



لجنة أبو ظبي للنظم والمعلومات
abu dhabi systems & information committee

TECHNICAL WORK PROGRAM

Foundation Program for the Abu Dhabi Spatial Data Infrastructure (AD-SDI)

ADSIC Charter
GO-R-026: Geographic Information Infrastructure

Abu Dhabi Emirate
United Arab Emirates (U.A.E.)

Prepared for

**Abu Dhabi Systems and
Information Committee (ADSIC)**

Prepared by

Geographic Planning Collaborative, Inc. (GPC)
California, USA



Table of Contents

1	INTRODUCTION	3
1.1	Background	3
1.2	AD-SDI Framework Overview	4
1.3	Expected Benefits, Products, and Outcomes.....	11
1.4	Major Components of the Technical Work Program	13
1.5	Implementation Stages.....	15
2.0	SCOPE OF WORK.....	16
2.1	Track 1 - Program Organization and Mobilization	16
2.1.1	Task 1 - Project Inception.....	16
2.1.2	Task 2 - Committee Formation and Mobilization	17
2.1.3	Task 3 - AD-SDI Program Update Seminar.....	17
2.1.4	Task 4 - SDCC Staff Recruitment and Mobilization.....	18
2.2	Track 2 – AD-SDI Strategy, Program Design and Implementation Plan	18
2.2.1	Task 1 - Conduct Stakeholder Situation Update Survey	19
2.2.2	Task 2 - Conduct Data Inventory and Assessment.	20
2.2.3	Task 3 - Prepare Requirements and Gap Analysis	21
2.2.4	Task 4 - Prepare AD-SDI Strategic Plan	21
2.2.5	Task 5 - Prepare Program Design.....	22
2.2.6	Task 6 - Prepare Implementation Plan.	25
2.3	Track 3 - Data Projects Coordination	26
2.3.1	Task 1 – Conduct Detailed Project Requirements Assessment	26
2.3.2	Task 2 – Prepare Data Project Alignment Strategy	27
2.3.3	Task 3 – Monitor and Follow-up Data Project Development	27
2.4	Track 4 – AD-SDI Website, Geospatial Portal and Data Clearinghouse.....	28
2.4.1	Task 1 – Prepare Technical Specifications.....	28
2.4.2	Task 2 – Conduct System Component Acquisition and/or Development.....	30
2.4.3	Task 3 – Prepare Technical Environment.....	30
2.4.4	Task 4 – Install and Test Technical Infrastructure and Application Software.....	30
2.5	Track 5 –Agency Enterprise GIS Capacity Building	31
2.6	Track 6 – SDCC Operations Support and Capacity Building Program	31
2.6.1	Task 1 – Create Detailed Operations Plan	31
2.6.2	Task 2 – Support SDCC Operations (Stage 1- Scope to be determined).....	31
2.6.3	Task 3 – Develop Capacity Building Program (Stage 1 scope to be determined).....	32
2.6.4	Task 4 – Conduct Capacity Building Program (Stage 1 scope to be determined).....	32

1 INTRODUCTION

The following summarizes a terms of reference and work program for the planning, design, implementation, operations support, and capacity building required to establish the initial Abu Dhabi Spatial Data Infrastructure (AD-SDI) program. This program is based upon the ADSIC Charter *GO-R-026 Geographic Information Infrastructure*. According to this work plan, a team of specialists with experience in SDI implementation around the world will work directly with government representatives to build on past efforts and further refine AD-SDI requirements, to design a program and implementation strategy for the staged development of the infrastructure over time, to facilitate coordination among several ongoing and planned major geographic data gathering efforts, implement an initial Geospatial Portal and associated metadata catalog and data clearinghouse facilities, provide operations support for the initial roll-out phase of the program, and carry out a capacity building program to prepare a local team to assume primary responsibility for the ongoing administration and operation of the AD-SDI.

1.1 Background

Geographic Information Systems (GIS) have become an indispensable tool for managing and using spatial information at the local, regional, national and global levels. Many organizations need the same information, but in most countries there is no structure for the effective coordination and sharing of these data, and information is essentially "locked up" within sector-focused ministries and institutions. This issue is being addressed in many countries around the world in the form of "Spatial Data Infrastructure (SDI)" initiatives that provide a framework of standards, policies, data, procedures, and technology to support the effective coordination and dissemination of spatial information. This framework is now recognized internationally as a critical foundation for more effective physical, economic and social development and environmental resource management. The term Geographic Information Infrastructure (GII) is synonymous with Spatial Data Infrastructure (SDI), but the latter is in more common usage internationally so it has been adopted here for the purposes of this work program.

Extensive national SDI programs are well underway in North America, Europe, Australia, South America and elsewhere, and a Global Spatial Data Infrastructure (GSDI) has been joined by more than 50 countries around the world. These existing programs have established important groundwork, but experience suggests that while these models provide valuable guidelines and insights, all countries have many special institutional, political, economic and legal contexts that require a unique approach tailored to this local context. For most countries in the world, effective SDI development is most often a step-by-step, incremental process that acknowledges and responds to the special circumstances of each nation.

The development of an AD-SDI is especially timely for Abu Dhabi Emirate. Most agencies are familiar with GIS and several have developed significant internal programs. Some of these are embarking on significant geospatial database development or updating and expansion efforts. The Military Survey Department (MSD) has initiated a major program to produce 1:25K basemap data for the entire Emirate. The Environmental Agency Abu Dhabi (EAD) is developing a soils map for the Emirate, has acquired various satellite imagery for all of the UAE, is developing a substantive and expanded update to the Coastal Sensitivity Atlas, and has initiated an aggressive and proactive program called the Abu Dhabi Global Environmental Data Initiative (AGEDI) to increase access and use of quality environmental data for conservation and sustainable development. Both Town Planning Departments in Abu Dhabi and Al Ain have defined major programs for the update and extension of detailed urban basemap data at 1:1,000 and 1:2500 scales. The Abu Dhabi Water and Electricity Authority (ADWEA) has developed and continues to maintain land base and water and electrical transmission and distribution facility information for

the entire Emirate. Other utilities and government agencies are likewise developing or considering development of their own GIS capabilities. All these efforts can receive significant benefit from a centrally coordinated and facilitated AD-SDI program.

The study proposed here will result in a clear picture of the current situation regarding geospatial data in Abu Dhabi, the issues, opportunities and constraints for the establishment of an AD-SDI for the Emirate, a compelling articulation of the most suitable AD-SDI design and emirate level SDI coordination process, and the resulting benefits that could be gained at all levels of society, and a practical road map for how to move this initiative forward.

1.2 AD-SDI Framework Overview

The work program contained in this report describes a process of physical and institutional infrastructure and stakeholder community development efforts that are required to initiate and grow the AD-SDI initiative. The end-state objective of this initiative is outlined in the following paragraph. It should be noted that these end-state targets are preliminary, based on a general philosophy of a decentralized, but coordinated AD-SDI initiative, and these will be further confirmed and refined in direct collaboration with the Abu Dhabi Executive Council (ADEC) and the various key agency stakeholders during the implementation of the proposed work program.:

The AD-SDI is to comprise a network of interoperable, agency nodes, and the standards, policies and procedures that are needed to support the coordinated development and sharing of commonly needed geographic information across the Abu Dhabi stakeholder community. The initiative is based on international best-practice standards for all aspects of SDI, including but not limited to the following as outlined in the ADSIC Charter and further extended here, and as illustrated in Figure 1 below:

- Institutional Framework: policies, procedures, technology and organizational arrangements for building, maintaining, integrating, and accessing most commonly needed, fundamental data sets;
- Spatial Data Clearinghouse: Central data storage system, for maintaining and transferring data between different entities;
- Data and Metadata Standards: describing ways to collect, automate, exchange and update data and details about the source of the data and relevant information;
- Process Standards: describing the processes required for smooth data flow and maintenance, for data transfer, access, analysis and storage procedures, classification methodology, presentation standards and quality control;
- Technology Standards: providing standards and requirements for hardware, software, and system tools and protocols;
- Fundamental Data Framework: detailing the type of the most commonly needed data (Fundamental Geospatial Data Sets – FGDS) required to have a comprehensive AD-SDI, including but not limited to cadastral information, orthoimagery, elevation data, transportation, hydrography, governmental administrative units, land cover/land use, demographics, soils, climatology, air and water quality, at various scales and levels of resolution as needed to support stakeholder applications;
- Communication Channels and Cooperative Partnership: creating a distributed network for & of data producers/users and developing partnerships that allow organizations and individuals from all sectors to work together & share geospatial info;
- Set up an Abu Dhabi Spatial Data Coordination Center (SDCC) to be the focal governing point for all GIS related work in the Emirate based on the AD-SDI model developed in the previous component;
- Document the required operating model for the SDCC and the underlying processes for inter- and intra- GIS data exchanges of FGDS between the concerned government and non-government stakeholders;

- Develop governance framework for AD-SDI operations to ensure availability of consistent, congruent and up-to-date base map and administrative layers data for all potential users whether government, businesses or the general public;
- Facilitate GIS adoption by the concerned government entities by providing a series of data production, maintenance and usage toolkits and templates, and by promoting and following agency capacity building efforts;
- Design and develop a GIS portal that provides government as well as public access to the vast amount of GIS data available for Abu Dhabi.

