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FEDERAL GEOGRAPHIC DATA COMMITTEE

NATIONAL SPATIAL DATA INFRASTRUCTURE STRATEGIC PLAN 2021 - 2024

Public Comment Draft (Version 2)
August 27,2020

Federal Geographic Data Committee

NOTE:
This revised draft of the NSDI Strategic Plan (Version 2) has been prepared for public review and comment. Instructions for submitting comments are posted at www.fgdc.gov/nsdi-plan. Comments are due by September 17, 2020.

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PART I: INTRODUCTION

What is geospatial data and why is it important to the Nation?

Everything happens somewhere. In today's knowledge-driven society and economy, people and organizations benefit on a daily basis, often unknowingly, from location-based information and services. Critical capabilities that depend on geospatial information include weather forecasting, flood early warnings, land titling and administration, transportation network analysis, water resources management, food production, supply chain management, urban service delivery, economic growth areas, and responding to disease outbreaks.

Today's mapping technologies and data can illuminate the connection between places, people, and their activities and illustrate where, when, how, and why. For example, without geospatial data, our smartphones could not provide directions with digital maps to easily get us to our destinations. Digital spatial information is a critical component of the national infrastructure and knowledge-driven economy because it provides the means to integrate a wide variety of data and services that contribute to public health, national security, environmental sustainability, and national prosperity.

> **Geospatial Data**
>
> The GDA defines geospatial data:
> *"(A) Means information that is tied to a location on the Earth, including by identifying the geographic location and characteristics of natural or constructed features and boundaries on the Earth, and that is generally represented in vector datasets by points, lines, polygons, or other complex geographic features or phenomena;*
> *(B) May be derived from, among other things, remote sensing, mapping, and surveying technologies;*
> *(C) Includes images and raster datasets, aerial photographs, and other forms of geospatial data or datasets in digitized or non-digitized form"*
>
> In addition, Sec. 752(5)(D) of the GDA defines data and activities that are not covered by the GDA.

What is the National Spatial Data Infrastructure?

The National Spatial Data Infrastructure (NSDI) was initially envisioned in the early 1990s and has evolved over time as technologies have developed. The Geospatial Data Act (GDA) of 2018 defines the NSDI as:

> "...the technology, policies, criteria, standards, and employees necessary to promote geospatial data sharing throughout the Federal Government, State, tribal, and local governments, and the private sector (including nonprofit organizations and institutions of higher education)."

It also states that the NSDI "shall ensure that geospatial data from multiple sources…is available and easily integrated to enhance the understanding of the physical and cultural world."

The GDA charges the Federal Geographic Data Committee (FGDC), under the direction of the U.S. Department of the Interior, to be "the lead entity in the executive branch for the development, implementation, and review of policies, practices, and standards relating to geospatial data." Participating agencies in the FGDC develop and maintain National Geospatial Data Assets (NGDAs), which are the core data components of the NSDI. A key element of the NSDI is the GeoPlatform (www.geoplatform.gov), which provides access to trusted geospatial data from various levels of government and a range of web-based geospatial services.

Over the years as the NSDI in the United States evolved, it became a model for other nations around the world. In 2011, the United Nations created the Global Geospatial Information Management (UN-GGIM) program to "address global challenges regarding the use of geospatial information..., and to serve as a body for global policymaking in the field of geospatial information management." As of 2020, more than one hundred nations have Spatial Data Infrastructures (SDIs). Because they have embraced open international standards for geospatial data and technologies, these SDIs have enabled greater levels of data sharing on topics that cross boundaries.

How is the NSDI being advanced?

The NSDI depends upon the active commitment and participation of Federal, Tribal, State, and local governments, the private sector, academia, and non-profit organizations, and increasingly upon direct input from citizens. This multifaceted web of relationships is being advanced by an emerging framework of data-focused laws and policies. For example, the GDA extends existing components of the Office of Management and Budget (OMB) Circular A-16, expands congressional oversight of federally funded geospatial activities, and establishes the National Geospatial Advisory Committee (NGAC) as a statutory advisory committee. It also aligns with other recent data initiatives such as the Federal Data Strategy, the Foundations for Evidence-Based Policymaking Act of 2018, and the Open, Public, Electronic, and Necessary (OPEN) Government Data Act. These statutes and policies underscore the growing importance of data development and coordination as key drivers in economic growth, policy development, and informed decision-making.

