Directives of National R&D and Major projects related to Geographic Information System in Korea

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5. Confronted Obstacles & Challenges
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Objectives

- **Orientation on** National R&D and Major projects related to Geographic Information System in Korea.

- **Directives** to improve U-Eco city application based on GIS in Korea.

- **Projection of** the Potential applicable fields.

History of GIS paradigm changes in Korea

<table>
<thead>
<tr>
<th>Year</th>
<th>Achievement of GIS Tech.</th>
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<tbody>
<tr>
<td>1990</td>
<td>2D spatial data vectorization</td>
</tr>
<tr>
<td>2000</td>
<td>3D spatial data vectorization</td>
</tr>
<tr>
<td>Present(2008)</td>
<td>Just Viewing and Browsing</td>
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<tr>
<td></td>
<td>3D Geographic visualization &amp; Analysis</td>
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<td></td>
<td>Flight Simulation</td>
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<td></td>
<td>Ubiquitous Tech.</td>
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<td></td>
<td>Real Time 3D Analysis &amp; Real World Access and Control</td>
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<tr>
<td></td>
<td>U-EcoCity</td>
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Why U-Eco City?

GIS-centered R&D lists

Korean Land Spatialization by M.O.C.T.

<table>
<thead>
<tr>
<th>Key project</th>
<th>Contents</th>
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</table>
| Geospatial information Infrastructure | - R&D on Innovative Management of Geodetic Reference Frameworks  
- R&D on Integrated Equipments for Constructing Geospatial Information  
- R&D on Constructing Next Generation Digital Maps |
| Land monitoring                     | - Base Technology Innovation for Aerial Monitoring  
- Base Technology Innovation for Ground Monitoring  
- Development of Integrated Monitoring Systems |
| Intelligent Urban Facility Management | - R&D on Management of Underground Facilities in Intelligent Cities  
- R&D on Urban Ground Facility Management based on Ubiquitous IT  
- Development of Integrated Platforms of Urban Geospatial Information for Intelligent Urban Management |
| U-GIS Informative Construction Tech. Innovation | - R&D on Renewal of Geospatial DB with a Construction Blueprint  
- R&D on Construction of Indoor Space DB with Application of a Construction Blueprint  
- R&D on Construction of Indoor Space DB with Application of a Construction Blueprint |
| U-GIS Core SW Tech.                | - R&D on Processing and Managing u-GIS Geospatial Information  
- R&D on the Next Generation Visualization for u-GIS  
- R&D on Providing Customized Land Information |
Issues left behind...

- Where do we have to apply the National GIS-infra?
  - Selected Target is “Urban”
  - Good infrastructure of GIS/RS
  - Good market opportunity of commercial use of GIS

- How to maximize the utility of GIS Tech.
  - Confederation of telecommunication Tech. with GIS tech in Urban.
  - GIS incorporated with RFID tech. \( \text{U-city} \)

A Necessity of U-Eco City Project

Urban troubles + City Competitiveness = Paradigm shift

Increasing Requests for future Urban Concept

City paradigm shift; Convergence between IT & Ecological city

- Information Tech.
- Urban Planning
- Ubiquitous Tech.
- Artificial City
- Environment Friendly City

Evolution to the Sustainable Ecological City
### Government policies

#### National frontier policies related to U-City
- Legislation of a new law supporting U-city Construction
- U-city Activation Master Plan
- ITS project
- U-Korea Strategies
- UIT-839 strategies
- NGON Prj.
- Local Informatization
- Improvement of administration services
- Fostering new industry
- Developing high tech. on Key industry
- Fostering service industry
- 5y. plan on culture industry development
- culture industry vision 21
- Standardization of Digital Contents

#### National Eco-Friendly policies related to Eco-city
- Legislation of landscape law
- Development of architectural culture
- Reducing Measures for building on greenhouse gas
- Maintenance plans for Environment Friendly liver system
- Comprehensive water management plans
- Introduction of S.E.A.
- Natural landscape influence system
- Development of next generation essential environmental tech. (Eco technopia 21)
- Fostering new industry
- Developing high tech. on Key industry
- Fostering service industry
- Using & developing New & recycled energy

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**U-City is...**

Physical Architecture

Cyber Network
The advent of Ubiquitous society

Policies to acquire Ubiquitous society

Concept of the U-City

Application Schedule for U-City project
Concepts of Technological Development

- 3D Ecocity Planning & Management Tech.
- Creation & Management tech. of 3D Environment Ecological Info.
- Creation & Management tech. of Water circulation sys.
- Creation & Management tech. of Ecological roads
- Ubiquitous (RFID, USN)

U-City Service Components

**U-City Service** compose of **Object**, **Sensor Network**, **Digital Network**, **Middleware/Platform** and **User** largely.

