

해외출장복명서

기 간: 2014. 4. 28~2014. 5. 1

출장지: 인도네시아 자카르타

출장자: 김태환 국토관리·도시연구본부장

I. 출장개요

1. 출 장 지: 인도네시아 자카르타

2. 출장기간: 2014. 4. 28~5. 1

3. 출 장 자

소속	직급	성명	비고
국토연구원	국토관리·도시연구본부장	김태환	

4. 출장목적

- 인도네시아 그린 인프라스트럭처 서밋 2014(INDONESIA GREEN INFRASTRUCTURE SUMMIT 2014) 참석 및 발표(PLENARY SESSION 3B : BUILDING GREEN INFRASTRUCTURE: REALITY VS CHALLENGES)
- 인도네시아의 그린 인프라스트럭처 건설을 위한 한국의 선진사례 소개
- 인도네시아의 지속가능한 경제와 향상된 인프라스트럭처를 건설할 차기 리더와의 교류협력 기회 모색

○행사의 개요 및 목적

- INDONESIA GREEN INFRASTRUCTURE SUMMIT 2014
29 - 30 April 2014, Ritz Carlton - Pacific Place Jakarta
- Combining the need to gear up for a green economy, and the current major agenda of developing infrastructure, KADIN infrastructure division as the ultimate platform for Indonesia's businesses, believe that embracing green economy principles as part of the Indonesia's infrastructure development is a necessity. In fact infrastructure is one of the tools to increase growth, but its development is still static in Indonesia



II. 출장일정

날짜	출발지	도착지	방문기관/장소	주요 수행업무	관계자
4.28 (월)	인천	자카르타		도착	-
4.29 (화)			Ritz Carlton - Pacific Place Jakarta	(08:00) OPENING CEREMONY 참석	Suryopratomo (News Director of Metro TV)
				(13:00) PLENARY SESSION 1 참석	Nur Pamudji (CEO of PLN)
				(15:30) PLENARY SESSION 2 참석	Kania Sutisnawinata (Lead anchor of Bloomberg TV)
4.30 (수)			Ritz Carlton - Pacific Place Jakarta	(08:30) PLENARY SESSION 3A 참석	- Irman Gusman (Chairman of House of Representatives Indonesia)
				(10:30) <u>PLENARY SESSION 3B 발표</u>	Rodrigo Chaves (Country Director of Indonesia of World Bank)
				(08:30) PLENARY SESSION 4 참석	Bernardus Djonoputro (Chairman of Indonesia Planology Expert)
				(10:30) PLENARY SESSION 5 발표	Rikard Bagun (Editor in Chief of Kompas)
5.1 (목)	자카르타	인천	-	도착	-

III. 수행사항

1. INDONESIA GREEN INFRASTRUCTURE SUMMIT 2014 참석

- 일시 및 장소: 29 - 30 April 2014, Ritz Carlton - Pacific Place Jakarta
- 참석자: H.E Mr. Suryo Bambang Sulisto (Chairman of Indonesian Chambers of Commerce and Industry), Bert Hofman (Chief Economist for East Asia and Pacific Region of World Bank), Prof. Dr. Boediono (Vice President of Republic of Indonesia), Armida Alisjahbana (Minister of National Development Planning of Indonesia), Yani Witjaksono (Head of Inter-Organizational Cooperation and APEC RE Forum of Indonesia Renewable Energy Society) 등 약 200명 참석
- 주요 논의내용
 - 세션별 주제

구분	주제
OPENING CEREMONY	MINISTERIAL SESSION on GREEN INFRASTRUCTURE
PLENARY SESSION 1	RENEWABLE ENERGY TRANSFORMATION TOWARDS INDONESIA'S GREEN INFRASTRUCTURE
PLENARY SESSION 2	INDONESIA'S GREEN TRANSPORTATION AND INFRASTRUCTURE NETWORK READINESS
PLENARY SESSION 3A	GREEN INFRASTRUCTURE FROM FINANCIAL PERSPECTIVE
PLENARY SESSION 3B	BUILDING GREEN INFRASTRUCTURE: REALITY VS CHALLENGES
PLENARY SESSION 4	GLOBAL LEADERS ACTION AND EXPERIENCE OF CITIES FOR GREEN INFRASTRUCTURE
PLENARY SESSION 5	THE FUTURE OF INDONESIA'S GREEN INFRASTRUCTURE POLICY

- Green economy was a focus of the landmark Rio Summit 2012, where despite the debates surrounding how green economy needs to be defined, there is a relative consensus on the need to increase the “green” intensity of every economies of the world.

- Inline with this understanding, KADIN infrastructure division with support from World Bank, JICA and ICLEI, plans to organize a conference, which will serve the objective of raising the awareness not only to the Indonesian businesses, but also to the society, on the strategy that Indonesia can pursue, in embracing green economy at the urban planning and infrastructure development level.
- Encourage business players in Indonesia to venture new industries adopting green solutions such as recycle and waste to energy through share of best practices to improve local industry and introduce local products (Indonesia) go to international as a financial solutions.
- Find deeper connection between the concept of green with better productivity, efficiency and quality as key elements for sustainable economic growth and provide input to the next leadership in improving the infrastructure in Indonesia in the future.
- The combination of KADIN infrastructure division as the ultimate platform for Indonesian businesses, with Kompas and Bloomberg as leading media locally and internationally, will allow this conference to become a landmark event, that will positively gear Indonesia up to the challenge of embracing green economy.