The GDA includes a set of overarching goals for the NSDI. These goals, which are addressed in this plan, indicate that the NSDI should:

- Ensure that geospatial data complies with privacy policies and statutes
- Protect personally identifiable information from disclosure
- Enhance the accuracy of statistical information
- Promote free and open access to geospatial data, information, and interpretive products
- Protect proprietary interests related to licensed information and data
- Promote interoperability and sharing capabilities of Federal information systems and data
- Advance a Global Spatial Data Infrastructure and development of international geospatial data in accordance with voluntary consensus standards

Purpose of the NSDI Strategic Plan

This strategic plan will help ensure that the Nation has consistent, trusted, geospatial data to promote effective governance, economic growth, and technological innovation at local and national scales. It includes a vision, mission, and guiding principles that describe a long-term path forward for the sustainable development of the NSDI. It also includes a set of actionable goals and objectives to achieve the NSDI vision.

This plan also lays the groundwork for geospatial strategies that will be developed by FGDC agencies. These strategies, as outlined in the GDA, will describe the steps that individual agencies will take to support the national NSDI goals and to advance utilization of geospatial data and technology within their organizations.

PART II: SHARED VISION, MISSION, AND GUIDING PRINCIPLES

The FGDC worked collaboratively with the NGAC, the Federal geospatial community, and stakeholders from geospatial organizations to develop a shared national vision, mission, and guiding principles for the NSDI.

NSDI Vision:

Empowering a geo-enabled Nation and world for place-based decision-making

The National Spatial Data Infrastructure enables citizens, commerce, and all levels of government to contribute to and utilize a national network of geospatial resources. Readily accessible and easy to use geospatial resources – including data, information, applications, and expertise - empower our nation by enabling improved understanding, in-depth insight, and informed decision-making to address a range of economic, social, and environmental challenges. Nearly everything and every event is geographically located and contextually described. The NSDI geo-enables the Nation and world for the benefit of society, economy, and the environment.

NSDI Mission:

The NSDI provides a national network of geospatial resources that seamlessly integrates location-based information to serve the needs of the Nation and wider global interests.

The purpose of the National Spatial Data Infrastructure is to design, build, maintain, and enhance the value of geospatial resources in conjunction with statistical data and other sources of information. The NSDI coordinates the ever-evolving collection of data, information, technology, standards, services, policies, and people. It enables seamless data development, information sharing, and collaborative decision-making within a trusted, accuracy-assured, and properly protected environment. The NSDI informs decision-making at all levels of society with the ability to understand, protect, and promote national and wider global interests.

NSDI Guiding Principles:
1. **Promote the utilization of geospatial resources to improve insight and decision-making**
2. **Ensure that geospatial data are current, accurate, open, interoperable, timely, and easy to access**
3. **Build trust by safeguarding privacy, confidentiality, and intellectual property and by ensuring ethical practices**
4. **Foster an open, inclusive, and collaborative environment across sectors**
5. **Encourage innovation and a culture of learning and accountability**
6. **Leverage resources, expertise, and investments through partnerships**
7. **Lead, support, and advance spatial data infrastructure globally**

The guiding principles describe a set of values for National Spatial Data Infrastructure actions and decision-making. These principles leverage concepts from relevant laws, policies, and best practices and reflect inputs from diverse geospatial communities. By contextualizing ethical governance, conscious design, and learning culture in developing geospatial resources and empowering place-based decision support, the NSDI guiding principles cultivate partnerships to strengthen our national and global geospatial enterprise.

PART III: STRATEGIC GOALS AND OBJECTIVES

The GDA requires the FGDC "to lead the development and management of and operational decision-making for the National Spatial Data Infrastructure strategic plan and geospatial data policy." These goals and objectives—which were established through extensive collaboration and consultation with Federal agencies, the NGAC, the interagency NSDI core team, and multiple geospatial organizations—reflect the perspectives of the broader geospatial community.

The goals focus on four critical components to accelerate the development of the NSDI – policy, data, shared services, and partnerships.

