United Nations Forum
on Climate Change Mitigation,
Fuel Efficiency and
Sustainable Urban Transport

Korean Policies to Stimulate Bicycle Use for Transportation

March 17, 2010

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1 Introduction

Problems with Old Paradigm

Energy crisis & climate change
- Oil-dependent economy & transport system
- Green house gas

Auto-oriented transport system
- Congestion, air/noise pollution
- High energy consumption

Non-motorized transport as a bridging strategy towards "Low Carbon and Green Growth"

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2 Role of Cycling

What is Bicycle Transportation?

- Main Non-Motorized Transport (NMT)
- Mainly for short-trips and recreation
- “Forgotten mode” in today’s Korean transport planning

See the definition of NMT at http://www.vtpi.org/tdm/tdm25.htm

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Why Bicycle Transportation?

- Ecological impact

	Car	Car plus catalytic converter	Bus	Bicycle	Air	Train
Space consumption	100	100	10	0	1	6
Primary energy consumption	100	100	30	0	405	34
CO2	100	100	29	0	420	30
Nitrogen oxides	100	15	9	0	290	4
Hydrocarbons	100	15	8	0	140	2
CO	100	15	2	0	93	1
Total atmosphere	100	15	9	0	250	3
Risk of accidents	100	100	9	2	12	3

Source: UPI Report, Heidelberg, 1989, quoted by the German Ministry of Transport

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Why Bicycle Transportation? (contd.)

- Socio-political impact
  - Increase individual freedom of mobility & self-confidence
  - Greater autonomy & accessibility to young & elderly people

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Why Bicycle Transportation? (contd.)

- Economic benefit
  - Low purchasing and maintenance cost
  - Less cost to build infrastructure than cars
  - Low space requirement

VS.

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3 Current Status and Barriers

The GHGs Emissions Volume (Korea)

- About 1 Billion Greenhouse Gas Emissions in Transportation Sector
  - **Road (85.7 million),** Railway(2.0 million),
    Marine transportation (11.6 million), Flight (6.6 million)
  - Road (85.7 million) : Automobile (61.1 million)
    Motorcars for Business use (24.6 million)
- About 4.5 trillion won
  - **Road (3.6 trillion),** Railway(0.1 trillion),
    Marine transportation (0.5 trillion), Flight(0.3 trillion)
  - Road (3.6 trillion) : Automobile (2.6 trillion) ,
    Motorcars for business use (1.0 trillion)
- Greenhouse Gas Emissions is lower than other developed countries but increasing rate is about the double (2005) (unit : ton)
  - Korea (125.73 million), U.S.A.(1947.5 million)
    U.K (172.6 million), France (160.43 million)

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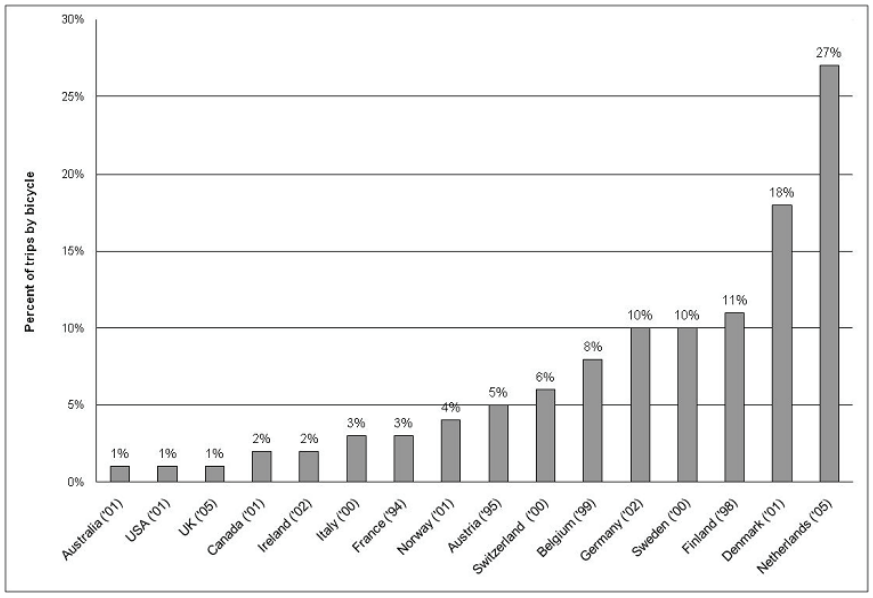
International Trend



Bicycle share of trips (%)

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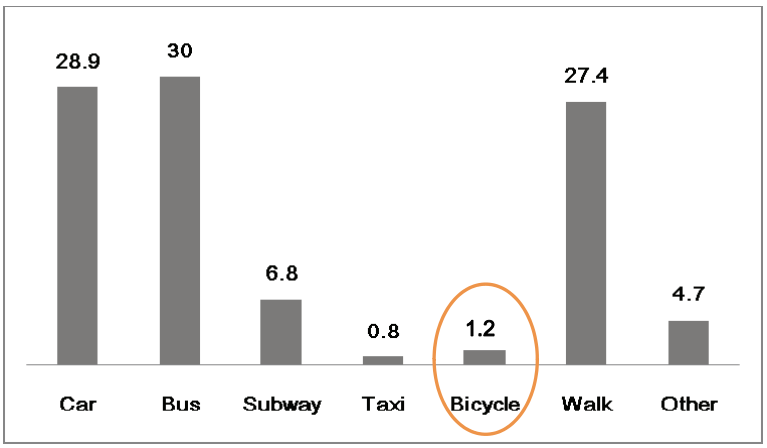
Source: data quoted from Pucher and Buehler (2008)

Current Status in Korea



Transportation Mode Share (%)

