

Korea's Challenge for People-centered Mobility

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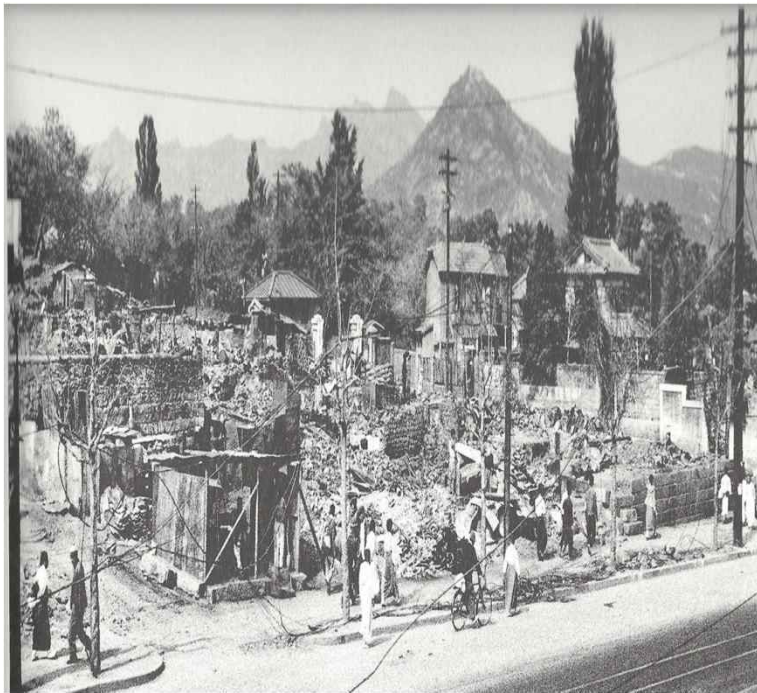
I. Major changes of recent decades in Korea

Year 1950: Korean War

■ Post-war Reconstruction

- Walking main transport mode. Transport facilities started to restore.

Seoul a war-torn city (past)

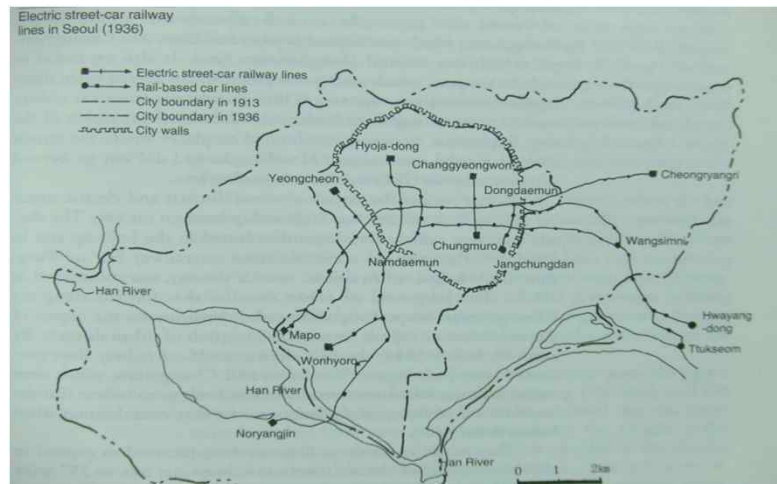


Seoul a skyscraper city (present)



I . Major changes of recent decades in Korea

Year 1960's: Tram in Seoul 40.6km

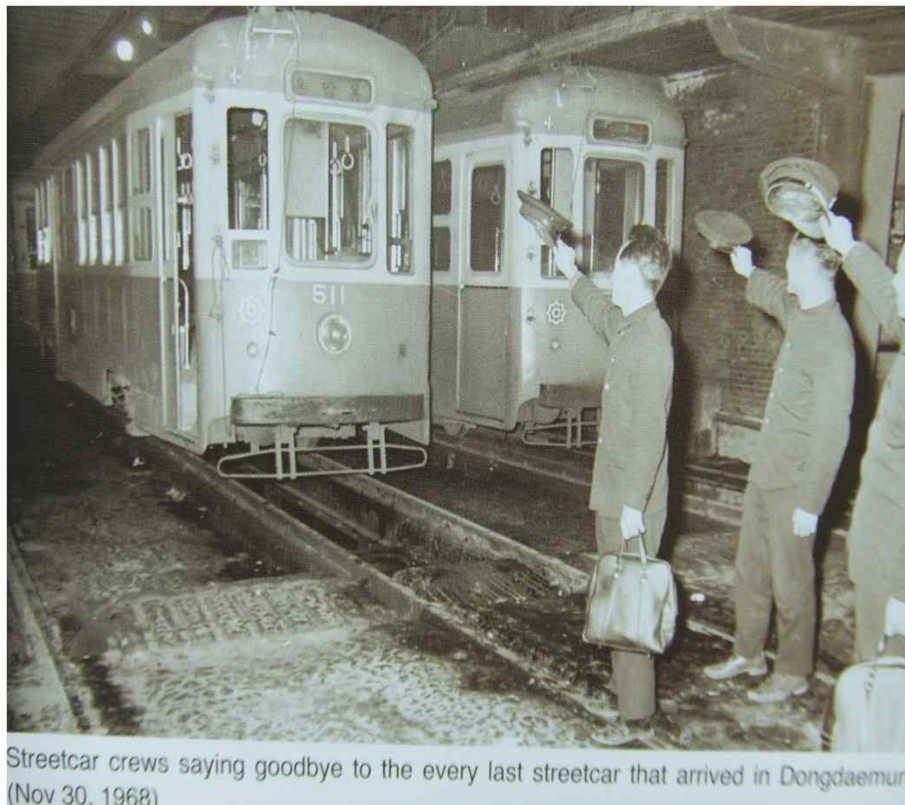


Year 1960's: main urban transport mode - Tram + Bus



Year 1968: Korean Tram Resignation

- Frequent tram road accidents
- Losing competitiveness to bus



Late 1960's

- Bus main transport mode
- Rapid migration toward cities (jobs, education)
 - Send sons to Seoul, horses to Jeju
- Lack of supply of transport infrastructures



A crowd of people waiting to ride the streetcar due to the strike of bus drivers (1964)



A female conductor in local transit (1964)
They collected fares and assisted the drivers' stops and starts for safe operation.

