

# Strategies for the Integration of Pedestrian, Bicycle, and Public Transportation System in Korea

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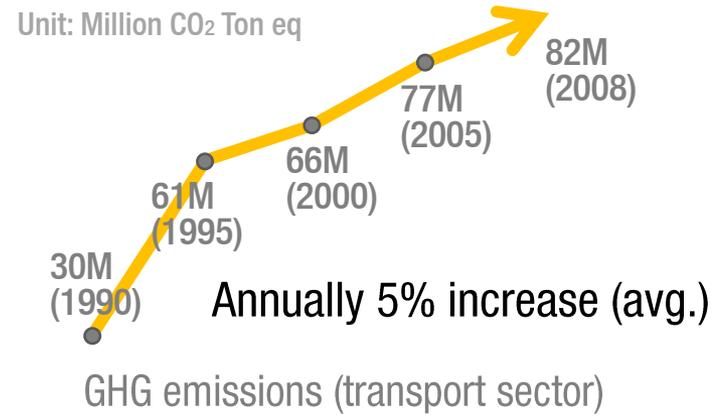
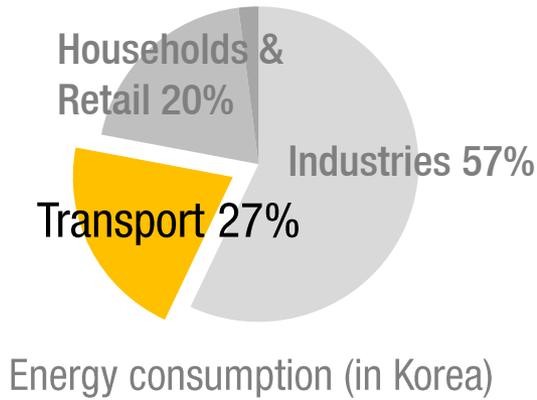
2013. 4

- I. Background**
- II. Current Status of Transport System**
- III. Strategies for Integrated Transport System**
- IV. Expected Effects**

# Background

**Transport sector is the 2<sup>nd</sup> largest national energy consumer in Korea, the fast increase related in GHG emissions**

➔ Need to reduce the GHG reduction of transport sector

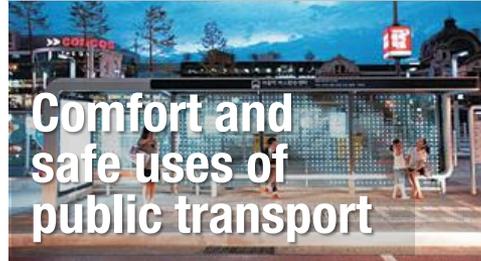


## Korea's diverse efforts, somewhat insufficient

In Quantity



In Quality

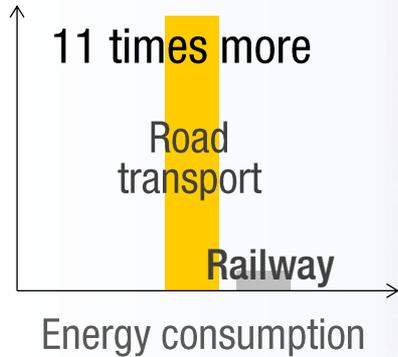


Integration

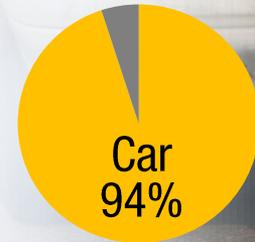
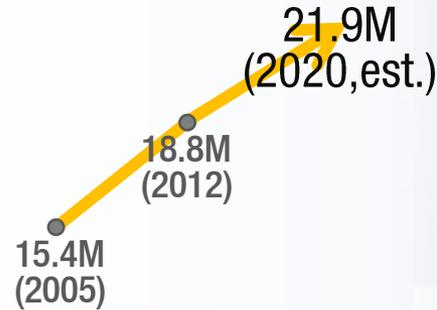