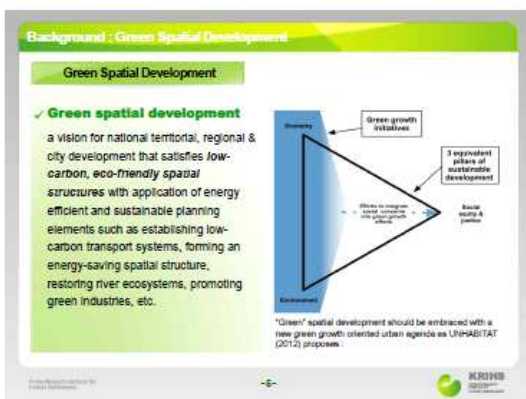
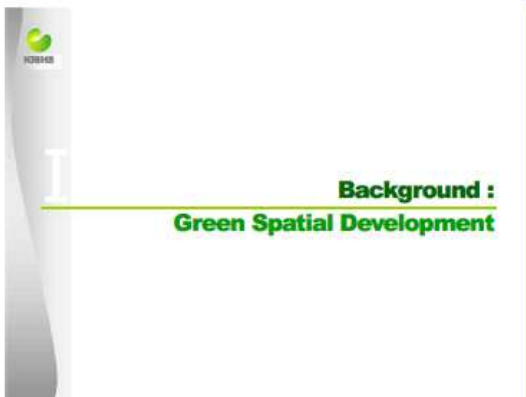
2. PLENARY SESSION 3B : 발표

- 일시 및 장소: 30 April 2014, Ritz Carlton – Pacific Place Jakarta
- 참석자: Dr. Nils Schmid (Deputy Prime Minister President of the State Government, Minister of Economics and Finance of the State of Baden–Württemberg), Antony Sprigg (CEO of Infrastructure Sustainability Council of Australia), Prof. Dr. Emil Salim (Chairman of President Advisory Council), James Gilling (First Assistant Director General in the Policy and Sector Division of AusAID)
- 주요 논의내용
 - The Case of Green City DevelopmentPlan : Korean Experience
 - Green spatial development a vision for national territorial, regional & city development that satisfies lowcarbon, eco–friendly spatial structures with application of energy efficient and sustainable planning elements such as establishing lowcarbon transport systems, forming an energy–saving spatial structure, restoring river ecosystems, promoting green industries, etc.
 - The Revised 4th CNTP (comprehensive national territorial plans : 2011~2020)
 - Introduced Green Growth as its new vision Aims to create a global green territory that will serve as a springboard for Korea’s next leap forward.
 - Low–Carbon Green City
 - A city designed to reduce potential carbon emissions and absorb emitted carbon to actively respond to climate change issues



IV. 부록

□ 발표자료(BUILDING GREEN INFRASTRUCTURE: REALITY VS CHALLENGES)



Background: Green Spatial Development

Concept of Green City Development

✓ **Low-Carbon Green City: A city designed to reduce potential carbon emissions and absorb emitted carbon to actively respond to climate change issues**

Source: 2009 report for construction of green cities

Background: Green Spatial Development

Concept of Low-Carbon Green City

Source: 2009 report for construction of green cities

Urban Development History in Korea

Urban Development History in Korea: Overview

Government structure and Population Distribution

✓ **Government structures**

- 1st tier: 16 regional governments
- 7 metropolitan governments
- 9 provincial governments
- 2nd tier: 224 local governments
- 77 cities, 50 rural counties
- 69 city counties

✓ **Population distribution**

- Urban area: 90%
- Capital region: 45%
- 7 Metropolitan cities: 47%

Urban Development History in Korea: Urban development Policy in Korea

Urbanization path

✓ **Rapid urbanization followed by industrialization**

- 37%('60) → 90%('00)

✓ **Dominance of large cities**

- No. of million cities: 2('60) → 5('03)
- Population share: 39%('60) → 52%('03)

✓ **Spatial polarization**

- Population share of Seoul Metropolitan Region: 21%('60) → 42%('05)

Urban Development History in Korea: Urban development Policy in Korea

Legal system

Name of Law	Duration
Urban Planning Act	1962 - 2008
Housing Improvement Promotion Act	1962 - 2008
Urban Redevelopment Act	1962 - 2008
Urban Poor Resident Improvement Training Act	1962 - 2008
Urban and Residential Environment Improving Act	1962 - 2008
Urban Regeneration Promotion Act	1962 - 2008
Urban Planning Act	2008 - 2010
Housing Improvement Promotion Act	2008 - 2010
Urban Redevelopment Act	2008 - 2010
Urban Poor Resident Improvement Training Act	2008 - 2010
Urban and Residential Environment Improving Act	2008 - 2010
Urban Regeneration Promotion Act	2008 - 2010

✓ **Legal system for new development**

- Urban Planning Act
- Local Planning Act
- Land Readjustment Act
- Housing Construction Promotion Act
- **Planning Act for Developed Provision Act**
- Revision of National Land Use and Management Act
- Urban Development Act
- National Land Use & Planning Act

