Belize National
Spatial Data Infrastructure
*Supporting Sustainable and Resilient
National Development*

Programme Design
Policy Component

Final Draft v2

22nd January 2018

GPC Group
A Global Network of Information Professionals

Belize National Spatial Data Infrastructure

PROGRAMME DESIGN
Policy Component

FINAL DRAFT
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Government of Belize

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EXECUTIVE SUMMARY

This report provides a formulation of the policy for the establishment of the BNSDI as a permanent function in the government of Belize. This has been developed in reference to, and extending, the initial "Belize National Spatial Data Infrastructure (NSDI) Policy" which was approved at a meeting of the government of Belize government held 21st August, 2012, government-Confidential Memorandum No. 40 of 2012.

A complete analysis of the existing BNSDI Policy as well as other relevant policy frameworks that may enable or otherwise influence the BNSDI in Belize is presented in Section 7.1 of the Requirements Analysis report under separate cover. The draft extended policy presented in sections following has been developed in alignment with these references, with several exceptions that are noted in the body of the text.

The model, principles and terms as suggested in this document are to be deliberated by the BNSDI Technical Committee and this input will be used to refine the draft policy. Following this the draft will be reviewed with the Executive Committee and their feedback will be used in the development of a final policy that will then be recommended for adoption by the government.

Definitions and Acronyms

(Please remove all acronyms from this list that are not mentioned in the document)

APAMO		Association of Protected Areas Management Organizations
BACONGO		Belize Association of Conservation NGOs
BAD		Belize Archives Department
BAHA		Belize Agricultural Health Authority
BAS		Belize Audubon Society
BBIS		Belize Biodiversity Information System
BCB		Banana Control Board
BCC		Belize City Council
BCCI		Belize Chamber of Commerce and Industry
BCS		Belize country Strategy for Adaptation of the Sugar Industry
BEL		Belize Electric Company Limited
Bmp CITCO		Belmopan City Council
BNSDI		Belize National Spatial Data Infrastructure
BERDS		Biodiversity and Environmental Resource Data System of Belize
BEST		Belize Enterprise for Sustainable Technology
BLPA		Belize Livestock Producers Association
BNCC		Belize NSDI Coordination Center. Function or unit proposed to provide the facilitation, coordination, promotion and support that is needed to build and operate an NSDI
BNE		Belize Natural Energy Ltd.
BNSDI		Belize National Spatial Data Infrastructure
BRDP		Belize Rural Development Programme
BSI		Belize Sugar Industry
BTB		Belize Tourism Board
BWSL		Belize Water Service Limited
CARDI		The Caribbean Agricultural Research and Development Institute (CARDI) was established in 1975 to serve the agricultural research and development needs of the member states of the Caribbean Community (CARICOM).
CATHALAC		Water Center for the Humid Tropics of Latin America and the Caribbean (in Spanish ¨CATHALAC¨- Centro del Agua del Trópico Húmedo para America Latina y el Caribe) is an autonomous international organization dedicated to promote sustainable development through applied research and development, education, and technology transfer in the areas of integrated watershed management, climate change, environmental modeling and analysis, and risk management in Latin America and the Caribbean
CARICOM		Caribbean Community
CBA		Central Building Authority
CBD		Convention on Biological Diversity
CBO		Community Based Organization
CCB		Citrus Company of Belize
CCCCC (5C's)		Caribbean Community Climate Change Center
CDB		Caribbean Development Bank
CN		Central Node
CEO		Chief Executive Officer / Chief Environmental Officer
CFR		Chiquibul Forest Reserve
CGA		Citrus Grower's Association
CH4		Methane
CIARMP		Community Initiated Agricultural Resources Management Project
CITES		Convention on International Trade in Endangered Species of Wild Fauna and Flora
CITO		Central Information Technology Office
CNP		Chiquibul National Park
CO		Carbon Monoxide
CO2		Carbon Dioxide
CPA		country Poverty Assessment

CPACC		Caribbean Planning for Adaptation to Climate Change
CRIP		Climate Resilient Infrastructure Project.
CZMAI		Coastal Zone Management Authority and Institute
DfID		Department for International Development (formerly ODA)
EIA		Environmental Impact Assessment
Enterprise GIS		Enterprise GIS refers to a geographic information system that is effectively integrated as a fundamental component of an organization's information infrastructure, business processes and customer services.
EPA		Environmental Protection Act.
ERI		Environmental Research Institute of the University of Belize
ESTAP		Environmental and Social Technical Assistance Project
EU		European Commission / Union
FAO		The Food and Agriculture Organization of the United Nations leads international efforts to defeat hunger. Serving both developed and developing countries, FAO acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy. FAO is also a source of knowledge and information. We help developing countries and countries in transition modernize and improve agriculture, forestry and fisheries practices and ensure good nutrition for all. Since our founding in 1945, we have focused special attention on developing rural areas, home to 70 percent of the world's poor and hungry people.
FCD		Friends for Conservation and Development
FD		Forest Department
FGDC		Federal Geographic Data Committee (USA)
FGDS		Fundamental Geospatial Data Set. This is any data theme or topic that is needed in common across a stakeholder community.
FIRMS		Fire Information for Resource Management System
FPMP		Forest Planning and Management Project
GBIF		Global Biodiversity Information Facility
GDP		Gross Domestic Product
GEF		Global Environment Facility.
GeoNode		GeoNode is an open-source, web-based application and platform for developing geospatial information systems (GIS) and for deploying spatial data infrastructures (SDI)
GEO		Group on Earth Observations
GEO		Global Environment Outlook
GeoMaturity		A set of performance standards for the measurement and assessment of the optimization of GIS technology within an organization, sector and NSDI community
GHG		Green House Gas
GIS		Geographic Information System. A Geographic Information System is a computer system designed to allow users to collect, manage, and analyze large volumes of spatially referenced and associated attribute data. The major components of a GIS are: a user interface system; data base management capabilities; data base creation/data entry capacity; spatial data manipulation and analysis packages; and display/product generation functions.
GoB		government of Belize
GPA		Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (UNEP)
GPS		Global Positioning System
HDI		Human Development Index
HIV/AIDS		Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
Hydromet		Belize National Meteorological Center
IABIN		Inter-American Biodiversity Information Network
ICRAN		International Coral Reef Action Network
ICT		Information and Communication Technologies
IDB		Inter-American Development Bank