# II. Current Status of Transport System

## Less energy-efficient transport system focused on roads and cars



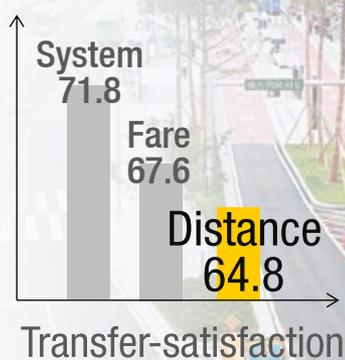
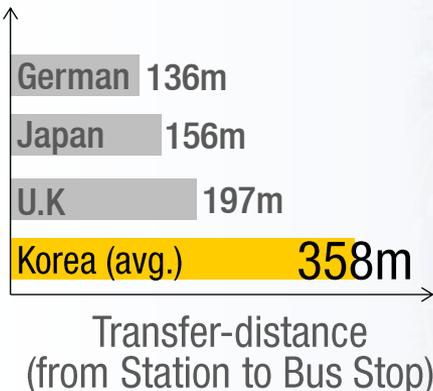
## Increasing No. of cars that emit most of the GHG emissions



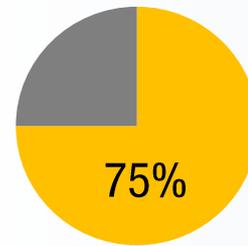
Vehicle registration

Carbon emission (in transport sector)

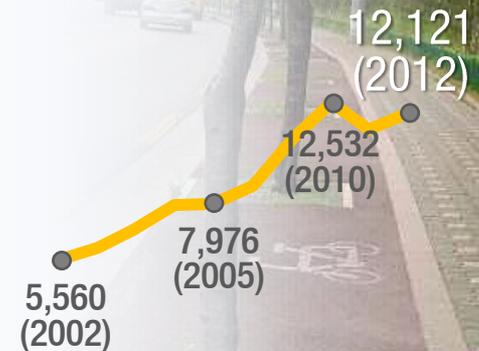
## Transfer inconvenience in public transport



## Poor condition of bike-environment



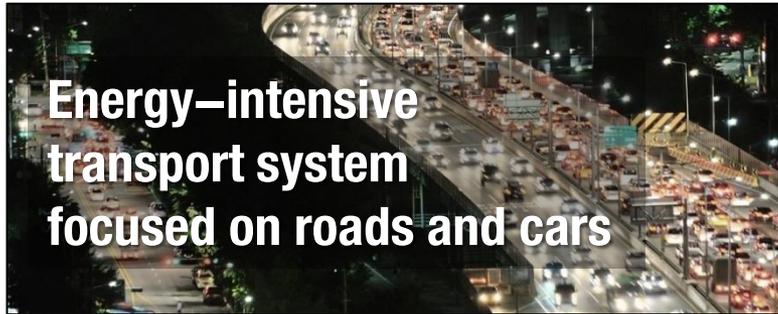
Required maintenance (in SMA bikeway)



Bicycle accident

Source: The Road Traffic Authority

# Paradigm Shift to the Integrated Transportation System



## Strategy for Policy Shift

- Increasing public transportation investment continuously
- Focusing pedestrian and bicycle connection with transit system
- Promoting pilot projects and policies about integrated transport system

# III. Strategies for the Integrated Transportation System

## Vision

**Human–Friendly and Green Transportation**

## Goal

**Realization for Integrated Transportation System**

## Five Major Tasks

- 1. Developing of Transit Malls**
- 2. Enhancing Bicycling Environment**
- 3. Transit–Oriented Corridor (TOC)**
- 4. Application and Expansion of the Complete Street**
- 5. Improving Legal System for Safety and Convenience**

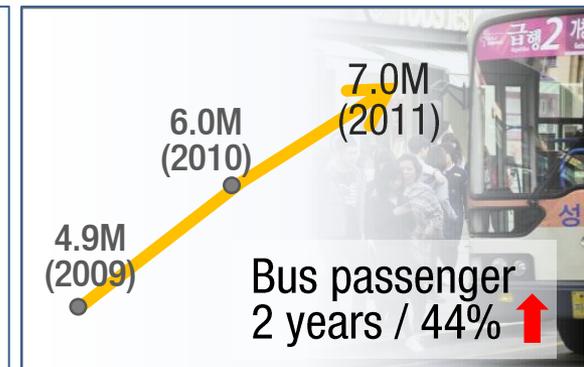
# 1. Developing of Transit Malls

Transit Mall : **Daegu** (Jungang-ro / 1.05km / \$8.8million)



Roads in old city centers are turning to 'Transit Mall'

	Before (2009)	After (2010)	
<b>Bus passenger</b>	4.9million	<b>6.0 million</b>	22% ↑
<b>Pedestrian</b>	56thousand	<b>66 thousand</b>	18% ↑
<b>Traffic speed</b>	16.7km	<b>21.4km</b>	28% ↑
<b>Carbon dioxide</b>	0.039ppm	<b>0.018ppm</b>	54% ↓
<b>Particulates</b>	67 μg/m <sup>3</sup>	<b>43 μg/m<sup>3</sup></b>	36% ↓