1970's: Bus Congestion, Immature Transport Operation (CBD)



Traffic congestion at Gwanghwamun Intersection (1970)

1970's: Lagging Transport Infrastructure Provision

- Lack of Transport Infrastructure
- Road-centered infrastructure expansion
- Lack of public transportation

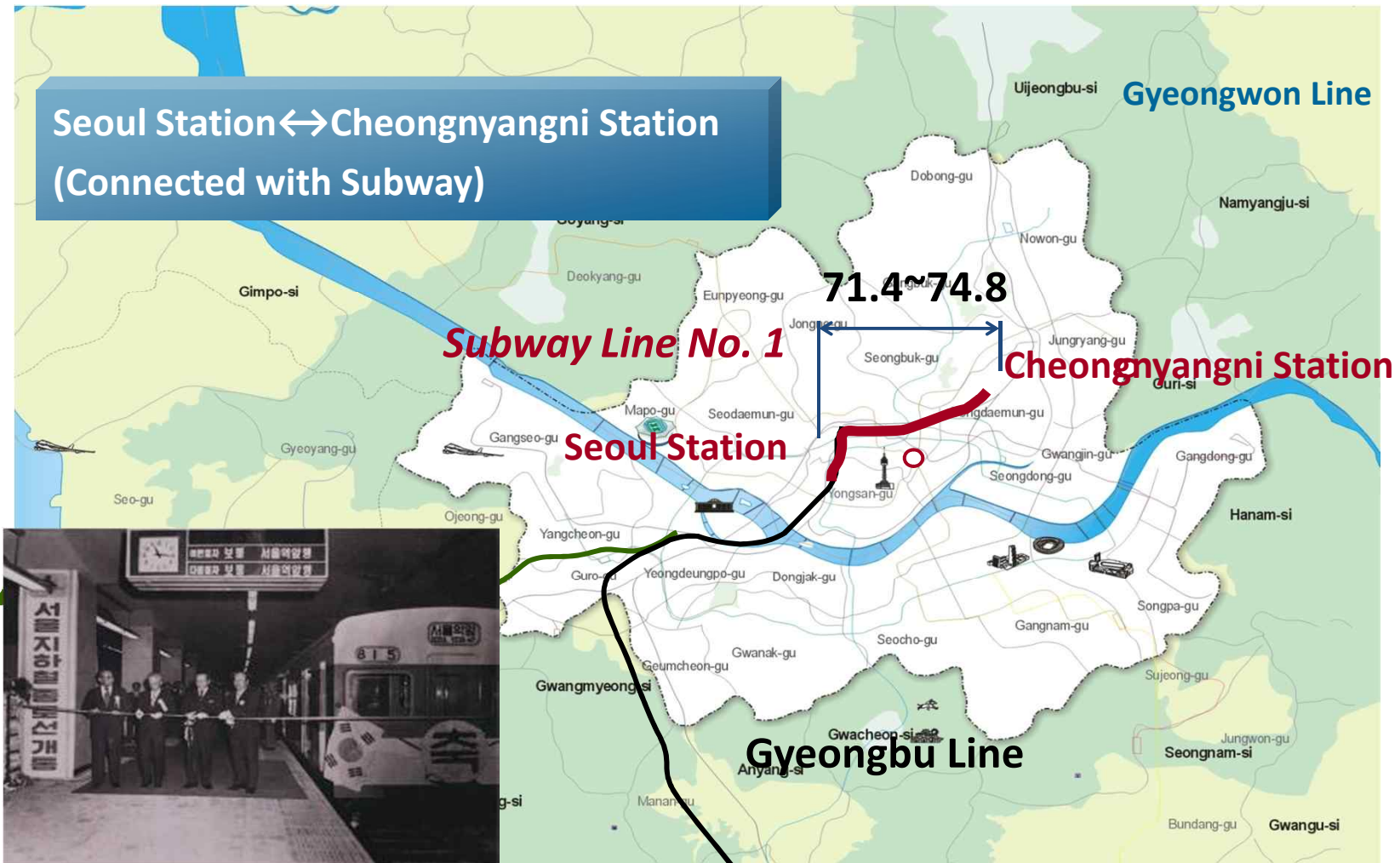


1970: Subway Line #1 Construction

- Rapid Increase of Population.
- Recognition of the capacity limit of bus



Seoul Subway line #1: 7.8km



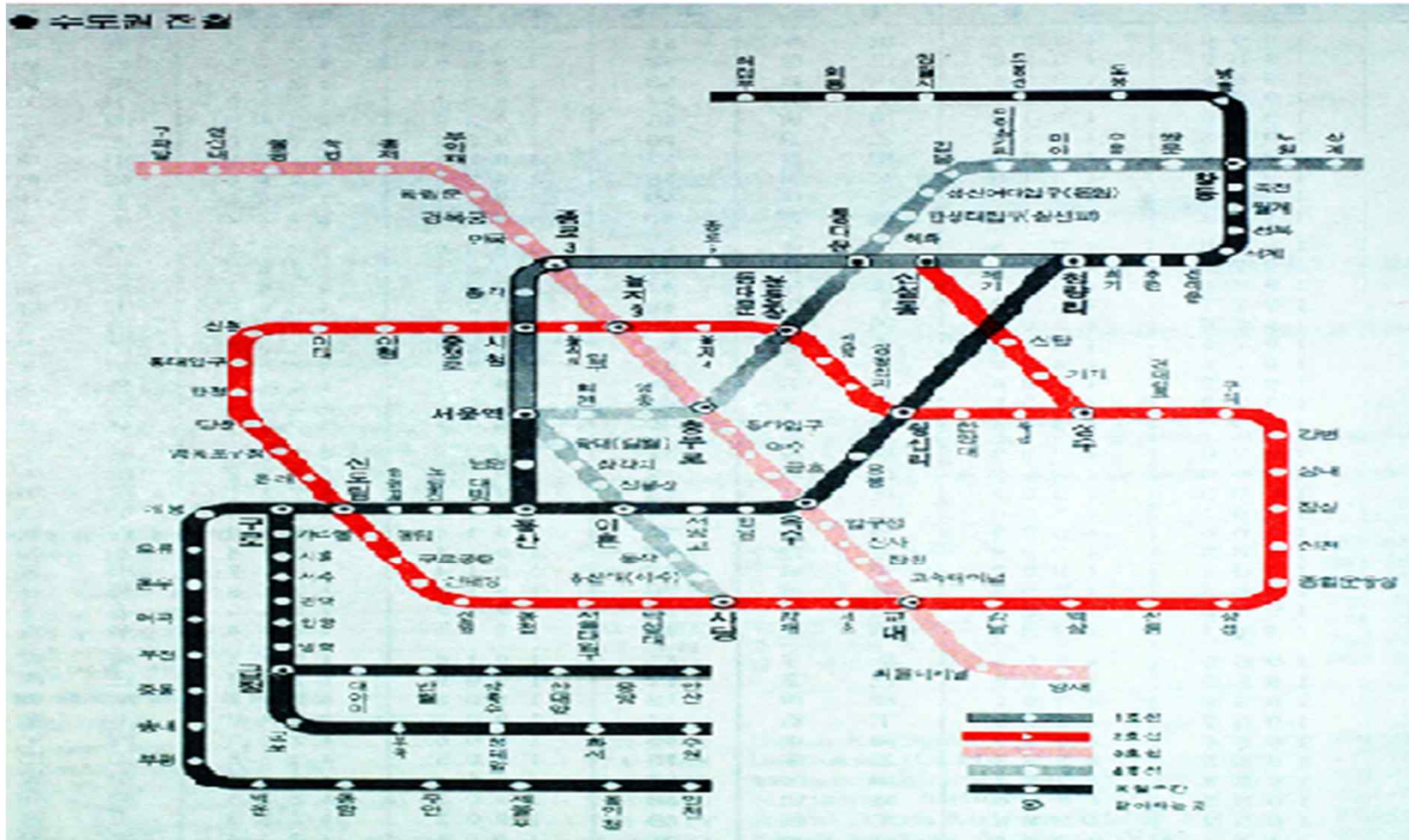
1980's : Chaos of Public Transportation

- **Lack of public transport of Subway and bus Provision**
- **Increase in Privately Owned Cars (As of 1985, exceed 1 million cars)**
 - Decrease in bus passengers
 - Traffic Impact Analysis/TSM need to be Introduced.