IICA		The Inter-American Institute for Cooperation on Agriculture (IICA) is a specialized agency of the inter-American system, and its purposes are to encourage and support the efforts of its Member States to foster agricultural development and rural well-being in their territories.
IP		Internet Protocol
IPCC		Intergovernmental Panel on Climate Change
ISO		International Organization of Standardization
ISP		Internet Service Provider
IT		Information Technology
IUCN		International Union for Conservation of Nature
IUU		Illegal, Unreported and Unregulated
IWRM		Integrated Water Resource Management
KB		Kilobyte
KCB		The Ke'kchi Council of Belize
LIC		Land Information Centre
LLES		Limited Level Environmental Study.
MAR		Mesoamerican Reef
MARPOL		International Convention for the Prevention of Pollution from Ships
MBRS		Mesoamerican Barrier Reef System
MDG		Millennium Development Goals
MEA		Millennium Ecosystem Assessment
Metadata		Standardized catalog of information about each geospatial data set
MFED		Ministry of Finance and Economic Development
MFFSD		Ministry of Forestry, Fisheries and Sustainable Development
MLGRD		Ministry of Local government and Rural Development
MNR		Ministry of Natural Resources
MoESTPU		Min of Energy, Science & Technology, and Public Utilities
MoFED		Ministry of Finance and Economic Development
MoH		Ministry of Health
MoWT		Ministry of Works and Transport
MPAs		Marine Protected Areas
MPRFR		Mountain Pine Ridge Forest Reserve
NASA		The National Aeronautics and Space Administration (NASA) is the agency of the United States government that is responsible for the nation's civilian space programme and for aeronautics and aerospace research
NAVCO		National Association of Village Councils Organization
NBII		National Biological Information Infrastructure (USA)
NBSAP		National Biodiversity Strategy and Action Plan
NCB		National Coordinating Body
NCCC		National Climate Change Committee was established to advise government on issues regarding climate change
NCRIP		National Climate Resilient Investment Plan
NEAC		National Environmental Appraisal Committee. The Committee was established to review development projects in the context of the national environment.
NEAP		National Environmental Action Plan
NEMO		National Emergency Management Organization
NFAB		National Fisheries Advisory Board established to provide guidance on fisheries commodities extraction strategies and policies
NFP		National Focal Point
NGO		Non-governmental Organization
NICH		National Institute for Culture and History
NMS		National Meteorological Service
Node		A facility that is connected to other facilities over the Internet for the purpose of publishing and sharing data
NPAC		National Protected Areas Committee. This Committee was established to advise the government of Belize on issues concerning the national protected area system
NREPS		Natural Resource and Environmental Sub- committee was established to increase the national understanding and acceptance of the linkages between natural resource and

		environmental protection and socio-economic development
NSDI		National Spatial Data Infrastructure. An institutional and technical framework for coordinating and sharing geospatial information across a stakeholder community.
NSDI Unit		BNSDI central coordination unit
OAS		Organization of American States
ODA		Overseas Development Administration
OIRSA		The International Regional Organization for Plant and Animal Health (OIRSA) is a technical organization established to provide administrative and technical support to the Ministries or Secretariats of Agriculture from its member countries, to protect and develop their agricultural resources in order to achieve a healthy production to satisfy population's demands and provide well-being. OIRSA's assistance is focused on its member countries' projects and plans for plant and animal health, food safety and facilitation towards agricultural commerce
ON		BNSDI organization node
PACT		Protected Areas Conservation Trust
PAHO -		Pan-American Health Organisation
PCPU		Policy Coordination and Planning Unit
PEU		Programme Execution Unit
PFB		Programme for Belize
PUC		Public Utilities Commission
QuickStart		An activity that is an accelerated portion of a longer term initiative, intended to result in near-term, visible and compelling results.
RAMSAR		Convention on Wetlands of International Importance Especially as Waterfowl Habitat
REDD		Reduction of Emissions from Deforestation and Degradation
SERVIR		Regional Visualization and Monitoring System
SIB		Statistics Institute of Belize
SICB		Sugar Industry Control Board
SIF		Social Investment Fund
SIRDI		Sugar Industry Research and Development Institute
SISE		San Ignacio/ Santa Elena Town Council
SPAGs		Spawning Aggregation Sites
Spatial Data Clearinghouse		Common repository of geospatial information, often composed of data provided by multiple custodians
SIG		Special Interest Group. A permanent multi-stakeholder body that is established to provide communication, coordination and support around a particular common interest or practice.
Stakeholder		Any organization or person that will be involved in the development and/or use of the Belize NSDI
SCADA		System Control and Data Acquisition
SWMA		Solid Waste Management Agency
SWOT		Strengths, Weaknesses, Opportunities and Threats
TBSL		Total Business Solutions Ltd.
TNC		The Nature Conservancy
TOR		Terms of Reference
UB		University of Belize
UN		United Nations
UNCBD		United Nations Convention on Biological Diversity
UNCCD		United Nations Convention to Combat Desertification
UNDP		United Nations Development Project
UNEP		United Nations Environment Programme
UNESCO		United Nations Educational, Scientific and Cultural Organization
UNFCCC		United Nations Framework Convention on Climate Change
USAID		United States Agency for International Development
WB		World Bank
WCMC		World Conservation Monitoring Centre
WCS		Wildlife Conservation Society

WMO		World Meteorological Organisation (UN)
Working Group		A temporary body, normally consisting of representative members from multiple concerned organizations, assigned to address a particular subject over a certain period of time
WRI		World Resource Institute
WWF		World Wildlife Fund
XML –		eXtensible Markup Language
CINTEC		Council for Information Technology (CINTEC)
DMC		Disaster Management Centre
FGDS		Fundamental Geospatial Data Sets (FGDS).
Geomaturity		Geomaturity is a measure of the level of technical and institutional development in regards to the use of GIS technology in an organization.
Geoportal		Web-based portal for discovering, accessing and viewing GIS data services
Geospatial Data		"Geospatial data" means information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the earth. This information may be derived from, among other things, remote sensing, mapping, and surveying technologies. Statistical data may be included in this definition at the discretion of the collecting agency.
GIS		Geographic Information System
GPS		Global Positioning System
GSDI		Global Spatial Data Infrastructure
ICT		Information and Communication Technologies
ICTA		Information and Communications Technology Authority
IP		Internet Protocol
IT		Information Technology
ISO		International Standards Organisation
ISO/TC		International Standards Organisation/Technical Committee
ISP		Internet Service Provider
LGN		Lanka government Network
National Geospatial Data Clearinghouse		The "National Geospatial Data Clearinghouse" means a distributed network of geospatial data producers, managers, and users linked electronically
NMP		National Map Portal
NSDI		National Spatial Data Infrastructure. An institutional and technical framework for coordinating and sharing geospatial information across a stakeholder community.
OECD		Organisation for Economic Cooperation and Development
OGC		Open Geospatial Consortium
PDF		Portable Document Format
RDBMS		Relational Data Base Management System
RTI		Right To Information
SDD		Spatial Data Dictionary
SDE		Spatial Data Engine
SDI		Spatial Data Infrastructure
BNSDI		Belize National Spatial Data Infrastructure" (BNSDI) means the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data
SME		Subject Matter Expert
SOA		Service Oriented Architecture
TOR		Terms of Reference
UN		United Nations
VGI		Volunteered Geographic Information
WofG		Whole of government
WFS		Web Feature Service
WMS		Web Map Service
XML –		eXtensible Markup Language

1.0 INTRODUCTION

1.1 Background

This BNSDI Programme Design – Policy Framework Component report provides the draft Policy that extends the original BNSDI policy adopted by government in 2012 and provides the official enabling environment for furthering the Programme. This "Policy Framework Component" is one of several component reports comprising the complete Programme Design.