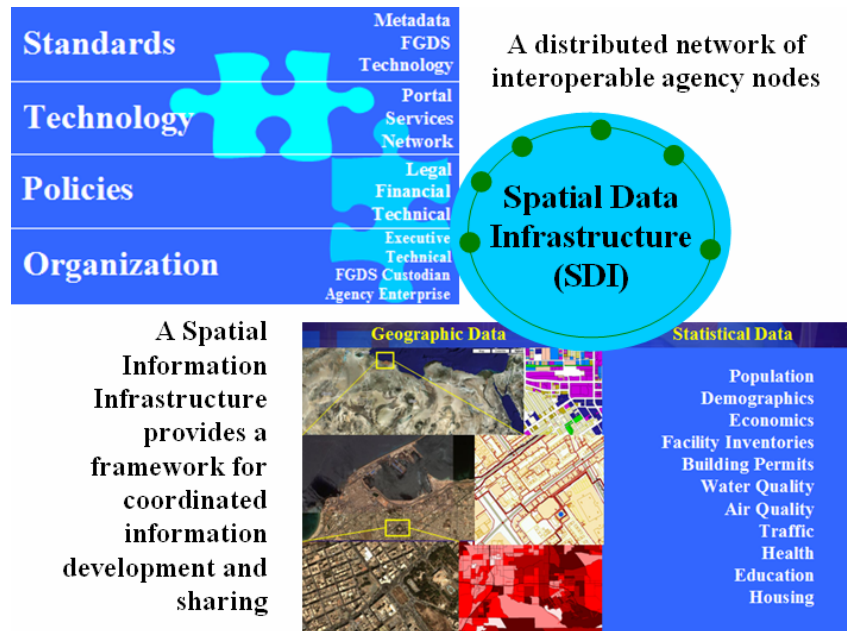


Figure 1 – AD-SDI Is Proposed As A Network of Interoperable Nodes Within a Common Framework of Policies, Standards and Coordination Procedures for Developing and Sharing High Quality Geospatial Data

Distributed Agency “nodes” are to be connected to one another through Internet-based services. A Spatial Data Coordination Center (SDCC) function under the Abu Dhabi Executive Council (ADEC) and hosted initially at ADSIC will be established to guide the effort through both initiation and operation stages of AD-SDI development. The purpose of the SDCC is to facilitate, coordinate and support the AD-SDI initiative on a full time basis, and to provide geographic analysis and decision support to the ADEC. Individual agencies will continue to be the custodians of Fundamental Geospatial Data Sets (FGDS) that are needed in common by other agencies. All such datasets will be developed and maintained according to content, format and procedural standards agreed by the community. The AD-SDI will be guided by an Executive Steering Committee (ESC) that includes high-level management representatives from all key participating agencies, and which will be chaired by an appointee of the ADEC. A Technical Committee chaired by the SDCC Program Coordinator and comprising technical representation from these same agencies will provide day-to-day technical representation and coordination among the agencies. The basic concept of the AD-SDI is illustrated in Figure 2.

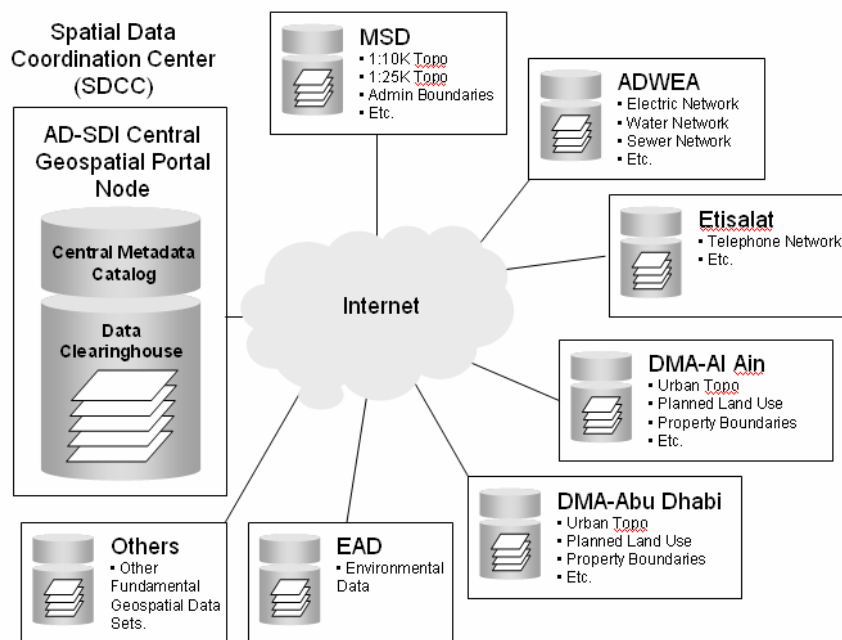


Figure 2 – AD-SDI Stakeholders are Custodians of Specific Fundamental Datasets

As illustrated in Figure 3 below, it is suggested that the SDCC function should be based within the Office of the Executive Council, and closely aligned or integrated with the e-Government initiative. This scenario acknowledges that the e-Government and AD-SDI initiatives overlap significantly in terms of policy and regulatory frameworks, administrative and technical infrastructure requirements, multi-agency coordination needs, framework data interrelationships, and other matters. Therefore, the AD-SDI might be thought to comprise one component of a broader Abu Dhabi Information Infrastructure (ADII) within the framework of the ultimate operational stage of the e-Government initiative, and supportive of the government re-structuring program. It is expected that this will be worked on as part of an Information Infrastructure ADSIC charter. International experience suggests that umbrella coordination, facilitation and support function at the highest level of government is required to keep such initiatives on track and integrated, and at least the initiation of this function is being carried out by ADSIC, inclusive of Charter component GO-R-026: Geographic Information Infrastructure.

It is important that the stakeholder community have involvement in the identification and resolution of issues that affect them, thus some mechanism for such representation is suggested in the form of two levels of AD-SDI Committees. Such representation must address both policy and technical levels, thus a two-layer structure is proposed, much as ADSIC has already conceived a “Leadership Committee” at the executive level and has already implemented a “User Committee” at a more operational level for the e-Government program. The AD-SDI Committees may be created specifically to support the initiative, or these may be subsumed as sub-components of the existing e-Government coordination bodies. Also, there will be topical issues that must be addressed on a periodic basis (standards, data models, domain focus interests, and others), thus a mechanism by which Topical Working Groups can be formed by the Technical Committee on an as-needed or periodic basis to address particular issues is provided for. The following summarizes the basic functions that are envisioned relative to AD-SDI for each component of the proposed conceptual organigram. The configuration and administrative organization will be refined during the preparation of the Strategic Plan, and the organigram presented here is for reference purposes only. It is expected that elements of this will be revised based on new information and insights gained in the preparation of the Strategic Plan, and in alignment with the operational frameworks that may be defined for e-Government and ADSIC.

Executive Council. The Abu Dhabi Executive Council (ADEC) is the final authority on all policies and high level decision-making. Functions related to the AD-SDI would include:

- Emirate-wide policies and decision making;
- Allocate AD-SDI-related finances;
- Resolution of any issues that cannot be solved at lower administrative levels;
- Approval of all major proposals for public/private/institutional partnerships;
- Oversee and monitor performance of the SDCC.

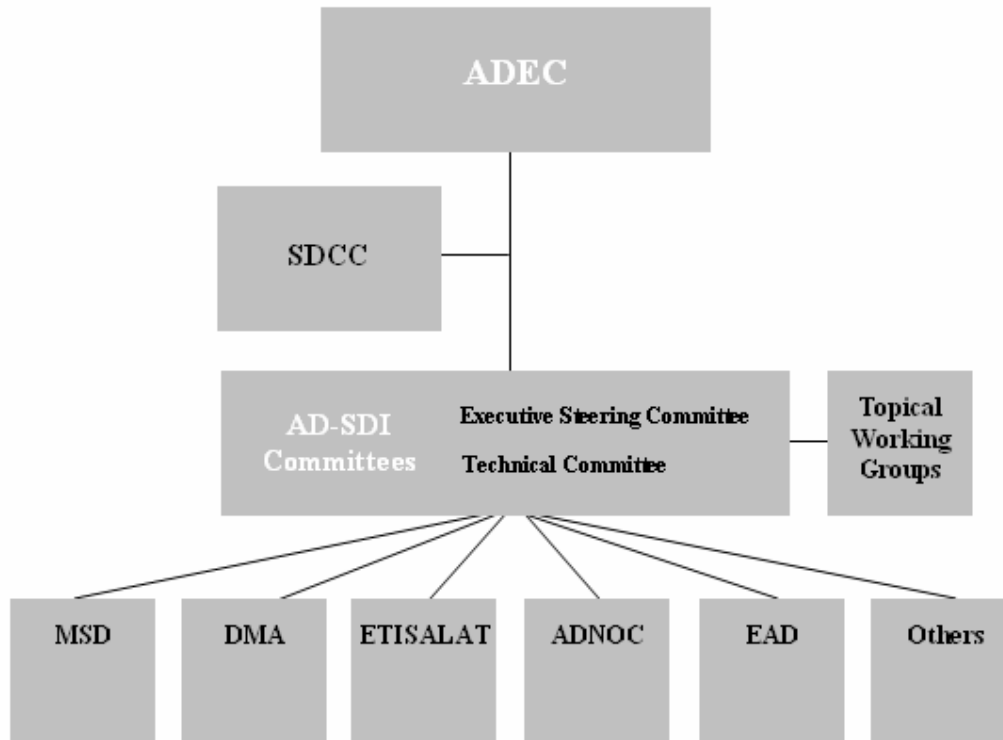


Figure 3 – Potential AD-SDI Organigram

SDCC The SDCC as envisioned would include specialized staff and physical infrastructure needed to promote, coordinate, facilitate, and support the spatial component of the Abu Dhabi information infrastructure. This office would report directly to the Abu Dhabi Executive Council (ADEC). Functions of the SDCC within the context of the broader AD-SDI initiative would include:

- AD-SDI policy assessment and development for consideration by ADEC. Work with Steering Committees and stakeholders to do so;
- Develop common standards and guidelines, in consultation with Technical Committee;
- Assist Executive and Technical committees in cross-agency coordination, business process reconciliation, and related matters;
- Provide ADEC with “honest broker” decision-support analysis of various financial, technical, and other issues;
- Promote and develop strategic public/private/institutional partnerships;
- Develop, manage and operate main spatial data clearinghouse node;
- Coordinate data security and setting of data publisher and user rights, in collaboration with the Executive Steering Committee, and where necessary the ADEC;
- Promote and support the development of value-add services by the private and institutional sectors;
- Promote and support in collaboration with ADSIC the expansion of spatial components of online eGovernment services;

- Promote adoption and enforcement of quality assurance and quality control measures in all application service development and framework spatial data acquisition efforts;
- Participate in the development and adoption of common framework data standards, in partnership with custodian agencies and in consultation with stakeholder agencies;
- Monitor framework data acquisition projects and maintenance activities, including the maintenance of metadata by custodian agencies;
- Participate in framework data configuration management, in partnership with custodian agencies and in consultation with affected stakeholders;
- Administer acquisition and licensing of data for which there is no other logical custodian;
- Provide general oversight for FGDS data development and maintenance in the AD-SDI Community;
- Develop and implement SDCC staff training and professional development;
- Promote and support common training program needs throughout the stakeholder community;
- Provide helpdesk support services to the SDI Community in regards to SDI matters;
- Develop and maintain a GIS Library;
- Operate a service bureau function in order to support the AD-SDI Community in the provision of SDI related services;
- Provide periodical reporting and monitoring to the Executive Steering Committee and ensure that the AD-SDI member agencies and working groups report the same based on the set forth service level agreements;
- Develop and maintain AD-SDI program performance monitoring and management;
- Develop and coordinate Program Business Development with the Executive Steering Committee.

The basic conceptual structure and major functions of the SDCC is illustrated in Figure 4.