✓ **Legal system for re-development**

- Urban Planning Act
- Housing Improvement Promotion Act
- Urban Redevelopment Act
- Urban Poor Resident Improvement Training Act
- Urban and Residential Environment Improving Act
- Urban Regeneration Promotion Act

Urban Development History in Korea: History of Korea Traditional New Town

1962: Ulsan

1970: Pohang, Daegu

1980: Changwon, Gimhae, Yeosu, Gumi

1990: Seogwipo, Gwangju

2000: Incheon, Daejeon, Suwon, Gyeongju

2010: The new type (Bundang, Jwi, Pyeongtaek, Gyeongju, Jeonju), Paju, Gyeongju, Green City (Low-Carbon) Gyeongju, Gyeongju

Urban Development History in Korea: History of Korea Traditional New Town

Urban Development History in Korea : Green City Pilot Project by Central Government

9 Green City Pilot Projects

✓ **9 Green City Pilot Projects commissioned by Central Government**

- Ministry of Environment**
3 projects
Pilot City for Climate Change, Green City, Eco City
- Ministry of Land, Transportation and Maritime Affairs**
4 projects
Eco Rich City, Low-Carbon Green City Guideline, Sustainable New Town Planning Guideline, Innovative City
- Ministry of Planning and Economic Affairs**
1 project
Low-Carbon Green Community
- Ministry of Science and ICT**
1 project
Environment-Ecology Planning

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Urban Development History in Korea : Green City Pilot Project by Central Government

Category	Project Title	Goal	Key Milestones	Authority
CITY LEVEL	Seoul City	Realize and Promote a Low-Carbon Green Growth Model City where Environment and Economy Coexist and Cooperate	1 key construction facility Energy, Consulting, Clean, Recycle, Industry, Comfort, Humanism	President's Committee on Green Growth
	Pilot City Development for Climate Change	Encourage awareness of and participation in measures to cope with climate change and reduce carbon emissions	1040 WCU, main theme and pilot projects with central government by each municipality are selected	Dept. of Climate Change in Ministry of Environment
	Green City	Realize Environment Management Capability of Metropolitan and Decentralized Administration	Provide incentives for municipalities selected as green city (price policy, environmental budget)	Dept. of Participatory Cooperation in Ministry of Environment
	Blue City	Promoting regional development focusing on backward areas while maintaining environmental preservation policies	Target backward areas (10 municipalities, 100000 people) with high interest in eco-city projects or participatory creation along riverside	Dept. of Nature Policy in Ministry of Environment

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Urban Development History in Korea : Green City Pilot Project by Central Government

Category	Project Title	Goal	Key Milestones	Authority
Community	Low-Carbon Green Community	Reduce the nonrenewable energy usage (water, heating, power, etc.) and improve energy efficiency. Realize energy saving and energy efficiency projects	Set up target energy savings for pilot projects using the nonrenewable resource, locally made resources and available renewable energy information, and prepare plans for effective operation and maintenance expenses	MPAC, MOEF, MOUW, KEM, MOE, Korea Power Exchange, etc.
	Low-Carbon Green City Sustainable	Overcome risks of resource and environment challenged by climate change and create low-carbon green growth opportunities	Collect up-to-date information for data-based investigation and forecast on GHG emission and reduction target	Dept. of Urban Policy, MTR
Sustainable New Town Planning	Sustainable New Town Planning Sustainable	Create healthy environment and builded knowledge in harmony with economic and social developments to achieve sustainable green growth	Create healthy environment and builded knowledge with technical economic and social development to achieve sustainable green growth	Dept. of Urban Development, MTR
	Environment Building Planning	Reduce risk of flood and carbon green growth resource sustainability and increase local capabilities to cope with global warming	Collect and use regional information on environment planning and urban environment cooperation planning, which are prepared before land use planning	Green Landmark Service in LH Corporation
Other	Innovative City	Reduce low-carbon green city through low-carbon sustainable and green jobs	Prepare growth plans to identify the 10 innovated cities as green growth hubs through resident experiential strategies including renewable energy	Dept. of Urban Development, MTR

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Best Practice Cases

- III-1. Gangneung Green City Development
- III-2. Geomdan New Town Development
- III-3. Magok Urban Development, Seoul

III-1. Gangneung Green City, National Pilot Project

Best Practice Cases : Gangneung Green City Development Project

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Best Practice Cases : Gangneung Green City Development Project

2018 PYEONGCHANG Winter Olympic Place (Gangneung - Coastal Cluster)

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Best Practice Cases : Gangneung Green City Development Project

✓ **The first pilot project for Low-Carbon Green City in Gangneung city (18,326㎡) started from July, 2009.**

- The project aims to create a globalized city to lead low-carbon green growth
- Until 2020, 26 sub-projects will be carried out

- Phase 1 (2009)**
 - Green Renaissance Landmark Project, Gyeongpo Lake Wetland Restoration Project, Green Path Project, Project for 10 Bicycle Cities, etc.
- Phase 2 (2010)**
 - Home Stream Project for Gyeongpo Stream, Healing Forest Project, Green Forest Park, LED Security Lighting Project, Green City New/Recyclable Energy Project, ZED Village Project, etc.
- Phase 3 (2010)**
 - Green Technology Theme Park Development, U-City Energy Generation Facility using Waste Resources, etc.

