3rd Land Administration Forum For The Asia And Pacific Region – Re-Engineering The Cadastre To Support e-Government

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“CADASTRAL REFORM IN MALAYSIA TO SUPPORT SPATIALLY ENABLED GOVERNMENT”

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LOCATION OF MALAYSIA
MALAYSIA: GEOGRAPHICAL CONTEXT

- Covers an area of about 329,758 sq. km.
- Consists of 11 states in Peninsular Malaysia, 2 states in the island of Borneo (Sabah and Sarawak) and 3 Federal Territories (Kuala Lumpur, Putrajaya and Labuan)
- Lies close to the equator between latitudes 1º and 7º North and Longitudes 100º and 119º East.
- A multi-racial country with a population of approximately 24.9 million.
MALAYSIA: ADMINISTRATIVE SYSTEM

- Federal Government
- State Government
- Local Authorities
Establishment of Computerised Information Systems by some Government Agencies

<table>
<thead>
<tr>
<th>Year</th>
<th>Computerised Information Systems</th>
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<tbody>
<tr>
<td>1970</td>
<td>Sabah Land Data Bank</td>
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<tr>
<td>1973</td>
<td>Sarawak Land and Survey</td>
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<tr>
<td>1983</td>
<td>Quit Rent System Peninsular Malaysia</td>
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<tr>
<td>1985</td>
<td>Computer Assisted Land Survey System</td>
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<td>1986</td>
<td>National Forestry Information System</td>
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<tr>
<td>1988</td>
<td>Computer Assisted Mapping System</td>
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<td>1989</td>
<td>Property Assessment System</td>
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<tr>
<td>1991</td>
<td>Valuation Information System</td>
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<tr>
<td>1993</td>
<td>Land Use Information System</td>
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<tr>
<td>1993</td>
<td>Demographic Information System</td>
</tr>
<tr>
<td>1993</td>
<td>Coastal Erosion Monitoring System</td>
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<tr>
<td>1993</td>
<td>Forest Information System Sabah</td>
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<tr>
<td>1994</td>
<td>Penang GIS (PEGIS)</td>
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<td>1994</td>
<td>Public Works System (SUTRA)</td>
</tr>
<tr>
<td>1995</td>
<td>Computerised Land Registration System</td>
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<tr>
<td>1999</td>
<td>Cadastral Data Management System (CDMS)</td>
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<tr>
<td>1999</td>
<td>National Property Information Centre (NAPIC)</td>
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e-GOVERNMENT

- Started since the initiation of Multimedia Super Corridor (MSC) by the Malaysian government in 1996
- Seeks to improve government operation and delivery services.
- Introduction of new policies and regulations such as
  - Communications and Multimedia Act 1998 [Act 588] and [Act 589]
  - Digital Signature Act 1997
  - Computer Crimes Act 1997
  - Copyright Amendment Act 1997
  - Personal Data Protection Act 2004
7 pilot projects of the Electronic Government Flagship Application:

- Project Monitoring Systems (PMS) - G2G (government to government)
- Human Resource Management Information System (HRMIS) - G2G
- Generic Office Environment (GOE) - G2G
- Electronic Procurement (EP) - G2B (government to business)
- Electronic Services (e-Services) - G2C (government to citizen)
- Electronic Labor Exchange (ELX) - G2C
- E-Syariah - G2C
MY GOVERNMENT PORTAL

MALAYSIAN SDI

- Formed in 1997, then known as NaLIS (National Infrastructure for Land Information System)

- Purpose:
  - To promote and facilitate sharing, exchange, dissemination and use of geospatial information among Land Related Agencies
  - To avoid duplication of effort in collection and management of geospatial information
  - To ensure accuracy, timeliness, correctness and consistency of geospatial information

- Restructuring in 2002; subsequently named MyGDI
MyGDI MANAGEMENT STRUCTURE

NATIONAL LAND COUNCIL

MyGDI NATIONAL COORDINATING COMMITTEE

DEPT. OF STANDARD

SIRIM

TC 2

MyGDI PLANNING & IMPLEMENTATION COMMITTEE

STATE COORDINATING COMMITTEE

MaCGDI

NATIONAL MAPPING & SPATIAL DATA COMM.

TECHNICAL STANDARD COMM.

TECHNICAL FRAMEWORK COMM.

TECHNICAL CLEARINGHOUSE COMM.