Goal 1 – Implement the national geospatial policy and governance framework as defined by the Geospatial Data Act and related statutes and policies

This goal describes what stakeholders in the geospatial community will do to align policies, management, and governance practices with current policy requirements and best practices in order to facilitate the continued development of the NSDI.

Objective 1.1
Align FGDC policies with the GDA, the Federal Data Strategy, the Foundations for Evidence-Based Policymaking Act, and OMB Circular A-16.

> **Anticipated Outcomes:** FGDC policies and procedures are consistent with key statutes, policies, and management best practices to promote a coordinated and integrated approach to using data to deliver on missions, serve the public, and steward resources while safeguarding integrity, privacy, confidentiality, and national security.

Objective 1.2
Develop FGDC guidance for agencies to implement GDA requirements.

> **Anticipated Outcomes:** Clear, consistent guidance, governance practices, and operating procedures are developed by the agencies, enabling coordinated and effective implementation of the GDA and other related requirements.

Objective 1.3
Identify common approaches and tools to meet GDA and related planning and reporting requirements.

> **Anticipated Outcomes:** Common templates and enterprise approaches are developed to enable efficient, consistent fulfillment of planning and reporting requirements; promoting transparency and accountability for results.

Objective 1.4
Review and update FGDC structure and governance processes to incorporate best practices and to align with the GDA and related statutes and policies.

Anticipated Outcomes: An updated governance process that meets statutory and policy requirements and promotes effective interagency, intergovernmental, and cross-sector collaboration, engagement, and accountability.

Goal 2 – Advance the maturity, accelerate acquisition, and expand sources of National Geospatial Data Assets to ensure they are findable, accessible, interoperable, and reusable

Through partnerships and understanding user needs, high value core datasets are identified as NGDAs and curated by applying lifecycle management best practices across the data portfolio. The national geospatial community will commit sufficient resources to ensure that quality geospatial data are easily accessible, managed using effective data stewardship practices, and can be integrated with other meaningful non-geospatial data to support a multitude of stakeholder uses.

Objective 2.1
Update, validate, and streamline NGDA portfolio management practices and establish standards for NGDA data themes and associated datasets.

> **Anticipated Outcomes:**
> - NGDA management practices are effective, efficient, and facilitate reporting of NGDA status information.
> - Standards have been established for NGDA data themes and associated datasets.

Objective 2.2
Implement data acquisition and lifecycle management strategies through collaboration and ongoing outreach.

> **Anticipated Outcomes:** NGDA lifecycle management practices are consistent and maintained through data stewardship, resource planning, and support.

Objective 2.3
Advance the practice of integrating government and non-government data into national datasets.

> **Anticipated Outcomes:** Roles, responsibilities, agreements, acquisition strategies, and funding approaches are developed for sustainable methods to integrate geospatial data.

Objective 2.4
Identify, validate, and advance best practices to ensure geospatial and other meaningful data can be easily integrated and used.

> **Anticipated Outcomes:** Geospatial data are designed to enhance the utility of statistical information and other non-geospatial data by linking them to a place.

Goal 3 – Promote open standards-based interoperability to enable geospatial shared services

This goal describes how activities associated with the GeoPlatform and other shared services will accelerate the development and use of geospatial information. Shared services are web-accessible standards-based tools, applications, and services that enable the discovery, access, integration and application of geospatial data. They offer an all-inclusive collaborative environment for improved decision-making.

Objective 3.1

Increase awareness and broaden use of national shared services, including the GeoPlatform, to publish, discover, integrate, promote, visualize, analyze, and disseminate national geospatial data. Apply open standards to ensure that shared services can be improved and expanded at minimal effort and cost.

>   **Anticipated Outcomes:** As a key Federal information system, the GeoPlatform and other shared services provide accessible, high-value geospatial data and services, while reducing duplication and improve services.

Objective 3.2

To improve national geospatial shared services capabilities, identify and test innovative information sources and technologies including real-time data from fixed and mobile sensors, social media, the Internet of Things.

>   **Anticipated Outcomes:** The value and use of national data and services is increased through a culture of experimentation and innovation.

Objective 3.3

Update shared services policies and practices to improve the ability of users to discover, qualify, access, combine, and use geospatial services with geospatial data, spatial analytics, and non-spatial data.

