

# UN-GGIM Arab States Riyadh

24<sup>th</sup> Feb, 2015

Director General of Survey  
Survey & Land Registration Bureau

Naji Sabt Salim Sabt





# Presentation Overview

Bahrain SLRB Strategy

Initiatives: National 3D Mapping of Bahrain,...

National Data Model of The Kingdom of Bahrain



**Survey & Land Registration Bureau**  
**Head of Bureau**

**General  
Directorate of  
Resources &  
IS**

**General  
Directorate of  
Survey (6)**

**General  
Directorate of  
Land  
Registration**

**HR & Finance**

**Cadastral  
Directorate  
(100)**

**Registration &  
Follow-up**

**Information  
Systems**

**Topographic  
Directorate (60)**

**Technical  
Affairs**

**Hydrographic  
Directorate (10)**

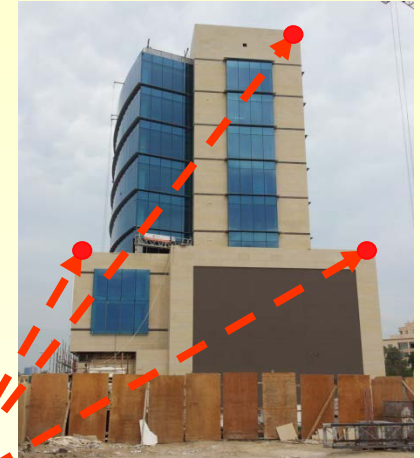


# SLRB Capturing Spatial Data

Aerial Photography



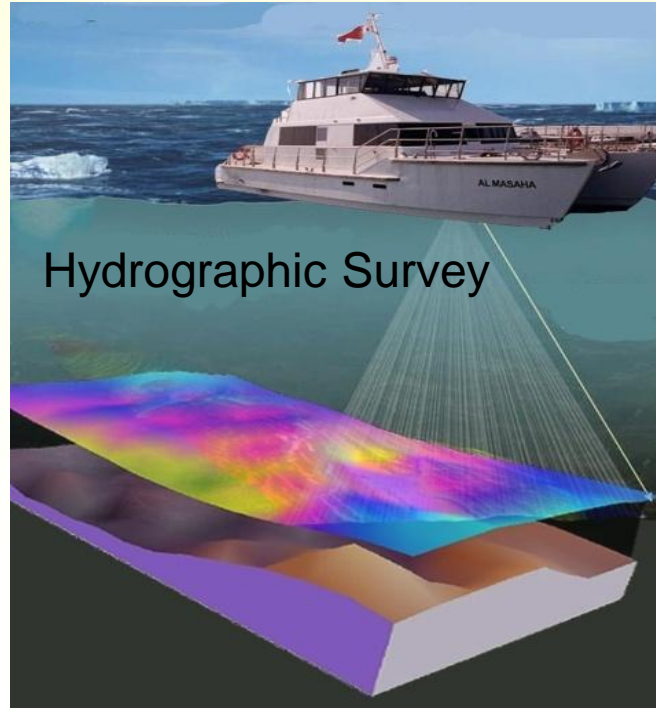
GPS



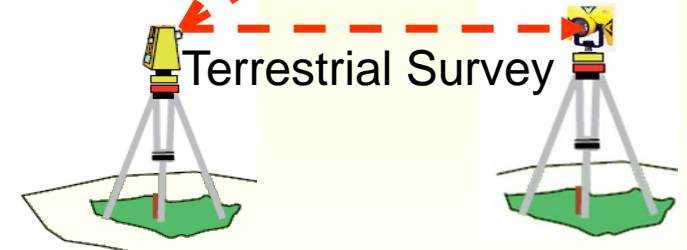
Land Registry



Hydrographic Survey



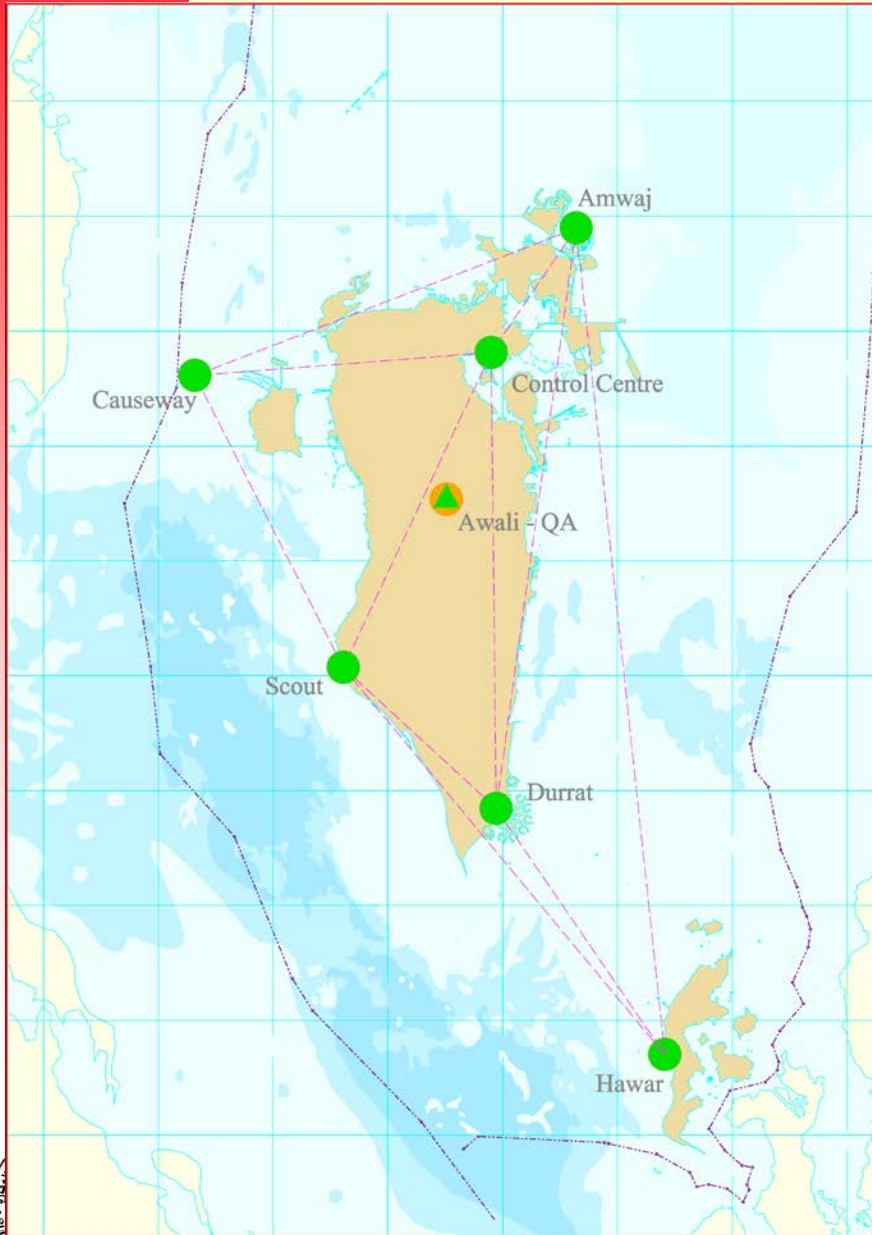
Terrestrial Survey



Photogrammetry



# PRN Background

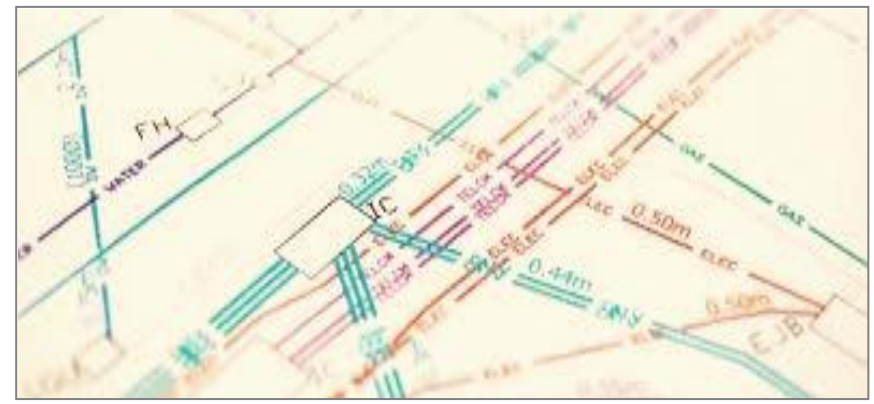
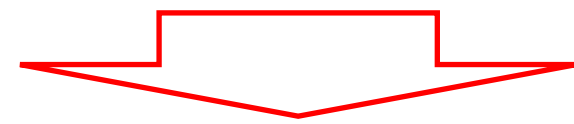