Source: data obtained from Korea National Statistical Office, 2000

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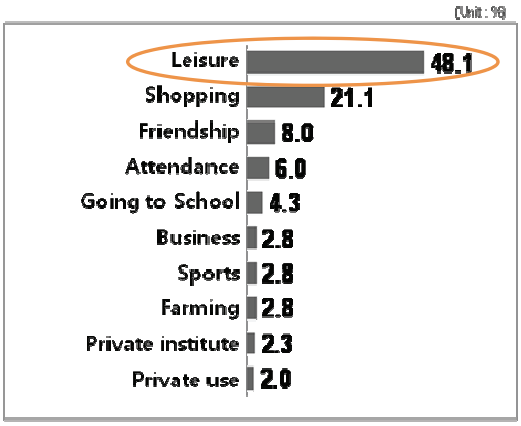
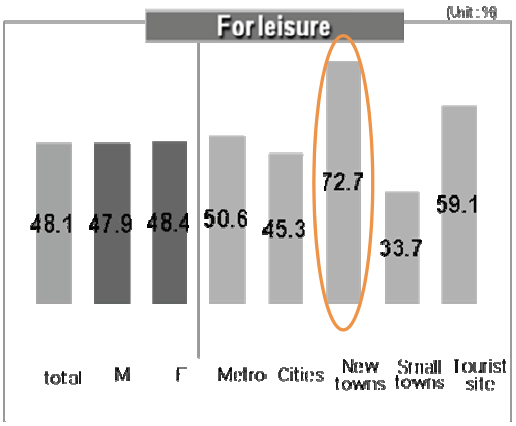
Current Status in Korea (contd.)



Purpose of cycling



Recreational cycling by region

- Half for leisure, the others for everyday activities
- About 73% using bikes for leisure in new towns

Source: Shin, Hee Cheol, Basic Plan for Implementing Bicycle Route along the Regional Road, Korean Transport Institute, 2006

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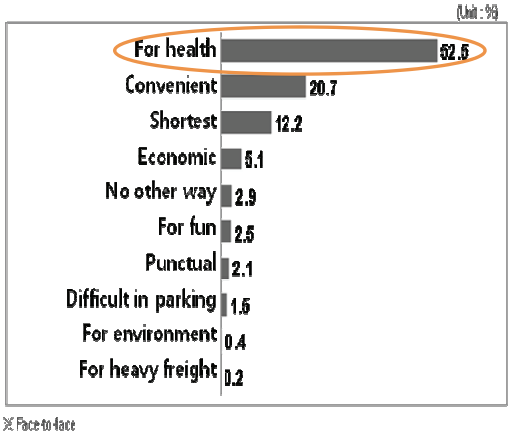
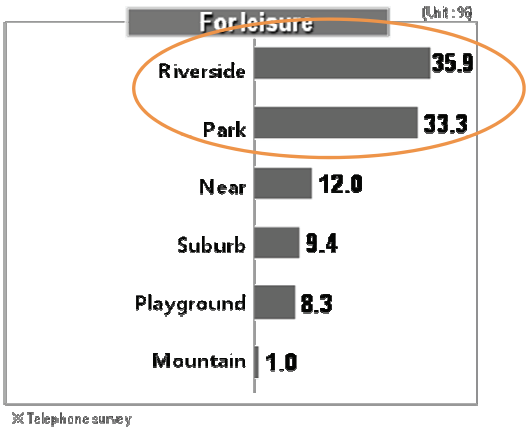
Current Status in Korea (contd.)



Reasons for cycling



Preferred location of recreational cycling

- Mostly for health, correspondent with leisure purpose
- Riverside and parks preferred location of cycling

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Source: Shin, Hee Cheol, Basic Plan for Implementing Bicycle Route along the Regional Road, Korean Transport Institute, 2006

Perceived Barriers and Attractors

Road users	Barriers for cycling	Attractors for cycling
Car drivers	· **The cycling network is incomplete** · Cannot transport heavy things · Depend on the weather · Cycling is dangerous · Badly signed cycle routes	· **Cycling is fun** · **Cycling is environment-friendly** · Cycling is healthy · You make exercise
Cyclists	· **The cycle network is incomplete** · High speed of car drivers · Lack of secure parking · Car noise and fumes	· **Cycling is fun** · **Cycling is environment-friendly** · You feel flexible and independent · Cycling are fast

- Both feels that the cycle network is incomplete
- Both thinks that cycling is fun and environment-friendly

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Source: EU research project WALCYNG, Proceedings, Velo-city '97 Barcelona 15-19 Sept 1997

Common Barriers to Cycling

- **Safety**: cyclists are vulnerable to motor vehicle traffic
- **Security**: fear of theft or damage
- **Infrastructure**: incomplete and unmanaged cycle network
- **Distance**: increased travel distance discourages cycling
- **Health**: toxic emissions from cars and buses
- **Social status**: cyclists perceived as poor people
- **Weather**: unfavorable weather conditions for cycling
- **Topology**: hilly terrain and steep roads can discourage cyclists.

