• The easiest issue to address in any SDI development
• The most difficult issue to address in any SDI development
• Which one do you recommend addressing first in SDI development
• Brief example of these from your own experience/observations

• The easiest issue to address in any SDI development
  ➢ Organisational needs
  ➢ Individual data/metadata inventory

• The most difficult issue to address in any SDI development
  ➢ Consensus / cooperation
  ➢ Financing

• Which one do you recommend addressing first in SDI development
  ➢ Awareness / needs
  ➢ Policy (top down)

• Brief example of these from your own experience/observations
Formation of NSDI (National Spatial Data Infrastructure) for Negara Brunei Darussalam

National GIS / NSDI

The formation of National Spatial Data Infrastructure (NSDI) for Brunei Darussalam was initiated by The Surveyor General, Survey Department, Ministry Of Development Brunei Darussalam.

Why do we need NSDI?

- To share geographic data among all users
- To produce significant savings for data collection
- To enhance decision making

Data Sharing in GIS

Objectives

- To reduce duplication of effort among agencies, improve quality and reduce costs related to geographic information.
- To make geographic data more accessible to the public.
- To increase the benefits of using available data, establish key partnerships with Government Departments, Academia and the Private sectors.

NSDI Benefits

- Greater sharing and better access to high quality geographic data could also improve the well being of our communities.
- If sharing data among organisations were easier, millions $ could be saved annually, and governments and businesses could become more efficient and effective.
- In line with our e-Government projects.
Problems / Challenges

- Data collection is an expensive business. In many cases, however, data are duplicated.
- There may be many Government departments and other organisations collecting the same data.
- Data created for one application may not be easily translated into another application.
- Some Government departments and other organisations may not be willing to share data with one another.

Problems / Challenges

- The lack of metadata or information on the "who, what, when, where, why, and how" databases exist.
- Public access to data is also a concern. Many government agencies have public access mandates.
- Confidentiality of data is controlled by higher authority (KDN).

How to integrate the data

- The System used by other organisations should be interoperable.
- Geospatial Standard needs to be introduced.
- The Government and other agencies should always work together.
- Data should be transparent. Any national law and government policies on data confidentiality need to be reviewed and amended.

Our stages towards the formation of B-NSDI

- First stage:
  - Forming Working Committees.
  - The Committee should look into the Survey Department SDI (SDSDI) requirements.
- Second stage:
  - Awareness programme to other departments and ministries.
- Third stage:
  - Expand the scope of work to other departments under the Ministry of Development.
- Fourth stage:
  - Expand the scope of work to other ministries and private sectors.
  - Forming NSDI Committees.

NSDI

National Spatial Data Infrastructure Working Committee

First stage:

The Committees identify the Survey Department SDI (SDSDI) requirements:
- Inventorise existing data (graphics and textual) in all sections including formats (Done)
- Data analysis (Done)
- Metadata creation (in process)
- Follow-up standard with reference to ISO TC 211
- Brunei NSDI policy (in process)
- Access mechanism (Clearing house) (in process)
- IT Infrastructure (network etc.) (in process)
- Database Management (in process)
- Compile the SDSDI report (90% completed)
List of existing data in our database

- RSO / Cadastral Data 1/2500.
- Raster Data (Remote Sensing, Aerial Photograph)
- Digital Map 1:1,000 and other...
- Geodetic Control Points
- LOT Books System
- LTS / TOL
- Gazettes

Oracle 8.0.5 Database, Unix Server KPN1

- Coordinates of lots, TOL, LA, GRCad 200/500, point database system.
- Coordinates of control points, Geopan, Geodetic system
- Lot book system, TOL system, Details of surveying, details of lots, details of tol, details of control points
- House numbering system
- Owner of lots and Tol LRS and Tol in land departments

List of existing data in Land Department’s Database

- Land Ownerships / Land Title Registration.
- Land Tax
- Land Transaction
- TOL Registration

List of existing data in TCP Department’s Database

- Master Plan
- Development area
- Conservation area

Second stage:

Awareness programme to other departments and ministries
- Seminars
- Workshop
- Meetings
- Study Visit
- Conferences

Awareness Programme GIS / NSDI MEETING
( UKUR & K.H.E.D.N ) 23rd March 2005
Findings from the KHEDN officers and NSDI Working Committees meeting:

- They need up-to-date and more precise Base Map for their GIS.
- The location map should be clearly and precisely presented. (eg: using Aerial photo, Ikanos Satellite Imagery)
- Fire Services Department wishes to share their data (Location of Fire Hydrants and location of their buildings).
- KB Municipal Department requested us to show the municipal boundary on the map.
- Our GIS (SIKA) should be updated from time to time. Some information are still missing.
- District office requested GIS for Kampong Information (We have Sungai Akar Pilot project, SAIS done by Licensed Surveyor, JPS. Still in the process of compilation).