- Provides realisation of geodetic datum – it is the fundamental geodetic infrastructure
- Coverage of all major land areas
- Six (6) stations
- GG Tracking
- Spider processing server
- RT & Rinex data
- Permanent Rover QA
- CSCS model

# Underground Utilities:



# Underground Utilities:





# Underground Utilities:



Objects

- Group A
- Walls
- Utilities
- Stadium
- Open Space
- Cafeteria
- Administration
- Classrooms
- Building A
- Walls
- Utilities
- Faculty
- Campus Trees

Properties

Scenario Bookmark

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### Utilities

Attribute Analyze Simulate

▶ Gas Lines  ×

▼ Water Lines  ×

Water Line Type

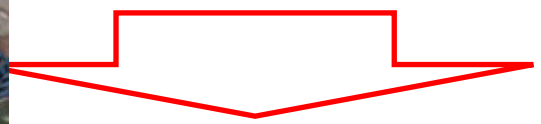
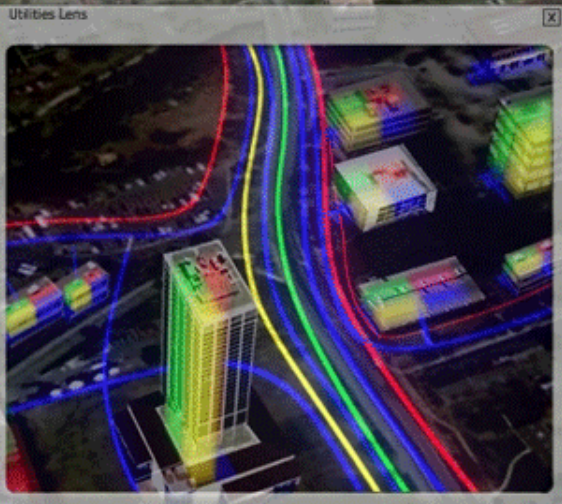
Water Line Table

Line 124-C	Active	<input checked="" type="checkbox"/>
Line 124-D	Active	<input checked="" type="checkbox"/>
Line 126-A	Active	<input checked="" type="checkbox"/>
Line 127-A	Active	<input checked="" type="checkbox"/>
Line 127-B	Active	<input checked="" type="checkbox"/>
Line 127-C	Active	<input checked="" type="checkbox"/>
Line 127-D	Unused	<input type="checkbox"/>
Line 133-A	Active	<input checked="" type="checkbox"/>

▶ Waste Removal  ×

▶ Electricity Lines  ×

Link



(Sensysmag 2008)

# Bahrain SLRB Strategy

- Stakeholder needs vs, Government Objectives

SLRB's Stakeholders' Needs	Government Programme Strategic Objectives									
	1) Strong and attractive and secure society	2) Provide social society services – health education social security	3) Give Bahraini opportunities to be successful – education	4) High quantity of economic growth – reflect to citizen	5) Knowledge based economy – Entrepreneurial society	6) Openness	7) Excellence on auditing and infrastructure	8) Manage resources by more efficient and effective use of resources	9) Provide opportunities for financial investment and sustainability	10) Sustainable management for strategic resources
A single definitive supplier of location information	✓	✓			✓	✓		✓		✓
Fast online systems to deliver up to date Geospatial Information and services to Government and private enterprise	✓	✓	✓	✓	✓	✓		✓		
A national geospatial data programme that is revised and maintained in collaboration with stakeholders		✓	✓		✓			✓	✓	
Regulated and controlled Geospatial activity to build Bahraini capability and capacity and reduce inefficiencies		✓	✓		✓			✓		✓
Platform to coordinate the use and sharing of location based planning information across government to enable efficient use of assets and resources	✓	✓			✓	✓		✓		