I . Major changes of recent decades in Korea

1985: Completion of Lines #1,2,3,4 of 135km



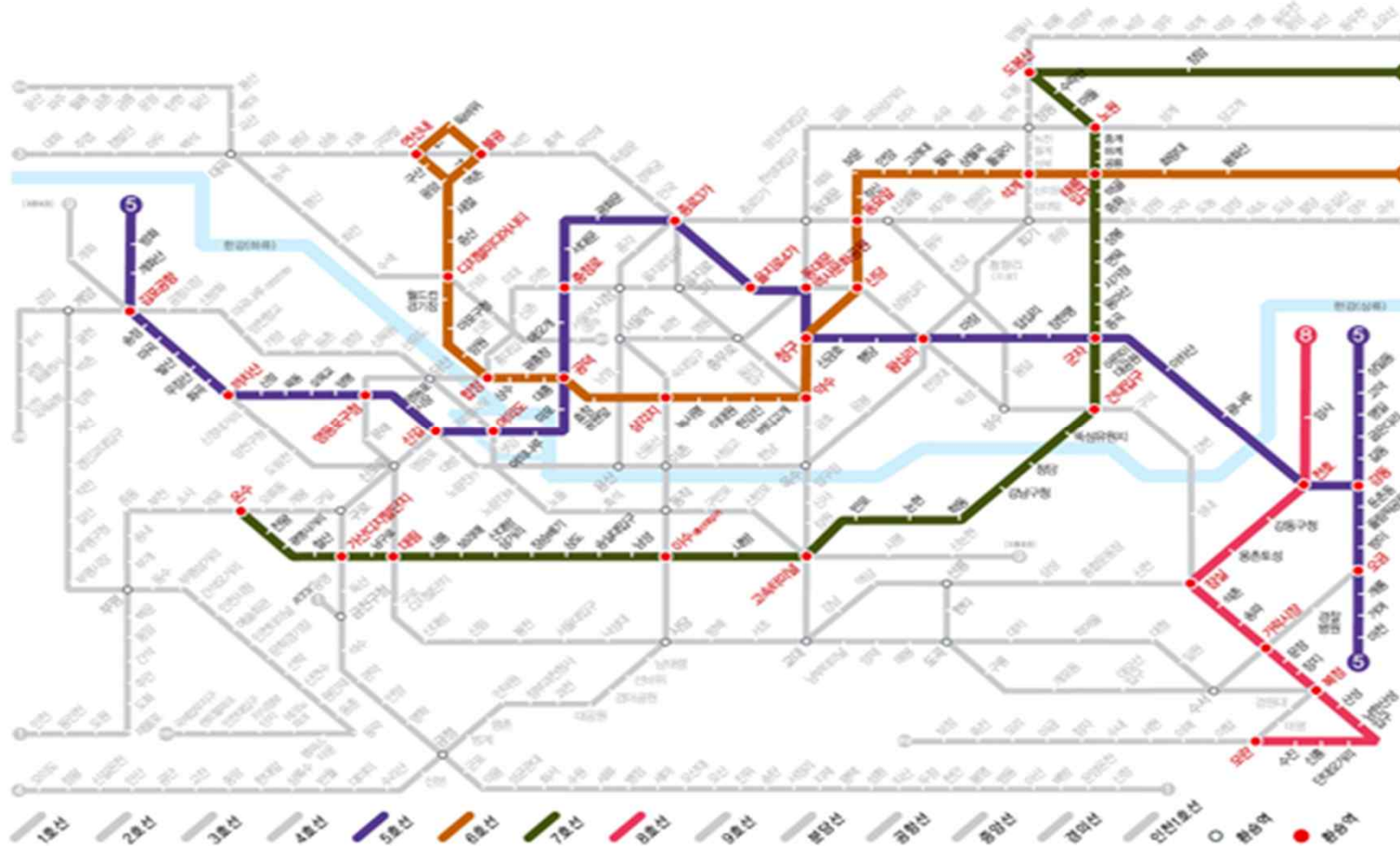
1970-1990: Rapid Increase in Personally Owned Cars

- Total 127,000 – 17,941,000: 10 times increase
- Seoul 60,000 vehicles – 3,000 thousand vehicles: 50 times increase
 - Need for policy of mass transport and metropolitan transport
 - Need TDM strategy