>   **Anticipated Outcomes:**
>   - Metadata policies are updated, and processes are improved and simplified by incorporating new technologies and by providing tools to assist in metadata creation, conversion, and efficient management practices.
>   - Metadata about geospatial data and services are aligned, resulting in improved discoverability and use, compliance with licensing terms, interoperability, and user confidence.

Goal 4 – Enable and promote collaborative partnerships to meet national needs, priorities, and circumstances

All stakeholders benefit from a mature NSDI built, maintained, and championed through robust partnerships that engage the operational expertise of multiple sectors and users to address priority issues and business needs. This goal describes how the national geospatial community can work collaboratively to use geospatial data, assets, technologies, communications approaches, and services to advance the NSDI and meet the goals and requirements of the GDA.

Objective 4.1
Collaboratively define priorities, roles, and responsibilities for the development of the NSDI as described in the GDA.

> **Anticipated Outcomes:** A broad consensus among partners and stakeholders on achievable goals, priorities, roles, and responsibilities.

Objective 4.2
Develop processes and tools, in collaboration with partners, to promote effective communication and exchange knowledge about the benefits and utilization of geospatial data, technology, and the NSDI.

> **Anticipated Outcomes:** Greater communication, awareness, and understanding of collaborative approaches to leverage geospatial and geospatially-referenced information to enable informed and effective decision-making.

Objective 4.3
Develop innovative partnerships across sectors to pilot-test scalable and replicable approaches to improve geospatial data creation and maintenance for national use.

> **Anticipated Outcomes:**
> - Development of successful pilot partnership initiatives that share risk and reward for all involved, and that can be emulated or expanded by other cooperating public and private sector organizations.
> - Improved availability, affordability, maintenance, and use of geospatial data.

Objective 4.4
Promote partnerships among academia, the private sector, professional organizations, and government to ensure that the emerging workforce has the skills needed to meet the growing needs of the geospatial community.

> **Anticipated Outcomes:** A diverse and adaptable geospatial workforce trained with the critical technology, problem-solving, and management skills required to adapt to emerging user requirements, organizational challenges, and technological advances.

Objective 4.5
Partner with international organizations to ensure the continued development of a robust, interoperable, global spatial data infrastructure in accordance with requirements in the GDA.

> **Anticipated Outcomes:** U.S. interests and NSDI practices lead and influence the global spatial ecosystem through interoperability, data sharing, and collaboration; and the U.S. continues its leading role in the global geospatial marketplace.

PART IV: IMPLEMENTATION APPROACH

Implementation Framework

The NSDI strategic plan provides a shared vision for the development of the NSDI, designed for application by Federal agencies, partners, and stakeholders throughout the geospatial community. A broad range of stakeholders will participate in activities to implement the NSDI goals and objectives. The FGDC will work closely with the NGAC to ensure broad engagement of the geospatial community on implementation teams, and to promote collaborative approaches to advance the Nation's critical geospatial infrastructure.

The GDA establishes the FGDC as "…the lead entity in the executive branch for the development, implementation, and review of policies, practices, and standards relating to geospatial data." The FGDC also serves as a catalyst for implementing the NSDI strategic plan. Designated Federal representatives, appointed by the FGDC, will serve as champions for the advancement of specific strategic goals. Champions will report to the FGDC Steering Committee, and will coordinate teams consisting of representatives from across the geospatial community as they implement actions that advance strategic plan goals and objectives. NGAC members will be designated to provide advice and recommendations on issues related to the advancement and attainment of strategic goals and reporting responsibilities.

Successful implementation of the goals and objectives in this plan will align with the requirements of the GDA, the Federal Data Strategy, the Foundations for Evidence-Based Policymaking Act, and OMB Circular A-16. This will require senior policy-level leadership to ensure appropriate resources and support for FGDC agencies.

Agency Planning and Reporting

Federal agencies will play a significant role in implementing the NSDI. Under the terms of the GDA, FGDC agencies will develop geospatial strategies and implementation plans that support the NSDI goals and advance agency mission responsibilities. As part of their work to meet mission goals and objectives, agencies will take actions and meet milestones that directly support implementation of the NSDI strategic plan. As a result, agency implementation activities will be a key component of the overall NSDI monitoring and reporting process.