The BNSDI Programme Design is one component of a structured work programme for the planning, design, and implementation of the BNSDI. The position of this report relative to the entire work programme is illustrated in the Figure below.
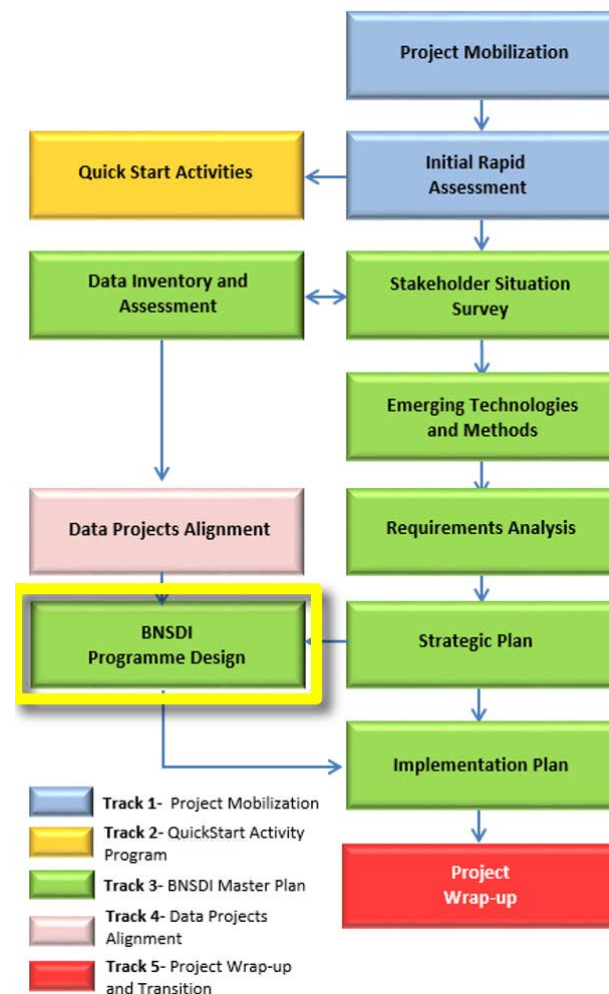
Figure 1 – Work Programme Illustration

The synthesis of BNSDI programme targets outlined in this report draws upon previous five contributing activities, including:

BNSDI Stakeholder Situation Update Survey. The BNSDI Stakeholder Survey involved over 60 units of government and other sectors and identified over 370 major functional areas that are or could benefit from GIS and the BNSDI. The study also outlined over 1700 specific applications of GIS and the BNSDI that would directly benefit and streamline those functional areas identified, as well as other information and findings.

Data Inventory and Assessment. The Data Inventory and Assessment provides a listing of the geospatial data resources that were identified as needed in common by the BNSDI stakeholder community. This document provides a summary of the information available for over 35 data themes that are further broken down into over 140 specific geospatial data topics and then grouped to nearly 100 fundamental geospatial datasets that are needed in common among the BNSDI stakeholder community.

e-Merging Technologies and Methods. This report outlines a wide range of emerging technologies and methods that have implications for the form and function of the BNSDI in the future. This report outlines a broad range of technologies, applications and enabling policies and methods, from new advanced space platforms for remote sensing, to unmanned aerial vehicle (UAV) survey techniques, to the many uses of social media and crowd sourcing, to the policies and incentives needed to catalyze innovations within the country, among many other areas. The results of that analysis have been incorporated to this report where appropriate.

Requirements Analysis. This Requirements Analysis report provides a comprehensive overview of the elements that the Belize National Spatial Data Infrastructure (BNSDI) will need to address for it to become a fully functioning, permanent fixture in the government of Belize. This covers the full range of programme requirements that can be classified roughly into business, technical and institutional frameworks and their interdependencies. Information collected and compiled in the previous Stakeholder Situation Update Survey, Data Inventory and Assessment and e-Merging Technology Reports has informed the current report. International best practices in national efforts of a similar scope have been used as a frame of reference that has been extended and adapted to reflect the specific context in Belize.

Strategic Plan. This BNSDI Strategic Plan outlines the vision, defining principles and priorities for the initiative. As described in this Strategic Plan, BNSDI is to comprise a central programme coordination unit, an interconnected network of interoperable entity nodes, geoportal, data repository and the standards, policies and procedures that together provide the enabling environment to support the coordinated development and sharing of commonly

needed geographic information across the Belize stakeholder community. This document is currently under finalization in Phase II of the project.

1.2   Purpose of this document

The original BNSDI Policy adopted by government in 2012 outlined basic components and activities to be followed and an assignment of one Ministry to facilitate a multi-stakeholder engagement to further the engagement. This document builds on the original policy and extends it with reference to the findings of earlier study activities and international model policies from other NSDI initiatives around the world. The model, principles and terms as suggested in this document are to be deliberated by the BNSDI Executive Committee and their feedback will be used in the development of a final policy that will then be recommended for adoption by the government.

Note – the articulation of the roles, responsibilities and organization for the BNSDI is to be addressed in a separate Programme Design component paper, based in part upon the final form of this policy.

1.3   Organization of this document

This document is organized into the following sections:

> *Section 1: Introduction*. This Introductory section outlines the background and purpose of the BNSDI programme, the methodology being followed, and other general reference information.

> *Section 2: BNSDI Policy.* This section provides the content of the draft policy in its entirety.

The current document should be considered a "discussion draft" that will undergo further refinement with the guidance of the BNSDI Executive Committee.

2.0   BNSDI POLICY

With the aims of improving optimum use of spatial data across the government and making effective evidence based decisions, the government of Belize is in the process of implementing a National Spatial Data Infrastructure (NSDI) programme, in collaboration with stakeholder institutions. NSDI has been identified as one of the critical matters to support climate-smart, resilient and sustainable national development.

The following provides a formulation of the policy for the establishment of the BNSDI as a permanent function in government. This has been developed in reference to and extending the initial "Belize National Spatial Data Infrastructure (NSDI) Policy" which was approved at a meeting The Cabinet held 21st August, 2012 (Ref.: Confidential Memorandum No. 40 of 2012). According to the Memorandum, the government approved the draft NSDI policy as:

   a) *"The first step in the start of developing of a fully functional NSDI in Belize; and,*
   b) *The commencement of a pilot project of the NSDI."*

A complete analysis of the existing BNSDI Policy as well as other relevant policy frameworks in Belize is presented in Section 7.1 of the Requirements Analysis report. The draft extended policy has been developed in alignment with these references, with several exceptions.

2.1   Preamble

Geographic information is critical to promote climate-smart, resilient, sustainable development in Belize, diversify and grow the economy, improve the stewardship of natural resources, protect the environment and optimize development investment. Modern technology now permits improved acquisition, distribution, and utilization of geospatial data through the use of computerized geographic information systems (GIS) technology.