1990-2000: Completion of 155km subway line #5,6,7,8

- World's only construction record: 300km construction in 30 years

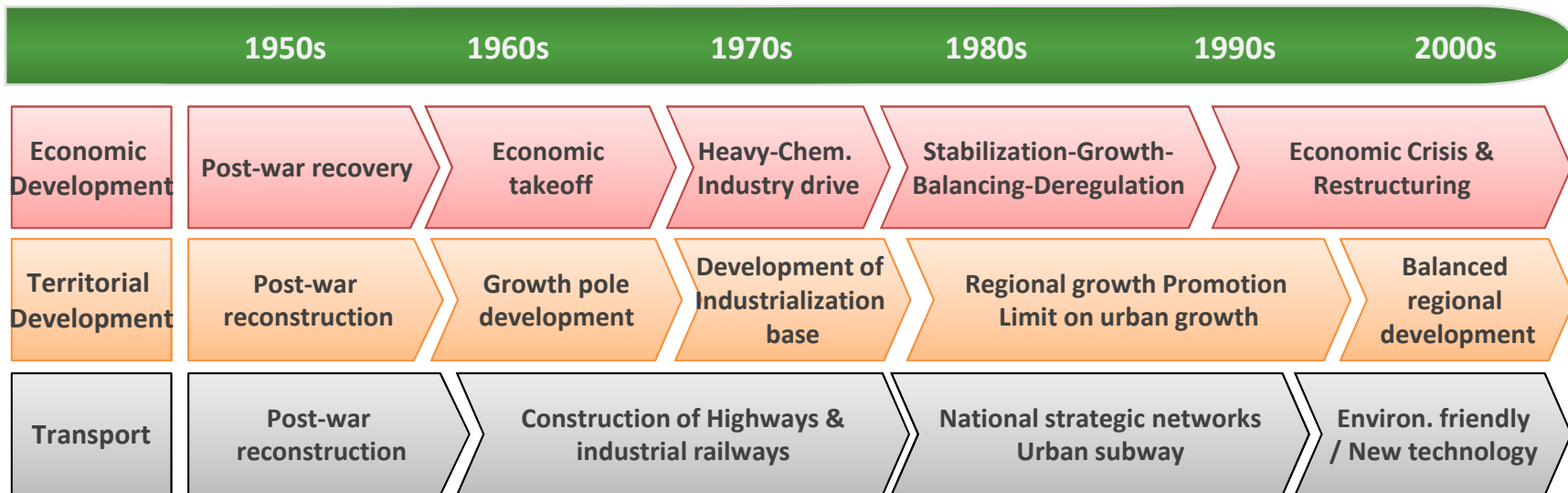


2010: 540km of Urban Railway in Metropolitan Area



I . Major changes of recent decades in Korea

Korea's Pathways at a glance

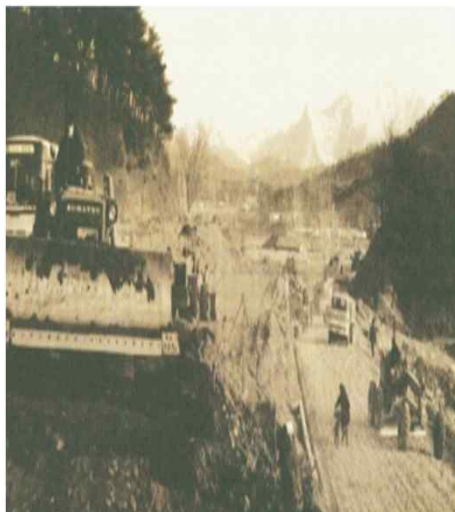


	1950	1960	1970	1980	1990	2000	2010
Population (1,000 pop.)	20,189	24,989	31,435	37,407	43,390	45,985	48,580
GDP (\$)	-	1,154	1,994	3,358	6,895	11,347	16,372
No. Cars (1,000 cars)	-	-	127	528	3,395	12,059	17,941
Length of Road(km)	25,683	27,169	40,244	46,950	56,715	88,775	105,565

1960-1970: Economic Development & Construction of Transportation Infrastructure

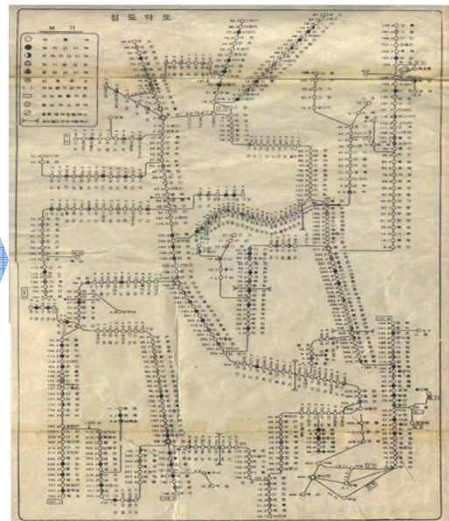
- Population increase with economic development plan, income level increase, Preparation of foundations for urbanization
- Expansion in transportation infrastructure and transport mode provision
- But Bus-oriented Public Transport System

<1950s>



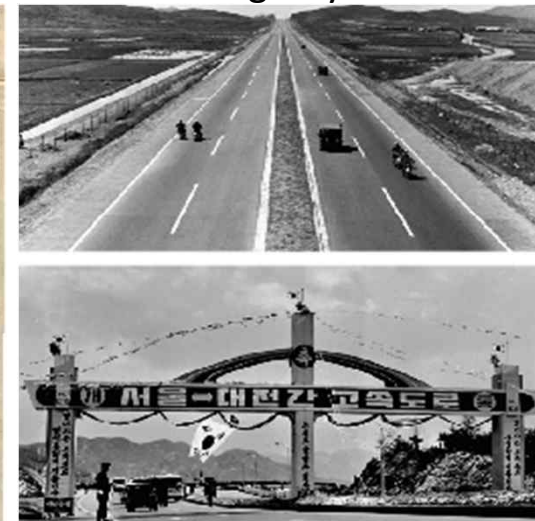
Transportation System Restoration

<1970s Railway Network>



3,193 km(1970)

<1970s Highways>

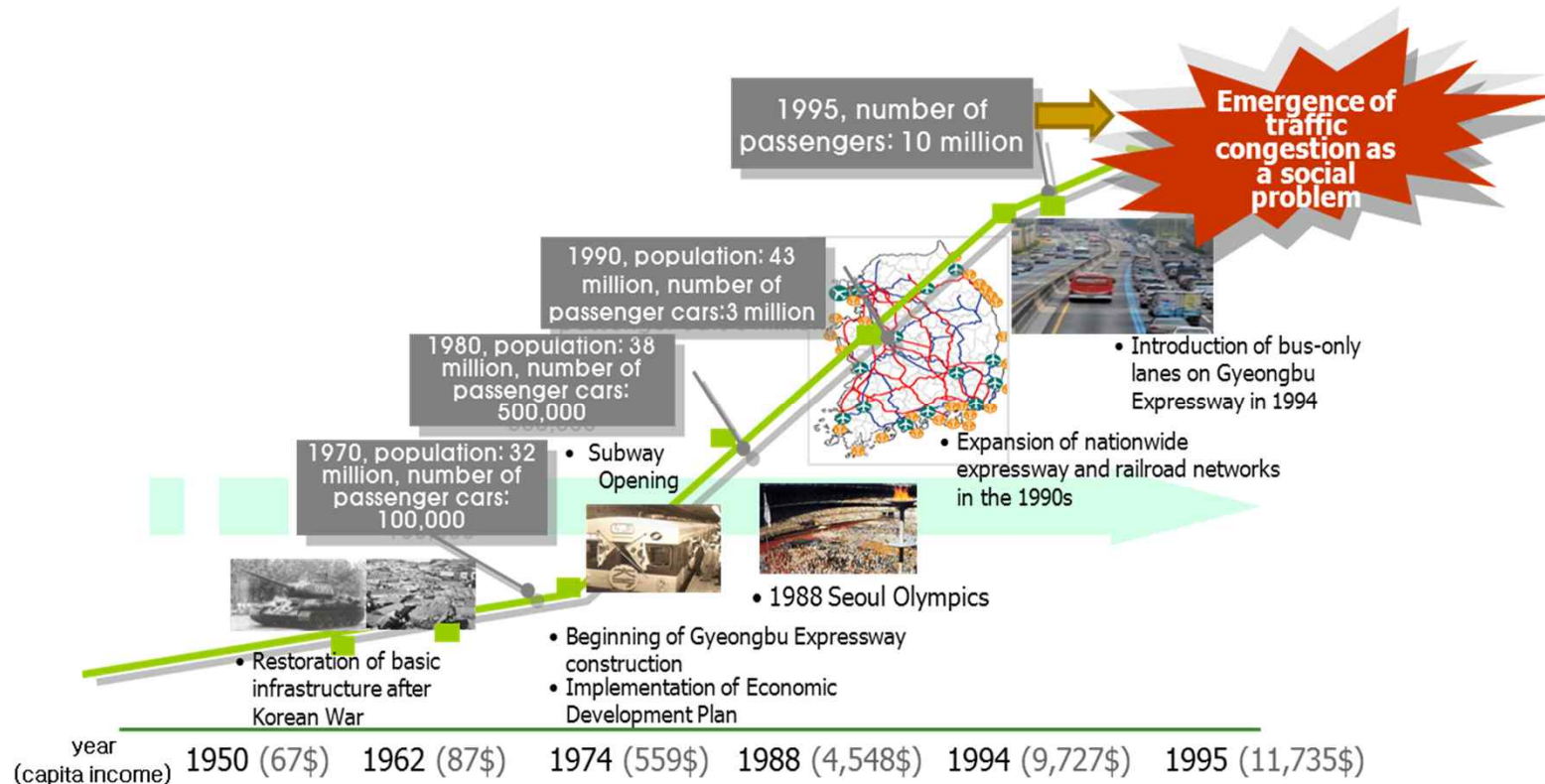


551 km(1970)