# SLRB Vision

*Our vision is to provide trusted high-quality land information services, expertise and to be a model for Government sector management through investing in excellence to support the future needs of the Kingdom of Bahrain.*



# SLRB Critical Success Factors

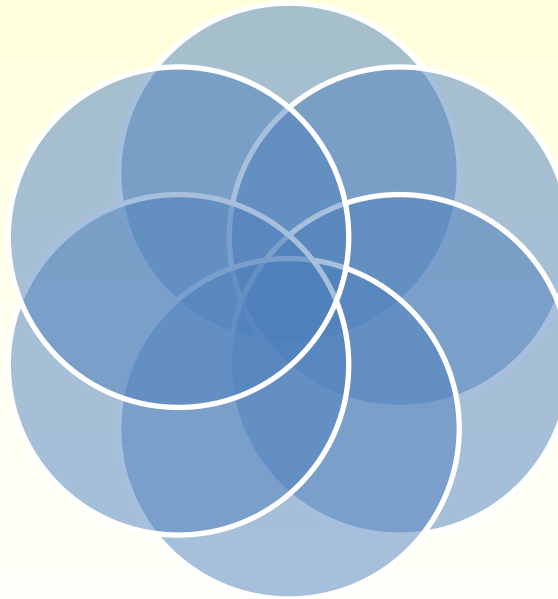
*- be the geographic information authority for the Kingdom of Bahrain*

*- invest in the organisation to support the future needs of the Kingdom*

*- deliver quality and timely services and products*

*- be a model of Government sector management*

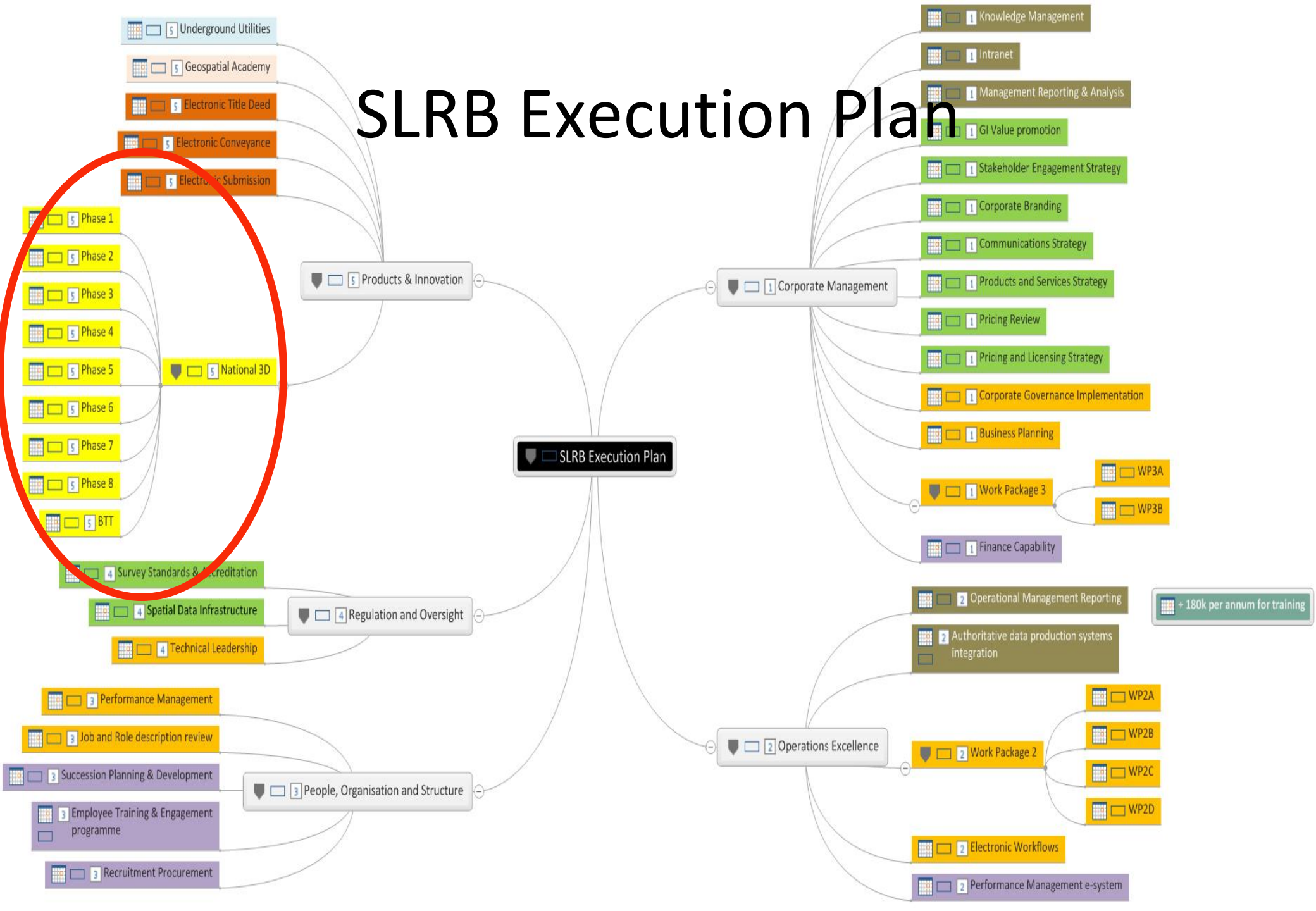
*- be an employer of choice within the Kingdom*