GIS has become an indispensable tool for managing and using spatial information at the local, regional, and national levels. Many organizations need the same information, but in Belize there was previously no formalized structure for the effective coordination and sharing of these data, and information has been essentially "locked up" within sector-focused ministries and institutions. The Belize National Spatial Data Infrastructure (BNSDI) provides a framework of standards, policies, data, procedures, and technology to support the effective coordination, dissemination and utilization of geospatial information.

2.2   Authorization

This policy has been developed in alignment with the following existing and proposed national policy frameworks:

- Belize Freedom of Information Act, Chapter 13, 1.38.4 revised edition 2000;
- Intellectual Property Act, No. 36 of 2003;
- Belize Intellectual Property Office – established under Part II of the Patents Act (Chapter 253), revised edition 2000
- Confidential Memorandum No. 40 of 2012 – Establishment of Belize National Spatial Data Infrastructure. Cabinet meeting held 21st August, 2012.

2.3   BNSDI Business Perspective

The BNSDI is to be established as a permanent function in government and serving the entire Belize Society according to the following fundamental principles and objectives:

(a) Sharing Fundamental Geospatial Data. The BNSDI Programme shall develop and maintain a spatial enabling environment including operational frameworks, procedures, tools, support functions and collaboration platforms designed to support the identification of common spatial data across government entities that needs to be shared among other government organizations to support the respective business requirements. The BNSDI programme will develop, maintain and operate an environment that facilitates and coordinates spatial data acquisition and sharing across the programme stakeholders considering security requirements and relevant access controls;

(b) Each BNSDI programme stakeholder entity, through collaboration with the BNSDI programme, in its capacity as a data custodian will coordinate on the common spatial data acquisition, management and dissemination processes aligning with the geospatial business requirements from other stakeholders. The stakeholder entity, in its capacity as a spatial data and services consumer, will comply with the BNSDI programme policies and controls governed through the programme agreements framework;

(c) Geospatially Enabled government Operations and Services. The BNSDI Programme shall develop and maintain a spatial enabling environment including operational frameworks, procedures, tools, support functions and collaboration platforms designed to support the respective government organizations to spatially empower, enhance and innovate business functions covering operations, services and decision-making. Each BNSDI programme stakeholder entity will, in collaboration with the BNSDI programme steward designated by the government, identify all business functions across the entity that generate or utilize spatial data as well as functions that can be optimized and enhanced through the utilization of geospatial data and technology. Each

organization will develop and share with the BNSDI programme plans for and progress on, developing, purchasing, adopting and utilizing spatial data and technology within the organization. The stakeholder entity will maximize the utilization of the BNSDI programme support services and common spatial services to optimize investments and expedite adoption.

(d) Cross government operations and value chains. government entity business operations encompass business functions that focus on internal functions and processing to fulfill the entity mandated objectives as well as outward facing business functions that focus on delivering services. Similar to the identified need for sharing common information across government entities there are significant operations and services that cross the boundaries of two or more entities to fulfill common business requirements. These cross-government operations constitute value chains where more than one entity is required to contribute to the fulfillment of the operation or public service. This class of business operations requires focused attention from the perspective of spatial data, technology and integration needs.

The BNSDI Programme shall, in collaboration with the stakeholder organizations, identify, and evaluate the geospatial requirements for cross-government value chains. The BNSDI programme, in collaboration with the concerned stakeholders, will coordinate on the common spatial data requirements, common spatial tools, and integration requirements that will have a positive impact on optimizing and enhancing the operations and services. The BNSDI programme stakeholder entities shall collaborate with the BNSDI programme to identify and evaluate cross-government value chains and the needs for spatial data and technology, and will also coordinate on designing the required enhancement solutions and tools and will fulfill the agreed upon roles and responsibilities in that respect. The BNSDI programme stakeholder entity will collaborate with the BNSDI programme on tracking and monitoring the implementation of the solutions to address the identified cross-government value chains and on tracking and monitoring utilization performance.

(e) Support Coordinated Sustainable Development Investment. The BNSDI shall provide a comprehensive repository of information that can be used to more effectively plan, prioritize and manage sustainable development investment across all sectors. By "de-risking" investments with better information, the government of Belize will be able to both prepare project proposals more effectively and quickly. This will also help to attract a broader and more diverse range of investors and investment options including institutions, sovereign wealth funds and the private sector that might not otherwise invest in less qualified projects. Well considered climate resilient low carbon development project portfolios will also be important in attracting desirable

"triple-bottom-line" investors who are looking for positive social and environmental returns on investment, in addition to financial returns.

(f) Decision Support. Organizational performance is directly correlated to decision making and decision effectiveness. Effectiveness is also attributed to organization frameworks that enable informed and timely decision making practices. government entities having complex structures and inter-related business functions and operations need to maintain accurate and current information that can be accessed and evaluated in a timely manner by decision makers supported by advanced decision support systems. The geospatial dimension to information has become an integral component to almost all information that is required to manage government business. Leveraging geospatial data and spatial technology to build advanced geospatially enabled decision support systems empowers decision makers at various levels within an organization and will ultimately enhance the overall organizational performance of government organizations in Belize.

(g) Customer Centric. The BNSDI programme ultimately contributes to enhancing and innovating government operations and services. The utilization of these geospatially enabled products and services by the various end users and the satisfaction that these products and services both address their needs and improves their quality of life is a primary indicator to achieving the goals of the programme. A customer-centric approach, whether these customers are users within government entities or consumers of government of services, means focusing on the needs and requirements of the various end users and catering for their needs.

2.4   Executive Branch Leadership

An Executive Committee is to be established upon approval of the revised NSDI Policy by the Cabinet. The Executive Committee is to be chaired by the CEO of the Ministry responsible for the National Spatial Data Infrastructure. The government will likewise designate units of government to participate in the BNSDI Executive Committee.

The BNSDI Coordination Centre has been established as a Unit in the Ministry of Natural Resources. (NSDI Unit), which will act as the Secretariat supporting and acting at the direction of the Executive Committee and will be responsible for carrying out the daily activities required to operate, facilitate, promote and support the development and management of the BNSDI.

Governing Principles:

(a) Executive branch departments and other government organizations ("organizations") that have a primary interest in the development of the BNSDI are designated by the government to join the Executive Committee;

(b) Each member agency shall ensure that its representative on the Executive Committee holds a policy-level position;

(c) The Executive Committee shall seek to involve District, local, and other government organizations in the development and implementation of the initiatives contained in this order;

(d) The Executive Committee shall establish an BNSDI Technical Committee comprising technical representatives from each of the member organizations;

(e) The Executive Committee shall utilize the expertise of academia, the private sector, professional societies, civil society, and others as necessary to aid in the development and implementation of the objectives of this policy. This is to be accomplished through Working Groups and Special Interest Groups that will be formulated and assigned to address specific and general topics on a periodic basis.

