, emergency response, environmental management, and information technology.”

#### This Section Addresses

- What is the NSDI
- Defines the Spatial Technologies Market Model
- Validates the lack of private sector participation in the NSDI
- Identifies NSDI issues from a private sector perspective

The NSDI consists of “the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data.” Thus, the NSDI is a means to assemble geographic data nationwide to serve a variety of users, both public and private. The Executive Order called for:

- Executive Branch leadership
- Development of a National Geospatial Data Clearinghouse
- Development of standards for data documentation, collection, and exchange
- Development of a National Geospatial Data Framework, and
- Partnerships for data acquisition

The NSDI provides an environment within which organizations and technology interact to foster activities for using, managing, and producing geographic data. In addition to calling for executive branch leadership for development of a coordinated NSDI, the E.O called for the development of a National Geospatial Data Clearinghouse, the development of standards for implementing the NSDI, the development of a National Digital Geospatial Framework, and the development of strategies for maximizing cooperative participatory efforts with State, local, and tribal governments, the private sector, and other nonfederal organizations *to share costs* and improve efficiencies of acquiring geospatial data consistent with the Executive Order.

The private sector is an essential contributor to realizing a robust, successful NSDI and a beneficiary of a comprehensive, accurate, and current NSDI. The NSDI's charter, articulated in the Executive Order, envisioned cooperation from state, local, tribal governments, and the private sector to develop the NSDI. Some key questions to ask might be:

- What exactly is expected of the private sector?
- How realistic are these expectations?
- What contribution is expected from the private sector?
- What metrics should be used to evaluate private sector participation in the NSDI?
- Is it realistic to expect extensive private sector data sharing?
- Under what circumstances and conditions would private sector participation in the NSDI be expected?
- Are there limitations to the NSDI components of metadata, clearinghouse, and framework data that define the NSDI as less than a “whole offering”?
- And what, if anything, needs to be done at the Federal level to provide the elements of a whole offering that would drive increased private sector participation and support for the development and continued maintenance of the NSDI Framework?

It is important to set realistic expectations on partners in partnership efforts at the outset to:

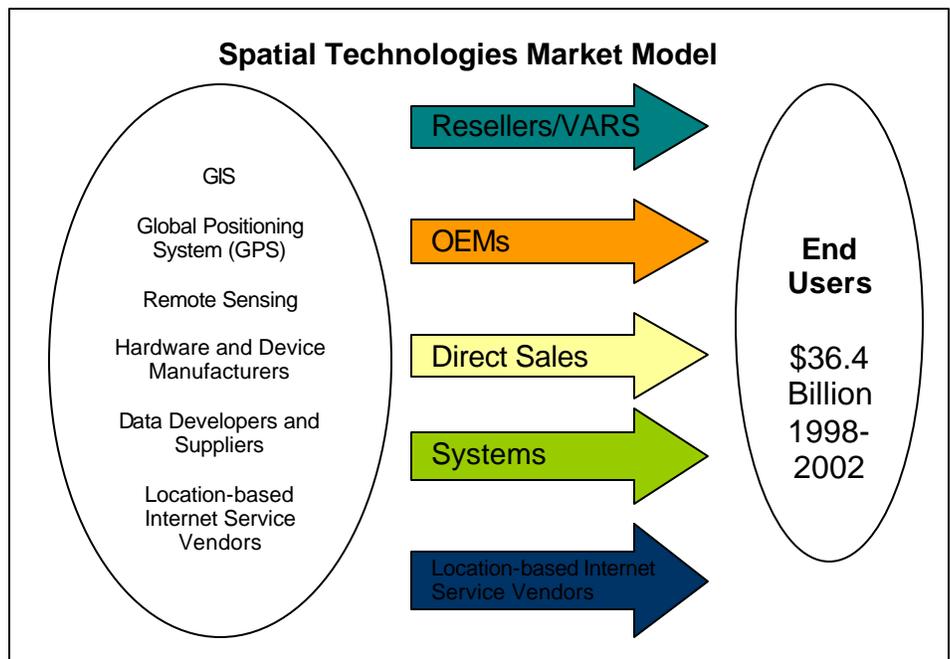
- Lessen the prospect for disappointment, and
- Be capable of measuring performance against realistic goals.