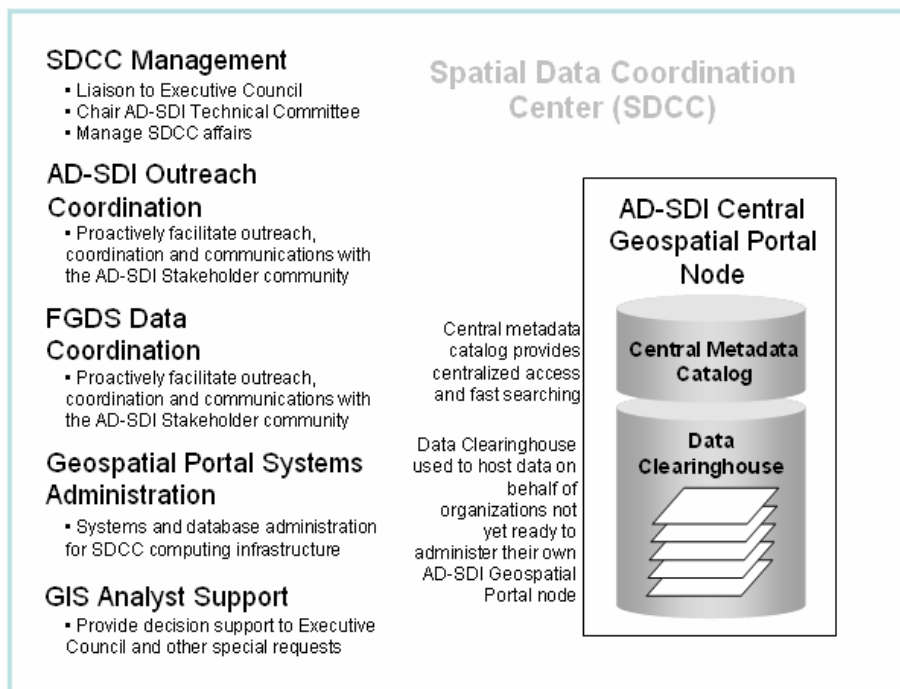


Figure 4 – Conceptual SDCC Structure and Functions

AD-SDI Executive Steering Committee. A two-level Committee structure comprising representatives from all the participating stakeholder agencies will ensure that agency interests and concerns are considered in all AD-SDI matters. This would include an Executive Steering Committee (or Leadership Committee) to provide policy and management guidance, and a Technical Committee (or User Committee) to address operational and technical issues. Functions of the Executive Steering Committee (ESC) would be as follows:

- Participate in the analysis, development and adoption of AD-SDI related policies;
- Provide cross agency management coordination and decision making;
- Make decisions regarding any issues that cannot be resolved at the Technical Committee level, with the support of the SDCC;
- Guide the development and streamlining of cross-agency business processes;
- Participate in AD-SDI-related budget analysis;
- Oversee data clearinghouse data security and user privilege setting;
- Monitor and review SDCC performance, and provide management perspective feedback to the ADEC;
- Promote and participate in selected AD-SDI events and conferences.
- Promote and support agency staff training and professional development where this can strengthen agency contribution to the AD-SDI initiative.

The ESC would be chaired by an appointee of the ADEC for a 3-year term and would hold meetings at a minimum once per quarter (3 months). Special sessions may be called from time to time to support urgent issues. The ESC Chair will be supported in logistical and follow-up matters by the SDCC Management.

AD-SDI Technical Committee. A Technical Committee will provide agency representation in the consideration of day-to-day technical matters. This Committee would comprise individuals with sufficient technical and institutional experience to effectively represent the interests of their agency, as well as the common needs and opportunities of the AD-SDI community. This Committee would be chaired by a person elected by the members on a yearly basis. Functions of the Technical Committee would be as follows:

- Work closely with the SDCC in the formation and analysis of pertinent policy matters that are of a technical nature;
- Support the Executive Steering Committee in identifying and carrying out cross-agency coordination;
- Lead the coordination of technical issues across the AD-SDI community;
- Work closely with the SDCC to develop and promote common standards and interoperability guidelines, including participation in Topical Working Groups when needed;
- Participate in evaluating cross-agency e-Government business processes and applications where spatial information is concerned;
- Participate in the development and promotion of common quality assurance and quality control specifications, methods and tools;
- Participate in the development and adoption of framework data standards and specifications;
- Participate in SDCC data clearinghouse design, development and operations performance monitoring and provide feedback regarding potential improvements to the SDCC and Executive Steering Committee on a regular basis;
- Promote and support technical staff training and professional development where this will support strengthening of the AD-SDI framework, including the participation and contribution of individual agencies.

The Technical Committee will be chaired on a revolving basis by an individual from one of the participating agencies. This position will be voted on by the members on an annual basis. The Chair will be supported in logistical and follow-up matters by the SDCC staff.

The SDCC Management will serve as a member of the Technical Committee and will be eligible to serve as Chair, if elected by the other members.

Topical Working Groups. Topical Working Groups can be initiated by the ADEC, the SDCC, the Executive Steering or Technical Committees on mutually agreed basis to allow multi-agency teams to address special topics of common interest. Working Groups may be formed to address specific short term issues (e.g. assess an urgent issue), or long term (oversight of framework data issues). These groups would be staffed from any of the participating agencies depending on the particular project or issue to be addressed, and the interest, experience and availability of staff. Specialized consulting support can be mobilized where needed to address specific short-term issues, or to provide periodic review and advice. Functions of any Working Group that might be formed would include, but not be limited to:

- Policy research and development;
- Data and metadata standards and best practices research and development;
- Public access to information;
- Computing infrastructure emerging standards and technologies research;
- Feasibility studies for potential public/private partnerships;
- Financial modeling and assessment;
- Staff training and development;

Stakeholder Agencies. Stakeholder agencies includes all those organizations in the Emirate that are participating in the ADII/ADSDI programs. For the moment, this is focused on government entities, however as the information infrastructure initiatives grow there will be increasing interest from other levels and sectors, including UAE national organizations, international agencies, private sector, education sector, civil society, and other special interests. Their functions related to the AD-SDI would include:

- Manage all enterprise information matters that do not affect other agencies, including e-Government services;
- Initiate and promote public/private partnerships;
- Manage framework data development acquisition projects once appointed as the logical custodian agency, and coordinate with the SDCC and appropriate Committees to ensure all stakeholder needs are met to the extent practical. In some cases, work with other primary stakeholders to carry out projects where their direct participation is warranted;
- Conduct framework data maintenance, including associated metadata maintenance, according to accepted standards and specifications, and with oversight and monitoring by the SDCC and Technical Committee;
- Administer internal staff training and professional development. Where there are needs and interests in common with other agencies, coordinate with the SDCC and those agencies to optimize common training programs.

Any SDI is only as strong as the organizations that comprise it. All stakeholders will rely upon data developed and maintained by others, thus it will be important that data custodian agencies have the human and technical infrastructure to fulfill this role. Also, it is in the interest of the Government of Abu Dhabi that all agencies that utilize geospatial data in their business activities have sufficient capacity to take advantage of the benefits of the AD-SDI infrastructure. In both cases it will be important to ensure that the existing capacity of each organization is carefully assessed, any gaps in such capacity identified, and capacity building programs instituted to fill these gaps.

Private Sector. The Government of Abu Dhabi is taking aggressive steps to encourage and support involvement of the private sector. This extends from promoting business and economic development to outsourcing non-core government functions. There are many ways that the private sector can be involved in, contribute to, and benefit from the AD-SDI,

and this sector can be a key partner in future AD-SDI development. Areas for programmatic involvement can include, but not be limited to:

- Development of value-add applications that utilize government data (i.e. location based services, commercial promotion mapping);
- IT outsource support;
- Application development contracting;
- Database acquisition contracting;
- Database maintenance outsourcing;
- Targeted marketing (based on demographic and socioeconomic data, business location data, customer location geocoding, and other measures);
- Logistics analysis (service and product delivery routing, etc.).

Education. The universities, technical schools and primary/secondary schools can likewise play a significant role in helping to build the AD-SDI initiative. Areas for programmatic involvement can include, but not be limited to:

- The institutions of higher learning and technical schools can help to provide the conceptual and technical principles and skills that are needed to apply GIS and other technologies effectively to agency business;
- Research and development regarding emerging methods and technologies;
- Incorporation of GIS and other information technologies into primary school education, both to build awareness and promote information technology literacy.

1.3 Expected Benefits, Products, and Outcomes

The implementation of SDI in general, and the proposed work program specifically, can be expected to result in the following benefits, products and outcomes:

General Benefits and Outcomes

Establish an accurate and up to date inventory and ongoing tracking of conditions in the Emirate. Data about Abu Dhabi is currently spread among many agencies, and it is difficult to access and integrate this information to understand the whole picture. The AD-SDI will integrate and harmonize geospatial information from all the key agencies and make it accessible through a coordinated network of interoperating nodes.

Support data sharing and eliminate redundancy and costs in mapping and geographic data development among government agencies. Sharing of key data among government agencies will eliminate the need for redundant data development and maintenance.

Provide decision makers with the full range of geographic data and spatial analysis and visualization tools needed to better understand issues and analyze the implications of alternative decisions and scenarios. The SDCC will provide a wealth of multi-sector data and the analysis and visualization tools that can provide an invaluable decision-support function across all levels of government.

Better coordination among government agencies. Sharing of accurate and up-to-date information among all the key government agencies will help to ensure that these organizations are aware of each other's fixed assets, facilities and activities. Potential conflicts and areas for coordination and cooperation will become more obvious.

Support civil society and private sector. International experience suggests that SDI can provide many benefits beyond government within both the civil and private sectors. Community interest groups can use the information to support their planning and activities,

and the private sector can be instrumental in leveraging GIS data to create new business opportunities and markets.

Provide a model system that can be emulated by the other Emirates and the Country.

At present there is no UAE-wide SDI, and the development of this program in Abu Dhabi can establish an important footprint for such a system that might be adopted by other Emirates and/or expanded to the entire country in the future.

Specific Products and Outputs of this Work Program

Establishment of an AD-SDI Program Coordination Function closely linked to the Abu Dhabi e-Government Program. At the foundation of the Abu Dhabi e-Government initiative is the notion of a societal Information Infrastructure, of which the SDI can be seen as an important part. This project will establish a permanent Spatial Data Coordination Center (SDCC) that will be responsible for the facilitation, coordination and support of the AD-SDI over time.

Establishment of Executive and Technical Coordination Committees to oversee the development and ongoing evolution of the initiative. The establishment and operation of an effective SDI requires the direct participation and cooperation of the agencies that comprise it. The establishment and mobilization of agency representative committees at both executive and technical levels will provide important direction and buy-in to the program.