I . Major changes of recent decades in Korea

1980s-1990s: Economic Growth & Expansion of the National Transport Network

- The number of privately owned car increases with the level of national income
- The necessity of TDM/TSM emerges with roadway traffic issue
- Political interest on promoting public transport such as bus, rail, and others



2000's: Pursuit of a Sustainable Transport System

- Provider-oriented → User-oriented
- Brown Growth → Policy Shift from Eco-friendly Green Growth
- Road Operation Efficiency and Railway Prioritized Provision
- Expansion of Diverse Public Transportation Modes Responding to Users' Demand

<Highway Extension>



3,860 km(2010)

<National Railway Network>



3,577 km(2010)

<Expansion of Public Transport Modes>



CNG Low Floor Bus



M Bus



Electric Bus



KTX



Light Rail Transit



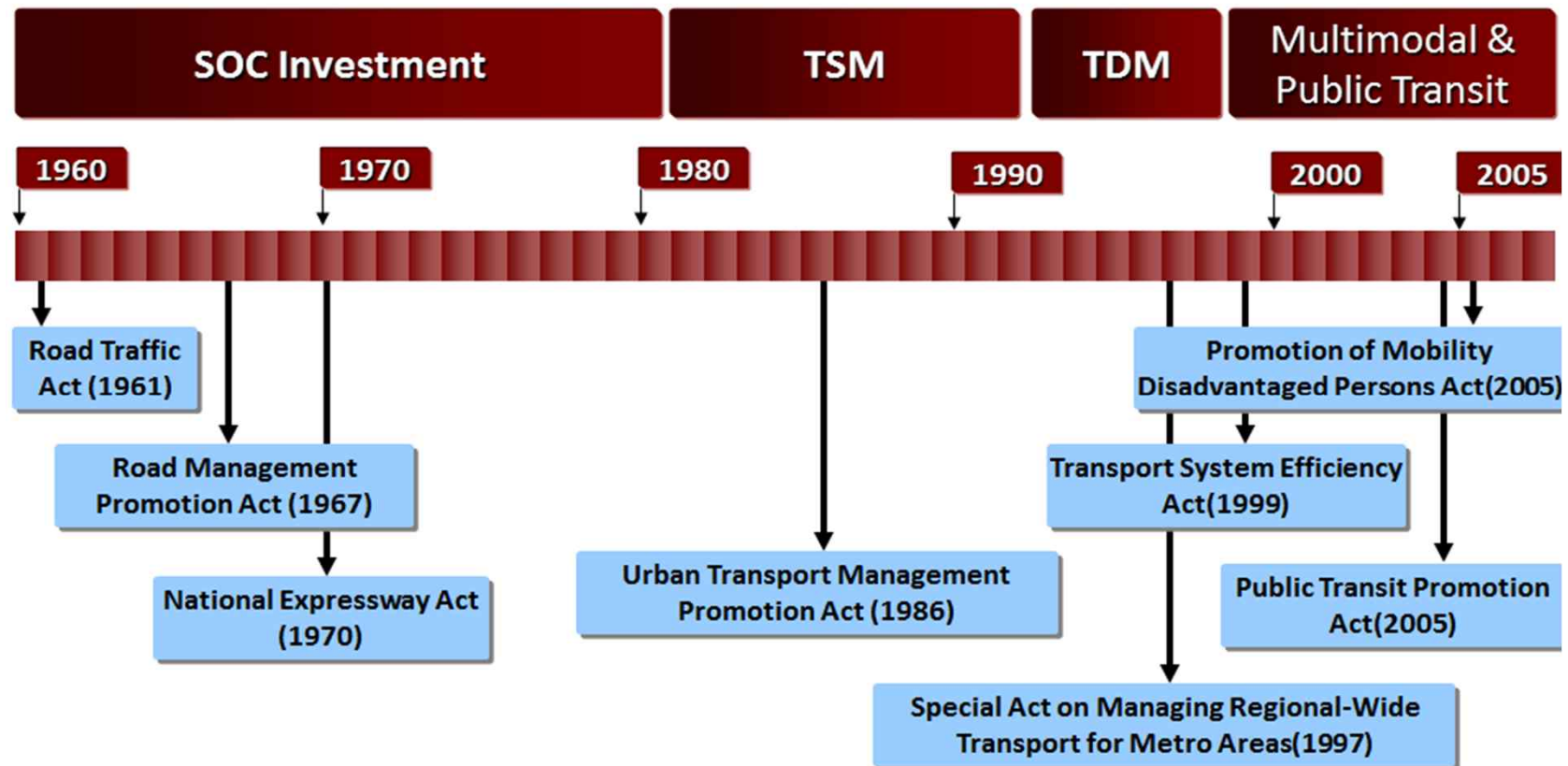
Airport Express Rail

Transport Policy Change by Period

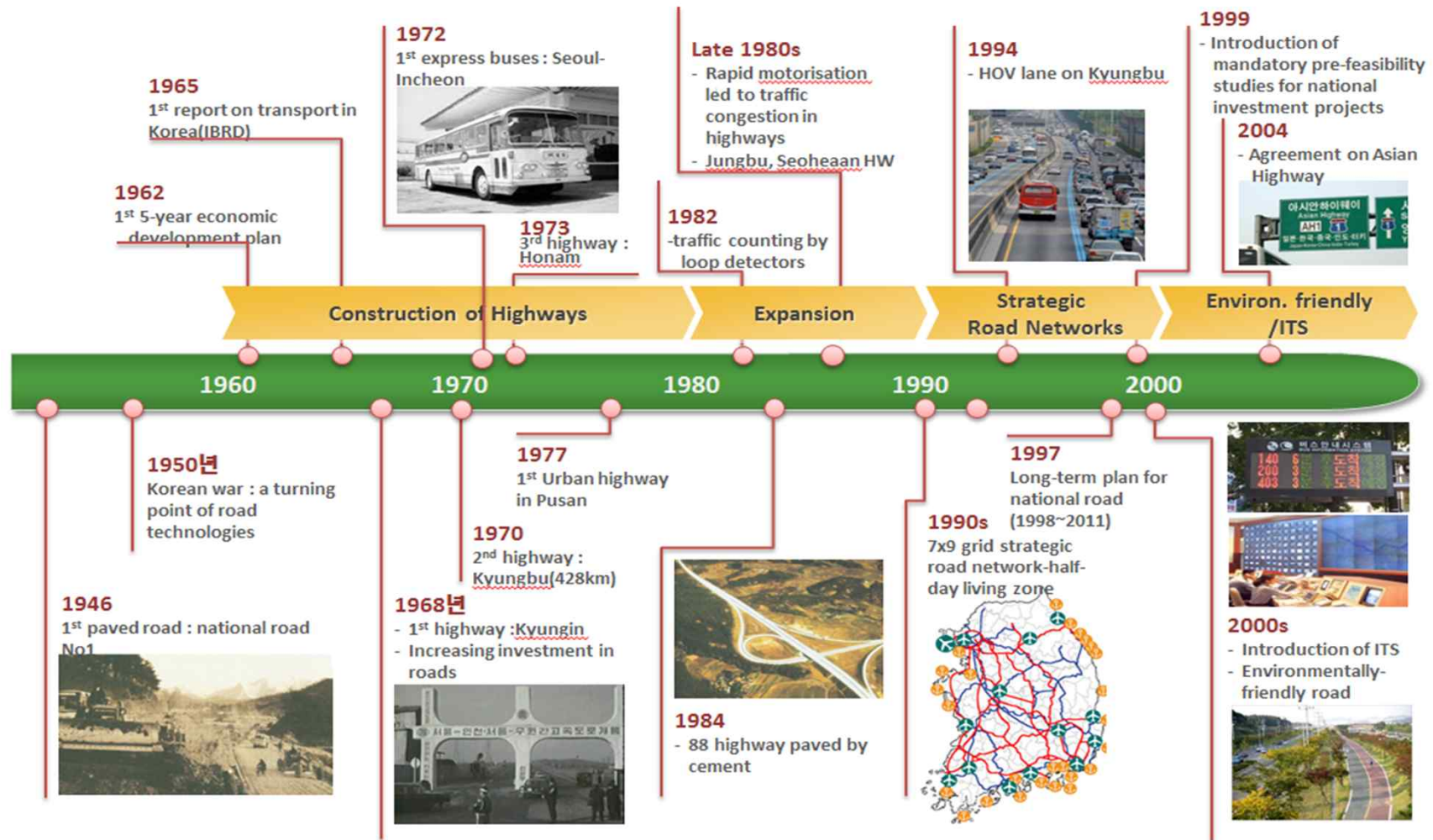
■ Transport policy criteria and implementation directions of recent decades