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History of Korean Cycling Policy

History of Korean Cycling Policy

Formulated the campaign plan for cycle use (April 1993)

- Ministry responsible : Ministry of Home Affaires
- Origin of Ministerial Directives for development of cycle infrastructures

Promulgated the Law for Cycle Use Activating (Jan. 1995)

- Ministry responsible : Ministry of Home Affaires
- Origin of implementing ordinance and enforcement regulation

Announced national cycling use activating plan

- Ministry responsible : Ministry of Home Affaires
- 5 years plan focused on infrastructures

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History of Korean Cycling Policy

Announced the Second national plan for cycling use activating

- Ministry responsible : M. of Government Administration and Home Affaires
- Based on the assessment of 1st national plan

Some briefs of the Assessment of 1st national plan

- Modal share increased : 1.85%for 1995, 2.4% for 2002
- Total budgets used : 478 billion won (National 30%, Local 70%)
- Infrastructures : Cycling path 4,419km / Cycle parking for 190,000 cycles

Objectives of 2nd national plan

- Budgets : 500 billion won (National 40%, Local 40%, Other 20%)
- Infrastructures : Cycling path 4,000km, cycle parking for 80,000 cycles
- New : National campaign, education for safety

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History of Korean Cycling Policy

Lee Myung Bak administration announces new era

- Announced green growth (Aug. 2008)
- National Initiative plan was released (Jan. 2009)

New national plan

- Modal share target: 5% for 2012
- Total budgets: 1.2 trillion won (national only, local independently)
- Infrastructures target: Cycling path 17,000km

Other plans

- Promote bicycle industries
- Revision of laws
- National campaign, education for safety, Expo, and so on

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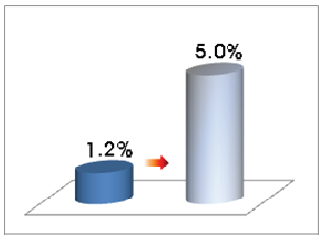
5 Comprehensive Bicycle Plan of Korea

Comprehensive Plan for Green Growth

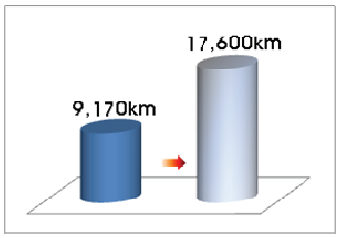
• Bicycle industry + bicycle infrastructure ⇒ Green Growth

Policy Direction

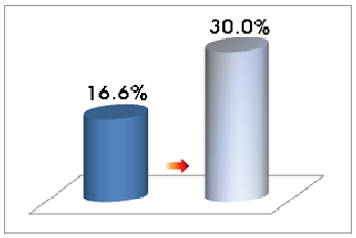
Objectives



Modal Share



Infrastructure



Ownership

Strategies

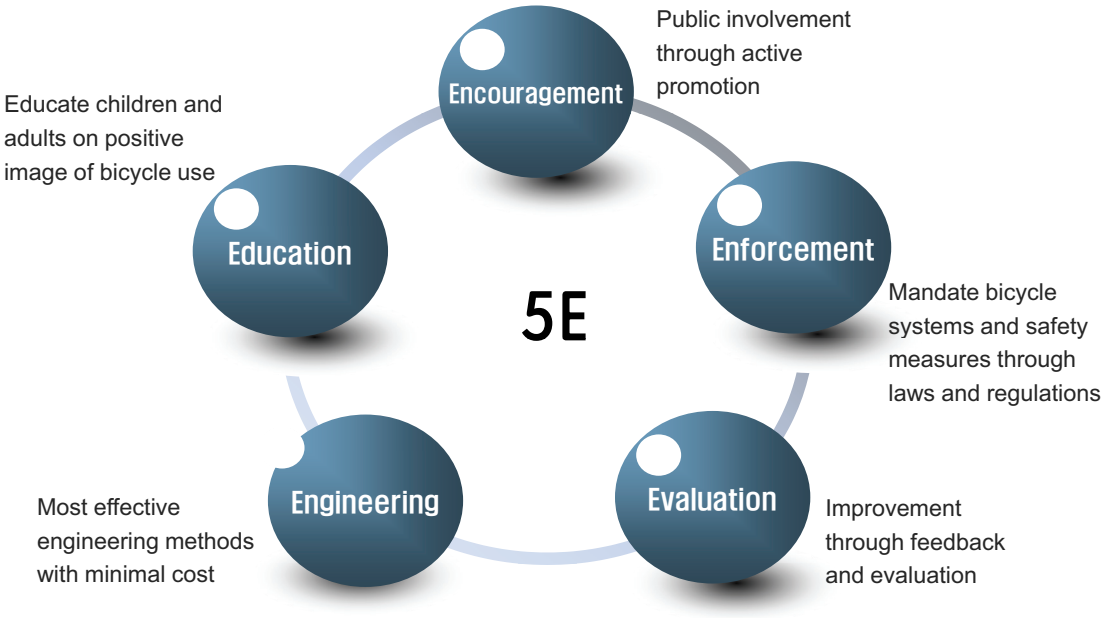
OUR FOCUS

Legal / Institutional
- Mandate facilities
- Safety and regulations
- Bicycle insurance

Infrastructure
- Bike facilities
- Utility bikeways
- National bike network

Public awareness
- Campaigns
- Education & promotion

Legal / Institutional Framework



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Institutional Support

Public Affairs	Revise Bicycle Promotion Act and improve management Establish Dept of Sustainable Transport, Bike education, and relevant organizations Provide public facilities for bike education Manage national bicycle network
Environment	Develop and promote environment-friendly bike program
Land	Improve National Transport Network Establish 'National Integrated Transport Plan'
Education	Develop target-group curriculum and materials Encourage bike commute, provide accommodations
Public Health	Research on health effects of bicycle use
Finance	Expand budget on effective bicycle policy Develop general bicycle insurance
Economic	Cultivate bicycle-related industries
Culture	Support development of general bike insurance Organize national and international events

Role of central government

Evaluation & financial support

- Establish evaluation and execution system
- Develop bicycle compatibility index
- Establish information hub (website)
- Provide national cycling policy
- Designation of responsibility
- Conflict resolution among municipalities

Role of municipality

Evaluation & execution

- Use of bicycle compatibility index
  - Update and manage index, utilize index for basic estimation and policy improvement
- Develop evaluation system: implement database
- Devise maintenance measures and conduct regular facility check-ups

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Bicycle Infrastructure

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Public Awareness

Campaigns

- Integrate national and regional bicycle festivals
- Adopt national bicycle day
- Encourage active civic engagement

Education & Promotion

- Mandate safety and maintenance education
- Establish bicycle education school
- Foster bicycle communities and clubs (on/off-line)
- Launch various events (Tour de Korea, etc.)