MyGDI – Malaysian Geospatial Data Infrastructure
MaCGDI – Malaysian Centre for Geospatial Data Infrastructure
SIRIM – Standards Research Institute of Malaysia
MyGDI FRAMEWORK DATA

12 categories of spatial data developed to form the framework data for MyGDI.
STANDARDS

- Development of Malaysian Metadata Standard
  - Template developed
  - Consistent metadata management tool based on ISO/TC 211 standard
  - Can be used for all data categories
  - Documented and provided to all data providers
  - Free metadata publishing and searching through MyGDI

- Development of Malaysian Standard Feature & Attribute Codes (MS1759)
  - Took into consideration the need to use a standard code for features & their attributes in spatial databases.
  - Documented and published in 2004

- Unique Parcel Identifier
- Standardised Street Addresses
MALAYSIAN CADASTRAL SYSTEM

Historical Outline:

- The Torrens system was introduced into the Federated Malay States (FMS) between the years 1879 and 1890.

- Finds presence for expression in:
  - The Sabah Land Ordinance, in the state of Sabah.
  - The Sarawak Land Code, in the state of Sarawak.
MALAYSIAN CADASTRAL SYSTEM (cont.)

Malaysian cadastral system has essentially two basic components:

1. Land Registration: Administered by the State Land Offices and coordinated by Department of Lands and Mines.

Textual aspect - the land register furnishes all necessary information, the basic ones being the name of the proprietor and the actual land alienated - through a description of its area and location, and the survey plan showing the limits. Other information include those on owner's rights, encumbrances, express conditions, caveats and prohibitory orders, if any.
MALAYSIAN CADAstral SYSTEM (cont.)

2. Cadastral Survey: Responsibility of Department of Survey and Mapping Malaysia (DSMM), a federal agency and supported by Licensed Land Surveyors

(Note: The cadastral survey in the state of Sabah and Sarawak are administered by the respective Department of Lands and Surveys which are state entities.)

Spatial aspect - the country's cadastral parcel fabric can be conveniently viewed from the cadastral map produced and maintained by DSMM. With the exception of land parcels on qualified titles (awaiting surveys and finalisation of boundaries) the map depict all land parcels (i.e. surveyed) together with their unique lot numbers or identifiers, as well as the certified plan numbers for ease of reference and search.
PURPOSE OF CADAstral SYSTEM

- To provide security and simplicity to all dealings on land.
- The title is conclusive proof that the person mentioned therein is the owner of the land described therein.
- Valid titles require an accurate description of boundaries and as such cadastral survey plays an important role in the system.
LAND TITLES

Two type of land titles are issued:

- Qualified titles – (Titles issued prior to survey to speed up land development)

- Final titles – (Titles issued after accurately surveyed and boundary marks emplaced).
CADASTRAL SURVEY

- Accurate field survey with emplacement of boundary marks.
- Certified Plan Drawn
- Unique Parcel Identifier (lot number)
- Standard Sheet - Cadastral Map
Sample of Standard Sheet
CADASTRAL REFORMS

- Computerisation
  - Computer Assisted Land Survey System (CALS)
    - CALS Johor in 1985
    - CALS Pahang in 1990
    - CALS for other States in 1995
Sample of Digital Certified Plan
Sample of Digital Cadastral Map
CADASTRAL REFORMS (cont.)

- Feasibility study on Coordinated Cadastral Systems (CCS) – 1996
- Pilot study in the state of Melaka
**CCS**

| 1. | 1996 | INITIAL PILOT STUDY IN THE STATE OF MELAKA - test on the use of an adjustment technique and GPS for Cadastral Controls. |
| 2. | 1997 to 2000 | FEASIBILITY STUDY ON COORDINATED CADAstral SYSTEM FOR PENINSULAR MALAYSIA. |
| | | MODULE A The Adjustment of Large Cadastral Network using RSO |
| | | MODULE B On The Use of A Global Geocentric Datum |
| | | MODULE C Legal Traceability, Standards, Specifications for GPS Surveys. |
| 3. | 2000 to 2002 | STUDIES TOWARDS THE DEVELOPMENT OF IMPLEMENTATION PLAN OF COORDINATED CADAstral SYSTEM FOR PENINSULAR MALAYSIA |
| | | MODULE A Definition & Realisation of A Geocentric Datum for Malaysia |
| | | MODULE B Methodology for Development of Digital Coordinated Cadastral DB |
| | | MODULE C Integrating the Digital Coordinated Cadastral Data with Mapping (CAMS) Data. |
| | | MODULE D Institutional Issues: Legal & Organisational Issues. |
ELEMENTS OF CCS

- GPS Compatible
  Easy integration of Datasets

- Control Based on Highest Geodetic Order
  Control Network of Adequate Density

- Cadastral Control Infrastructure (CCI)
  COORDINATES

- Least Square Adjustment Technique
  Employ “Whole-to-Part” Concept

- Contains a Complete Cadastral Map
  Layered of Data Content
  Has a Unique Parcel Identifier
  Design According to Appropriate Data Modeling Technique

- Legal (Contributory) Evidence of Boundaries
  Unique Single Set of Survey Accurate Coordinates

- GDM2000

- DCDB
CADASTRAL REFORMS (cont.)