Recruitment and Training of UAE Nationals to run the program. Ultimately the AD-SDI must be administered by a strong team of UAE Nationals. SDI is a highly specialized program area, and there are few places in the world that provide any substantive training and professional development tracks in this subject. Therefore, a proactive program for recruiting UAE Nationals and providing them with the necessary background, knowledge and experience in the form of on-the-job involvement will be critical to the long-term success and sustainability of the AD-SDI. The level of staffing and capacity building required will depend on the ultimate business model chosen for the permanent SDCC operation, and this decision will be made in the context of the AD-SDI Strategic Plan.

Geospatial Portal and Data Clearinghouse. The ultimate goal of the AD-SDI is to provide a network of seamlessly interoperable agency nodes. A Geospatial Portal will help by providing a single point of access for all the geospatial information across the entire AD-SDI community, and the map services to be able to see and use that information. The Data Clearinghouse will provide a facility for publishing information on behalf of those agencies that are not yet prepared to implement and administer their own distributed node.

Geospatial Metadata Standard and Catalog. A geospatial metadata catalog will provide a master inventory of all the most commonly needed fundamental data available in Abu Dhabi. This will be developed around International Standards Organisation (ISO) standards that will be adapted for use in Abu Dhabi. Once developed, this information will be kept current by each of the agency data custodians, and the tools for doing so will be provided through the Geospatial Portal.

Harmonization and Leveraging of Critical GIS Data Development Projects Among Multiple Agencies. The government of Abu Dhabi is investing heavily in GIS data development among many agencies, but there is presently no central coordinating function to ensure that these are carried out in a manner that will ensure compatibility and usability across the community. This project will establish such a linkage and seek to harmonize

these efforts to a practical extent, thereby ensuring that the investment is leveraged to serve many needs.

AD-SDI Promotion and Awareness Program. The significance and benefits of SDI is not well recognized, outside of a few individuals that have been exposed to this area through technical conferences and early coordination meetings. This project includes activities for the promotion and education of various levels of decision-makers, managers and staff as to the principles, practice, benefits and challenges of SDI development, and to keep them apprised of the progress and status of the AD-SDI program in Abu Dhabi over time.

Promote and Support GIS Capacity Building in All Key Agencies. The AD-SDI will only be as solid as the agency building blocks that comprise it. Agency custodians will be responsible for developing and maintaining information that is under their area of responsibility. It will therefore be critical that agencies have the technical and human capacity to responsibly maintain fundamental geospatial data that is under their responsibility, as well as to take maximum advantage of GIS technology and the benefits of the AD-SDI initiative. This program includes an effort to assess the “GIS and SDI readiness” of each agency, and to define the capacity building programs that will be necessary to ensure that any readiness gaps are filled.

Establish and Monitor Effective Maintenance of All Fundamental Data. Once the basic program elements for the AD-SDI are in place, it will be important that there is proactive and effective follow-up to ensure that all provisions of the program are properly carried out, including the maintenance of all commonly needed fundamental data according to agreed upon specifications and timeframes. This project includes the establishment of the monitoring and intervention principles, procedures and responsibilities that are required to ensure ongoing monitoring, assessment, strategic intervention and adaptive management of the program over time.

Provide Geospatial Analysis and Decision Support to the Executive Council. This project includes the establishment of a small but well-trained team of GIS Analysts within the SDCC that can provide support to the Abu Dhabi Executive Council (ADEC) and other high-level decision makers on an as-needed basis.

1.4 Major Components of the Technical Work Program

This work program comprises six interdependent implementation tracks. These tracks are designed to address immediate critical needs with the objective to show fundamental and compelling near-term results while also laying the strategic foundations for a long-term, well-considered and sustainable SDI program integrated to the essential operations of the Abu Dhabi government, civil society and the private sector. The six Tracks can be summarized as follows:

Track 1 – Program Organization and Mobilization. This first track will involve the organization and mobilization of various project teams and committees that will be responsible for carrying out and overseeing the AD-SDI initiation phase. This will include a team of specialized consultants and technical staff with extensive experience in the planning, design and implementation of SDI initiatives, recruitment and mobilization of a permanent local program coordination team that will eventually take over the program, and the establishment of executive and technical committees comprising representatives from the participating agencies to oversee and guide the program in a manner that best addresses the needs of the stakeholder community.

Track 2 - AD-SDI Strategic Plan. A feasibility study for the AD-SDI was prepared in 2006 which describes many of the elements needed to develop a long term, sustainable SDI

program. This information can support the development of a refined AD-SDI Strategic Plan involving the project team working with key stakeholders across the government of Abu Dhabi to refine the expression of AD-SDI data, technical and institutional requirements and priorities, and to design a program and implementation strategy for the staged development of the infrastructure over time. This effort will leverage information and plans developed previously, but will also include carrying out an “AD-SDI readiness assessment” and definition of capacity building programs for all of the most important agencies to ensure that they have the technical and trained staff resources required to be effective custodians of fundamental data, and/or users of the AD-SDI. It will also consider the participation of the private sector and civil society as participants and beneficiaries in the AD-SDI.

Track 3 - Project Data Coordination. In parallel with the above, specialized teams will be mobilized to work with agencies that are responsible for specific major projects that will generate data that will provide the primary information foundation for the AD-SDI. These teams will work with each of the involved agencies to assess existing data and data development programs, and to work with them to ensure that data format and content specifications and other issues can both meet the custodian agency needs as well as the broader requirements of the AD-SDI as identified in Track 2. In these cases, the data best practices and standards associated with the data topics being addressed in these projects will be expedited, then later folded into the standards frameworks being developed in parallel in Track 2. This Track will also include monitoring of the progress in those projects to ensure that they continue to be carried out according to mutually agreed technical specifications and timeframes. The precise scope and timeframes of this oversight beyond the foundation stage will be defined during this Track.

Track 4 - AD-SDI Geospatial Portal and Data Clearinghouse. A sub-team will focus on the design and implementation of an initial Geospatial Portal and data clearinghouse capability within the ADSIC. This initial Portal will be based on proven and supported commercial off-the-shelf software that is consistent with international standards, open and scaleable to meet future needs. The extent to which a centralized data clearinghouse is required will have to be determined during Track 2, and implementation options for this facility will be included in this Track.

Track 5 - Agency Enterprise GIS Capacity Building. Once the commonly needed geospatial data layers have been identified in the earlier phases of Track 2, it will be critical that the custodian agencies responsible for those data sets begin the task of continuous data updating to ensure that the information investment is maintained into the future. In this Track, the ADSIC project team will support selected custodian agencies in the development and implementation of their own enterprise GIS plans, system design, and capabilities, including the implementation of the required technical and human infrastructure. Alternatively, such capacity building will be initiated and conducted by an agency without direct ADSIC support, and in such cases the progress of these efforts will be monitored by the AD-SDI project team to ensure that such capabilities are established within an acceptable timeframe and form.

Track 6 – AD-SDI Coordination Office Operations Support and Capacity Building Program. In this track, the ADSIC project team will support the initial operations of the AD-SDI Spatial Data Coordination Center (SDCC) and will carry out a capacity building program for permanent staff that will ultimately take over the operations and administration of the AD-SDI program. The “roll-out” of the SDCC will be supported by contract staff until the permanent National staff are fully capable and prepared to take over full responsibility. This will be ensured through a systematic capacity building program that may include classroom study, various awareness building venues, professional development, and on-the-job training and support.

The tracks outlined above will be carried out as parallel activities, with as-needed interdependencies and coordination among them. It is expected that carrying out this entire program will require approximately 3 years, at the end of which it is expected that Abu Dhabi Emirate will have a fully functional and sustainable AD-SDI program that will establish this infrastructure as a fundamental and permanent fixture within the government. The AD-SDI Strategic Plan will provide a more accurate estimate of the AD-SDI implementation timeframe with a set of foundation 'quick win' projects to be delivered in the first 6 months, preceding the more involved long term initiatives.

1.5 Implementation Stages

The implementation of the several Tracks outlined above will span three basic stages of AD-SDI development, as outlined below. Each stage is designed to focus on particular elements and issues that must be addressed in sequence, first to establish the AD-SDI foundation and show visible results, secondly to monitor and strengthen the foundation elements, and lastly to institutionalize the AD-SDI as an essential aspect of the Abu Dhabi government.

Stage 1 – Foundation. The first stage of AD-SDI development, expected to last approximately 6-7 months, will establish the basic foundation elements of the AD-SDI that will be extended and built upon in subsequent stages. Encompassing a set of tactical 'quick wins', this stage will include the refinement of the previous stakeholder situation assessment, regarding GIS development in all the key agencies, development of an AD-SDI Strategic Plan that delineates data, technical and institutional target states, alignment of existing major data development projects, establish a Geospatial Portal and Data Clearinghouse, populate the Clearinghouse with representative data from all the agencies, leverage existing data for visible results, establish representative Committees to participate in and guide the AD-SDI development process, and ensure that capacity building programs are in place for all participating agencies that need it to be responsible custodians and users of the AD-SDI.

Stage 2 – Strengthening and Monitoring. The second Stage is expected to last approximately 12 months, and will include the expansion and refinement of the AD-SDI infrastructure foundations established in Stage 1, including the addition of data and metadata, assist selected agencies to develop their own Geospatial Portal nodes, monitor data and capacity building projects, continue providing analyst support to ADEC and others, and add integration and spatial-enabled applications to the e-Government portal and government agency websites where appropriate.

Stage 3 – Institutionalization. This final Stage will ensure that the AD-SDI is integrated and adopted as an essential function within the Abu Dhabi Emirate government. To an extent, the process of institutionalization will be addressed at some level at each stage of development, but in this stage all remaining "build" stage elements will be transitioned to an "operational" status. Depending on decisions made during the development of the AD-SDI Strategic Plan, this will include the final implementation of the chosen business model (i.e. outsource, dedicated team of UAE Nationals, or combination of the above), recruit and train permanent staff, and finalize integration within e-Government and government restructuring programs. A scope and timeframe for this final phase of development will be developed in Track 2 as part of the AD-SDI Strategic Plan.

2.0 SCOPE OF WORK

This section outlines the specific tasks that will be necessary to accomplish the six implementation Tracks outlined in the Introduction section. Two of the later Tracks cannot be defined until the completion of Track 2, and these are thus not further broken down. Otherwise, each sub-section below provides further elaboration of the purpose and objectives of each Track, followed by a description of each of the implementation tasks involved. Task summaries include a description of the activities that will be carried out, the outputs and deliverables that will be produced, and a bulleted listing of the respective responsibilities of the Consultant and Agency team participants.