2.5   Establishment of an BNSDI Coordination Centre (NSDI Unit)

The Government of Belize has established the BNSDI Coordination Centre (hereinafter referred to as NSDI Unit) to operate, facilitate, promote and support the development and management of the BNSDI. Initial functions to be supported by the NSDI Unit include:

(a) Establishing a National Geospatial Data Clearinghouse (National Clearinghouse). The Executive Committee, through the NSDI Unit, and in consultation with, as appropriate, District, local, and other government organizations and other affected parties, shall take steps to establish an electronic National Geospatial Data Clearinghouse ("Clearinghouse") for the BNSDI. The Clearinghouse shall be compatible with the CITO egovernment Infrastructure to enable integration with their infrastructure;

(b) Establishing the BNSDI Technical Committee. The NSDI Unit will be responsible to facilitate a process for the formation and operations of a BNSDI Technical Committee. The members of the Executive Committee will be responsible to assign one senior staff to act as primary technical representative from each organization, with an additional senior staff assigned as backup. The general function of the Technical Committee will be to hold periodic meetings, facilitated by the NSDI Unit, to confer on technical issues that are of common interest across the stakeholder community. It will be chaired by the Head of the NSDI Unit;

(c) Assignment of Data Custodianship. The NSDI Unit will immediately undertake a process to facilitate the establishment and formalization of custodianship for every Fundamental Geospatial Data Set (FGDS) layer. Custodianship will be determined through a systematic consultative process. Custodian responsibilities will be clearly defined in a Service Level

Agreement (SLA) between the Custodian organization and the Executive Committee. Once executed, it will be the responsibility of the Custodian organization to comply with the terms of this agreement and the responsibility of the NSDI Unit to monitor such compliance and report status to the Executive Committee on a periodic basis;

(d) Standardization of Data and Documentation. Each designated FGDS Custodian agency shall participate in a consultative process, coordinated by the NSDI Unit, to standardize the content and form of data they will be responsible for contributing to the Clearinghouse. This will also include the provision and maintenance of descriptive information about each FGDS in the form of standardized "metatdata" that will be used to populate the Clearinghouse metadata catalog;

(e) Establishing a National Geoportal and Data Services. The NSDI Unit will be responsible for the development and management of a National Geoportal to support access and utilization of the data resources contained in the National Clearinghouse. The Executive Committee, through the NSDI Unit will establish data security measures and conditions of access in alignment with national policies and laws. The NSDI Unit will publish web mapping data services according to the directives of the Executive Committee;

(f) Establishing Application Services. The NSDI Unit will be responsible for the development and management of common application services. The NSDI Unit, in consultation with the Technical Committee will identify, develop, deploy and manage common application modules where such modules can be developed once and then support multiple applications within the

(g) Establishing Technology Infrastructure. The BNSDI programme will involve the development and delivery of a variety of services beyond data sharing. The Executive Committee, through the NSDI Unit will facilitate a process to ensure that the technology infrastructure of the Central Node at the NSDI Unit and the Organization Nodes within each participating organization is established and maintained in a form that will optimize the use of geospatial data and tools across government.

(h) Development and updating of Strategic and Annual Plans. The Executive Committee, through the NSDI Unit will be responsible for the development and management of both the BNSDI Strategic Plan that shall be updated on a three-year basis, as well as Annual operating plans that will be developed each year. Strategic plan updates will suggest course changes for the programme based on an evolving context and an expanding stakeholder community and its associated requirements. Annual plans will address scope, resourcing and budgeting for both operational costs and capital investments required in the following year.

(i) government Use of the Clearinghouse. The Executive Committee will adopt, through the NSDI Unit, internal procedures to ensure that each organization accesses the Clearinghouse before any expenditure of government funds to collect or produce new geospatial data, to determine whether the information

has already been collected by others, or whether cooperative efforts to obtain the data are possible. This is inclusive of both government of Belize funding as well as external loans or grants from International Finance Institutions, foundations, development aid organizations or others;

(j) Promoting Geo-maturity and Capacity Building. Optimizing the investment in BNSDI requires that each FGDS custodian or user of the platform has the internal technical and institutional capacity to use it effectively. "GeoMaturity" refers to a measure for determining the readiness of an organization to leverage spatial data and technology in executing business operations and provision of services. GeoMaturity measures readiness with respect to enterprise alignment, infrastructure, resource management and data management as well as usage in operations and products and services. The Executive Committee, through the NSDI Unit will undertake a bi-annual process to collaborate with member organizations to measure the geo-maturity level and rate of improvement within each;

(k) Community Outreach and Communications. The BNSDI programme ultimately serves and impacts a wide spectrum of beneficiaries crossing the government sectors, non-government sectors, private sector and the public. The programme activities and achievements are dependent on the programme stakeholders' collaborative sharing of information and adoption of spatial data and technology to empower operations and services as well as the utilization and consumption of information and services by the community. The NSDI Unit will be responsible for establishing and implementing an effective outreach and communication function to orchestrate building awareness, knowledge and collaboration to secure the efficient execution of the BNSDI programme activities and realization of the programme goals and objectives. Outreach and communications will address both national and international perspectives; the national perspective ensures that the BNSDI is visible and appreciated by decision makers and the general public; while the international focus provides channels for mutual understanding and sharing of ideas and best practices across the broader SDI communities nationally, regionally and internationally;

(l) Working Groups (WG's). The NSDI Unit will facilitate the establishment of Working Groups to carry out specific activities and outputs. Working Groups will be formed around special topics and comprised of representatives from all the key stakeholders that will be most affected by the topic. Working groups will have a specific scope of work, timeframe and assigned resources for the development of specific outputs, such as data content standards. At the completion of the scope the Working Group is dissolved.

(m) Special Interest Groups (SIG's). The NSDI Unit will facilitate the establishment and support to Special Interest Groups. As opposed to Working Groups that are formed to complete a specific task, Special Interest Groups represent the voluntary association of various communities of practice that share common requirements and needs. SIG's will identify and explore topics of mutual interest and communicate requirements and recommendations to the NSDI Unit.

(n) Funding. The government shall provide funding for the NSDI Unit to cover the development and management of the facility, Geoportal platform and any other services and duties as may be assigned to it. government organizations shall continue to fund their respective programmes that collect and produce geospatial data; such data is then to be made part of the Clearinghouse for wider accessibility.

2.6 Standards Activities

The adoption of data and other standards are important to maintain interoperability across government systems, to better align and streamline government functions and fundamentally improve delivery of services to the public;

(a) General Coordination Center Responsibility. The BNSDI NSDI Unit will facilitate a process for the development and implementation of standards, in consultation with National, District and local government authorities, the private and academic sectors, and, to the extent feasible, the international community;

(b) Role of Standards Working Groups. For each FGDS theme or other standard, the NSDI Unit will convene a Working Group comprising representatives from those stakeholder organizations with an interest in each specific standard. The Centre will consult with the BNSDI Technical Committee to identify those organizations that need to be represented in each Working Group. The Centre will then draft a terms of reference (TOR) outlining the standard to be developed, the process for doing so, a schedule for its completion and the roles and responsibilities of the Working Group members.