1. **Object**: A Target for Collecting
2. **Sensor Network**: Unit sensor or sensor network for collecting data
3. **Digital Network**: cable/wireless communication network for data transfer
4. **Middleware/Platform**: data-processing, management, service integration
5. **User**: Acquiring data or searching for through a terminal
**Applied Technologies - GIS /Sensor**

- Air pollution
- Water pollution
- Soil pollution
- Underground
- Facility
- Remote asset
- Bridge
- Natural disaster
- Emergency
- Stadium
- Underpass
- Control center

**U-city taskforce composition**

**Korea Communications Commission**
- Standardization of U-service /tech. & Creation of IT-Infra.
- Regulation maintenance related to u-IT

**U-city governance**
(U-city forum, U-city committee)

**M. of Construction & Transportation**
- Regional Balanced development & Urban development policies
- Regulation maintenance related to urban development

**U-City Taskforce**

**Local government**
- Activating Regional Economy through developing specified service
- Improving the local citizen’s Quality of Life
Case studies of U-city in Korea

U-city project has been implemented in 14 existing city (seoul, busan and etc.) and 8 new town (sejeong city, hwa-sung and dong-tan).

- Seoul SangAm
- Incheon

- Daejeon
- Chungbuk

- Jeonju
- Gwangju
- Jeju

- Hwasung dongtan
- yeongin-heungdeuk
- Kwangkyo
- Paju-unjeong

- Busan

- Pohang, Yungsan, Ulsan, Kangreung, Incheon, Hongseung, Jeonbuk, Sejong, Asan tangeong

Issues & Considerations

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<tr>
<th>Issues</th>
<th>Considerations</th>
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<tr>
<td>Service Design</td>
<td>Customer Satisfaction-oriented</td>
</tr>
<tr>
<td>- Feasibility</td>
<td></td>
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<tr>
<td>- Deficient procedural plan</td>
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<tr>
<td>- A Need for specified plan</td>
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<tr>
<td>Service Provider</td>
<td>Sustainable Biz model</td>
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<tr>
<td>- Network infra, Control center centred plan</td>
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<tr>
<td>- A need for Advanced tech of Existing Info. system</td>
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<tr>
<td>Implementation Plan</td>
<td>Feasible service for Present</td>
</tr>
<tr>
<td>- Deficiency of Existing resource use</td>
<td></td>
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<tr>
<td>- Deficient consideration for User contentment</td>
<td></td>
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<tr>
<td>- A need for Regulation improvement</td>
<td></td>
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<tr>
<td>Invest / cost</td>
<td>Possible tech. solution base</td>
</tr>
<tr>
<td>- Similarity to Previous plan “digital city”</td>
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<tr>
<td>- A need for countermeasures for Financial trouble</td>
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**Principle issues**

<table>
<thead>
<tr>
<th>Troubles</th>
<th>Contents</th>
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<tr>
<td>Overestimated U-City</td>
<td>- U-city offered by Urban supplier is “Public service”</td>
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<tr>
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<td>- User expect SF level private service by misconception.</td>
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<tr>
<td>Deficient Financial resource of local gov.</td>
<td>- Decrease of population in local society cause financial difficulties</td>
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<td>- U-city has been selected as a Future city model but financial trouble prohibit continuous implementation.</td>
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<tr>
<td>Limitations by regulation</td>
<td>- Enormous budget is need to set up and operate.</td>
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<td>- Revenue-making business is needed for sustainable operation</td>
</tr>
<tr>
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<td>- Various regulations hinder business.</td>
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<tr>
<td>Deficient Professional workforce &amp; Organization</td>
<td>- Insufficient professional workforce</td>
</tr>
<tr>
<td></td>
<td>(administration + urban planning + Information &amp; communication + consulting)</td>
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<td></td>
<td>- Operating Organization for U-city is not prepared in local gov.</td>
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**Essential Technologies for E-Eco City Project**

**Key 1. Future city strategies & U-city support policies**
- U-city Future Social phases & Future Space
- Changes prediction of U-city Space structure & Sound spatial structural model
- Mid-long term strategies for the efficient implementation of U-city
- Supporting policies for Efficient application of U-city

**Key 2. U-city Infrastructure Construction Tech.**
- U-city Future Infrastructure creation & Use tech.
- Development of Tech. for the integrated city operation center
- Merchandizing Essential strategic tech. for implementing U-city

**Key 3. U-Space Creation Tech.**
- Building standards for constructing U-city
- Development of Public service tech. for constructing U-space
- Development of private service tech. for constructing U-space

**Key 4. U-based Eco-space Creation Tech.**
- Development of Implementation tech. for Environmental Ecological Info.
- Development of 3D Urban environmental planning & Assessment tech.
- Development of ubiquitous water cycle system
- Development of Eco-road formation tech.

**Key 5. U-Eco City Test Bed Creation**
- Selecting implementation tech. & operation method for Test Bed
- Setting Building management Process for Test Bed
- Pilot Project application & suitability Assessment
- Model Project & monitoring for Test Bed
U-Eco City Agency Budget plan

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Application and concepts of USN service

USN
- Ubiquitous
- Sensor
- Network

RFID
- Radio Frequency
- IDentification

- Safety management (Architecture)
- Management of Growth (temp., humidity)
- Anti-disaster (Fire alarm, Flood control)

- Product process management
- Tracking of produce
- Product info. search
- Produce record management

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Confronted obstacles for U-Eco city

– A need for streamlining heavy DB
– A Request for Implementing Ecological & sustainable U-Eco city
– Exploiting applicable fields based on end-user’s demand

Applicable Fields for U-Eco City related to Water resources

– HyGIS (Hydro Geographic Information System) Project in NewFrontier
– Security Management using Water quality Modeling incorporated with tele-monitoring system
Thank you !!!

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