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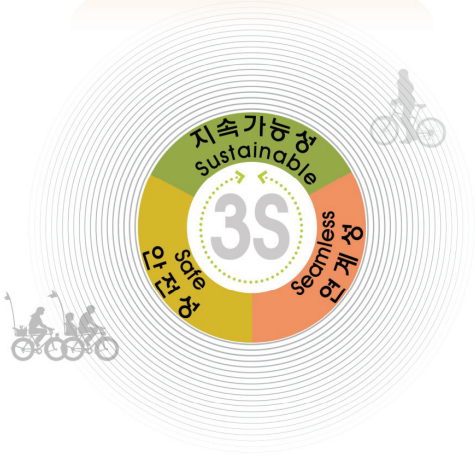
6 Bicycle Infrastructure

Overall Strategy

3S Sustainable, Safe, and Seamless Implementation

Objectives



Strategies

- Contribute to low carbon, green transportation
- Ensure safety thru physical & regulatory means
- Increase connectivity of various bicycle paths
- Incorporate regional, historical & cultural traits
- Framework for continuous implementation

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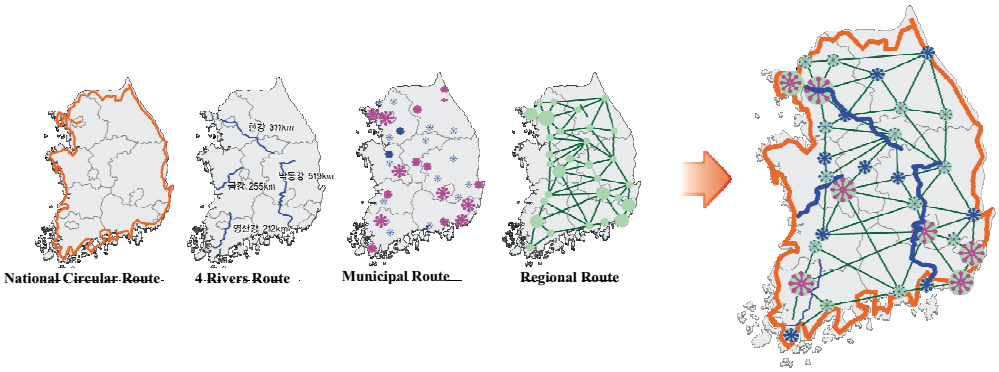
Types of Implementation

Type	Context	Responsibility	Purpose
National	Near DMZ and along coastal lines	Ministry of Public Admin	For connection and utility/leisure
4 Rivers Route	Along the 4 rivers	Ministry of Land	For connection and leisure
Regional Route	Community border	Ministry of Public Admin	For connection and leisure
Municipal Route	Urban and metropolitan areas	Municipality	Utility/leisure



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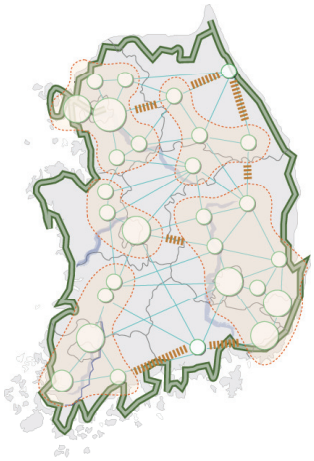
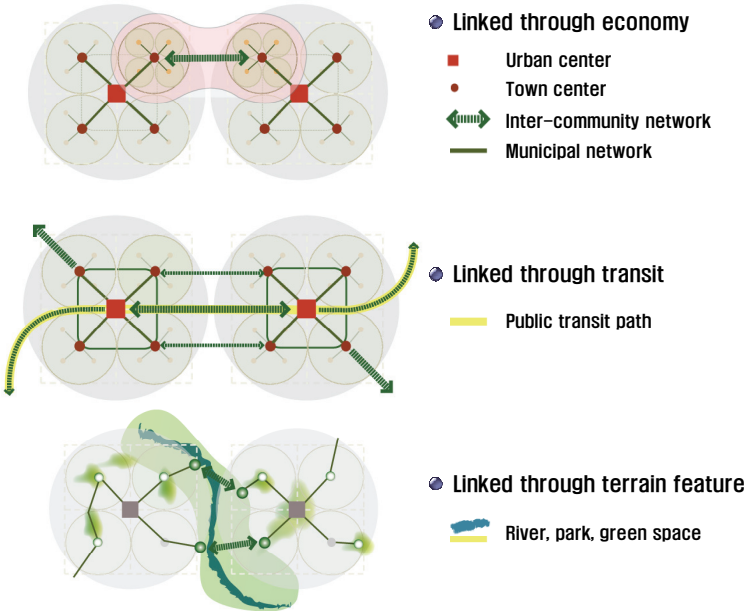
Regional Route

- Inter-community link



- Establish inter-community link through regional plan



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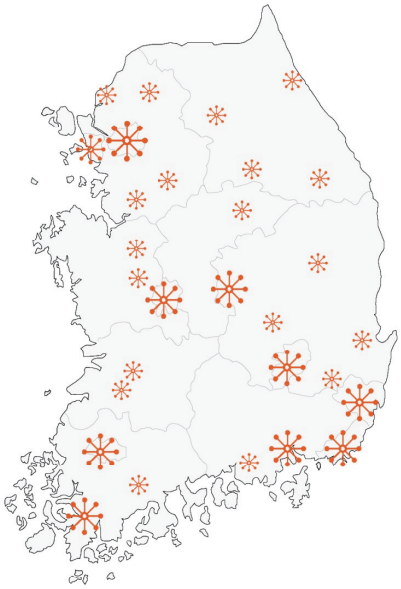
Municipal Route



- Each city responsible for construction
- Quick and easy inter-modal transport
- Road-diet and traffic calming
- Link to public transit & bike terminal
- Compact & mixed-use development

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Municipal Route (contd.)