(c) Standards for Which Agencies Have Specific Responsibilities. Agencies assigned FGDS custodian responsibilities for data categories by the Executive Committee shall develop, in cooperation with the NSDI Unit and Working Groups, standards for those data categories, so as to ensure that the data produced by all organizations are compatible.

(d) Other Standards. The NSDI Unit may from time to time identify and develop, through its member agencies, and to the extent permitted by law, other standards necessary to achieve the objectives of this policy. The NSDI Unit will promote the use of such standards and, as appropriate, such standards shall be submitted to the CITO for consideration as national information processing standards. Those standards shall apply to geospatial data as defined in this policy;

(e) Organization Adherence to Standards. government organizations collecting or producing geospatial data, either directly or indirectly (e.g. through grants, partnerships, or contracts with other entities), shall ensure, prior to obligating

funds for such activities, that data will be collected in a manner that meets all relevant standards adopted through the NSDI Unit process;

(f) Standards Change Management. The NSDI Unit will be responsible to monitor requested changes to any adopted standards, and to facilitate a systematic change management process in consultation with affected stakeholders.

2.7 National Digital Geospatial Data Framework

(a) In consultation with the BNSDI Technical Committee, the NSDI Unit shall submit a plan and schedule to the Executive Committee for completing the initial implementation of a national Fundamental Geospatial Data Set (FGDS) framework ("framework") and for establishing a process of ongoing data maintenance. The framework shall include geospatial data that are significant, in the determination of the Executive Committee, to a broad variety of users within any geographic area or nationwide.

(b) Partnerships for Data Acquisition. The Executive Committee, under the auspices of the NSDI Unit, shall develop, to the extent permitted by law, strategies for maximizing cooperative participatory efforts with District and local governments, the private sector, and other non-federal organizations to share costs and improve efficiencies of acquiring geospatial data consistent with this order.

2.8 Technology Infrastructure Activities

The BNSDI technological infrastructure includes all those elements and processes needed to establish, use and maintain both central and distributed nodes.

(a) Central Node. The NSDI Unit is responsible for establishing and maintaining all the computing infrastructure and software required for the Geoportal, management of the data repository, data and application services. It will also require additional computing infrastructure, software and technical staff capacity to support all the other functions assigned to the NSDI Unit including decision support, special projects, technical capacity building and the management and processing of requests for information and technical help desk;

(b) The Executive Committee, through the NSDI Unit may elect to enter into government-wide software and hardware purchasing agreements where such agreements will materially benefit the participating organizations and result in a significant net-benefit and lower overall cost to the government;

(c) Distributed Node. Each participating organization will be required to maintain the technology infrastructure needed to support their own internal operations as well as connectivity to and utilization of the resources available through the Central Node.

2.9   BNSDI Controls

The BNSDI programme is a government wide programme that involves a large number of stakeholders and requires high levels of collaboration, commitment and compliance to the programme governing legislation, policies, agreements and procedures. The following controls shall be established and maintained to ensure the efficient programme operation guidelines are sustained towards achieving the BNSDI objectives and overall government goals:

(a) Geo-Legal Activities. The geo-legal framework is one facet of the government e-laws, corresponding policies, guidelines and legislations approved by the Government of Belize and promulgated by the BNSDI Programme. The BNSDI Programme shall research and develop recommendations to spatially enable e-laws towards strengthening the BNSDI legislative framework in the country. The programme shall also develop policies, guidelines, procedures and other tools towards supporting the geo-legal framework and its implementation across the stakeholder entities and the community. The stakeholder entities shall participate and contribute to the development and implementation of the supporting legislative framework and tools.

(b) Agreements. The BNSDI Programme, facilitated by the NSDI Unit shall develop, adopt and disseminate a comprehensive framework for agreements with the stakeholder entities supported by tools, guidelines and procedures. The agreements shall include, but are not limited to, the following: entities' membership agreements/MOUs, that provide an umbrella for all aspects of collaboration and coordination between the BNSDI Programme and the stakeholder entities; Service Level Agreements for licensors and Licensing agreements for licensees/ licensors to streamline access and sharing of commonly needed spatial information and related services among the stakeholder entities, 3rd party contractors, consultants and the general public.

(c) Compliance & Enforcement. Compliance with this BNSDI Policy is mandatory. All involved government of Belize personnel and Service Providers must comply with the roles, responsibilities and policy controls set forth in this document to fulfill the Belize government vision and the BNSDI programme to empower the government and society with access to spatial

information and spatially enabled services. Monitoring and enforcement of the BNSDI policy is the responsibility of each Belize government organization. The BNSDI programme shall develop a comprehensive compliance framework including timelines and escalation procedures. The overall compliance with the BNSDI Policy will be monitored and managed by the BNSDI programme. Non-conformance will be managed and escalated to the Executive Committee for advice and resolution according to defined compliance management procedures.

(d) While compliance with the BNSDI Policy is considered mandatory for the government of Belize organizations, the remaining BNSDI stakeholder entities including academia, businesses, civil society organizations and others shall coordinate with the BNSDI Executive Committee, through the NSDI Unit for effective alignment, as appropriate, where agreement to the terms of the BNSDI policy forms a pre-requisite to their membership in the BNSDI Community.

(e) Performance. Performance management is essential to monitor and measure the progress of the BNSDI programme activities in addition to measuring the impact of the programme services on overall government operations and services. A comprehensive performance framework will support decision makers in addressing programme issues and provide support towards advancing programme initiatives. Stakeholder government entities will be able to provide performance feedback on BNSDI related practices and impact on business operations and services.

(f) The BNSDI programme shall identify, develop and maintain a comprehensive performance management framework based on international sound practices and focusing on Return On Investment (ROI) covering tangible and intangible benefits, and supported by guidelines, procedures and tools. This framework shall support an enhanced programme monitoring approach built on linking the programme activities and investments to efficiencies in operations and services across government while providing a comprehensive view to decision makers. The performance management framework will focus on internal BNSDI goals and activities while linking to external stakeholder operations and services that use and utilize the programme products and services.

(g) The performance management framework shall also support cross-government value chain solutions and services identifying and integrating Key Performance Indicators (KPIs) for all activities contributing the overall operation or service KPI. This will further optimize and direct investments towards activities that positively impact the targeted goals.

(h) The BNSDI stakeholder entities shall collaborate with the BNSDI programme on developing the performance management framework and will take appropriate measures to adopt and apply the framework and tools towards supporting internal operations, services and decision support processes. The stakeholder entity will provide periodical and as needed performance feedback on BNSDI related topics.