The six Tracks outlined in this scope of work are designed as a series of parallel activities, each of which has interdependencies among them. They are designed to address the need for long term strategic planning and institutional capacity building over time, while simultaneously producing near-term visible results that will be necessary to build awareness and maintain support for the initiative. The complete breakdown of the various Tracks and associated tasks and interdependencies are shown in Section 3 of this Work Program.

2.1 Track 1 - Program Organization and Mobilization

2.1.1 Task 1 - Project Inception

In this task, a series of activities will be undertaken to organize and initiate the AD-SDI project. Firstly, the Contractor project manager and key support staff will come onsite to start the project inception activities. Prior to this, the ADSIC will have designated the project office space and installed all the required office furniture and other basic facilities. It is expected that the AD-SDI project office will utilize existing ADSIC office infrastructure, including phone system, copy and fax machines, internet access, office supplies, and other basics. ADSIC will also assign specific staff who will participate in all initial inception meetings to ensure clear communications and early alignment and consistency with the ADSIC charter and related e-Government activities.

Initial Project Manager meetings will include explanation of the current status of the program, the general work program to be followed, and the identification of those other agencies that should participate directly in the initial AD-SDI program. Initial agencies include, but are not limited to, the following:

- Abu Dhabi Systems and Information Committee (ADSIC);
- Environmental Agency Abu Dhabi (EAD);
- Military Survey Department (MSD);
- Abu Dhabi Water and Electricity Authority (ADWEA);
- Department of Municipal Affairs (DMA – inclusive of representation from both Abu Dhabi and Al Ain Municipalities);
- Etisalat.

It will be stressed that the AD-SDI is intended for a broad range of stakeholders in the Emirate, but that this initial list will be those agencies that will be most directly involved in getting the initiative launched, after which the membership will be broadened incrementally over time. Once this list has been prepared, it will be submitted to the ADEC for review and approval. All agencies on the final list will then be sent a letter from the ADEC requesting their participation, including the assignment of appropriate persons to represent them on the Executive and Technical Committees.

Immediately following the agency letters, the AD-SDI team will follow up with meetings with each Agency Director or suitable management level alternate to answer any questions about the program and to review the requirements, roles and responsibilities of those persons that will be assigned to represent the agency on the two AD-SDI committees. These meetings will also include discussion of what departments and specific staff should be included in the Stakeholder Interviews discussed later, including where possible, laying the timeframe and schedule for such interviews.

During all the process above, background information concerning all the key stakeholder organizations will be collected, including any formation decrees, mission statements, annual reports, organizational charts and other useful documentation about each organization. This information will be used by the AD-SDI team to understand the basic business and focus of each agency in preparation for subsequent tasks.

Task Outputs

- Project office setup;
- AD-SDI Committee Membership Identification
- Stakeholder interview schedule;

2.1.2 Task 2 - Committee Formation and Mobilization

The previous task will have established what organizations are to participate directly in the AD-SDI initiation program, and what persons are to represent these organizations in the Executive and Technical committees. In this task, draft charters will be developed for both committees, and initial meetings will be held with both groups to review and discuss each charter, including the expected roles and responsibilities of each member. Feedback from these meetings will be considered in the development of final committee charters that will be submitted to ADEC for final review and approval. Once approved, these charters will be formally adopted, and a schedule for future regular committee meetings will be published to the AD-SDI website.

Task Outputs

- Executive and Technical Committee establishment;
- First Committee meetings

2.1.3 Task 3 - AD-SDI Program Update Seminar

This task will involve the preparation and presentation of an AD-SDI Program Update Seminar. This Seminar is to be attended by all the agency representatives that will participate directly in the AD-SDI initiation program, and will be open to attendance by any other interested persons and organizations in the Emirate. The AD-SDI issue has been under discussion in Abu Dhabi since 2002, and the official decree to begin the development of the initiative has been in place since 2005. Since then there has been a feasibility study prepared and other activities undertaken to attempt to get the AD-SDI program underway. The current effort is a continuation of this process and builds on all the previous discussions and findings. The Update Seminar will therefore be positioned to bring stakeholders up to date on this initiative and what can be expected in the coming months.

The first portion of this seminar will review the state of the art in GIS and the evolution of the spatial data infrastructure issue over the past two decades, including a review of internationally accepted SDI sound practices and case examples. A second portion will include 20 minute presentations by each of the key participating agencies to explain what they have been doing with GIS, what their near-term plans are, and their thoughts about how the AD-SDI can benefit their organization. A third segment will explain the current Work Program and the roles and responsibilities of the participating agencies. A final segment will review the Stakeholder

Situation Assessment process to be undertaken in Track 2, and the type of questions that will be asked and information to be collected from each agency. All of the above information will be provided in digital form to the Seminar attendees for their reference, and to help the agency staff who will participate in subsequent interviews prepare themselves and their staff for these sessions.

For those agencies, institutions and organizations not directly participating in the initial program, provision will be made for making information about the program available to them, and to maintain communications and accept any feedback that those individuals or organizations may wish to make at any time during the AD-SDI initiation program. Such information access and feedback will be primarily solicited through the AD-SDI website, but other arrangements may be made to accommodate special requests or to keep selected communities of interest informed and involved in other ways. This latter issue will be addressed by the AD-SDI Outreach function within the SDCC.

Task Outputs

- Seminar presentation and handout.

2.1.4 Task 4 - SDCC Staff Recruitment and Mobilization

The business model for the operation of the SDCC once it is fully established will be addressed during the preparation of the AD-SDI Strategic Plan. Until that time, it will be undetermined whether it will be necessary to recruit and develop a full team of UAE Nationals to run the Center. However, it will be desirable to recruit at least one or two high-potential UAE National staff to participate from the very early stages of the program, and to position these staff to take over senior positions in the final operational stages. In this task, the AD-SDI team will work with ADSIC to prepare job descriptions for these positions, to advertise the positions in the appropriate media, to assess applicants, and conduct interviews. Based on this process, the ADSIC will then make final decisions and enter into negotiations towards hiring those candidates that show most promise. These staff will be hired as ADSIC employees who will then be permanently assigned to work side-by-side with the AD-SDI consultant team throughout the remaining stages of this work program. Special efforts will be made to ensure that these staff have an opportunity to participate and become familiar with each facet of the program, and to maximize capacity building and on-the-job training through direct participation on the various teams. Special training, seminars and conferences will also be identified to provide these staff with additional background and experience relevant to the AD-SDI.

Task Outputs

- Job descriptions and position postings for potential lead AD-SDI roles;
- Applicant assessment.

2.2 Track 2 – AD-SDI Strategy, Program Design and Implementation Plan

The objective of this Track is to develop a strategic plan, program design and implementation strategy for the AD-SDI initiative that builds on and goes beyond the current initiation phase and this work program. This Track will start by building on past studies to gain a clear understanding of the current situation with GIS and geospatial database developments in each participating agency and among those programs that will influence the future functioning of those agencies, such as the Abu Dhabi e-Government and government restructuring programs. It also includes review of other inter-institutional issues that can affect the AD-SDI, such as information access laws and policies, data ownership and distribution policies and practices, data copyright, and government transparency.

Part of this process will focus on identifying existing geospatial data that may be of common interest across the community. It will also identify existing or planned data development efforts that will need to be aligned to ensure compatibility and optimization across the AD-SDI stakeholder community, as well as any capacity gaps that will affect the ability of agencies to support data custodian responsibilities or otherwise affect their ability to take full advantage of the AD-SDI infrastructure. These insights will then be used to identify requirements and gaps within and among agencies when compared to relevant international “best practices”, and to identify all the most important issues, opportunities and constraints that will need to be addressed by the AD-SDI Strategy and Implementation Plan. All of the above information will then be used to formulate a high level ADA Strategic Plan that will spell out the basic vision, mission, goals and objectives for the AD-SDI, and a high level summary of the priorities and general implementation approach by which it will be further developed beyond the initiation program. The draft Strategic Plan will be fully vetted with the participating agencies to ensure that there is reasonable consensus before moving on to subsequent levels of more detailed planning and design.

The final Strategic Plan will then be used to frame an AD-SDI Program Design that spells out the major components of the long-term program, including elements outlined previously such as the institutional framework, the extended form and function of the geospatial portal and data clearinghouse, configuration of agency nodes, data and metadata standards, service level agreements for data development, maintenance and sharing, and other issues. It will also address the need for further staging and incremental development of some components of the AD-SDI, and outline the priorities, implementation programs and projects that will be needed to undertaken beyond the current work program to evolve the AD-SDI over the next several years. As with the Strategic Plan, the draft Program Design will then be vetted with all the stakeholder agencies in the development of a final Design.

The final Program Design and associated implementation priorities and staging potential will then be used to create an implementation strategy for future AD-SDI development. This can be expected in part to refine parts of the current work program, but also include implementation activities beyond the scope and timeframe of the current AD-SDI initiation project.

The following summarizes a series of steps that will be carried out to prepare the planning and design products mentioned above.

2.2.1 Task 1 - Conduct Stakeholder Situation Update Survey

The agencies identified for direct involvement in the AD-SDI initiation program will be interviewed to understand the current situation, resources and capabilities of each organization in regards to the development, maintenance and use of geospatial data and GIS technology. The scheduling of interviews will have been initiated in Track 1 through the initial discussions with agency managers, and the agency staff identified to participate in the interviews will attend the Program Update Seminar and will thus already be familiar with the purpose and process of the current program, and what is expected from them during the interview process.

As preparation for agency interviews, the AD-SDI Team will consolidate information from previous studies related to each agency and the agency background information collected earlier, and to determine the information gaps and focus that will need to be covered in preparation for each interview. A standard set of basic questions will be used as the starting point for the interviews, but these will be adjusted according to the form and function of the agency, what information already exists, and other areas of interest that surface during the discussions. Topics that will be addressed in each interview will include, but not be limited to the following:

- Agency mission and organization

- Agency functions and most common data topics needed;
- What geographic data generated or used;
- For data used, where acquired, and in what form, scale, data resolution, etc.;
- What major geospatial or related data development programs underway now, or planned for development in the near future;
- What issues, opportunities or constraints for AD-SDI development;
- What needs for information exchange regarding GIS and related technologies;
- What internal technical capacity maintained now, including staff skill levels, existing computerization, and data communications infrastructure;
- What existing framework of policies or regulations that would affect data sharing and related issues;
- What other issues, opportunities or constraints will need to be addressed by the AD-SDI program.