Measuring Progress

In parallel with the adoption of the NSDI strategic plan, the designated champions will work with strategic goal teams to develop a project plan outlining how the goals and objectives will be achieved. The project plan will include:
- Milestones
- Timelines
- Responsible parties
- Performance metrics
- Identification of resources available to achieve the objectives

The performance measurement approach is critical to the successful implementation of the goals and objectives described in this plan. Performance metrics will be based on data and will describe whether the identified action is achieving its expected result and if progress is being made toward attaining the goal or objective.

FGDC leadership will assist in identifying and committing resources as well as developing tracking and reporting tools. The champions, in collaboration with FGDC leadership, will monitor implementation performance based on established indicators and milestones through the use of tracking tools. Brief progress reports will be required for each objective on an ongoing basis. Progress will be reported to the FGDC Steering Committee on a regular basis. Updates and adjustments to the plan will be completed as needed.

Figure: NSDI Planning Overview
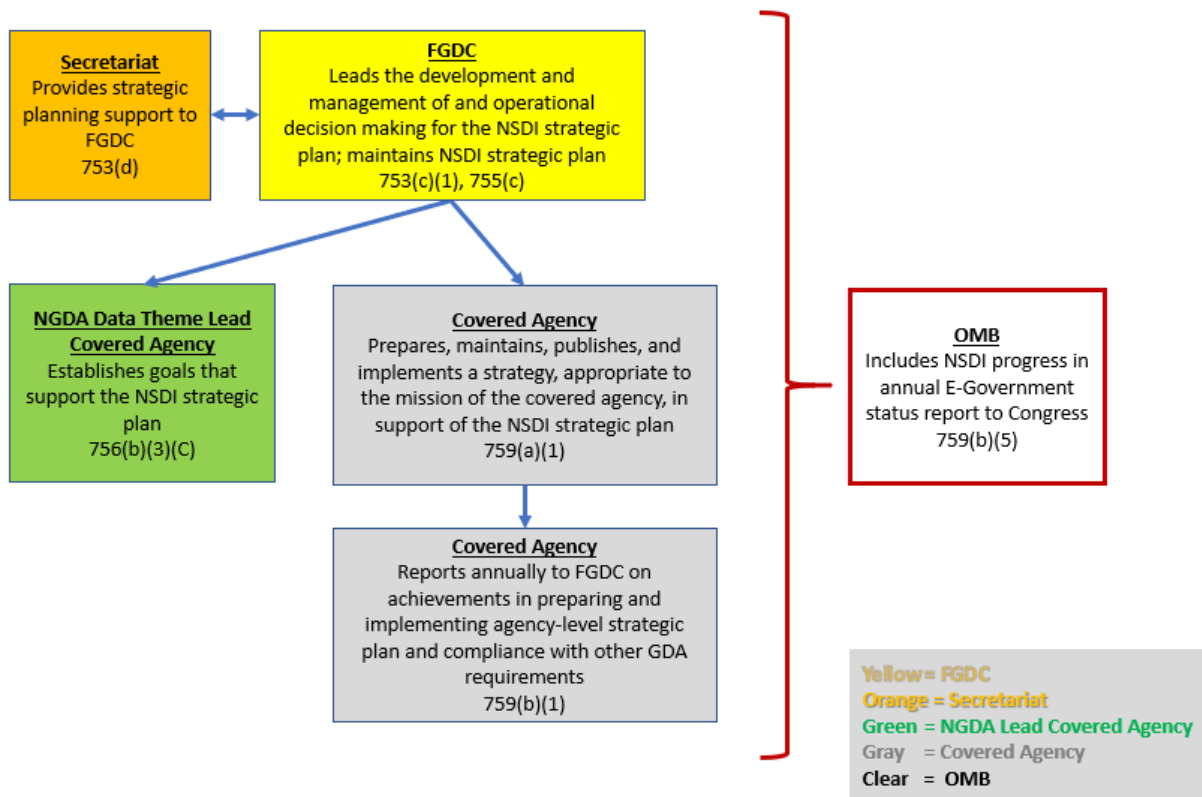
Initial Implementation Milestones