(i) Spatial Investment Optimization. The BNSDI programme objectives include introducing efficiencies and optimization across government operations and services. Efficiencies addressing tangible and intangible benefits will also include a financial element that relates to optimized government expenditure and increased ROI. The BNSDI programme activities will consider the investment, cost optimization and saving element in spatial related practices across government organizations. The BNSDI programme shall, in collaboration with the programme stakeholders, develop and implement practices towards expenditure efficiencies including:

- Assess and develop common shared spatial services that address entity requirements and can be deployed through a common platform to be consumed by all stakeholders.
- Develop joint projects alignment and coordination activities to reduce redundancy and maximize the benefits from investing spatial related projects across the stakeholder community in Belize.
- Develop BNSDI programme budget review procedures for spatial projects, or spatial components in projects, as part of the Projects Coordination and Alignment framework.
- Develop institutional agreements and initiatives for common BNSDI services that optimize government expenditure on common requirements related to spatial data, tools and services.
- Study, evaluate and recommend possible cost sharing and cost recovery models where consumers of a particular service will consume a service against a set fee. This type of service will be initially applied to consumers other thangovernment entities. Service-based-costing models will also allow for the sustainability and development of the service and the introduction of other related services for the community.

2.10 Data and Service Classification

The provision of access to data and how this is provided and to whom needs to be accomplished in alignment with the policy framework. The Executive Committee, through the NSDI Unit, will facilitate a process to develop data and service

classification level for each FGDS. Once developed, the classification will be applied within the BNSDI data and system security framework.

2.10.1 Data Classification

Data security classification is the first step in moving towards a data sharing paradigm. Through this framework, the data elements are identified and classified based on the sensitivity and impact of the sharing of that information. The major components in the framework include the following:

- Classification Levels –A Classification Level represents confidentiality rating (or security rating) that must be applied to the informational assets. Four main levels of security classification markings have been defined as part of the Information Classification framework; "Public", "Limited Access", "Confidential" and "Secret".

- Dissemination Limiting Markers (DLM) – Dissemination Limitation Markers supplement the security classification system for identifying official information. DLMs are markings for information where disclosure of information may be limited or prohibited by legislation or where it may otherwise require special handling. Departments/agencies are responsible for determining the appropriate protections to be applied to information bearing DLMs. DLMs have been categorized in the following four categories: Sensitive, Sensitive: Personal, Sensitive: Legal, and Sensitive: Government.

- Caveats – Caveats are warnings that specify or limit the people who can have access to the information. Use of caveats with information signifies that the information has special requirements in addition to those indicated by the protective marking. Information bearing agency specific caveats are to be re-labeled or appropriate procedures agreed up before the release or the transmission outside of that agency. The prior agreement of the originating agency—in other words, the agency that originally placed the caveat on the material—is required to remove a caveat. If the originating agency does not agree to the removal of the caveat, then the information cannot be released. The requirement to obtain agreement of the originating agency to release the material cannot be the subject of a policy exception under any circumstances. The following categories of security caveats are used: Eyes Only (EO), Permission Required (PR), When completed (WC), Do not release Until (DNRU).

2.10.2 Service Classification Framework

The sharing of data is done via services and therefore a separate service classification framework is defined based on the data classification framework.

Service Classification Level. Based on the type of security classification assigned, the access to the data may be regulated and limited to a selected group of individuals or operational units. While providing access it shall be noted that all government data is generated by using public funds and hence as far as possible access to the same should be unrestricted, easy, timely and user-friendly as long as the security and privacy requirements are preserved. Access provided to data held by government can be of following types:

- Open Access. Data that may be accessible freely by any individual / agency and the access is provided without any process or registration / authorization is referred to as open data and is freely available to all.
- Authorized Access. Access to data is restricted when data sets are accessible only through a prescribed process of registration / authorization by respective departments / organizations. Data having restricted access shall be made available to only the recognized institutions / organizations / public users, through defined procedures. The requester of such data may need to authenticate his / her identity and provide a valid reason to access the data in question by producing the correct documentation and authorizations.
- Restricted Access. Data declared as restricted shall be accessible only through and under authorization to selected individuals or organizations based on a need to know basis.

Service Types. This refers to the information types being shared through the provided services. The service types are categorized into two broad categories as mentioned below:

- Data Service. Some or all data elements within a geospatial data "Asset" can be shared depending on the derived sensitivity of the data Asset

- Verification Only Service. Given a set of inputs, an answer as of Yes/No may be provided after the proper verifications are carried out in the source data bases.

2.11   Roles and Responsibilities

The development, management and support of the BNSDI involves a community initiative, directed by an Executive Committee and supported by the NSDI Unit. Table 1 presents a summary of all the major BNSDI activities to be carried out. The approach to organizing these functions and processes involved is further described in the "Programme Design – Governance Framework Component" report.

Table 1 - BNSDI Support Functions

BNSDI COORDINATION CATEGORY	BNSDI COORDINATION FUNCTION
Executive Stakeholder Representation and Oversight	Represent the interests and executive perspective of participating stakeholder organizations
Executive Stakeholder Representation and Oversight	Jointly assess and make recommendations to government regarding relevant policies, regulations and programmes
Executive Stakeholder Representation and Oversight	Provide executive championship in support of the BNSDI programme
Executive Stakeholder Representation and Oversight	Overseeing coordination of geospatial investment management
Executive Stakeholder Representation and Oversight	Promoting agency compliance with BNSDI standards and responsibilities
Executive Stakeholder Representation and Oversight	Promoting the allocation of agency resources to fulfill the responsibilities of effective spatial data collection, production, and stewardship
Executive Stakeholder Representation and Oversight	Ensuring the communication of key national geospatial activities within the agency and with the greater BNSDI stakeholder community
Executive Stakeholder Representation and Oversight	Appointing an agency technical representative and alternate to serve on the Technical Committee of the BNSDI
Executive Stakeholder Representation and Oversight	Appointing representatives to lead or serve on working groups
Executive Stakeholder Representation and Oversight	Promoting the benefits of coordinating and partnering among government agencies in the development of the BNSDI within the member's agency
Executive Stakeholder Representation and Oversight	Serving as a champion for the use, value, and benefits of geospatial information in decision making and in the business of government
Executive Stakeholder Representation and Oversight	Collaborating with the member's agency IT and/or GIS manager to ensure that the agency leverages its cumulative geospatial information investments to benefit agency-wide business processes and services
Technical Stakeholder Representation and Oversight	Support BNSDI executive committee members in the formation and analysis of pertinent policy matters for those aspects that are of a technical nature
Technical Stakeholder Representation and Oversight	Support the BNSDI in identifying and carrying out cross-agency coordination