Interviews will be expected to last 2-4 hours depending on the role and complexity of each organization. In some cases more than one interview session may be required to cover all the relevant groups and associated functions. Interviews will be conducted at the offices of each of the selected agencies, and each will be documented according to a standard template. Wherever possible, data samples and associated metadata or other explanatory information will be collected regarding each data set used or generated, and this information will be used to start the compilation of a geospatial data inventory. Staff who are most familiar with these datasets will be identified for further, more detailed discussions during the Data Inventory and Assessment task described later. Also, staff that are responsible for any existing or planned geospatial data development projects will likewise be identified for further discussion. In many cases it is expected that the same technical staff may be responsible for both existing as well as planned or in-process data development projects, and in such cases the detailed data follow-up meetings will be carried out for both issues in an integrated way.

Task Outputs

- Interview questionnaire;
- Interview documentation;
- Initial data inventory

2.2.2 Task 2 - Conduct Data Inventory and Assessment.

In the previous task a basic inventory of geospatial data used or generated by each agency will have been identified and documented at a summary level. In this task, those data items that are likely of common interest to the broader AS-SDI stakeholder community will be identified, and more detailed investigations will be carried out with the agency staff most familiar with that information. This will include both data in digital as well as hardcopy forms. Beyond basic geographic information, this investigation will also include any tabular and statistical information that can be linked to geography and thus providing additional information value will also be included. Care will be taken in how interviews are scheduled and conducted to ensure that agencies are subjected to the minimum number of survey visits possible to avoid any undue impacts on their staff's time.

The data inventory will be documented according to a standard template that is consistent with international metadata standards, but that also includes fields of information that are necessary for conducting the assessment portion of this task. Characteristics of the data sources such as map accuracy and resolution, map scale and geographic extent, currency and quality, subject matter presented, and possible automation or maintenance issues will be considered. The assessment will also address redundancy of data collected by different agencies, as well as inconsistencies between data sources of the same data theme, geographic and identification scheme coincidences among logically connected themes, content and format standards relative

to international standards for such topics and other issues will be explored. A data inventory and evaluation report will be produced to summarize the findings of the assessment as input to the next task.

Task Outputs

- Data sample archive;
- Initial data inventory database;
- Data Inventory and Assessment Report.

2.2.3 Task 3 - Prepare Requirements and Gap Analysis

The results of the previous tasks will be compiled to a synthesized form that will define the broad requirements of the AD-SDI. This will include a comparison of common requirements and issues across the stakeholder community, and a comparison of the current situation with “best practice” experiences and standards from the international community. The findings of this analysis will be documented in a form that characterizes the existing situation, identifies the gaps between the current state and international sound practice, and summarizes the issues, opportunities and constraints that will need to be addressed in the planning and design process in following steps. Subjects that will be addressed in the requirements analysis will include, but not be limited to the following:

- Major national and sectoral priorities that can be supported by AD-SDI;
- Existing situation with GIS technology use in Abu Dhabi, general overview;
- Existing framework data infrastructure issues and opportunities (this will also refer to existing and planned geospatial data development projects, but the details of this will be addressed separated in Track 3);
- Existing technical computing infrastructure issues and opportunities;
- Existing human computing infrastructure issues and opportunities;
- Organizational and institutional issues and opportunities;
- Policy and regulatory issues and opportunities;
- AD-SDI staging and timing issues, opportunities, constraints and interdependencies.

The results will be documented in a report for reference in the remaining tasks. The findings of the requirements and gap analysis will be presented and discussed separately with both the Executive and Technical Committees. This is important both to keep the Committee members informed of major findings and directions, and to solicit their input and perspective. Any feedback gained from those exercises will likewise be documented for reference in the next tasks.

Task Outputs:

- AD-SDI Requirements and Gap Analysis Report;
- Review workshops with both Executive and Technical Committees

2.2.4 Task 4 - Prepare AD-SDI Strategic Plan

This task will involve the preparation of a high level Strategic Plan outlining the overall vision, mission, goals and objectives for the AD-SDI, and the general principles and priorities that are to guide implementation beyond the initiation program. The primary purpose of this Plan is to ensure that there has been sufficient consideration of different possible approaches to AD-SDI development, and that there is sufficient agreement and support for the general guiding principles of the final AD-SDI program prior to investing more time and resources in the development of detailed program designs and implementation plans in subsequent tasks.

To begin this task, the AD-SDI Team will prepare 2-4 alternative possible scenarios outlining different approaches to the positioning and ongoing development of the AD-SDI. Scenarios will

be structured to represent different philosophies for SDI development, and will incorporate ideas, biases and preferences that may have been expressed by the Stakeholders in previous activities. Separate workshops will be conducted with the Executive and Technical Committees to review each scenario, assess the strengths, weaknesses, opportunities and threats associated with each, and discuss scenario refinements that might reinforce strengths or mitigate weaknesses and threats. Following the two workshops, the AD-SDI Team will compare and contrast the results and determine if one or more scenarios are clearly more acceptable and desired by the stakeholders. One or two final scenarios will then be further developed, and presented to the Executive Committee for one last round of review. Input from this session will be used to refine either one or two final scenarios that will be presented to the ADEC for final review, comment and approval. The scenario chosen or further refined by ADEC will then be used as the basis for the preparation of the draft AD-SDI Strategic Plan.

The draft Strategic Plan will have several parts, including:

Vision. A statement of vision will describe the future identity of the AD-SDI initiative, and how leadership sees this fitting into the broader vision for electronic society and effective governance in Abu Dhabi in the future.

Mission Statement. A statement of mission will describe the purpose of the AD-SDI, and how the Vision is to be achieved, in general terms.

Goals and Objectives. The driving goals and objectives for the AD-SDI initiative will be stated. These will describe specific desired outcomes of the implementation of the strategic plan, including the data, technical and institutional end states that are to be achieved.

Primary Gaps and Challenges To Be Overcome. This section of the Plan will acknowledge special challenges to be overcome and commitments to be made for the AS-SDI to be fully realized.

General Implementation Approach. This section will outline the general philosophy, priorities and approach that will be used to implement the AD-SDI beyond the foundation stage represented by the current work program.

The draft AD-SDI Strategic Plan will be provided to the ADEC and Executive and Technical Committees for review and refinement. Feedback will be considered in the development of a final draft that will be submitted to the ADEC for final approval and official adoption.

Task Outputs

- AD-SDI Strategic Plan (draft and final);

2.2.5 Task 5 - Prepare Program Design.

In this task, a conceptual framework design for the AD-SDI program and general identification of staging potential for its implementation will be prepared. The strategy will address all the key components of the proposed AD-SDI, including:

Institutional. A basic structure for the Coordination Center, Committees, Working Groups, and relationships with the various stakeholder agencies and groups has been summarized previously in this work plan. The Program Design will extend these concepts to further articulate the institutional framework for the AD-SDI, including a more detailed definition of potential relationships with the private sector, federal, regional and international agencies, non-government organizations, educational and research institutions, and the public.

Policy and Legal. Some issues, such as revisions to existing information laws and policies may require extended, formal processes for further consideration and formal adoption. In these cases, recommendations and draft texts will be developed within the Program Design to be submitted to those processes for further treatment, but implementation may not be initiated until the AD-SDI Plan has been completed.

Spatial Data Coordination Center Organization. The Plan should define the conceptual structure for the permanent AD-SDI Spatial Data Coordination Center (SDCC). This design will need to further articulate the SDCC business model, including further articulation of the Center's purpose and function, position relative to ADEC and the rest of Abu Dhabi government, level of outsourcing, administrative organization and staffing (including basic job descriptions and requirements for each position), physical office space, furniture and equipment. This facility will be defined in terms of an office program with some description of spatial size and configuration requirements at a suitable level of detail that can be used as input to the detailed design of the final office, once its location has been determined.

Metadata. Geospatial metadata standards have been under development for many years, and one has in recent years been adopted by the International Standards Organisation (ISO) 19115 "Geographic Information - Metadata". This will be adapted to the needs and situation in Abu Dhabi. A draft standard will be circulated to the relevant stakeholders for review and comment. The final standard will be formally adopted, and then used to structure the metadata catalog in the Geospatial Portal. The AD-SDI Team will then work with each agency to prepare initial metadata for their key geospatial data sets.

AD-SDI Website. An initial AD-SDI website will be implemented in parallel to the preparation of the AD-SDI Plan. In the Program Design, the general specifications for extending and refining the website will be prepared. This will address user interface improvements, graphical refinements, new information, addition of discussion forums and interactive components, request for information system, and other issues.

Geospatial Portal. An initial Geospatial Portal will be implemented in parallel to the preparation of the AD-SDI Plan. In the Program Design, the general specifications for extending and refining the Portal will be prepared. This will address user interface improvements, graphical and cartographic refinements, establishment of direct linkages between the Geospatial Portal and e-Government and other websites. This component will also spell out the general specifications for other distributed geospatial portal nodes that will eventually be implemented within other selected agencies.

Spatial Data Clearinghouse. The conceptual design for the national spatial data clearinghouse will be developed, including a general definition of its recommended form, function and responsibilities. An initial Clearinghouse will have been developed in another parallel track. The Program Design will extend this facility to define an expanded hardware/software configuration, spell out the specific conditions under which data will be served centrally through the Clearinghouse, versus those that will be served through remote server nodes. Standard operating procedures for the operations and maintenance of the Clearinghouse will be defined, including procedures for establishing user access levels and associated permissions, database administration, systems administration, and other activities.

Data Standards. There will be a need to identify the Fundamental Geospatial Data Sets (FGDS) data layers that are commonly needed by the majority of potential users. A conceptual design for these layers will be prepared, considering the application requirements of the users, the business processes by which this information will need to be maintained, the form of the existing data, and any special relationships with other data that will need to be maintained. Spatial and tabular relationships among the fundamental data layers will be considered in the development of an integrated data framework. The conceptual design will also identify specific issues and conditions

that will need to be addressed in the physical design of these data layers during the development of the pilot program, as discussed later. Considerable work has already been done in the development of standards in many countries, and it may not be necessary or appropriate to develop completely new standards. Time and effort may be saved by adapting existing standards to national needs, thus existing international standards and “sound practice” data models and frameworks will be referenced. The FGDS framework will also identify logical data custodian agencies, as well as identification of those agencies that should be involved in associated Working Groups to ensure that the broader needs of the primary stakeholders are considered in any future development of these standards.

The final physical data models for FGDS will require additional study beyond the framework provided in the Program Design. This should be carried out by the custodian agency with the oversight and support by a Working Group comprising members from those agencies with the most interest in each topic. In such cases the need for a Working Group to address the development of final FGDS data models and agency service level agreements for the maintenance of that data will be identified, but unless part of a current project or one that is planned for the very near future, will otherwise be implemented following the development of the AD-SDI Plan.