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Best Practice Cases : Geordan New Town Development Plan

Geordan Newtown

- Location : Incheon Metropolitan City, near Seoul
- Area: Approx. 10.7 km² (4.14 miles)
- Population: 230,000 (82,000 households / 127 persons per ha)
- Project Duration: Feb. 2009 - Dec. 2014
- Promoter: Incheon City Government, Incheon Urban Development Corporation, Korea Land & Housing Corporation
- Projected Cost: Approx. 108000000 (14 billion USD)

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Best Practice Cases : Geordan New Town Development Plan

Geordan Newtown

Energy-Saving Planning

- 10 minute distance from subway station to transportation centers
- Pedestrian network for reducing energy consumption

Category	Methods	Techniques	Applied Techniques
Urban Structure	Formalism	Compact City Public Transportation	Station-centric Allocation (TOO, BOD, POD)
	Pedestrian network Environment	Pedestrian network Separate pedestrian road Traffic Calming	In-site pedestrian/bicycle road network Parking lots on site (Stages) Traffic Calming
Site Planning	Building Allocation	Placing living divisions & wind paths	Construction considering buildings facing directions
	Microclimate	Green spaces & water places	Green spaces & water place
Buildings & Facilities	Renewable Energy Use	Buildings with renewable energy system	Green energy from Transit Mall
	Water & Ventilation	Grey water & ventilation	Building system recycling grey water function

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Best Practice Cases : Geordan New Town Development Plan

Geordan Newtown

Urban Structure #1

- Public transportation (subway) centric system (TOO)
- All travels in the town are accessible in 10 minutes by foot (POD) or by bike (BOD)
- First urban planning based on eco-friendly transportation system

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Best Practice Cases : Geordan New Town Development Plan

Geordan Newtown

Urban Structure #2

- **Station-centric Allocation**
- 3 living unit areas divided by subway station
- Compact development on pedestrian network centered on subway station
- **Transportation Networks**
- 10 minute distance to subway station by foot (POD) or by bicycle (BOD)
- Circular pedestrian/bicycle network for interconnecting living unit areas

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Best Practice Cases : Geordan New Town Development Plan

Geordan Newtown

Site Planning

- **Zero Energy Town**
- Aims to control and restrict the use of traditional (fossil) energy within town
- Target population: 3,000 households
- Facilities: Houses, Elementary school, community facilities
- Strategies
 - pedestrian / bicycle network allowing 5 minute access to anywhere incl. subway and bus station
 - Traffic pathing to restrict internal car traffic
 - Buildings with renewable energy system

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Best Practice Cases : Geordan New Town Development Plan

Geordan Newtown

Site Planning

- Traffic Calming System to restricting car traffic within site
- Parking lots on basement or site fringes to separate cars from pedestrians
- Internal roads fit to walkers, perambulators or wheelchairs

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Best Practice Cases : Geordan New Town Development Plan

Geordan Newtown

Site Planning

- Allocate buildings and control heights and spaces, considering seasonal shadows
- Buildings with low floor on southern sections and partially on northern
- Design all buildings facing south direction but in diverse manner

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Best Practice Cases : Geordan New Town Development Plan

Geordan Newtown

Building Facilities

- Equip buildings with renewable or near energy system
- Requires 25-30m² areas per household considering 250-300 kWh electric consumption per household
- Pursues low floor houses for solar systems, also utilizes wind and geothermal energy and waste heat
- Energy systems focused on the collective consumption
- Design residential site with Energy saving facilities
 - Connects green spaces and water places to create microclimate
 - Recycling system and graywater system

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Best Practice Cases : Geosdan New Town Development Plan

Geosdan Newtown

✓ **Buildings & Facilities**

- Transit Mall
- Eco-friendly vehicles' intersection
- Complex use: commercial & business district
- Needs diversified activities by connecting key in-site facilities
- New and renewable energy system on buildings



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III-3. Magok District Urban Development, Seoul

KCI/IBS

Best Practice Cases : Magok Urban Development Plan, Seoul

Magok District

- ◊ Located at outskirts of Seoul
- ◊ Area: approx. 3.3 million m²
- ◊ Aims to develop eco-friendly high-tech industry complex accommodating harmonized land use
- ◊ Strategic:
 - Functions as urban center in west-southern Seoul
 - Contributes globalization of Seoul city
 - Provides high-end culture & eco-friendly living conditions



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Best Practice Cases : Magok Urban Development Plan, Seoul

Magok District

✓ **Renewable Energy Consumption**

- Accommodates renewable world-largest energy provision system using sewage water
- World largest fuel-oil generator(10MW) to digest 10% energy consumption in town

Heating System Using Sewage Water



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Best Practice Cases : Magok Urban Development Plan, Seoul

Magok District

✓ **Buildings high-efficient energy consumption**

- Apartment houses with highest energy efficiency (approx. 25% energy saving)
- Other buildings with 81 EPC* (approx. 25% energy saving)

