



The States' Perspective on Advancing the National Spatial Data Infrastructure

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Introduction

Spatial data applications are evolving and expanding rapidly. Public and private sector organizations around the world are discovering the rich benefits of using spatial data as a framework for improving services and public policies. The United States needs a renewed national approach for improving and integrating spatial data. To that end, the intent of this document is to refocus national efforts to complete the development of the National Spatial Data Infrastructure (NSDI) and to develop appropriate processes to maintain its data content.

The purpose of the NSDI is to provide accurate and reliable data for decisions regarding the health, safety and welfare, security, and prosperity of our citizens (See Page 2). Public and private sector decision-makers are realizing the challenges of implementing effective actions. Complex, dynamic, long-term policy areas require better and more accessible data, new analytic tools and new ways of collaborating between disparate stakeholders. The tools must be sophisticated enough to deal with the complexities of the public policy arena and must also be user friendly.

The NSDI will provide powerful capabilities that use digital map information to connect vast amounts of data by geographic location. It will help decision makers visualize and understand complex situations. A mature NSDI allows disparate information to be combined, analyzed and displayed in space and time to show patterns that are often critical to wise decision-making.

The NSDI was initiated by Presidential Executive Order fifteen years ago, but remains incomplete. Government agencies must be encouraged to work together to fully implement the NSDI. This document represents the perspective of NSGIC on the actions that should be taken nationally to implement the NSDI. More detail about each of the six strategic recommendations articulated below is contained in a separate report. In summary, those recommendations are:

1. Refresh and fully implement the 'Fifty States Initiative'
2. Establish an NSDI governance structure with equitable participation and responsibility for all sectors
3. Develop a 'For the Nation Initiative' implementation strategy to create nation-wide, authoritative core data
4. Define a national funding approach that compels adherence to NSDI requirements
5. Develop a strategic communication and advocacy agenda that all participants can use
6. Articulate a technology strategy based on proven technology, and standard designs and data models

Unified Vision and Principles

The NSDI will be a collaborative environment in which all government agencies that collect, manage, or use geospatial data do so in a way that facilitates data integration, sharing and access.

The following guiding principles provide a foundation for achieving this unified vision:

1. Business drivers will guide NSDI development
2. Data are a primary orientation of the NSDI
 - Build data once, use them many times
 - Data stewardship is essential
 - Data recognized as authoritative should form the foundation of the NSDI
 - Core datasets are freely available and readily accessible
3. Broad-based coordination and collaboration is critical
 - Partnerships are the key mechanism for NSDI development
 - All levels of government will be fully involved
 - The costs of implementing NSDI will be shared by all levels of government



Policy Area	Examples of what the NSDI will enable and improve	
Public Health, Healthcare, and Human Services	<ul style="list-style-type: none"> • Disease outbreaks response • Food-borne contamination tracking • Health services delivery • Public health linkages to pollution sources • Bio-terrorism response • Child support services 	
Homeland Security and Emergency Response	<ul style="list-style-type: none"> • Border security • Common operational picture/situational awareness • Earthquake preparedness • Fire response • Critical infrastructure management • Public communications • Terrorism threat assessment • 911 dispatch 	
Strategic Growth and Land Use	<ul style="list-style-type: none"> • Capital projects planning (bridges, roads, pipelines, etc.) • Population growth estimates • Transportation planning • Economic development sustainability and support • Resource allocation • Supply and demand studies • Housing design • Land use planning 	
Energy, Water, and Utilities	<ul style="list-style-type: none"> • Utilities mapping • Demand forecasting • Alternative energy sources development • Flood mitigation, planning, and response 	
Environment	<ul style="list-style-type: none"> • Global climate change impact mitigation • Greenhouse gas emissions reduction • Drought and natural resource management • Endangered species protection 	
Agriculture	<ul style="list-style-type: none"> • Crop safety • Animal and plant disease outbreaks response • Food supply safety and security • Exotic plants suppression 	

Strategic Recommendations to Further the NSDI

1) Fifty+ Statewide Spatial Data Infrastructures

We recommend the following actions by the federal government and state governments:

- As A-16 is implemented, its relationship to 50+ Statewide Spatial Data Infrastructures (SSDIs) must be fully implemented and maintained
- Refresh and augment the 50 States Initiative to better reflect the SSDI approach, including performance measures
- Develop criteria and requirements for interstate coordination to ensure a national approach
- Assist other sectors to develop NSDI participation guidelines

It will not be possible to build the NSDI without taking advantage of the day-to-day efforts of all levels of government. This will require that effective statewide coordination mechanisms be put in place. The Fifty States Initiative, developed by NSGIC and the Federal Geographic Data Committee (FGDC), describes the coordination criteria that must be in place, the characteristics of an effective statewide coordination council or office, the geospatial coordination activities that must be conducted, and the benchmarks

for measuring statewide participation in the NSDI. It also recommends strategies to the FGDC and all federal agencies on ways in which they can assist the implementation of effective statewide spatial data infrastructures.

The challenge we face is bringing consistency and parity to all fifty states. This will require buy-in from top elected and appointed officials in state, local and tribal governments. To achieve this buy-in, officials need to be engaged in ways that will help them understand the importance of geospatial technologies to the delivery of citizen services. The entire geospatial community must also be able to “buy in” to the strategies being developed and be willing to help support their implementation. The Fifty States Initiative will bring the required consistency and parity to each state.