Process. Processes and functions of the primary participants in the initial building of the AD-SDI should be clearly spelled out. Processes to be addressed in the feasibility study will be focused on data conversion, integration, management, data maintenance, and dissemination. The feasibility study should also describe other process-related standards that will need to be addressed in the future, such as the addition of new FGDS to the framework, changes to adopted data models, changes to hardware and software standards, addition of new stakeholders, and other such issues.

Technology. A technology framework for the AD-SDI will be described in the Program Design, including software, hardware, data communications and system protocol issues. The conceptual design will focus on integration and interoperability principles and standards to maximize compatibility of agency systems across the AD-SDI stakeholder community, while preserving flexibility and diversity in the solutions that can be developed. This will build on certain Open GIS interoperability and web service standards, among others.

Communications. A framework of methods and procedures to establish and maintain active communications among the AD-SDI user community will be identified in the Program Design. This will include but not be limited to standard and as-needed information disseminations, executive and staff level committee meetings, web site and other medium for communicating status and new developments, email list servers, annual conferences, and other means of maintaining clear communications and information flow among participants.

Cooperative Partnerships. A central mandate will establish responsibility for the AD-SDI SDCC, and for the development, maintenance and dissemination of framework data sets, among other cooperative arrangements that are needed for the AD-SDI to function. These arrangements will need to be supported by formalized agreements among all the key participating member agencies and organizations. These agreements may take the form of Memoranda of Understanding (MOU), joint cooperative agreements, Service Level Agreements, letters of intent, or other documented forms. Any such agreements should clearly spell out the roles and responsibilities of the participants, specific commitment of staff time, equipment, funding, or other resources, and timeframes for carrying out these commitments. The Program Design will identify what cooperative partnerships will need to be formulated later to carry out parts of the AD-SDI development, and templates for such agreements will be provided.

Staging. Experience suggests that SDI development is best approached as an incremental, staged process that can occur over a number of years. The definition of stages and associated

outcome scenarios beyond the current Work Program is important to defining what the AD-SDI will look like and how it will function through various rounds of development. It will also be critical that the staging strategy address both near term as well as medium and longer term issues. Some tactical matters must be addressed in the near term to align SDI development with other issues, such as a national census, land use planning projects for both Abu Dhabi and Al Ain, in order to make sure that the AD-SDI can both support and benefit from those efforts. Also, it is critical to show near-term and incremental “quick-wins” that keep the benefits and products of the AD-SDI visible to decision makers, stakeholders, and the public, which is important for sustaining executive and general support. Lastly, consideration should be given to responding to more opportunistic matters, including responding to VIP requests for information, representing the AD-SDI in support of public events, providing GIS support to high-visibility meetings, media events, and other ways of making the AD-SDI more visible and appreciated by a wider audience.

As with the Strategic Plan, the draft Program Design report will then be vetted with all the stakeholder agencies and the AD-SDI Committees in the development of a final Design. Workshops will be conducted with both the Executive and Technical Committees to explain, review and discuss the elements of the Program Design. Input will be used to prepare a final draft report to be submitted for review and approval by ADEC. Any further input from the Executive Council will be incorporated to the final report.

Task Outputs

- Program Design Report (draft and final);
- Design review workshops.

2.2.6 Task 6 - Prepare Implementation Plan.

An AD-SDI Implementation Plan for carrying forward the initiative beyond the scope of the initiation program will be prepared. While some fundamental components of the AD-SDI may take substantial resources and many years to complete, experience suggests that it is absolutely critical that visible and compelling benefits are made evident throughout the development process. The implementation plan should be carefully crafted to focus on the early execution of those components that are practical to implement, that can support the broadest needs, and that will yield near-term, visible benefits. These are all necessary to sustaining the executive and community support that will be necessary to build the system, and maintain support over time. Longer term issues should also be addressed in the plan, but these should be carefully balanced against the framework of more immediate and visible topics that will be needed to “market” the system during the early stages of development.

The implementation plan will draw upon elements of the Program Design mentioned previously, including the identification of specific implementation projects, tasks to be carried out, task responsibilities, timeframes, task interdependencies, milestones, task outputs and other issues.

The results of this task will be documented to a draft AD-SDI Implementation Plan. The initial draft Plan will be provided to both AD-SDI Committees, and separate workshops will be held with each to review and explain the components of the Plan and to solicit feedback. Feedback will be considered in the development of a final draft that will be provided to the ADEC for review and approval. Any feedback will be incorporated to the document, which will then be formally adopted.

Task Outputs

- Implementation Plan Report (draft and final);
- Plan review workshops.

2.3 Track 3 - Data Projects Coordination

There are several significant geospatial data development projects in Abu Dhabi that are either ongoing or planned for implementation in the near future. Ones that are known or that will be discovered through the Track 2 Stakeholder interviews will be included. In this Track, teams will be mobilized to work with agencies that are responsible for these projects to understand the specific requirements and plans of each project, to compare these to one another and to the Data Framework being designed in Track 2, and to work with the involved agencies to develop a plan to achieve maximum alignment of the data being produced with the needs of the broader community. Consideration will be given to the fact that existing projects have their own needs, timeframes and resource constraints, thus care will be taken to ensure that alignment recommendations do not unduly burden existing projects with new requirements, unless provisions are made to accommodate these. Conversely, any projects that are found to fundamentally contradict or adversely impact the goals and objectives of the SDI program will be identified for corrective intervention. This Track will address, but not be limited to the following projects:

- DMA - Abu Dhabi 1:1K Basemap Enhancement
- DMA - Al Ain 1:1K Basemap Enhancement
- MSD – 1:10K Topographic Basemapping
- MSD – 1:25K Topographic Basemapping
- MSD - Administrative Boundaries
- EAD – Soil Mapping
- EAD - Imagery Database
- EAD - Coastal Sensitivity Atlas
- EAD - Water Resource Database
- ADWEA - Water and Electrical Utility Mapping
- Etisalat – Telephone Utility Mapping
- DPE – Census Data Georeferencing

The following tasks will be carried out for each of the projects identified for inclusion in this Track.

2.3.1 Task 1 – Conduct Detailed Project Requirements Assessment

A series of project requirements working sessions will be carried out with each of the project teams. These sessions will be facilitated by the AD-SDI Team with the support of specialist consultants as needed. Workshops will generally pursue the following line of inquiry:

- Overview the project purpose and objectives;
- Describe the project scope of work;
- Identify project stages and timeframes;
- Identify data compilation or collection, manipulation, analysis, visualization, and reporting or thematic mapping requirements at each stage;
- Identify what agencies are expected to provide the required existing conditions data, and what information topics require original data collection (household surveys, traffic counts, census taking, detection of underground utilities, etc.);
- Identify what original data collection tools and techniques are being used or expect to be used;
- Identify what specialized data analysis tools and techniques are expected to be applied;
- Identify how the compiled or collected data are to be organized and managed during the project;
- Identify how the compiled or collected data are to be maintained and updated during the project;
- Identify how the analysis results are to be used, and managed;

- Identify how the plan scenarios are to be generated, managed, and used;
- Identify how the final plans are to be developed (master plan policy, master plan planned land use mapping, capital rehabilitation and system extension utility designs, etc.);
- Identify how the final plans are to be used by others;
- Identify how the final plans are to be refined and updated in the future (incremental adjustment according to procedures, as needed incremental adjustment, periodic update project, etc.).

The above information will be documented for each of the major projects to a Data Project Requirements Analysis report. A draft report will be submitted to the Executive and Technical Committees for review and comment. Comments will be used to correct or refine information in the report, and a final report will be generated.

Task Outputs

- Data Project Requirements Analysis report (draft and final);

2.3.2 Task 2 – Prepare Data Project Alignment Strategy

In this task, a strategy for the alignment of all the key existing geospatial data projects will be prepared, in direct collaboration with all the involved agencies. This will be carried out with reference to the project requirements analysis carried out in the previous task, and the international data standards research that will be compiled as part of Track 2.

The Alignment Strategy will address, at a minimum, the following:

- Consolidation of data topics (reduce redundancy across projects where possible);
- Identification and adaptation of international data models;
- Alignment of project timeframes;
- Formation and mobilization of cross-project data coordination Working Groups;
- Identification of any scope, timeframe or resource adjustments that are needed to accomplish effective data project coordination.

A draft Data Project Alignment Strategy report will be produced and distributed to both the Executive and Technical Committees for review and comment. Additional meetings may need to be held with specific project proponents to work out final alignment issues. Feedback from review and meetings will be incorporated to a final draft document that will be submitted to the ADEC for review and approval. Results of this effort will provide additional input to the AD-SDI Plan preparation tasks in Track 2.

Task Outputs

- Data Project Alignment Strategy report (draft and final);

2.3.3 Task 3 – Monitor and Follow-up Data Project Development

Once approved by ADEC, the Data Project Alignment Strategy document will be used as the basis for ongoing monitoring and follow-up of the involved projects to ensure that the terms of the Strategy are met. Any issues will be raised first with the appropriate Working Group. If an issue is or cannot be resolved by a Working Group, then depending upon the issue involved it will be referred either to the Technical Committee, the Executive Steering Committee, or the ADEC for final resolution and decision making. It is expected that this task will be initiated during Stage 1 of the AD-SDI initiation program, and most projects will continue through much or all of Stage 2.

Task Outputs

- Data project monitoring and follow-up on an ongoing basis;

2.4 Track 4 – AD-SDI Website, Geospatial Portal and Data Clearinghouse

The early deployment of a commercial-off-the-shelf (COTS) Geospatial Portal and the development of an initial data clearinghouse and website are proposed to establish initial foundation technical infrastructure to support the AD-SDI, as well as show early results. A program website integrated with or linked to either the existing ADSIC e-Government portal or the ADSIC website is proposed to provide a convenient medium for communication information about the program, including program implementation status, to the stakeholders and the interested general public.

The following tasks will need to be carried out to accomplish this Track.

2.4.1 Task 1 – Prepare Technical Specifications

Basic requirements for a Geospatial Portal, inclusive of metadata cataloging, map services and data publishing functions are well defined through the international experience. Existing commercial off the shelf (COTS) software functional descriptions will be used as a reference to determine those aspects that are most needed and applicable to the AD-SDI. These requirements will be documented and discussed with both the Executive and Technical Committees.

In general, the requirements for each component, include but are not limited to the following.