- Examples of cycle-oriented transportation planning

- Road-diet
  (City of Incheon)

- Traffic calming
  (Insadong Street)

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Municipal Route (contd.)

- Examples of compact & cycle-friendly urban planning

- Compact and NMT-friendly development (Cheonggye Stream)

- Bicycle-friendly city (City of Changwon)

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Municipal Route (contd.)

- Examples of bicycle and transit system in urban centers

- Easy transfer to transit (Korean Railway)

- Bike terminal (City of Seoul)

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Bicycle and Transit Oriented Development (BTOD)

- Public Bike System (PBS)
  - PBS has been validated worldwide, so is popular in Korea
  - Every Korean city is trying to introduce Velib-style smart PBS
  - Central government is building standard to make adjacent PBS compatible
- AND what else?
  - Because short distance characteristics, we are focusing on transfer system to transit
  - How to increase? PBS and U-Bike System
- U-Bike System
  - Korea has well-equipped transfer system between transit
  - T-money system is a transfer system without extra charge using RFID tech
  - We want to apply T-money system to bicycle; transfer without extra charge
  - And, green mileage or eco-mileage will be applied

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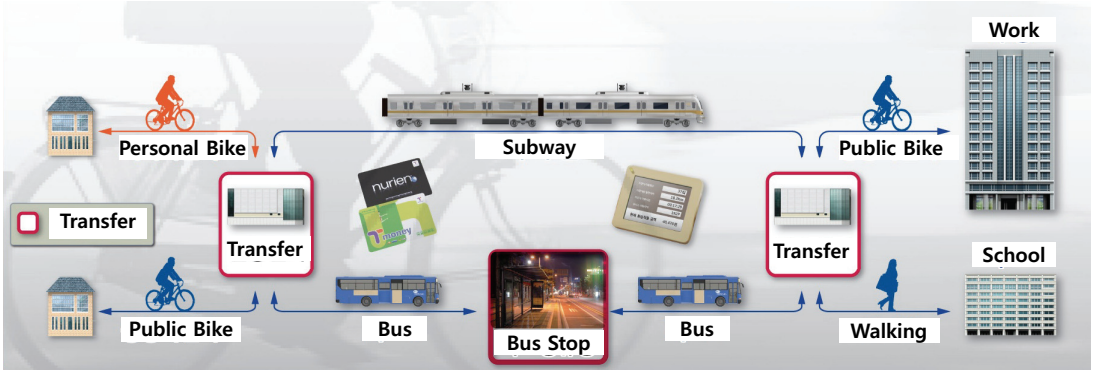
U-Bike System

U-Bike City

- Apply ubiquitous technology to link bicycle and transit system
- Select 10 cities for pilot program and focus national efforts



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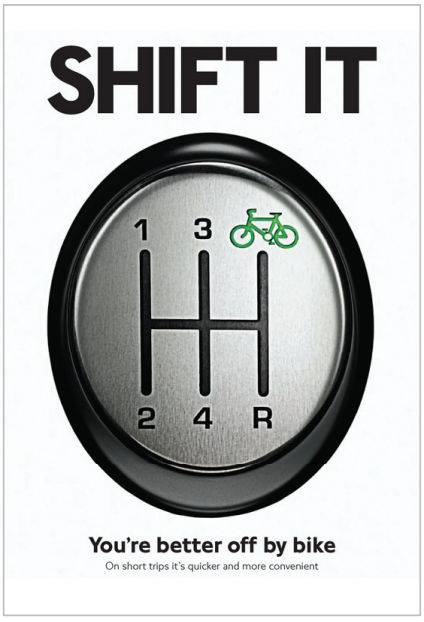
7 Conclusion

"A paradigm shift to green transportation"



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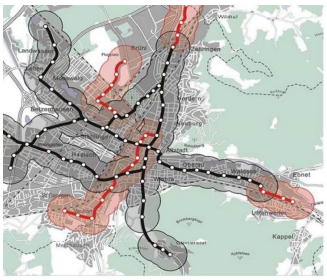
United Nations Forum on Climate Change Mitigation, Fuel Efficiency and Sustainable Urban Transport
16-17 March 2010
Seoul, Republic of Korea

COMPACT URBAN DEVELOPMENT AND REDUCTION OF MOTORIZED TRAVEL, ENERGY USE AND CO2 EMISSIONS

Policy Options for National and Local Governments

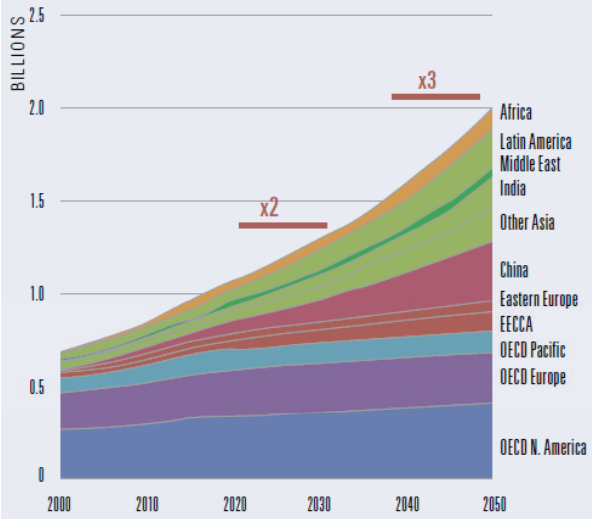
17 March 2010

Christian Schlosser, Ph.D.
UN-HABITAT, Human Settlements Financing Division
Transport and Energy Policy Section