*- lead and develop stakeholder relationships*

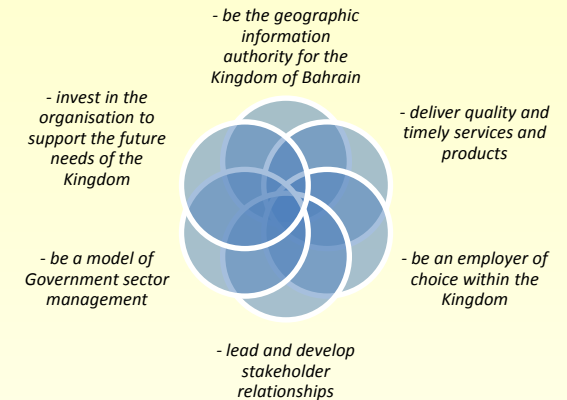


# SLRB Execution Plan



# National 3D Mapping of Bahrain

- With effective governance, all Stakeholders in the Kingdom of Bahrain will benefit
- SLRB data will be restructured to enable powerful GIS queries by all stakeholders
- Technology will be enhanced and Stakeholders will be trained to support the delivery of this rich GIS data
- SLRB to maintain and distribute Kingdom's authoritative high accuracy base map data



# National 3D Mapping of Bahrain High Level Project Plan

2014	2015												... 2016
Q4/2014	Q1/2015			Q2/2015			Q3/2015			Q4/2015			...Q4/2016
	J	F	M	A	M	J	J	A	S	O	N	D	

Prequalification

Consultancy Services for Design and Specs

3D Implementation



# National 3D Mapping of Bahrain

## Benefits

- Supports Vision 2030
- Supports development of knowledge-based business initiatives and key industries
- Enables informed and faster decision-making
- Supports development consultation
- Supports accelerated service delivery to citizens
- Eliminates duplication of effort
- Reduces delay costs arising from ambiguity in infrastructure planning and delivery





# Data Model of Bahrain developed in 2013

## What is the National Data Model of Bahrain?

*A dictionary describing the things we are interested in, their location and what's important about them.*