AD-SDI Website. The AD-SDI website will be created by an in-house team, either integrated within or linked to either the ADSIC e-Government portal or the ADSIC website. It is expected to contain the following components at a minimum:

Banner splash screen. A "banner graphic" will provide a simple graphical identity that will become part of the AD-SDI "brand image". The graphic should be consistent with the ADSIC e-Government site general look-and-feel, be simple, interesting, and representative of the Abu Dhabi context. The graphic should be right-sized to minimize download time when opening the site from a browser

About. This section should provide a general explanation of what an SDI is, and what the AD-SDI initiative will mean for Abu Dhabi.

AD-SDI Program Initiation Project Information. This part of the site will describe all aspects of the AD-SDI initiation program, including summaries of the work plan, expected outputs, timeframes, and current status.

Related Programs. This area of the site will need to list programs that are related in some way to the current initiative, and provide links to websites for those programs. This may include, but are not limited to Agency abstracts of their GIS programs and development efforts, links to information regarding major geospatial data projects now underway or planned for the near future, and any federal, regional or international programs to which the AD-SDI may be linked or aligned with.

Request for Information. A basic request form will be provided to allow website visitors to request specific information. This will be database driven, and will be used by the AD-SDI team to log and track requests that are made through the website, as well as those that might be received through other means, such as information and special project requests that may have been submitted over the phone, through letters, or by personal communication.

Work With Us. This section will provide information regarding ways that other entities that are not participating as an identified agency member of the AD-SDI initiation program can still work with the program and ensure that their interests and needs are heard.

Frequently Asked Questions. Provision will be made for the presentation of Frequently Asked Questions (FAQ's) and their answers. Ongoing monitoring of inquiries and requests for information will be conducted and used as the basis for the periodic refinement and update of the FAQ section.

Discussion Forum. A discussion forum function will be implemented to accommodate various discussion topics regarding the AD-SDI.

Contact Information. This section will provide contact information for various means of contacting ADSIC and the AD-SDI program.

The site will be developed and reviewed internally in English. Once the basic review is complete, an Arabic version of the site will also be produced.

Geospatial Portal. It will be important that a technology platform be chosen for the initial geospatial portal that provides all the most essential functionality, is based on international standards, can be quickly and cost-effectively implemented in a short period of time, is well supported by the vendor in Abu Dhabi, and is flexible and scalable to support a larger and more diverse user community over time. At present, the number of available technology solutions that meet these criteria is limited. An activity will be taken to compare the functional portal specifications to the available technology solutions at the time, and to choose and acquire the system that best meets the identified short term and longer term needs of the AD-SDI. In general terms, the chosen technology should support the following basic functionality:

Standards based. The platform should be consistent with all the most current open system, Open GIS, and web-based service standards;

Metadata Catalog Services. The application should support a customizable, bilingual metadata catalog, with full metadata authoring, query and brows capabilities. The metadata services should be consistent with the ISO geospatial metadata standards and z39.5 protocol.

Mapping Services. Provide the ability to access and display map data, including data from multiple distributed sources.

Data Publishing Services. Provide the ability for authorized data custodians to upload information to the Clearinghouse, or to download selected information to their local environment.

User Access Privileges. Provide the ability for setting different access privileges to different users from the government, private sector, education institutions or general public even within the same user group.

GIS Platform and Data Clearinghouse. A suitable GIS platform will need to be chosen to serve the functional needs of the SDCC and to serve as the foundation system to support the Geospatial Portal and Data Clearinghouse. This foundation system will need to have all the requisite functionality needed to support geospatial database management, spatial analysis, and visualization.

All three of the above specifications will be prepared and consolidated to a single report. This report will provide sufficient information to be used as a terms of reference for the acquisition of appropriate technical infrastructure components. The report will be submitted to both the Executive and Technical Committees for review and comment. Feedback received will be considered in the development of a final specification in preparation for system component acquisition.

Task Outputs

- Technical specifications for AD-SDI website, geospatial portal, data clearinghouse and foundation GIS capacity;

2.4.2 Task 2 – Conduct System Component Acquisition and/or Development

In this task, the specifications developed previously will be used to acquire and/or produce the necessary technical components for the initial SDCC system. It is expected that the AD-SDI website will be either programmed within the existing ADSIC e-Government Portal (or ADSIC website), or developed independently and linked to it. There are a few COTS geospatial portal application software suites available in the marketplace that include most of the functionality that will be required, and most can accommodate customization to meet additional requirements. The Data Clearinghouse and GIS foundation system functional requirements can likewise be supported through COTS software, and the specific packages to use will be decided upon between ADSIC who will own the system and the EAD who will be hosting this infrastructure during the time period of the AD-SDI foundation building program.

Task Outputs

- System acquisition and development

2.4.3 Task 3 – Prepare Technical Environment

The initial AD-SDI Geospatial Portal and Data Clearinghouse components are to be physically located at the Environmental Agency Abu Dhabi (EAD) until such time that ADSIC or other appropriate body is prepared to take over this infrastructure. EAD staff have already implemented similar infrastructure for their own purposes, and have a well established and managed computing facility. The AD-SDI components will be structured such that they will operate independently and can be easily moved to a permanent location whenever this decision is made. In this task, the AD-SDI Team will coordinate with EAD staff and their outsource contractor to prepare the physical location in preparation for system installation and testing in the next task.

Task Outputs

- Prepared technical environment

2.4.4 Task 4 – Install and Test Technical Infrastructure and Application Software

Once the physical environment has been prepared, the AD-SDI Team will conduct the installation and testing of all the components to ensure that all are working properly. Once the basic infrastructure has been tested, then a round of user and usability testing will be conducted to ensure that all components of the initial AD-SDI Website, Geospatial Portal, and Data Clearinghouse are in proper running order. It will also be important that the website and geospatial portal be easily navigated and utilized by non-experts. Feedback from this testing stage will then be used to develop any system fixes or application software refinements.

Task Outputs

- Installed system

2.5 Track 5 –Agency Enterprise GIS Capacity Building

It is expected that some agencies may need to conduct some level of additional capacity building to ensure that they can be responsible custodians of fundamental data that will be relied upon by others, as well as effective users of the AD-SDI. The need for such capacity building programs will have been identified and characterized in Track 2. In this Track, provision is made for either the AD-SDI Team to assist agencies in carrying out capacity building, or to monitor and assess each agency's progress should they choose to carry this out independently. While the focus of this Track is on ensuring that each agency be capable to support fundamental data custodianship, it is also in the interest of the Abu Dhabi government to ensure that each agency utilize GIS technology effectively to carry out their business. Therefore, such capacity building might be conducted in the context of "Enterprise GIS" development thus providing a means for participating agencies to build GIS infrastructure that first responds to its own business needs, and secondly to fulfill its obligations as a participant and/or data custodian in the AD-SDI program.

Capacity building programs will of course need to be tailored to the very specific situation and needs of each agency. The development of detailed agency capacity building programs is to be carried out, if needed, during Stage 2 – Strengthening and Monitoring of AD-SDI development.

2.6 Track 6 – SDCC Operations Support and Capacity Building Program

In this track, the AD_SDI project team will support the initial operations of the AD-SDI Spatial Data Coordination Center (SDCC) and will carry out a capacity building program for permanent staff that will ultimately take over the operations and administration of the AD-SDI program. This activity area will be defined in more detail during the preparation of the Strategic Plan and Program Design efforts in Track 2. The "roll-out" of the SDCC will be supported by contract staff until the permanent staff are completely capable and prepared to take over full responsibility. Alternatively, operational activities may be outsourced. The preferred business model for the SDCC will have been identified and developed during Track 2. The definition of this Track beyond the Stage 1 period is entirely dependent on the conclusions of Track 2 and will need to be defined based on the AD-SDI Program Design, once that has been completed. In general, it is expected that this will be equivalent to the organizational framework and functional outline for the SDCC provided in Section 1 of this document, but this will likely be refined and re-crafted based on additional interaction with and feedback from the stakeholder community and ADEC leadership.

2.6.1 Task 1 – Create Detailed Operations Plan

The AD_SDI project team shall develop a detailed operations plan that will build on outcome of the strategic plan and program design. The plan will further articulate the major SDI roles (refer to section 1.2) that will be carried out by the SDCC, and also inclusive of those functions listed below in Task 2.

Task Outputs

- SDCC Operations Plan

2.6.2 Task 2 – Support SDCC Operations (Stage 1- Scope to be determined)

In this task, the AD-SDI Team will provide the operations, administration and technical support for running the SDCC. At a minimum, this will cover the following activities:

Systems and database administration. The Team will oversee systems administration by the EAD IT outsource contractor. They will also conduct database administration for the AD-SDI Data Clearinghouse, in cooperation with the EAD GIS staff.

Stakeholder outreach and coordination. It will be critical during all stages of AD-SDI development to maintain close and proactive communications with the stakeholder community, and to ensure that the initiative and its accomplishments are visible to that community, decision makers and the public. A full time outreach coordination function is proposed to ensure that this issue is adequately covered.

Database integration and development. A sub-team of GIS analysts and geospatial data specialists will carry out activities for collecting data from agencies for populating the initial Data Clearinghouse, and integrating this information to the extent possible. They will also explore the potential to create new and useful derivative products from existing data and combinations of existing data, for example the geocoding of the 2006 population census, and the correlation of this to planning areas, generation of census thematic layers, and others.

Geospatial Portal maintenance. The Geospatial Portal will be maintained, including ensuring that it stays operational, adding new data and metadata as it becomes available, implementing cartographic and other enhancements to the map services, and related activities.

Special projects. Experience suggests that as soon as it becomes known that many data sources can be accessed and analyzed, there will soon be special requests from VIP's and others. A sub-team of GIS Analysts will support the other activities mentioned above, and will be mobilized to support special projects on an as-needed basis.

Task Outputs

- Periodical Reporting

2.6.3 Task 3 – Develop Capacity Building Program (Stage 1 scope to be determined)

In this task, the AD-SDI Team will, if needed, develop a more detailed near-term plan for SDCC staff capacity building. This will involve a staff skills assessment and gap analysis against what will be needed to effectively manage and operate the SDCC facility in the second stage of development. This issue is highly dependent on the business model to be adopted in the AD-SDI Strategic Plan. Regardless of the eventual scope of the Program, it can be expected that it will cover a variety of immediate and medium term capacity building issues, and that addressing these issues will involve a variety of capacity building venues, including but not limited to formal classroom training, seminars, workshops, on-the-job training, university and professional level career development, and others as might be appropriate.

2.6.4 Task 4 – Conduct Capacity Building Program (Stage 1 scope to be determined)

This task will involve carrying out the provisions of the Capacity Building Program developed in the previous task. It is expected that most of this implementation program will be carried out in Stage 2, and will not be addressed in Stage 1, other than limited formal classroom training and on-the-job skills that may be developed through involvement of any permanent staff in Stage 1.