(Source: Daegu metropolitan city, 2011)

Transit malls are being expanded nationwide

\* **Seoul** (Shinchon/2014/0.56km/\$5.1M), **Busan** (Seo-myeon/2014/0.74km/\$7.2M), **etc...**

# 2. Enhancing Bicycling Environment

## Building safe bike path network

서울형 자전거도로 설치 및 유지관리 매뉴얼

**2.5 종류 및 설치구간**

- 자전거도로 설치 시 도로 및 설치구간에서는, 자갈차도, 차선, 차질기 등 노면재질의 차이가 발생할 수 있으므로, 갈포크로, 갈포크 및 갈포크의 수평연속과 자갈차도용의 갈포크를 고려하여야 한다.
- 온·저온팽창에는 버스정류장, 보행자횡단의 무차속폭을 자갈차도 설치된 구간이 도로 표도상과 일치된 범위 및 유사한 자갈차도를 기준으로 작성하여야 한다.

**II] 버스정류장**

(1) 휴게실부

- 버스정류장에는 자갈차도 용량의 증가와 휴게, 자갈차도 버스도 전용 배차 등을 고려하여야 하며, 자갈차도 자갈차도가 설치될 경우에 버스정류장 용역영역은 다음과 같이 구체적 용역으로 작성할 수 있다.

(2. 표. 휴게실 버스정류장 용역영역(자갈차도))

구분	구분	구분
자갈차도 전용차선	자갈차도 우회차선	자갈차도 전용차선
자갈차도 전용차선	자갈차도 우회차선	자갈차도 전용차선
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자갈차도 전용차선	자갈차도 우회차선	자갈차도 전용차선



Bike path networks would be connected throughout the city

- Seoul(2013) published a manual for a better bike-environment.
- Bike's Modal share : 1.2%(‘07) ⇒ 5%(‘13) ⇒ 10%(‘20) (Seoul)

## Expanding bicycle parking facilities



Building more bicycle parking facilities and Introducing bike-rental system

Capacity : More than 15,000 bicycles

## Enhancing transit transfer-system



Gradual Increasing of taking bicycle on Train and Bus

Pilot operation for taking bicycle on train (Central Lane) at non-congested time

# 3. Transit-Oriented Corridor for the Integrated land-use and Transportation Development

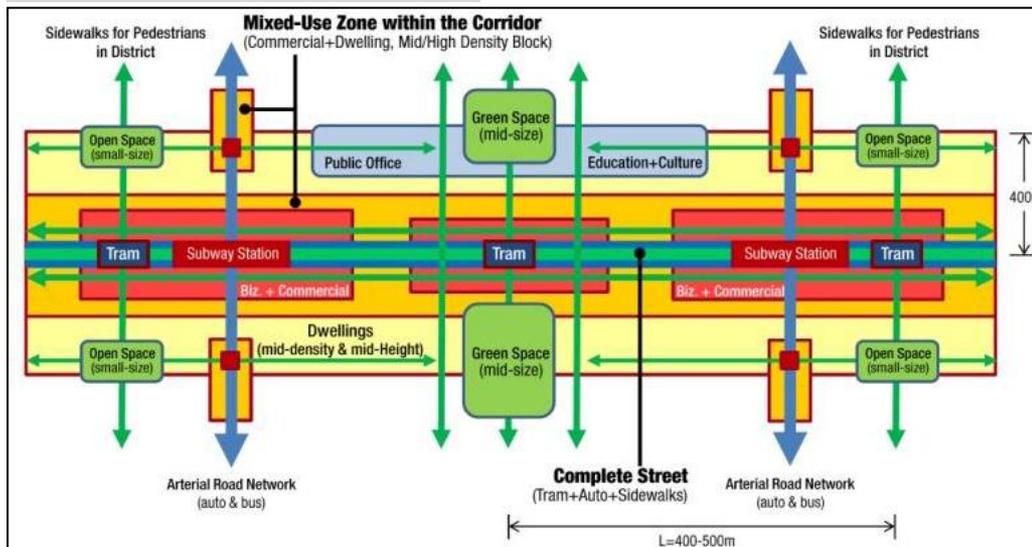
## TOC (Transit-Oriented Corridor)