Categories		1960s~1970s	1980s~1990s	2000s
Transport policy	Problems	<ul style="list-style-type: none"> - Concentration of population in cities - Shortage of rail transport - Difficulty in using public transport 	<ul style="list-style-type: none"> - Rapid rise in personal car ownership - Serious road traffic congestion 	<ul style="list-style-type: none"> - Deepening problems related to energy and the environment
	Policy criteria	<ul style="list-style-type: none"> - Expanding the passenger accommodation capacity of public transport 	<ul style="list-style-type: none"> - Passenger car demand management 	<ul style="list-style-type: none"> - Building an environment-friendly urban transport system
	Implementation directions	<ul style="list-style-type: none"> - Bus-centric urban traffic operation 	<ul style="list-style-type: none"> - Expanding facilities, including roads, and improving their operation - Building urban rail systems - Preparing public transport promotion measures 	<ul style="list-style-type: none"> - Ensuring effective operation of public transport - Improving public transport services
Transport modes	Bus	<ul style="list-style-type: none"> - Establishment of order in bus operations 	<ul style="list-style-type: none"> - Improvement of bus competitiveness 	<ul style="list-style-type: none"> - Bus reform and introduction of a semi-public operation system
	Rail	<ul style="list-style-type: none"> - Realignment of system and organization 	<ul style="list-style-type: none"> - Improvement of inter-city rail operations 	<ul style="list-style-type: none"> - Establishment of rail transport system
	Taxi	<ul style="list-style-type: none"> - Establishment of a taxi system 	<ul style="list-style-type: none"> - Improvement of taxi services 	<ul style="list-style-type: none"> - Improvement of management conditions of taxi industry

