Addressing Land Administration and Management Opportunities: A Land Locked Country’s Perspective
Kazakhstan
Land Locked Country

Area 2,724,900 km²
Population 17,500,000
GDP (nominal) 232.4 $ billion
Information basis for the Land Cadaster

**Customer**
- First name, last name (name of company)
- Date of birth (incorporation)
- Registration address
- Identity documents
- IIN/BIN

**Land parcel**
- Cadaster number
- Address (location)
- Floor area
- Designation purpose
- Land category
- Cadaster (evaluated) cost
- Limitations and encumbrances
- Registered title
  - Decision to grant the title
    - State Act (identification document)
    - Expiry date (for rent)

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**Land parcels**

**Accounting cadastral quarters**

**Administrative borders of districts**

**Planning cartographic basis:**
- Materials of aerial survey of different succeeding scale.
- Satellite images of different spatial resolution.
GOVERNMENT AGENCIES’ GIS

ALMATY CITY GEO-INFORMATION SYSTEM
Owner: ALMATY CITY AKIMAT

FORESTRY & HUNTING SECTOR INFORMATION SYSTEM
Owner: MINISTRY OF AGRICULTURE

GEO-PORTAL OF KYZYLORDA REGION
Owner: KYZYLORDA REGION AKIMAT

STATE TOWN-PLANNING CADA斯特
Owner: URALSК CITY AKIMAT
High-accuracy satellite navigation system of the Republic of Kazakhstan (HSNS RK)

HSNS RK – automated system of GLONASS, NAVSTAR and GALILEO global navigation satellite augmentation systems is designed to form the conditions of guaranteed quality coordinate-time and navigation services to be obtained by consumers of GNSS information in the territory of the Republic of Kazakhstan.

Differential stations network (DS)

Differential correction and monitoring center (DCMC)

Mobile differential station (MDS)

Conformity assessment laboratory of satellite navigation (CAL)

Marine local differential station (MLDS)

Pilot manufacturing of navigation equipment (PM)
USE OF SPACE TECHNOLOGY

Differential station of HSNS RK

- Entry into operation: 2014 year
- 60 differential stations
- 2 mobile differential stations
- Radius of action: 300 km
- The resulting accuracy of coordinates:
  - 1 m in real-time for 94% of the territory of RK
  - 2 cm in real-time for 18% of the territory of RK
  - < 1 cm in postprocessed mode

Marine differential station of HSNS RK

- Entry into operation: 2014 year
- 2 m positioning accuracy of the sea
- 1 m positioning accuracy in the coastal zone

The resulting accuracy of coordinates

1 m in real-time for 94% of the territory of RK
2 cm in real-time for 18% of the territory of RK
< 1 cm in postprocessed mode
Earth remote sensing cosmic system of the Republic of Kazakhstan

**KazGeoSat-1**
- Spatial resolution: **1m**
- Imagery mode: Panchromatic, Multispectral
- Scene size: **20 x 20 km**
- Imagery frequency: **3 to 5 days**
- Productivity: **220 000 sq.km per day**

**KazGeoSat-2**
- Spatial resolution: **6.5m**
- Imagery mode: Multispectral
- Scene size: **77 x 77 km**
- Imagery frequency: **3 to 5 days**
- Productivity: **1 000 000 sq.km per day**
According to Committee for Construction, Housing & Utilities Sector and Land Resource Management, nearly 80% maps are inconsistent with actual status of local area and with toponymy.

- No uniform formats of maps and the coordinates systems to be used; no interchange of maps.
- Duplication of works (costs) for creation of identical maps by different agencies.

According to Kazakh Research Institute for Construction & Architecture, town-planning cadasters with digital maps were created in only 8 cities of 86.

In Kazakhstan, there are altogether 223 cities/towns and townships, and also 6936 rural localities.
Integration of existing systems

1. Collecting and scanning paper-based maps

2. Migrating the e-maps to the uniform format

3. Standardization of all new surveys

4. Site-by-site surveys and updating through services

NGIS stores:
- Vector maps (reference ones)
- Metadata
- Minimum set of data
- Sets of tiles

Departmental systems:
- Full set of data
- Documentation on the sites
- Raster materials
- Non-normalized vector maps
- Archival and historical data
- Other departmental materials
INTERDEPARTMENTAL COOPERATION

As it is

How to
NGIS operation chart

Citizens and businesses

Single data repository

Agencies’ functions:
- Recording (cadasters)
- Analytics
- Management

Services to citizens:
- Formalization (lands, buildings)
- Agreeing upon (projects, Architectural Planning Assignment, Detail Specifications, etc.)
- Permits

Architecture

Land Relations Office/Sector

Housing & Utilities Sector

Workstation in agency

eogov
Economical and social effect

Self-updating map

Uniform formats

Mobile applications and navigation

General map

Transparency and control

Central and local government

Services

Economical and social effect
Thank you!