* EPC Energy Performance Index



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Best Practice Cases : Magok Urban Development Plan, Seoul

Magok District

✓ **Waterfronts**

- Constructing world class waterfronts thru Int'l competition for planning & design ideas
- Link with Hangeo Renaissance strategies
- Mitigating Urban Heat Island



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Best Practice Cases : Magok Urban Development Plan, Seoul

Magok District

✓ **Efficient Water Consumption**

- Recycling water from Han River
- Rainwater Catching & natural recycling
- Treated water from Seomun Water Recycling Center
- Prevention of drought & urban heat island by connecting streams of Han River & circulating water
- Expecting 3% to 4% temperature reduction




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Best Practice Cases : Magok Urban Development Plan, Seoul

Magok District

✓ **Green Technology Cluster**

- An industrial complex with R&D complex (740,250 m²)
- Accommodates three potential techs: GT(36.4%), IT(33.9%), BT(26.7%)
 - GT: renewable/unused energy businesses
 - IT: IT service businesses
 - BT: bio-chemical & bio science businesses



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Guideline of Green City Development Plan : Magok Urban Development Plan, Seoul

Magok District

Eco-friendly Transportation (1)

- Walkability**
 - 10 minute walks to all subway stations of three subway lines
 - Pedestrian network connecting every place
 - Pedestrian overpasses
- Urban development focused on public transportation**
 - Land use mix for public transportation use & pedestrian-friendly environment
 - Transit system connecting subway, subway Airport Railway, Bus stops
 - 100% connecting Magok's subway station (Line 4) with Magok Link station
- Underground parking spaces**
 - Developing underground parking spaces by block units & green spaces on the ground



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Guideline of Green City Development Plan : Magok Urban Development Plan, Seoul

Magok District

Eco-friendly Transportation (2)

- Bicycle-friendly environment**
 - Constructing bike network connecting every place within the city and extending to suburbs of each floor
 - Expanding facilities including rent & repair shops for better convenience
- Transit Mall**
 - providing vehicle pedestrian environment & extending public transportation use by linking private car access
 - Approaches should be made by administration or regulation rather than by urban planning & design practices



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Guideline of Green City Development Plan : Magok Urban Development Plan, Seoul

Magok District

Green Corridors

- Culture corridor attracting citizens visits
- Eco corridor providing ecological experiences



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Guideline of Green City Development Plan



Guideline of Green City Development Plan

"Low carbon Green City = Low carbon + Green City"

Green Independent	Use of renewable energy Expansion of carbon sinks Carbon disposing technology
Green Environment	Use of environment-friendly low carbon lands, Green transportation Virtuous cycle of water and resources
Green Society	Environmental education Activation of eco community
Green Economy	Use of local green resource

making together a happy green base
Low carbon Green City

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Guideline of Green City Development Plan

Structure of Guideline

Category	Concept	Objective
Land Use / Spatial Structure	Energy efficient urban structure through establishing facilities and promoting compact developments and land use	Compressed Spatial Structure (Compact City) Mixed Use Planning Plan for Self-sufficient Facility & Short Journey-to-Work Distance
Green Transportation	Transportation system to reduce CO2 emission through minimizing use of carbon fuels while promoting walk, bicycle and other green transportation	Development of Low Carbon Transportation System Transportation Contributed Development (TCD) Public Transportation Access System Car Sharing System Bicycle Network, Bicycle Road Car Free Zone
Green Energy	Minimizing carbon fuel use while promoting recyclable energy (solar power/thermal, geothermal, bioenergy) and new energy fuel (cell, hydrogen, etc.)	Construction of Waste Recycling System CLMARTOP and Heat Environment Planning Creation of Heat Island Prevention Zone Network for Wind Ventilation Path Rainwater Utilization System (Decentralized Rainwater Management)
Green Building	Zero-net or close-to-zero CO2 emission by high-efficient insulation, materials, natural ventilation and renewable energy utilization	
Green Industry	Promotion of diverse, emerging carbon-free industries from eco-friendly, new technology to green tourism	

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Guideline of Green City Development Plan

1) Land Use - Spatial structure

Concept

Energy efficient urban structure through establishing facilities and promoting compact developments and land use

Objectives

1. Converting structure from car-oriented to transit-oriented
2. Minimizing commuting distance through promoting job-housing proximity
3. Minimizing green distance through mixed use (residential, commercial and school)
4. Improving pedestrian environment through pedestrian and bicycle network
5. Efficient urban management system based on walkability
6. Promoting urban heat island phenomenon through expanding city-wide paths
7. Building urban absorption capabilities through expanding green space

Case

Principles Project in China the first green project commissioned jointly by China and England
Gallagher Residential Development in Germany and Master City in USA



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Guideline of Green City Development Plan

Compressed Spatial structure (Compact City)

Concept

Place with space is suitable by allowing high density development in the central area and create sustainable city by providing the environment

Objectives

1. Compact development in the central area and preserve open space in the suburban areas
2. Place considering landscape
3. Efficient and creative land use in the central area

Structure

Compressed development in the central area and preserve open space in the suburban areas