Third stage:

Expand the scope of work to other departments under the Ministry of Development.

- Forming Steering Committee (Chaired by JUA)
- Database Integration
  - Sharing data
  - Standard terms of reference (TOR)
  - Avoid data duplication
  - Centralise database

Fourth stage:

Expand the scope of work to other departments under the Ministry of Development.

- Forming NSDI Committees (top level)
  - Chairman: Permanent Secretary Ministry Of Development
  - Secretary: Surveyor General
  - Members: Director General of Public Works, Commissioner Of Lands, Commissioner Of Town And Country Planning, Director Of Housing, Director Of Electrical Services, Director Of Economic Planning, Director Of Environmental & Recreation, Director Of Road, PWD, Director Of Drainage & Sewerage, PWD, Director Of Building, PWD, District Officers, Other related departments

The existing data in Other Departments’ Database will be Integrated in our NSDI

- Electrical Department?
- Public Work Departments?
- Housing Department?
- Fire Services? (Location of Fire Hydrant, etc.)
- Police? (Location of Police Stations, etc.)
- Education? (Location of schools, etc.)
- Health? (Location of Hospitals, Clinics, etc.)
- Other ...

Milestone

<table>
<thead>
<tr>
<th>Stage</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1 -</td>
<td>List of existing data</td>
<td>July</td>
</tr>
<tr>
<td>Stage 2 -</td>
<td>Awareness programme</td>
<td>May - December</td>
</tr>
<tr>
<td>Stage 3 -</td>
<td>Expand the scope of</td>
<td>Oct - Dec</td>
</tr>
<tr>
<td>Stage 4 -</td>
<td>Expand the scope of</td>
<td>Jan - 21st Nov</td>
</tr>
</tbody>
</table>

Brunei-NSDI End Results

- Become one-stop online service that enable property buyers, lawyers, real estate agents, valuers, developers, surveyors, and the general public to easily access to GIS or Land information.
- B-NSDI enables you to find out what’s in and around the land / property you are looking at.
- B-NSDI enables the decision makers (Ministers, Heads of Departments and others) to make decision more efficiently.
- B-NSDI will reduce the cost of Government’s expenditure...!
**NSDI PROTOTYPE**

using ArcExplorer / ArcIMS

From Survey Department Database

- Control Points (Horizontal and Vertical)
- Standard Survey Sheet
  - Private Lots
  - Government Housing Scheme.
- Gazetted Areas
- Status of Land Subdivision
- House Numbering (Addresses)

**Details Information (Initial stage):**

- **Location**
  - Natural features and man made features.
  - Addresses.
- **Land Ownerships**
  - Private Land
  - Buildings, etc.
  - State Land
  - Gazetted land
  - Buildings, etc.
- **Land Development Application**
  - Subdivision Application Status
  - Building Application status
  - Land Taxations.

**Note:**
We need a base map of scale at least 1:1,000. Overlay with aerial photograph / satellite imagery (Iklanis or QuickBird) with the equivalent scale.

**NSDI PROTOTYPE**

From Survey Department Database

http://172.50.14/index.html

**BUDGET?**

- Start from $0…!
- Departmental Annual Budget
- Existing e-Government Projects
- **Proposed RKN 9 Project**

**Proposed NSDI in RKN 9 Project**

- NSDI project is a continuous effort
  - It involves Man powers, Hardware, Software and Knowledge.
  - Data collection.
  - Maintenance Hardware and Software.
  - Up-to-date information.
- Budget required approximately: $3,000,000.00

**To achieve our Vision and Objective, we need:**

- Support from Top Management (SUT and Minister).
- Support from **KDN** (Internal Security Department).
- Support from other related departments and other agencies.
- Support from Treasury, Ministry Of Finance.
Shukran

THANK YOU