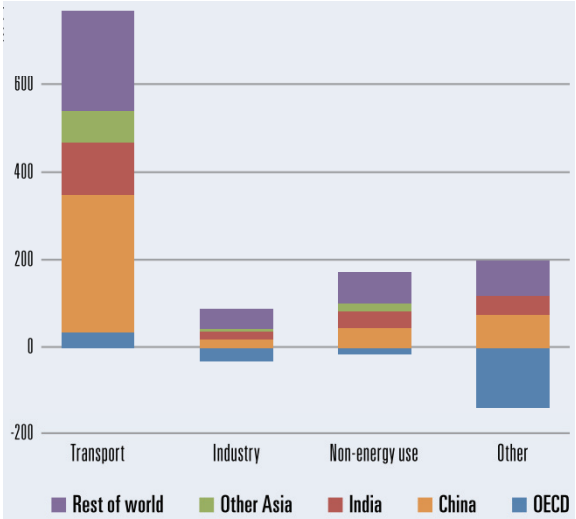
The Global Transport Challenge

Projected total stock of light-duty vehicles by region 2000-50



Source: GEF/WBCSD 2004

Projected Incremental Oil Demand by Sector 2006-30

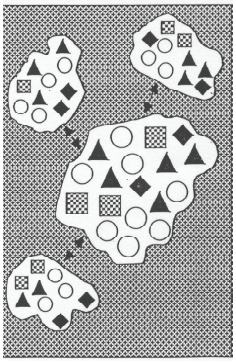


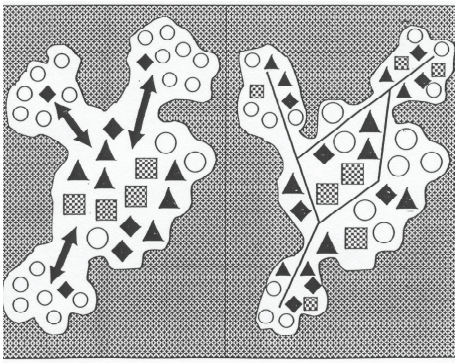
Source: GEF/IEA 2008

Defining Compact Development

Spatial development indicators: 5 "Ds":

- *Density:* of population/employment by geographic unit
- *Diversity:* mix and balance of land uses
- *Design:* neighborhood/street layout: connectivity, presence of sidewalks
- *Destination accessibility:* Ease or convenience of trip destinations from point of origin
- *Distance to transit:* Ease of access to transit from home or work (e.g. bus or rail stop within ¼ to ½ mile of trip origin)





Source: TRB Special Report 298 (US)/Cervero and Kockelman

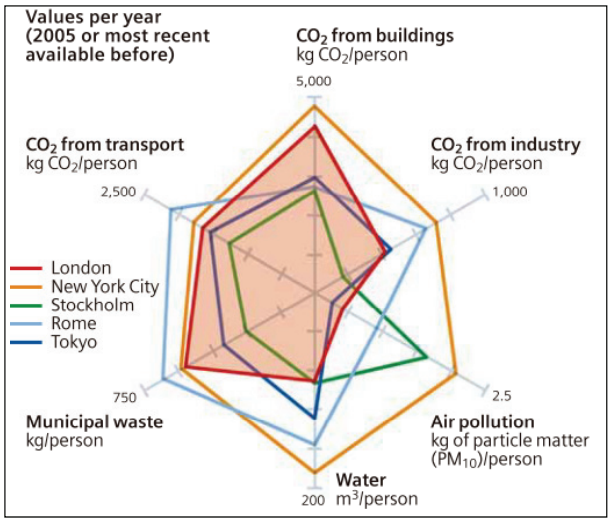
http://www.ecolup.info/

Development Patterns and Vehicle Miles Travelled

Findings of a recent 2009 US-TRB Report on "Driving and Built Environment":

Developing more compactly. i.e. at higher residential and employment densities, is likely to reduce VMT:

- doubling residential density across a metropolitan area might lower household VMT by about 5 to 12 percent,
- reductions as much as 25 percent possible if coupled with higher employment concentrations, significant public transit improvements, mixed uses, and other supportive demand management measures



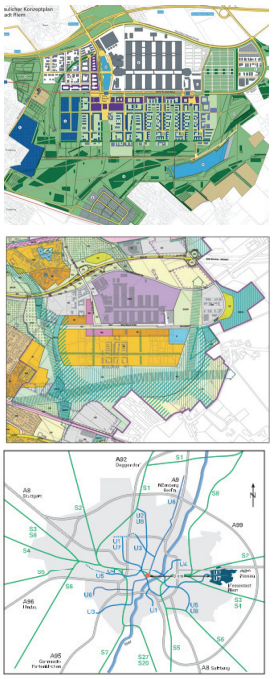
Comparison of cities' environmental footprint

Source: Siemens/McKinsey 2008

Levels of Compact Development Policies

Policies for Compact Development Patterns can be implemented at different geographical levels:

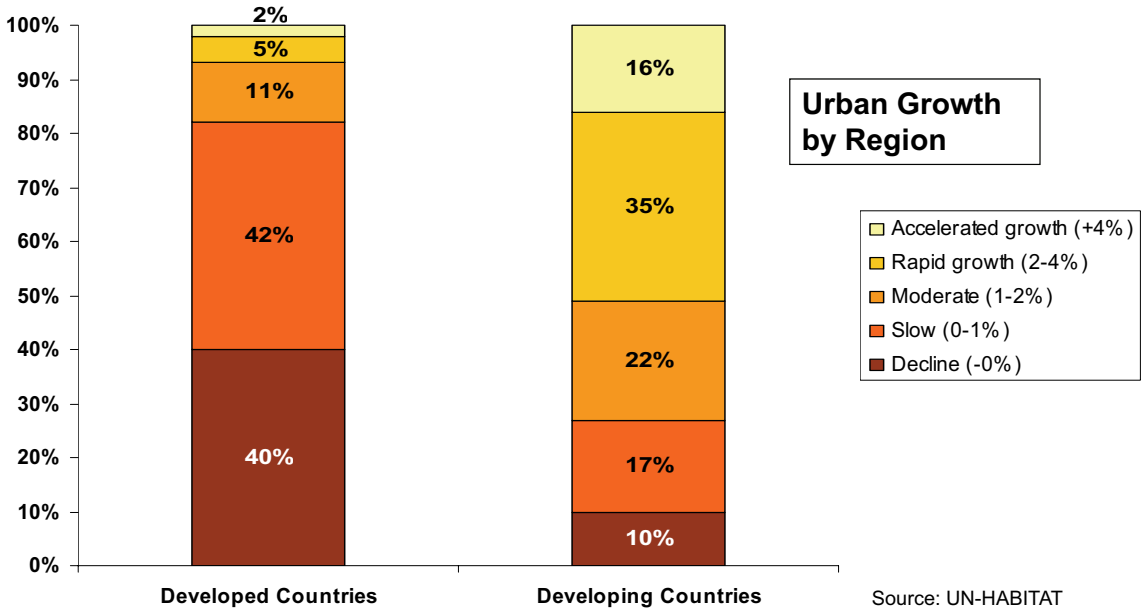
- Neighborhood: planning for density, mix of compatible uses, street design for non-motorized modes
- City: Establishing compact and viable sub-centers, planning for intermodality, compact affordable housing provision
- Urban regions: urban growth boundaries, urban renewal programmes, economic incentives/disincentives



Source: City of Munich

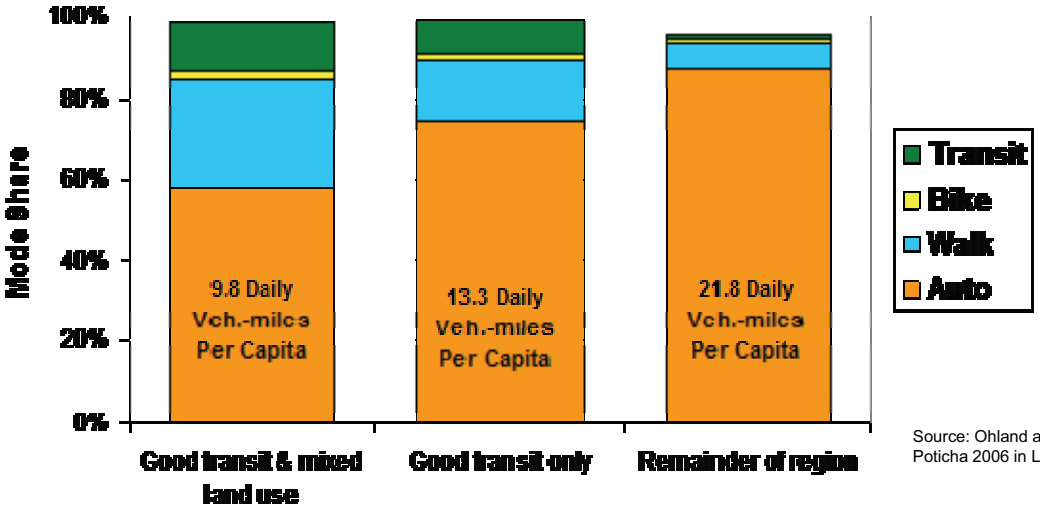
Global Variances in Urban Growth

In the North, almost half of the cities are declining
In the South, more than half of cities are growing very fast
Developing World cities grow 10 times faster



Source: UN-HABITAT

Developed Countries: Communities and Travel



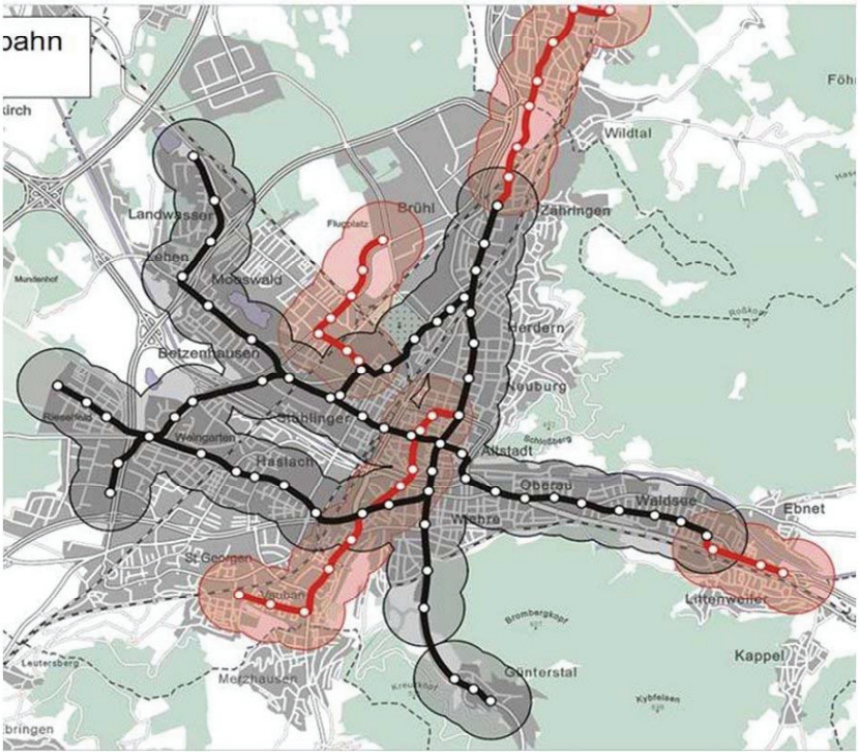
Source: Ohland and Poticha 2006 in Littman

Residents of neighborhoods with good transit service and land use mix drive about half as much, and walk, bike and use public about four times as much, as residents of conventional, automobile-dependent suburban communities

(Example from Portland, Oregon/USA)

Enabling a symbiosis of NMT and public transport

Residential areas within 300m of a light-rail stop in Freiburg/ Germany



Source: City of Freiburg, in: Pucher/ Buehler

Compact development in developing countries

Are urban slums compact neighbourhoods ?