1. Increase land efficiency by applying mixed use development in the central area and prevent low density spread by limiting compressed development which will allow self-sufficiency
2. Encourage to apply over 40% of floor area ratio of high density mixed use development near subway, light railway and BRT
3. Provide 20% of area with green space, and if the area presents similar density, allow 40% of the area to be green by allowing compactly structure
4. Prevent from large slums to be developed in the green spaces of suburban area

Place considering landscape

1. Green spaces and environment-friendly city design & required in the office, since environmental issues such as noise, vibration, pollution, sunlight, security are expected to be caused by high-density development

Efficient and creative land use in the central area

1. Avoid corner angle of high-density development and apply creative spatial design in the office



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Objective of Green City Development Plan

Mixed Use Planning

Concept

- By locating the stores, business, residential buildings, public facilities together, it will allow less amount of trips

Directions

- Multi-purpose planning in the downtown areas and transportation facilities
- Locate building clusters horizontally with multi-purpose land use
- Application of special zoning

Methods

- Multi-purpose planning in the downtown areas and transportation facilities
- Choose mixed use plans near facilities to downtown areas and community areas, and locate stores, commercial areas, residential areas, and public facilities appropriately within that cluster areas
- Locate building clusters horizontally in a way to allow short journey to work and recreational trips through utilization of category line along streets to avoid department stores and large retailers from sites leaving the residential nature
- Encourage people to reside in downtown areas and enjoy special zoning to allow multi-purpose usage of the land

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Objective of Green City Development Plan

Plan for Self-sufficient Facility & Short Journey-to-Work Distance

Concept

- Reduce home expenditures by securing a self-sufficient facility and provide short journey to work distance

Directions

- Encourage directly self-sufficient facility
- Maintain existing industry
- Provide short journey to work distance

Methods

- Regarding the developing city's function and character, self-sufficient style such as facility intensity type, knowledge based type or business intensity type is selected, and plan for city so that it coincide with the existing city
- 30-50% of the area should be developed into self-sufficient facilities
- Secure some industrial land nearby where it can be re-used, to maintain the existing industry
- Plan for the retention of facilities, in order to maintain and continuously run the industry
- Take benefits of existing facilities, and locate multi-tenants in joint-tenants
- Encourage regions and locate business buildings within that areas so that it close to public transportation systems

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Objective of Green City Development Plan

2) Green Transportation

Concept

- Transportation system to reduce CO2 emission through minimizing use of carbon fuels while promoting walk, bicycle and other green transportation

Directions

- Covering traditional transportation network to green transportation network that is free from harmful gas and greenhouse gas carbon emission
- Revitalizing public transportation network
- Increasing accessibility to public transportation network
- Wider policies for user oriented, sustainable public transportation network
- Introducing new transportation plans and strategies for right time
- Reinforcing transportation network plan to consider future changes and expansion
- Standardizing emergency plans to consider emergency vehicle network operation

Cases

- Carshare traffic reduction plans, Germany and Münster City, Ltd.
- Car share program in Seoul's residential district in England

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Objective of Green City Development Plan

Development of Low-Carbon Transportation System

Concept

- Along with current transportation systems such as light railway train and bus system, the new types of low-carbon transportation systems such as bicycle share and car share, electric bikes are being developed

Directions

- Introduction of new types of transportation systems
- New types of transportation - Green Car

Methods

- Introducing of new types of transportation systems
- Energy saving transportation systems such as electric train, bicycle share, BRT, electric bicycle are being developed, regarding the size and location of the cities
- Apply BRT system where population is less than 100,000
- Apply new types of transportation systems such as light railway train and bicycle share where population is approximately 300,000
- Consider applying water taxis in other types of new transportation system where sea and lake is present near large cities and areas
- Consider applying green cars, such as low speed electric cars and electric bicycle
- Consider green car share use
- Public car sharing is being developed in Paris

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Objective of Green City Development Plan

Transportation Centralized Development (TOD)

Concept

- Characterized concentration mode of transportation systems to complement the facilities of the community
- Land use planning to provide the usage of public transportation and walking

Directions

- Land use planning and development centralized in transportation stations

Methods

- Near public transportation transfer stations
- Central commercial area within 500-800m
- Multifunction housing and residential buildings within 800m
- Residential area within 1000m
- Provide nearby areas and pleasant and convenient transfer facilities near the public transportation stations
- Plan the city so that it provides neighborhood commercial and regional service facilities and include large retail stores, medical care, and other service facilities
- Locate high-density apartment buildings and multi-family houses, and enhance the accessibility in the public transportation stations by applying vertical linkage design within 800m
- Provide convenient parking for passengers and bicycle lanes to the stations and reduce automobile in areas where it is not really accessible by walking

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Objective of Green City Development Plan

Public Transportation Access System

Concept

- Reduce the usage of personal vehicles and increase the usage of public transportation and walking

Directions

- Public transportation access by walking
- Connection between bicycle and public transportation

Methods

- Locate the subway and BRT stations within the 10-minute walking distance approximately 500-800m
- Complete road conditions, surrounding land uses, and number of passengers when loading the bus station, and locate the stations with the walking distance of 500m from the residential communities
- Optimize between the bus stations within the 500-800m for the highway buses and 300-600m for the local bus routes
- Provide convenient bicycle lanes and parking for passengers to allow easy access in the public transportation stations
- Provide bicycle stations at the public transportation central areas for safe storage