- Use of Global Navigation Satellite Systems (GNSS)
  - Upgrade geodetic network
  - Malaysia Active GPS Network (MASS)
  - Use of Geocentric Datum (GDM 2000)
  - Real Time Kinematic Network (RTK Net)
  - Use of GPS in Cadastral Survey
MALAYSIA ACTIVE GPS NETWORK
REAL TIME KINESTATIC NETWORK (RTK Net)
Field to Finish Concept - 2002
  - Automation of District Office System
    - District Office Management System
  - Automation of Field Operation
    - Total Station System
  - Automation of Office Operation – upgrading
    - Cadastral Data Management System
    - Digital Signature - 2006
District Office Management System
CADASTRAL REFORMS (cont.)

- ‘e-cadastre’ Project - 2008
  - Coordinated Cadastral System (CCS)
  - Virtual Survey System
‘e-cadastre’ PROJECT

- Create Cadastral Control Infrastructure (CCI)
- Creation of a complete National Digital Cadastral Database (NDCDB).
- Web base integration between field and office using 3G / Internet.
- GLMS (GIS Layer Management Systems).
- Creating database for strata.
- Using GPS to collecting data (RTK Net).
- Coordinate system using Cassini GDM 2000
# CADASTRAL CONTROL INFRASTRUCTURE

<table>
<thead>
<tr>
<th>State</th>
<th>Number Of CCI</th>
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<tbody>
<tr>
<td>Perlis</td>
<td>203</td>
</tr>
<tr>
<td>Kedah</td>
<td>1,694</td>
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<tr>
<td>P Pinang</td>
<td>934</td>
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<tr>
<td>Perak</td>
<td>3,941</td>
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<tr>
<td>Selangor</td>
<td>4,324</td>
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<tr>
<td>WPKL</td>
<td>1,071</td>
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<tr>
<td>N Sembilan</td>
<td>1,608</td>
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<tr>
<td>Johor</td>
<td>4,221</td>
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<tr>
<td>Pahang</td>
<td>3,145</td>
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<tr>
<td>Terengganu</td>
<td>1,810</td>
</tr>
<tr>
<td>Kelantan</td>
<td>2,048</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24,999</strong></td>
</tr>
</tbody>
</table>

500 m for WPKL and 2.5 km for other states.
Cadastral Control Infrastructure (CCI)
APPLICATION MODULES

e-cadastre

Web GIS
- eLodgement
- eKadasOnline
- SUM LSA
- eNotiﬁcation

Desktop GIS
- ePU
- eGLMS
- eJalan
- eTownKg
- eAdminBdy
- eKiosk
- eReporting
- eMonitoring
- eWarta
- eGrid
- eSPID

Field
- eTSM
- eCRM
- eSSM
- eSSM

Non GIS
- eMedmAS
  - eMedmas
- eSupport
  - eSupport
- eReporting
  - eReporting
- SPPK
  - SPPK
- ePKI
  - PKI eSigning
  - PKI eVerifier
  - PKI 2D Barcode
  - eAnotation
- SPAK
  - SPAK
  - Kalibrasi EDM/GPS
- Security
  - Watchguard
  - Fortigate

Strata GIS
- Strata
- Strata Data Entry LS
- eSPID

SPEK
- eSPEK
- eQC
- eQC
‘e-cadastre’ PROJECT

Still being tested for full implementation
Application Of Cadastral Data For Acquisition Of Land

Data required:
- Location of parcels
- Size of parcels
- Land value
- Position of road
- Land owners
- Etc.

Answers to:
- Where to acquire?
- Size/area of parcel taken up by road?
- How much to acquire?
- Compensation?
- Whom to pay?
- Lot balance to issue new title?
- Etc.
CONCLUSION

- Cadastral data is one of the framework data needed for planning and various analysis.

- Cadastral reforms carried out are able to create accurate and complete National Cadastral Database and able to expedite the issuance of final title.

- Complete National Cadastral Database is much needed to ensure accurate planning and analysis for Spatially Enabled Government.
Thank You