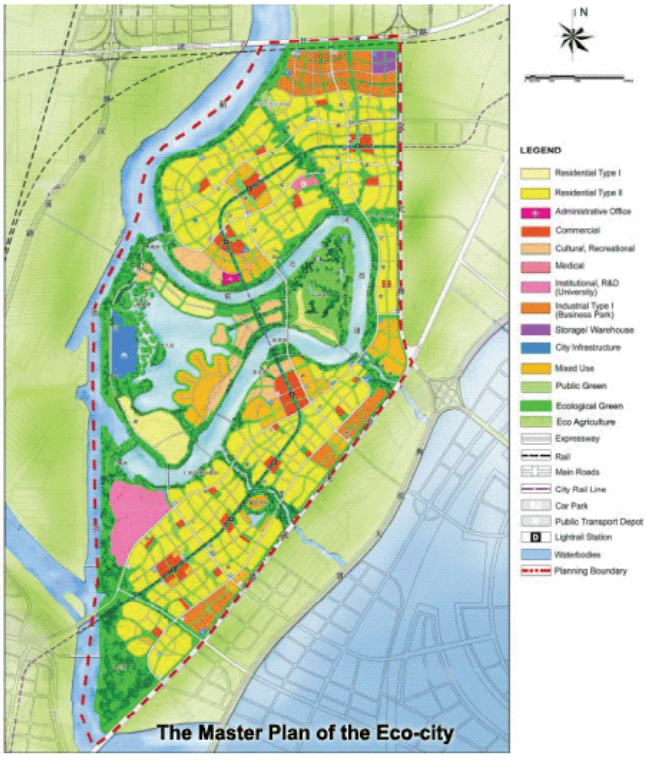
Mathare Slum, Nairobi

Source: UN-Habitat

Innovative Examples in developing countries

Master Plan of Sino-Singapore Tianjin Eco-City, China

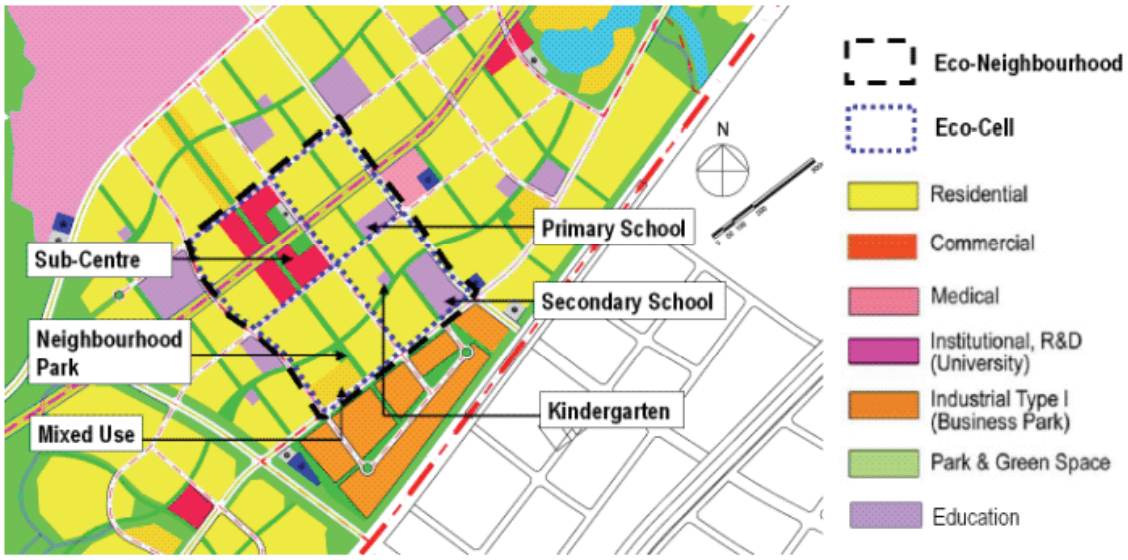
"as scaleable, practicable and replicable model for sustainable development for other cities in China and around the world"



Source: http://www.tianjinecocity.gov.sg/masterplan.htm

Compact Neighbourhoods Tianjin Eco-City, China

"Eco-Cell" concept: integrating different land uses within a modular 400m by 400m grid, basis for neighbourhoods, districts, and urban centres



An illustration of the Eco-cell

Source: http://www.tianjinecocity.gov.sg/masterplan.htm

UN-HABITAT Mandate in Urban Transport

- General mandates with provisions on transport (Vancouver Declaration on Human Settlements, Habitat Agenda, Istanbul Declaration on Human Settlements, the Declaration on Cities and Other Human Settlements in the New Millennium)
- Governing Council Resolution GC 22/8 (2009) "Access to basic services for all"
- MTSIP Focus Area 4: Environmentally Sound Basic Urban Infrastructure and Services

⇨ Focus on Enhancing Access to Mobility for the Urban Poor in the Context of Sustainable Urbanization