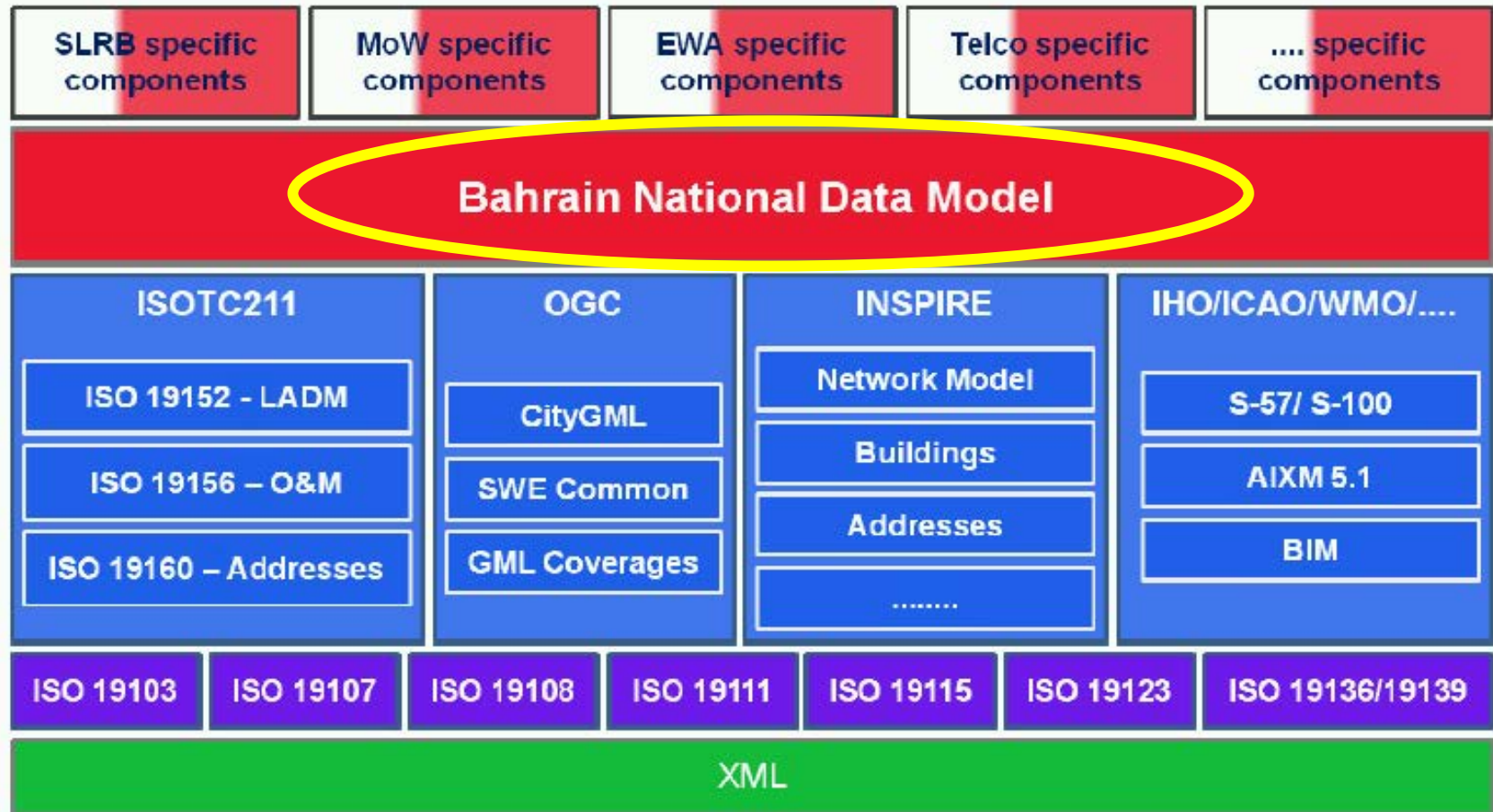
- A dictionary: *(a catalogue of geographic objects)*
- the things we are interested in: *(substations, oil pipelines, sewers, antennas, planning applications etc.)*
- their location: *(point lines and polygon symbols you can put on a map)*
- what's important about them: *(owner, length, diameter attribute information)*

**It is the mechanism for *exchanging* feature/object data across our National Stakeholders**



# Data Model of Bahrain

## Open International Standards and Governance



- Since 2013, now based on Object



# Data Model of Bah Themes, Features and A

- Address 1 featu
- Administrative Unit 9 featu
- Agriculture and Aquaculture 2 featu
- Bathymetry and Elevation 7 featu
- Buildings 7 featu