Technical Stakeholder Representation and Oversight	Lead the coordination of technical issues across the BNSDI community
Technical Stakeholder Representation and Oversight	Work closely with the BNSDI coordination office to develop and promote common standards and interoperability guidelines, including participation in Topical Working Groups when needed
Technical Stakeholder Representation and Oversight	Participate in evaluating cross-agency business processes and applications where spatial information is concerned
Technical Stakeholder Representation and Oversight	Participate in the development and promotion of common quality assurance and quality control specifications, methods and tools
Technical Stakeholder Representation and Oversight	Participate in the development and adoption of framework data standards and specifications
Technical Stakeholder Representation and Oversight	Participate in BNSDI data clearinghouse development and operations performance monitoring and provide feedback regarding potential improvements to the BNSDI executive committee on a regular basis
Technical Stakeholder Representation and Oversight	Promote and support technical staff training and professional development where this will support strengthening of the BNSDI framework, including the participation and contribution of individual agencies
Programme Administration and Management	Oversee and administer the functioning of the BNSDI coordination and support unit
Programme Administration and Management	Organize and provide secretariat support to the executive and technical stakeholder representation committees
Programme Administration and Management	Promote the BNSDI in various local and international meetings and conferences
Programme Administration and Management	Develop and disseminate information regarding the BNSDI through multiple channels
Programme Administration and Management	Lead the periodic refresh of the BNSDI Strategic Plan
Programme Administration and Management	Prepare annual operating plans and budgets for the BNSDI coordination and support unit (s)
Programme Administration and Management	Administer technical staff recruitment, training and retention programme
Programme Administration and Management	Develop, recommend and maintain BNSDI strategies and policies in coordination with Executive and Technical Committees
Programme Administration and Management	Develop and maintain Security Operations Plan
Programme Administration and Management	Research proposed initiatives and present the research for Executive and Technical Committees review and consideration
Programme Administration and Management	Develop and maintain BNSDI programme performance monitoring and management
Programme Administration and Management	Provide periodical reporting and monitoring to the Executive Committee and ensure that the BNSDI member agencies and working groups report the same based on the set forth service level agreements

Programme Administration and Management	Conduct Return On Investment analysis, monitor and report progress over time
Programme Administration and Management	Develop and maintain GIS Roadmap framework and support, facilitate, and oversee the Enterprise GIS roadmap development within the Stakeholder Entities
Programme Administration and Management	Promote and support common training programme needs throughout the stakeholder community
Programme Administration and Management	Coordinate data security and setting of data publisher and user rights, in alignment with service level agreements
Programme Administration and Management	Assist Technical and Working groups in cross-agency coordination, business process reconciliation, and related matters
Programme Administration and Management	Monitor fundamental geospatial data set (FGDS) acquisition projects and maintenance activities, including the maintenance of metadata by custodian agencies
	Promote and develop strategic public/private/institutional partnerships
Technical Infrastructure Management and Operations	Maintain BNSDI Geospatial Portal and Data Clearinghouse
Technical Infrastructure Management and Operations	Develop and manage/maintain catalog of data and application services (metadata)
Technical Infrastructure Management and Operations	Develop and maintain common application services
Technical Infrastructure Management and Operations	Conduct user support services including administration of user access priveleges, record and manage requests for information (RFI's), and user help desk
Technical Infrastructure Management and Operations	Manage computing infrastructure (hardware, network, software)
Technical Infrastructure Management and Operations	Administration of the common data repository
Technical Infrastructure Management and Operations	Manage execution of data owner service level agreements (SLA's) at the operational level, monitor performance and report same to Unit management
Technical Infrastructure Management and Operations	Support Working Groups in the development of fundamental geospatial data set data models
Technical Infrastructure Management and Operations	Support GIS technology planning for the Unit
Technical Infrastructure Management and Operations	Promote adoption and enforcement of quality assurance and quality control measures in all fundamental geospatial data set (FGDS) acquisition efforts
Technical Infrastructure Management and Operations	Administer acquisition and licensing of data for which there is no other logical custodian
Technical Infrastructure Management and Operations	Participate in FGDS configuration management, in partnership with custodian agencies and in consultation with affected stakeholders

Technical Infrastructure Management and Operations	Provide general oversight for FGDS data development and maintenance in the BNSDI Community, via data projects alignment and/or special projects
Technical Infrastructure Management and Operations	Develop common standards and guidelines in consultation with the appropriate stakeholder groups
Technical Infrastructure Management and Operations	Participate in the development and adoption of common geospatial content data standards, in partnership with custodian agencies and in consultation with stakeholder agencies
Technical Infrastructure Management and Operations	Promote and support the development of value-add services by the private and institutional sectors
Technical Infrastructure Management and Operations	Promote and support the geospatial-enabling of online e-government services
Technical Infrastructure Management and Operations	Promote adoption and enforcement of quality assurance and quality control measures in all application service development efforts
Technical Infrastructure Management and Operations	Conduct incident management
Technical Infrastructure Management and Operations	Conduct change and configuration mangement
Technical Infrastructure Management and Operations	Conduction BNSDI asset management
Technical Infrastructure Management and Operations	Conduct release management
Technical Infrastructure Management and Operations	Provide basic as-needed technical and analytical support to the participating stakeholder agencies based on sound system and database design, spatial analytical procedures, cartographic design and programmeming practices
Stakeholder Engagement and Support	Support stakeholder community organization and governance. Identify and strengthen community development and engagement activities to meet evolving requirements
Stakeholder Engagement and Support	Monitor geospatial system and database development across the stakeholder community and identify needs for programme coordination and alignment
Stakeholder Engagement and Support	Monitor compliance with agreed Standard Operating Procedures (SOP's) and Rules of Engagement among the stakeholder community
Stakeholder Engagement and Support	Develop and coordinate strategies for the development and dissemination of capacity building tools and methods
Stakeholder Engagement and Support	Support the development, publishing and dissemination of common BNSDI standards for use by the stakeholder community
Stakeholder Engagement and Support	Support the maintenance of the BNSDI Master Plan
Stakeholder Engagement and Support	Develop and manage the community outreach and communications activities of the BNSDI programme

Stakeholder Engagement and Support	Identify and manage key opportunities for publicizing the progress and achievements of the BNSDI programme, including the BNSDI website, geospatial portal, special events, seminars, exhibitions, conferences and other channels
Stakeholder Engagement and Support	Monitor and report on organization "GeoMaturity"
Stakeholder Engagement and Support	Establish and support ties with SDI related regional and international initiatives as well as bilateral collaboration and experience sharing with other national SDI programmes
Stakeholder Engagement and Support	Develop, implement and maintain public outreach and communications programme to increase awareness among interested groups (academia, private sector, public).
Stakeholder Engagement and Support	Maintain close communications and proactive working relationship with all BNSDI stakeholder organizations
Stakeholder Engagement and Support	Formalize, institutionalize, and extend BNSDI activities among existing stakeholders
Stakeholder Engagement and Support	Expand the BNSDI community through a well articulated community involvement strategy based on identified priorities
Stakeholder Engagement and Support	Work on strategies for developing and disseminating BNSDI capacity building tools and methods in the government Entities and their integration with e-government services
Special Projects and Decision Support	Provide periodic and as-needed decision support products and services to the leadership on a regular basis (CEO's, Ministers, government)
Special Projects and Decision Support	Provide special project support to entities on an as-needed basis (may require service fees or other financial arrangement)
Special Projects and Decision Support	Maintain specialized facilities and expertise that can be accessed on an as-needed basis by other entities (e.g. very large scale plotter, drone survey service, specialized GPS equipment, etc.)