It was the purpose of the Department of the Interior Grant, over four identified phases to:

- Examine the underlying principles of the NSDI relating to the private sector
- Look at the level of private sector awareness of the NSDI
- Examine current private sector participation in the NSDI effort
- Outline strategies to increase private sector awareness and enthusiastic participation in the future development of the NSDI.

### 3.2 Spatial Technologies Market Model Overview

The STIA defines the industry to include geographic information systems (GIS) and applications that incorporate positioning and imagery data, the Global Positioning System, transmission and imagery ground networks, remote sensing satellites, hardware and device manufacturers including computer manufacturers, manufacturers of PDAs, and mobile telecommunications and computing devices, data developers and suppliers, and location-based internet service vendors.



STIA recognized the convergence of these technologies into a definable industry sector – spatial technologies industry in 1996. Imagery products are integrated with GIS data sets and features and their locations are included in the data sets with GPS collected locations. GPS receivers collect location data for inclusion in location-based information and management systems. Thus, dependencies exist between GIS, GPS remote sensing technologies and the delivery of location-based services over wired and wireless communications systems.

These technologies are converging into mainstream computing technology with the current commercial growth being driven by advances in information processing, telecommunications technology, ease of use, and the increasing availability of “spatial data” from private sector commercial sources including

commercial satellite imagery companies, and commercial spatial data providers.

The end-user community includes vertical markets from agriculture to residential zoning. In car navigation systems available from On-star integrate computing and GPS hardware, telematics, and digital street maps to provide the automobile driver with an integrated navigation solution.

Thus, the private sector is actively engaged in building the “National Spatial Data Infrastructure” to meet market place needs defined as business opportunities. The Open GIS Consortium of over 200 private sector, public sector, universities and not-for-profit organizations representing technology users and providers is addressing the issue of easy access to spatial information in mainstream computing. OGC is working to develop open software approaches that facilitate the development and use of location dependent software applications using spatial data to increase farm productivity, identify disease and health threats, assist police and law enforcement in identifying crime patterns and many more.

### 3.3 Definition of the Issue

The framers of the National Spatial Data Infrastructure envisioned active and substantial private sector support and participation to develop the NSDI including the framework layers, the clearinghouse, and supporting the Federal metadata initiative.

The Vice President’s National Performance Review (NPR) went so far as to envision private sector funding for the collection, processing and distribution of the NSDI because of the value of the data, especially to profit-seeking private sector companies. It was contemplated that as much as 50% of the NSDI’s project costs could come from the private sector.

The Framework Data Survey was the first quantitative study of the development of the NSDI Framework. The Survey’s purpose was to measure progress of the nation’s framework activities or “uncover the nation’s hidden framework assets.” From 1996 to 1998, some 13,000 questionnaires containing 118 questions were distributed to organizations in the 50 states representing:

Organization	Respondents	Percentage
<b>Federal Agencies</b>	273	5.2%
<b>Non-Federal</b>		
Counties	1920	36.2%
State Agencies	772	14.6%
Regional Agencies	392	7.4%
Municipalities	1187	22.4%
Tribal	107	2.0%

<b>Private Industry</b>	433	8.2%
<b>Academia</b>	215	4.0%
<b>TOTAL</b>	<b>5299</b>	<b>100%</b>

The Survey was an invaluable tool to:

- Better understand how the NSDI effort is progressing nationwide
- Measure the success of existing efforts to develop the NSDI
- Develop future activities to achieve the goals of the NSDI program or modify activities based on the current understanding of how organizations participate in the NSDI effort.

The Data Survey validated the lack of private industry data sharing. Private industry exhibited the lowest sharing rates, and private industry participated the least in data sharing coordination groups. This finding is entirely understandable in that the private sector companies that participated in the survey can only sustain their activities by profitably serving marketplace needs. In the case of commercial remote sensing companies, significant capital investment is required to place in space imaging satellites and ground stations to capture the imagery to produce the first deliverable product. Thus, some of the underlying data sharing assumptions are not well articulated. Further, licensing and other intellectual property arrangements are in need of being defined.