## Data Model of Bahrain

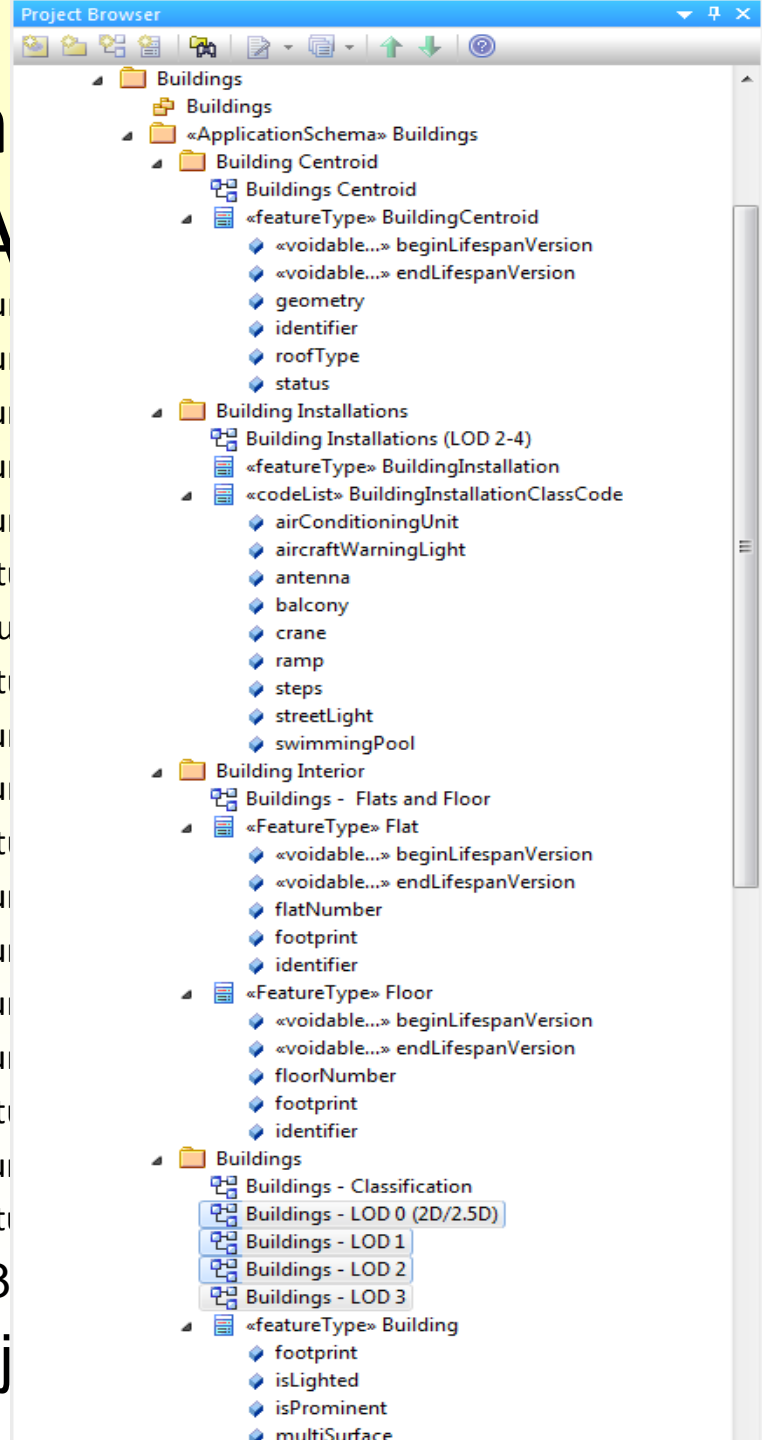
Theme	#	Feature	Attributes
Building	1	Building	24
	2	BuildingCentroid	6
	3	BuildingInstallation	12
	4	BuildingPart	24
	5	BuiltUpArea	4
	6	Flat	5
	7	Floor	5

- Surface Cover 3 featu
- Topographic Mapping 5 featu
- Transportation 45 featu
- Transportation - Rail 5 featu
- Utilities 31 featu