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Objective of Green City Development Plan

Public Transportation Transfer System

Concept

- Provide multi-functional systems at the transfer stations for the public transportation users

Directions

- Provide high technology city information and intelligent transportation system
- Connect public transportation systems by providing convenient transfer services

Methods

- Provide high technology city information and intelligent transportation system
- Locate transfer facilities where subway, BRT, and other transportation stations are centrally located
- Provide weather information, time table, route map, transfer points, transfer methods, fees, parking information, emergency information, etc. for the passengers
- Provide the passengers with useful facilities such as real time bus and train information board, sign boards, BRT information (BIA), internet cafes, etc. in order to reduce bus time and assist the passengers' search for information
- Minimize the distance between the transportation systems and provide easy passage route to reduce search time of the passengers

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Objective of Green City Development Plan

Car Sharing System

Concept

- Share the ownership of a vehicle and use it whenever they need it

Directions

- Complete application of car sharing system all throughout the country after testing out at a sample community

Methods

- Car sharing system
 - Complete operating by each community after testing the condition of community sharing and joint handling
 - Management will be operated by the community official or volunteer
 - It can be 1 community with 1000 families
- Car sharing management plan
 - It will be applied to residents of the rental houses and the fees of operating the vehicle will be included in the rent fee
 - The usage shall be supported after testing out its efficiency at the sample community

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Guidelines of Green City Development Plan

Bicycle Network

Concept

- To solve urban and environmental problems, environment-friendly bicycle-orientated green transportation system is being developed.

Directions

- Facilitate bicycle network
- Connect bicycle with public transportation
- Designate bicycle zone

Methods

Establish bicycle network

- Verify the usage of the site by considering the establishment of bicycle network in metropolitan areas and plan to provide close connection with the sites.
- Encourage establishing bicycle-orientated meeting sites, traffic lights, sign boards, etc.

Connect bicycle with public transportation

- Install bicycle racks and apply other safety measures at bicycle parking facilities to avoid fire risks.
- Support installation of information center, bike repair shop, and rental shop near the transportation-orientated areas.

Designate bicycle zone

- Consider using the bicycle to commute to work and school.
- Provide convenient facilities for the bike users.
- Establish network by developing the network and green way.



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Guidelines of Green City Development Plan

Bicycle Road

Concept

- Allow convenient and safe use of bicycle, and ensure safety of the pedestrians and vehicle users.

Directions

- Provide safety procedures for each space type, such as the only lane, bike and pedestrian road, bike and car road.

Methods

Only one lane (200km/h)

- Recommend establishing the only lanes equipped by barriers or bollards for safety where there is large number of vehicles.
- Recommend the distance to be 2m wide and speed limit of 20km/h.

Bike and pedestrian road (200km/h)

- Need enough space for the bike and pedestrians to proceed.
- Consider the road at least 2.5m wide, preferably 3.5m width for the bike lane, and 1.2m width for the sidewalk.
- For safety, eliminate the area of the pavement where accidents occur (road).

Bike and car road (200km/h)

- It is need to separate the bike lane from the road if there is low traffic and it is a one-way road, but recommend installing the 1.5m sign.



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Guidelines of Green City Development Plan

Car Free Zone

Concept

- To encourage the usage of public transportation and reduce personal vehicle uses, establish car free zones in downtown.

Directions

- Prohibit the usage of fuel using vehicles
- Encourage usage of environment-friendly vehicles

Methods

Declare car free zone

- Create the car free zone within 400m of the subway station.
- Prohibit underground parking lots near the car free zone for the personal vehicle users.
- Design the zone and coordinate with the bus lanes and connect with the green way.
- Introduction of the new transportation system and its connection connectivity with the bicycle and pedestrian.

Facilities

- Allow electrical cars and green cars to enter the car free zone.



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Guidelines of Green City Development Plan

Green Energy

Concept

- Minimize carbon footprint while providing recyclable energy (solar power, thermal, geothermal, seawater) and low energy (fuel cell, hydrogen, etc.)

Directions

- Establishing plans to develop renewable energy from local natural characteristics (sunshine, wind, waves)
- Using public facilities to generate renewable energy
- Using under-occupied spaces (parking, walk) for renewable energy generation
- Establishing plans to encourage use of electric/hybrid vehicles
- Providing use of energy efficiency equipment such as LED lights
- Establishing plans to reuse food waste, wood fragments, etc.