NSDI Strategic Plan & Agency Geospatial Strategy Implementation	
Timeframe	**Activity**
October 2020	NSDI strategic plan approved by FGDC Steering Committee and endorsed by NGAC
December 2020	FGDC covered agencies complete GDA geospatial strategies (in support of the NSDI strategic plan)
March 2021	Complete NSDI implementation plan
December 2021	First annual status report

PART V: SUMMARY/IMPACTS

A strategic plan is only effective if it has a strong implementation approach focused on achieving clearly defined outcomes. An effective strategy should engage those whose mission will achieve the aspirational vision. The goals and objectives in this plan are designed to mobilize the national geospatial community toward achieving the following results.

- **Improved governance**
  Establishing a strategic plan reflects a commitment to clarify responsibilities and objectives for improved effectiveness. This plan establishes a substantial foundation for solid governance that will balance needs with resources and promote an open environment for discussion and decisions needed to achieve the described objectives. Guidance from the FGDC in meeting Goal 1, when incorporated by the affected agencies and documented in their mandated reporting, will enable assessment of progress and identification of impediments.

- **Expanded partnerships**
  Increasingly, geospatial data-generating and geospatial data-using groups recognize that sharing work and its outcome paves the way to achieving desired benefits. Sharing is accompanied by expectations of reliability that trusted partnerships facilitate.

- **Sufficient resourcing**
  Resources include money, people, and time. Sufficiency demands analysis of available and required resources. Thorough accountability across a carefully self-governed community, with prudent oversight and guidance, will help focus attention on the existing distribution of resources, expose gaps for prioritized geospatial data components, and suggest budgetary realignments to address funding, people, and time shortfalls.

- **Better integration of data sets**
  "Data" in this paragraph are intentionally not characterized as exclusively "geospatial" or "location-based." Things do exist in specific places and events do occur at particular places and times. Knowledge-building and decision-making about things or events – influencing or influenced by location – demand timely and relevant data and information from a variety of

sources. That data inherently often has no reason to be tagged or characterized as spatial. For years, practitioners have struggled with the complexity of integrating different sources, quality, and formats of geospatial data. Increasingly, with new tools and capabilities, data integration is occurring across disciplines. This strategic plan not only addresses the need for geospatial standards and interoperability, but recognizes the more complex task of integration with other categories of data.

- **Preparation of the workforce pipeline**
  "People" are part of the resource equation. Therefore, capacity building through education and training is needed to ensure that the pipeline fueling the workforce is kept flowing. Although past practice may be a prelude to some traditional earth-science training in specific domains, it must also be subject to the evolution of intersecting disciplines. During the execution of this strategic plan, much more focus will be directed toward geospatial and interdisciplinary information management. The skills demanded by the community may range from the most basic collection and labelling of data to incorporation of machine learning and artificial intelligence innovation into a broad spectrum of applications.

- **Expanded markets**
  The past decade has seen the "democratization" of collecting and using geospatial data. Many have joined the ranks of "citizen scientists." The use of computer-generated mapping has become a daily habit. Those maps in numerous ways have helped urban planners to decide where growth can be encouraged; have permitted first responders to quickly mitigate disaster response; have shown where ecological damage and/or restoration is occurring. The availability of massive reliable stores of geospatial data will continue to expand services and include new markets that may not now recognize the need.

- **Innovation**
  As resources are expended to meet the known current needs of the NSDI and to satisfy the goals identified in this plan, disruptive thinking, nurtured by the expansive use of geospatial information integrated within so much other spatially ambiguous data, will also improve the way we understand Earth. Creativity dealing with new challenges will introduce innovation in tools and techniques that will not only improve the understanding of geospatial information but will also direct its penetration into new venues.

- **International influence / cooperation**
  Both the vision and the mission of the NSDI link our national interests with our global responsibilities. The four core themes of the goals in this plan – policy, data, shared services, and partnerships – are guided by the Integrated Geospatial Information Framework (IGIF) that was adopted by the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM). The IGIF "provides a basis and guide for developing, integrating, strengthening and maximizing geospatial information management and related resources in all countries. It will assist countries in bridging the geospatial digital divide, secure socio-economic prosperity, and to leave no one behind."

PART VI: APPENDICES

*TO BE ADDED