2) Governance

Implement FGDC’s “Future Directions” Report to establish an NSDI governance structure that includes:

- a national geospatial coordinating council
- fifty statewide coordinating councils
- national stakeholder groups
- the Federal Geographic Data Committee



The role of governance is to manage, maintain, and advance the NSDI’s activities and components — policies, data, technology, and standards — through the assignment of roles and responsibilities. The existing National Geospatial Advisory Committee (NGAC) is an interim step. It is challenging to govern the NSDI because it is a national process that is widely distributed and driven by differing needs and traditions. Therefore, standards and guidelines must leave states some freedom of interpretation to custom-tailor the NSDI.

Furthermore, the federal government must not dictate the actions of state and local governments, nor should state governments dictate those of local governments. However, each level of government can exert a strong influence on subordinate levels by making funding contingent on compliance with the policies and standards it establishes.

In short, each level of government will bear some responsibility for implementing and maintaining the NSDI and will have a role in governing it. Other stakeholders, however, must also have a role in the governance structure. The Coalition of Geospatial Organizations (COGO) should be considered to fill at least part of the role of other stakeholders.

3) “For the Nation” Initiatives

The “For the Nation” initiatives include baseline programs to meet federal needs, while options exist for state and local governments to enhance the baseline products to meet their own needs at an affordable cost. The following actions need to be taken collaboratively:

- develop and implement a lifecycle strategy for sequencing, coordinating, and funding all the “For the Nation” initiatives
- develop and implement “For the Nation” data stewardship guidelines
- develop measures of success related to data production and maintenance

A fundamental value of the NSDI is that core geospatial data should be universally and consistently available to support business processes year after year. This requires a formal mechanism to ensure that data development is done in compliance with appropriate standards. Data stewardship also requires a formal agreement because, in most parts of the country, no one agency has a mandate to maintain a dataset for the benefit of other agencies at all levels of government.

To accelerate the development of the NSDI, we must prioritize the core data layers, set realistic expectations for each one, focus on one implementation at a time, and start a pipeline program to introduce and plan the next one while we are working to deliver the previous one. The first of these, Imagery for the Nation, has already begun and is making significant progress.

4) National Funding

Efforts to encourage and facilitate collaborative funding should include:

- collaboratively develop a national NSDI funding strategy in which all governments can participate
- coordinate federal funds expended on NSDI -related activities (Geospatial Line of Business)
- make federal NSDI funding contingent on compliance with collaboratively established criteria and requirements

Even with unlimited funding, building the NSDI would be a complex task because of the variety of issues that need to be resolved in order to make something that works for all the stakeholders. Funding challenges constitute an additional layer of complexity. With few exceptions, NSDI-related activities are typically not government business functions, but are performed to support other government functions — such as road maintenance, public health, education, and public safety. In the zero-sum game of public funding, a business case for investing in geospatial services is only compelling if it proves that they significantly improve existing public services — for example, by enabling paramedics to reach heart attack victims a minute sooner, thereby saving more lives. Many local governments need funding help to build such systems, particularly if the system’s scope goes beyond their immediate business needs.

Unfunded mandates usually meet strong resistance. On the other hand, even small amounts of money, coupled with a well-thought out plan, can buy a lot of good will and get local governments and state agencies on board. Currently, not all federal funds for geospatial projects support NSDI-related activities — and those that do are typically not conditioned on following a consistent set of guidelines.

5) Strategic Communication and Advocacy

A strategy should be developed and implemented to communicate about and advocate for the NSDI. The strategy must:

- Recognize that the NSDI is large in scope and includes many different technical and organizational elements. The lack of an easily defined and narrow “target audience” complicates decisions about communication methods.
- Acknowledge that the NSDI will be developed over multiple years. It is important to manage expectations.
- Embrace a large group of active NSDI participants in promotion and communications activities.
- Provide an organized way to document quantitative and qualitative successes.
- Articulate ways to make wise use of the many, often “competing” channels of information for GIS users and potential future users of NSDI data and services.
- Suggest a method to identify and manage volunteers in a consistent way for NSDI education, promotion, and user support.

The primary objective of the strategic communications and advocacy strategy is to increase awareness, understanding of, support for, and participation in the SSDIs as the 50+ components of the NSDI. Each state should be able to use the fundamental strategy and augment it to fit its individual circumstances.

6) Technology

Technology is the most ephemeral component of the NSDI. We cannot accurately forecast which technologies will be relevant three or five years from now, so any specific recommendations we could make here would be quickly obsolete. Therefore, NSDI development should be opportunistic and advance along with the IT community, using proven technology whenever possible. There are now multiple businesses that provide standards-based technology that is designed to solve the problems of building the NSDI.

However, the governance methods, coordination, and data stewardship arrangements outlined earlier in this document will continue to apply to whatever technology emerges in the marketplace — as will the fundamental technical requirements. Therefore, we recommend a collaborative effort to develop and implement a national technology strategy that addresses:

- standardized core geographic datasets
- transactional workflows to maintain these datasets
- applications that use the standardized core information

Implementation will require:

- a common geospatial data model
- data management workflows
- a shared system design
- shared services and service oriented architecture
- professional technical and management leadership and education
- support for technological innovation

ABOUT NSGIC — The National States Geographic Information Council (NSGIC) is an organization of States committed to efficient and effective government through the prudent adoption of geospatial information technologies. Members of NSGIC include delegations of state GIS coordinators and senior state GIS managers from across the United States. Other members include representatives from Federal agencies, local government, the private sector, academia and other professional organizations. A rich and diverse group, the NSGIC membership includes nationally and internationally recognized experts in GIS, geospatial data production and management, and information technology policy.

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