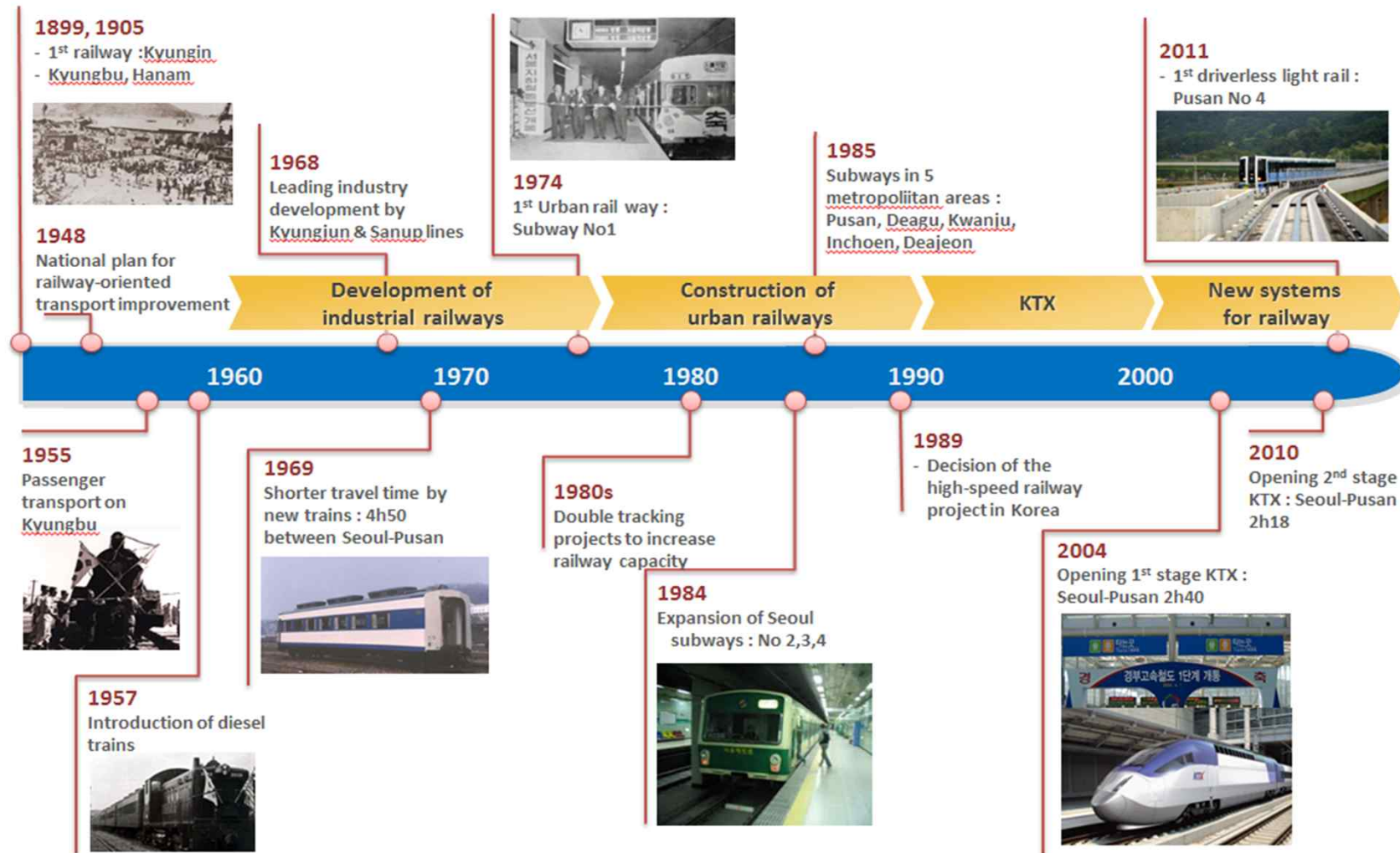
History of Urban Transport Policies



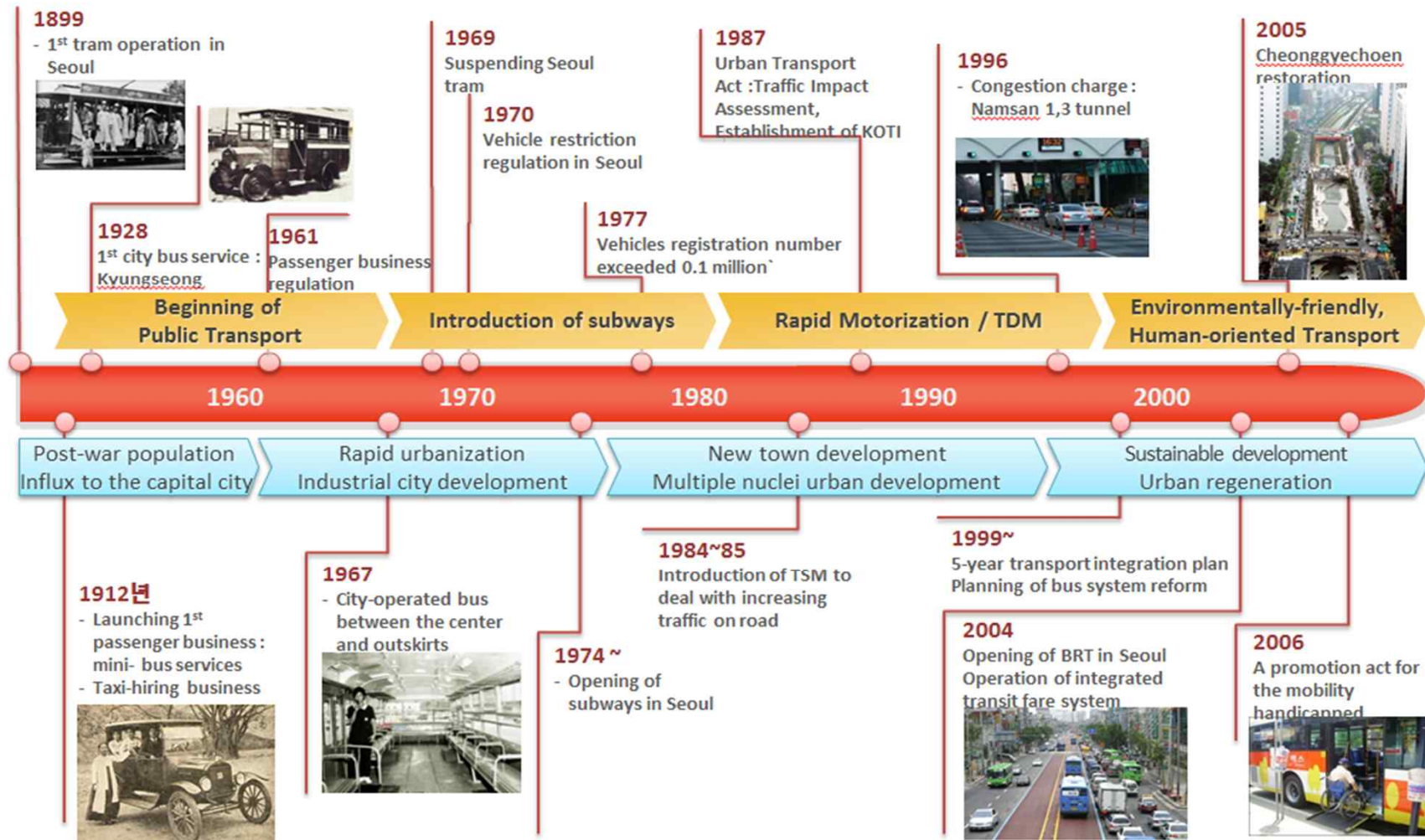
Transport Timeline : Road



Transport Timeline : Railway



Transport Timeline : Urban Transport





II. People-centered Public Transport

**KOREA's Challenges:
Urban Bus System Reform**

Gridlock in Seoul in 90's



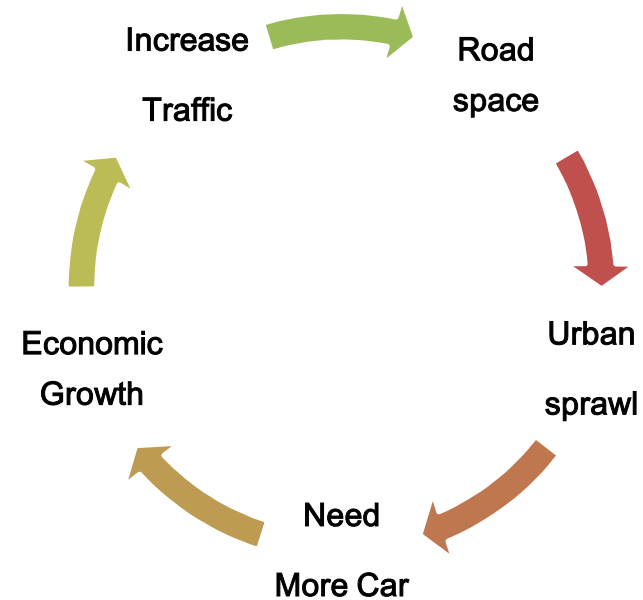
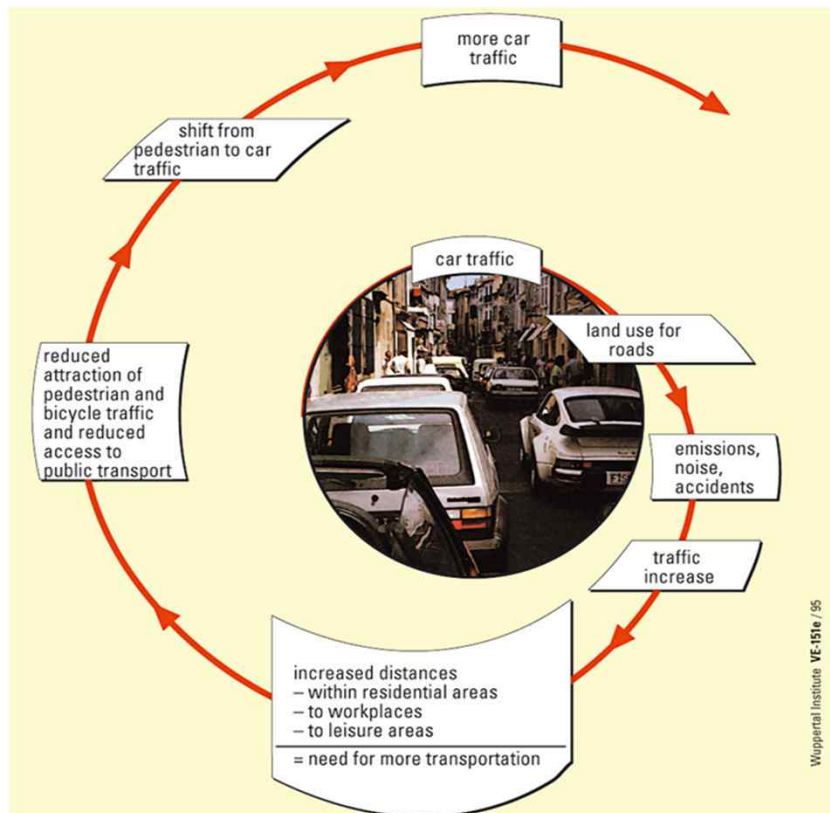
Gridlock in Seoul in 90's