Goals

- Make the City in LNG purity rate of a status of new & recycle energy (goal 50%, success 10%, until 1%)
- Seawater (goal 10%, institutional Administrative City 10%) in Korea



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Guidelines of Green City Development Plan

Construction of Waste Recycling System

Concept

- Reduce and reuse the waste in order to prevent carbon reduction due to waste disposal

Directions

- Introduction of waste collection system
- Construct facility to handle waste (oil, fuel)
- Use an energy recovery system

Methods

Waste collection system

- Install your facilities/waste collecting facilities in green belts and parks
- In the kind of single family residential area, multi-family residential area, multi-use area, commercial facility area, the developer makes the your facilities to the east part of the road and the east of the facilities should be installed by the construction in the course of the project
- The waste collecting facility should be designed to be used as energy education center

Reusing waste (oil, fuel) and energy recovery

- Consider facilities to handle waste (oil, fuel), such as storage and used fuel
- Waste that could not be recycled should be carefully processed by separating the heat energy



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Guidelines of Green City Development Plan

CLIMATOP and Heat Environment Planning

Concept

- Obtain the best effect by preventing natural resources such as green belts, streams, and lakes, and managing the environment

Directions

- Prevent and expand the Cool Spot
- Create the climate map by applying the CLIMATOP and heat environment

Methods

Prevent and expand the Cool Spot

- Prevent large green belts, rivers, lake, streams, and lakes
- Expand Cool Spot by preserving green belts and wetlands
- Prevent the wet path when building the buildings and green areas

Create the climate map by applying the CLIMATOP and heat environment

- Produce best climate conditions such as temperature, humidity, wind direction, wind speed, and so on by analyzing the climate environment
- Analyze and predict the heat environment affected by development actions through thermal island effect
- Create the climate map by analyzing climate environment, climate prediction, climate vegetation, heat environment, and environment, etc. and set up to planning



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Guidelines of Green City Development Plan

Creation of Heat Island Prevention Zone

Concept

- Contribute to controlling the present urban environment by preventing the temperature rise caused by artificial grounds and buildings of green belts

Directions

- Alleviate the heat island effect by designating 'Heat Island Prevention Zone', whose management is needed such as high density commercial and business areas.

Methods

Designate the Heat Island Prevention Zone where heat management is needed by considering the analysis of the CLIMATOP

Apply green belt and elevated commercial, business, and multi-use area (apartment) areas where heat management is needed

When designating the Heat Island Prevention Zone, select 50% of green rooftop and environment-friendly outdoor parking lot



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Guidelines of Green City Development Plan

Network for Wind Ventilation Path

Concept

- Transfer fresh air created by abundant vegetation to the city through the wind path and make the city environment pleasant

Directions

- Prevent and create an 'air'
- Transfer fresh air to the urban area
- Location of buildings considering the wind path

Methods

Prevent and create an 'air'

- The air barrier (between the trees, trees and other vegetation) that create fresh air and it needs to be prevented when establishing a development plan
- The air areas near the target location should be preserved and to develop actions should be allowed
- Create the artificial air barrier if there is no natural air barrier existing

Transfer fresh air to the urban area

- Locate the buildings and communities considering the wind direction, and connect with the parks & green belts
- Secure at least 5m distance between the buildings where the wind path flows through

Location of buildings considering the wind path

- Avoid building the buildings across and blocking the main path of the corridor and air areas
- Prohibit construction of the buildings at the air areas, but if necessary, keep it as low-density and low floor 2 stories high



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Guideline of Green City Development Plan

3) Rainwater Utilization System (Decentralized Rainwater Management)

Concept

- Prevention of abnormal rain fall due to climate change, low water management system is realized (prevention of decentralized rainwater management)

Objective

- Improvement of local environment and water circulation within the community
- Efficient use of rainwater in the buildings

Methods

Improvement of local environment and water circulation within the community

- Install the permeation facility considering the regional land condition and location, and the purpose of the facility to maintain the underground water level
- Maintain the natural water flow by applying the natural drainage systems such as grass ditch, permeation ditch, water flowing green belt, and ecological pond

Efficient use of rainwater in the buildings

- Install the rainwater management system from the planning stage of the building construction, considering regional precipitation and rainwater usage conditions
- Plan to collect as much rainwater as possible from the collecting points including the roof surface
- Use the 50% rule to decide the capacity of the storage tank

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Guideline of Green City Development Plan

4) Green Building & Industry

Green Building

Concept

- Zeroed or close to zero CO2 emission by high-efficient insulation materials, natural ventilation and renewable energy adoption

Objective

- Encouraging southern facing construction for maximum use of sunshine
- Maximizing insulation efficiency by encouraging use of high-efficient insulation materials and triple window system
- Air circulation by automation of air ventilation and conditioning system
- Maximizing the efficiency of both conditioning energy by least use of water and greenhouse energy
- Selecting power using renewable energy (solar, wind, etc.)
- Promoting use of locally manufactured construction materials in reducing distribution vehicle miles
- Promoting parking in rooftop and wall parking to reduce indirect fuel emissions

Green

- Energy-efficient houses in selected residential area in England
- Zero-carbon house in England, seismic house in Japan, etc.

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Guideline of Green City Development Plan

4) Green Building & Industry

Green Industry

Concept

- Introduction of diverse emerging and/or new industries that sustainably use technology in green tourism

Objective

- Establishing resource circulation network for water and energy exchange between green growth industries
- Ensuring profitability and economic feasibility
- Establishing knowledge cluster among enterprises, universities, institutes and public organizations
- Paying as an incubator for new green industry and business
- Operating local green industries to expand as full markets
- Developing and providing green tourism products linked to local resources
- Connecting to residential sites to ensure job-housing proximity

Green

- Manufactured town, tertiary related town and established a dual economy activation system with developed carbon emission

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THANK YOU!

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