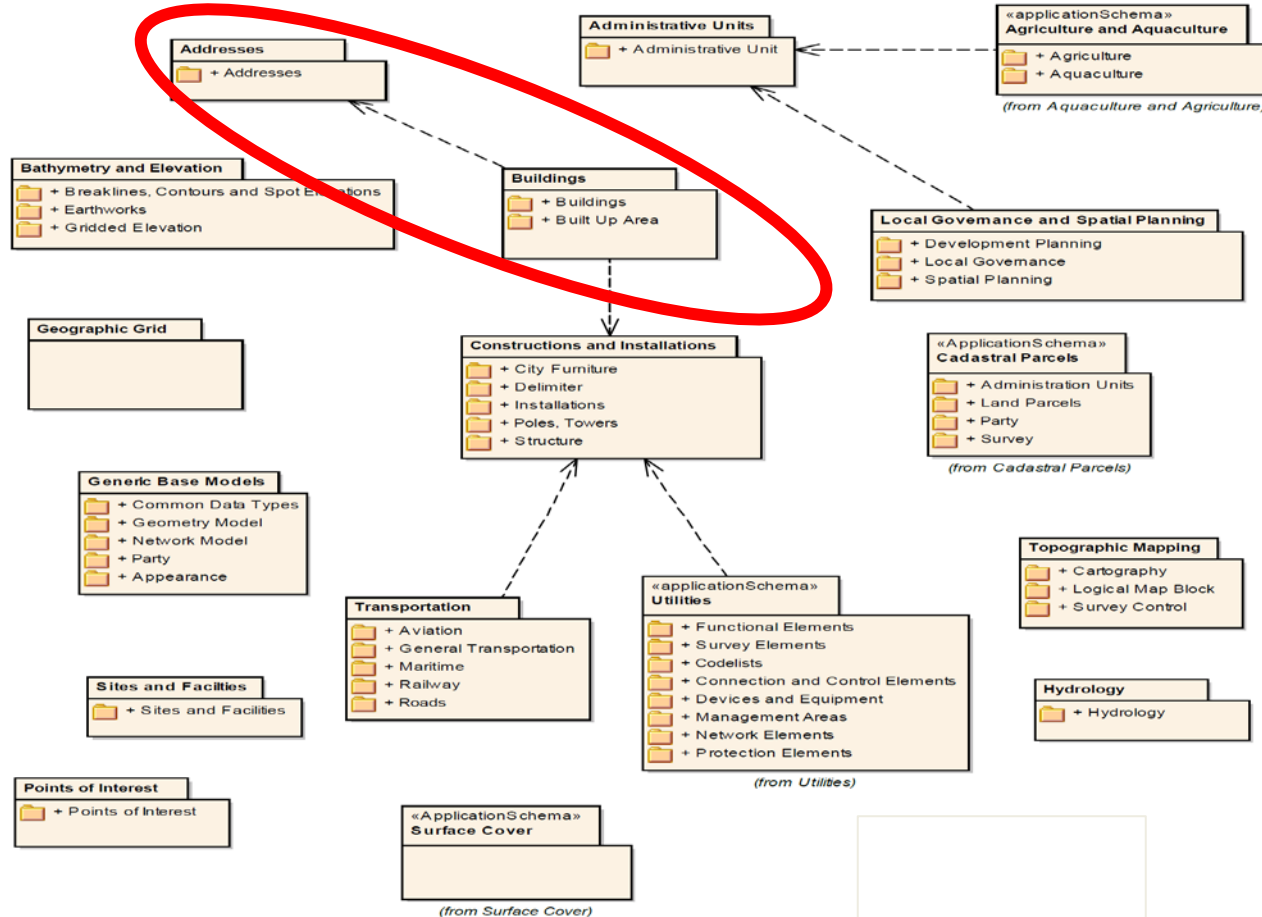
18 Themes

238

- Since 2013, now based on Obj



# Data Model of Bahrain UML Package Diagram



- Since 2013, now based on Object



# Data Model of Bahrain Prototype

- Block 317 (Diplomatic Area) used to implement physical data model
- Utilities data and other spatial data collected from Stakeholders and integrated with SLRB's basemap
- Data migrated using safe software FME workbenches into Oracle Spatial
- Data tested with 2D and 3D GIS software – an open solution



- Since 2013, Prototype now based on Object





Thank you