⇒ Integrated land use and transport development along transit corridor

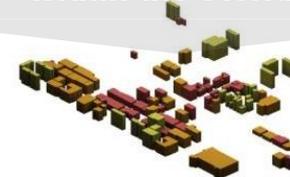
≠ Automobile-dependent and large scale development

- ➔ Changing street to pedestrian and transit-friendly
- ➔ Building mixed-use “neighborhood corridor”
- ➔ Revitalizing the old urban center along transit corridor

## TOC's Planning Concept



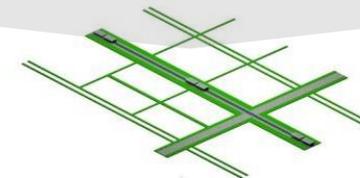
Adjustment of density and height within the corridor



Addition of Mixed-use and Residential use



Introduction of tram system and improvement of street environment



Selective preservation and renewal considering contexts



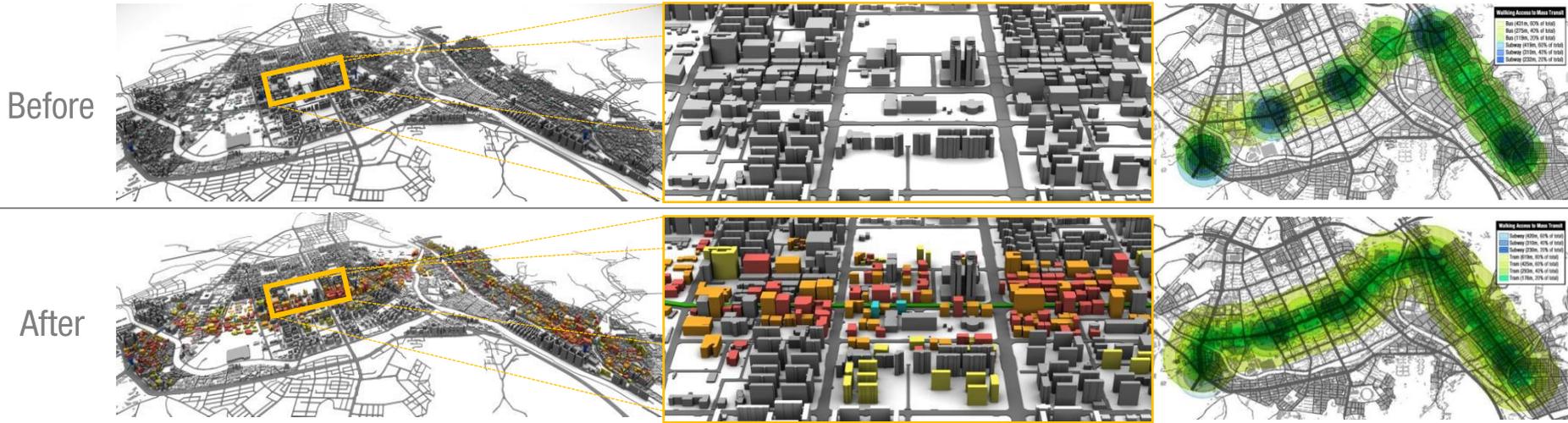
# TOC's Traffic and Environmental Impact Simulation

Anyang city (in Seoul Metropolitan Area)

Urban Spatial Structure

District

Accessibility to Mass Transit



## Anyang City

Population:  
623,000  
Area:  
58.5km<sup>2</sup>  
Location:  
South-West  
in Seoul  
Metropolitan  
Area

	Before	After	
<b>Population</b>	282,381 persons	<b>324,553 persons</b>	<b>13% ↑</b>
<b>Net population density</b>	268.4 persons/ha	<b>308.4 persons/ha</b>	<b>13% ↑</b>
<b>Industrial mix</b>	31.4 %	<b>38.1 %</b>	<b>7.3%p ↑</b>
<b>Road share</b>	17.7 %	<b>16.6 %</b>	<b>1.1%p ↓</b>
<b>No. of blocks per ha</b>	0.448 blocks/ha	<b>0.777blocks/ha</b>	<b>42% ↑</b>
<b>Transit modal share</b>	31.9 %	<b>37.8 %</b>	<b>5.9%p ↑</b>
<b>Pedestrian volume change</b>	N/A	<b>52,724 persons/day</b>	<b>52,724 persons/day ↑</b>
<b>Transport energy reduction</b>	N/A	<b>274,896 kℓ/year</b>	<b>274,896 kℓ/year ↑</b>
<b>CO2 reduction</b>	N/A	<b>686,416 tons(TOE)</b>	<b>686,416 tons(TOE) ↑</b>
<b>Additional net income</b>	N/A	<b>13.6 million dollars/year</b>	<b>13.6 million dollars/year ↑</b>
<b>Effects of CO2 reduction</b>	N/A	<b>39.7 million dollars/year</b>	<b>39.7 million dollars/year ↑</b>

# 4. Application and Expansion of the Complete Street

## Complete Street for everyone

That can be used safely and conveniently by all users regardless of transport mode and personal characteristics.