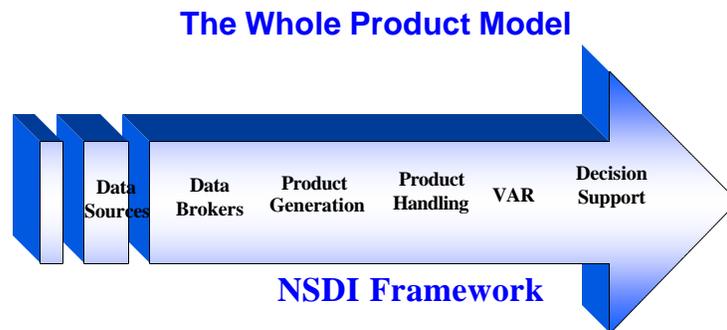
From our review of the NSDI program, we have identified a number of issues that need to be addressed to increase private sector participation:

- Build a Plan: Plans outlining activities to attract private industry to support the NSDI have not been developed. What elements of the NSDI can industry agree on? Are there activities such as a national funding program to support a community enterprise spatial resource planning capability that would be part of the NSDI. Other activities could include increased private sector awareness through a promotional campaign highlighting the benefits of the NSDI is needed and “all the elements needed to convert the aspirations into reality within a reasonable time” need to be articulated.
- Include the Private Sector: Private industry interests are not represented at the FGDC and thus, the private sector does not have a vested interest in the NSDI. The NAPA Study addressed this issue with the recommendation that a National Spatial Data Council be created legislatively to establish an entity that would represent national interests, including the private sector in policy, planning and administrative councils responsible for the success of this national effort. Many have remarked that the FGDC should refocus its activities more toward coordinating

Federal agency spatial data activities and less on the role assigned to the FGDC to develop the NSDI in Executive Order 12906.

- Review and Target the NSDI: The seven Framework layers have not been completed and concerns are expressed by NSDI “customers” of the need to develop the various layers beyond digital orthophotos offering a common, complete Framework of value to the end-user community. The May 11, 2000 report prepared by the Design Study Team, Commissioned by the Federal Geographic Data Committee, “Improving Federal Agency Geospatial Data Coordination,” recommended focusing Federal agency efforts toward building and distributing integrated national geospatial data assets. The “whole NSDI offering” needs to be considered.

In marketing, it is critical to understand the whole product concept, its importance to marketplace acceptance, and its relationship to the technology adoption life cycle. Customers least in need of whole product support are the technology enthusiasts or early adopters. In order to achieve “mass market” appeal the “product” must meet certain criteria.



The whole product is defined as the minimum set of products and services needed for customers to achieve the value proposition needed.

The Gartner Group stratifies enterprises into Type A, Type B and Type C based on the aggressiveness of their technology adoption. The meaning of these types is:

- Type A: pioneers, technology-driven, cutting-edge
- Type B: mainstream, moderate adopters, implement proven technologies
- Type C: followers, risk-averse, cost-conscious, late adopters

To shift enterprises from Type A to Type B requires that technology providers address these issues:

- Type B users require industry-specific solutions where Type A users are willing to perform customization themselves.
- Type B users want turnkey solutions where Type A users are willing to either pay for custom integration or perform integration themselves.
- Type B users don't need all of the functionality that Type A users needed and they will not be willing to pay for Type A features they don't need.

- Type B users are not power users and require more templates, interfaces and Web-enabled tools.
- Type B users have less internal IT support. They need single-point-of-contact support from the technology providers they choose, even if their solution is an integration of many technologies.

To succeed in increasing private sector participation in the NSDI, the drivers to private sector participation must be better understood. The NAPA study commented that, “Although the FGDC has promulgated a vision, goals, and objective for achieving the NSDI, no one has thought through all of the elements needed to convert these aspirations into reality within a reasonable time.” The lack of a strategic plan to “convert these aspirations into reality within a reasonable time” impacts private sector participation in the NSDI effort.