- Infrastructure improvement for transfer and access
- Integration of pedestrian space and road
- Coexistence of transport infrastructure and community

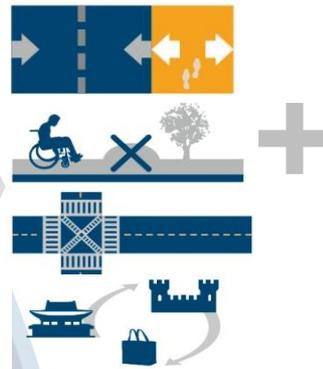


Source: New York DOT (2009), Boston Complete Streets Guidelines (2010)

## Seoul's case

### ➔ Vision: "Seoul, a Pedestrian-Friendly City"

- More sidewalk
- Road-Diet
- Pedestrian-priority road
- Universal design
- Traffic calming
- More crosswalks
- Circular pedestrian route
- Policy Integration



**Blocking off for exclusive use by pedestrians**

### Expansion

1. Pedestrian-only streets
2. Low-speed road
3. Variable bike lane



Expanding a pedestrian-friendly policy after pilot projects

# 5. Improving Legal System for Safety and Convenience

## Revision of legal system and policy for integrated transport system

### ➔ Enactment and Amendment of related Acts

<b>(Mass Transit System)</b>	Act on the Support and Promotion of Utilization of Mass Transit System
<b>(Bicycle)</b>	Promotion of the Use of Bicycles Act
<b>(Pedestrian)</b>	Act on Promotion of the Pedestrian's Safety and Convenience
<b>(Disadvantaged)</b>	Act on Promotion of the Transportation Convenience of the Mobility Disadvantaged
<b>(Urban Transport)</b>	Urban Traffic Improvement Promotion Act National Transport System Efficiency Act
<b>(Railway Station Area)</b>	Act on the Development and Utilization of Railway Station Area

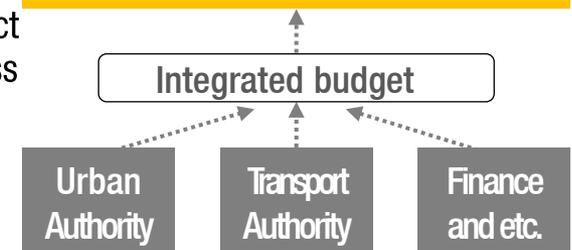
To improve citizen's safety, convenience, and accessibility to transit and pedestrians

## The Integrated land–use and transport policy through budget system

### ➔ Issue and place–centered comprehensive planning

**(Planning)** Integrated assessment of architectural design and transportation impact  
**(Budget system)** Comprehensive budget allocations linked to the relevant business  
e.g. Block Grant(U.S.), Single Regeneration budget(U.K.)

Integrated Pedestrian, Bicycle, and Public Transportation Development



To enable immediate policy responses to current issues

# VI. Expected Effects

## Accessibility Improvement

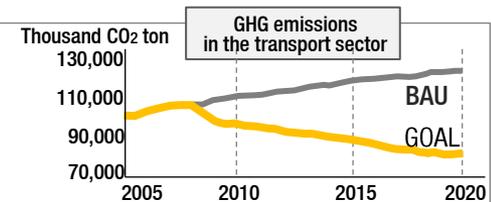
- Safe and convenient access to public transport facilities
- Pedestrian-centered street environment

## Passengers and Pedestrians Increase

- Bus passengers 22% ↑ , pedestrians 18% ↑ (Daegu's case)
- Transit modal share 7% ↑ by 2020 (Seoul's case)

## Environmental Quality

- 20~24% CO<sub>2</sub> ↓ compared to 2005
- 33~37% CO<sub>2</sub> ↓ against BAU by 2020



## Economic Revitalization

- Additional profits = \$13.6 million/year (Anyang's Case)
  - Economic effects by CO<sub>2</sub> reduction = \$39.7 million/year
- ➔ Tax revenue increment of local government

**Virtuous circle for integrated system and green society**

# Thank You

Sustainable transport will lead to a safe and livable society