- **Air Pollution and Energy Consumption**
 - Car centric Society
- **External Effects and Costs**
 - Traffic Accidents & Discomfort



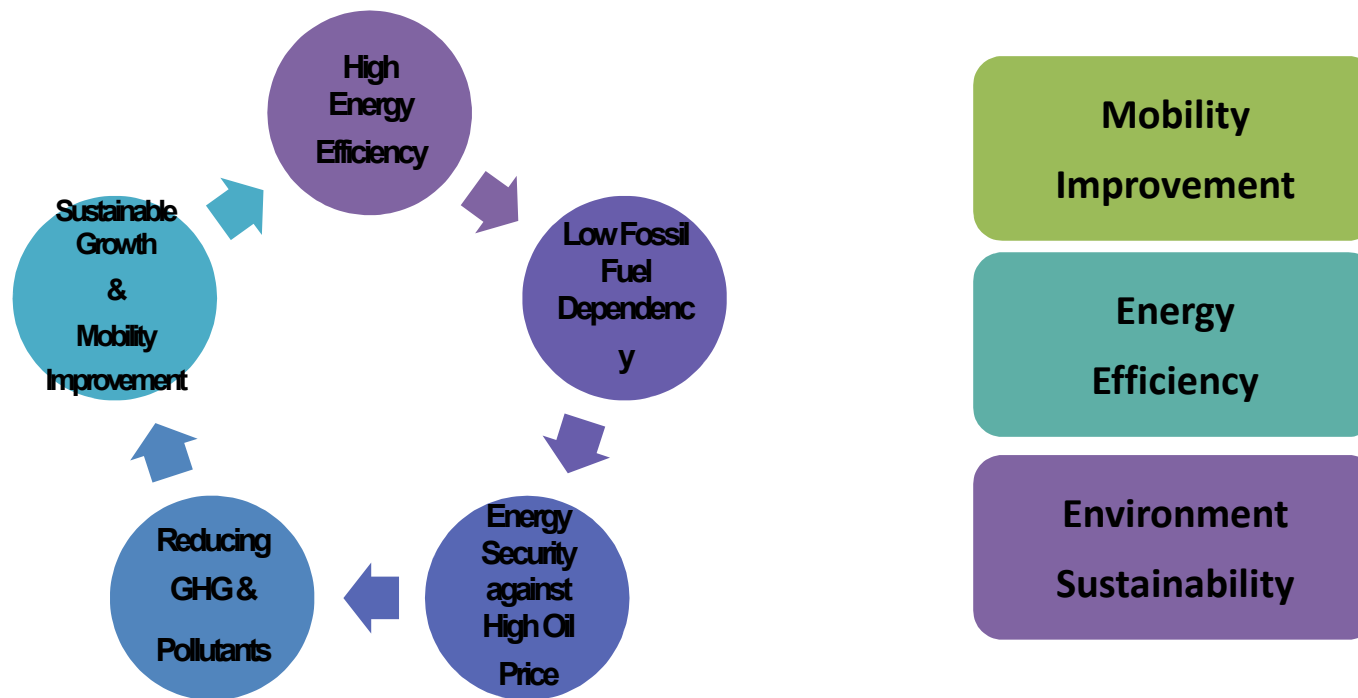
Vicious Cycle

- 'Vicious Spiral' : increasing car traffic, urban sprawl leading to more demand for road space



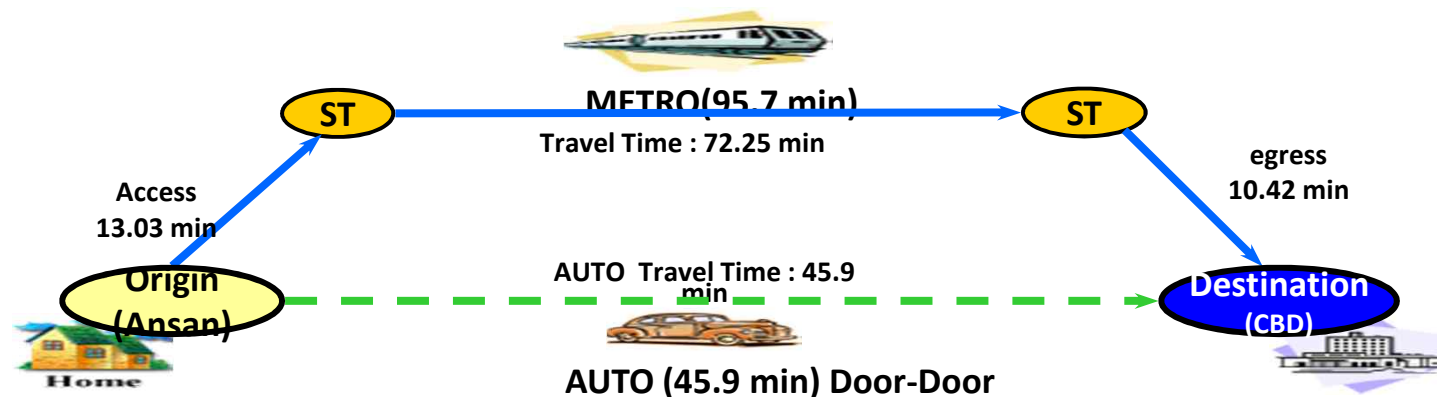
Virtuous Cycle

- Virtuous Cycle between Low Carbon Emission and Energy Efficient System with Social Equity



Seoul has not been a good provider

- People want competitive public transport service ;
 - easy to use, - cheaper than car
 - comfortable - similar travel time with car
 - safe

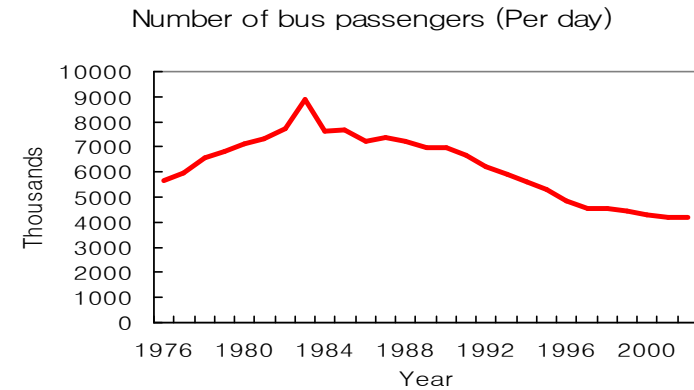


- But failed to satisfy buyers with enough money to buy their own car...

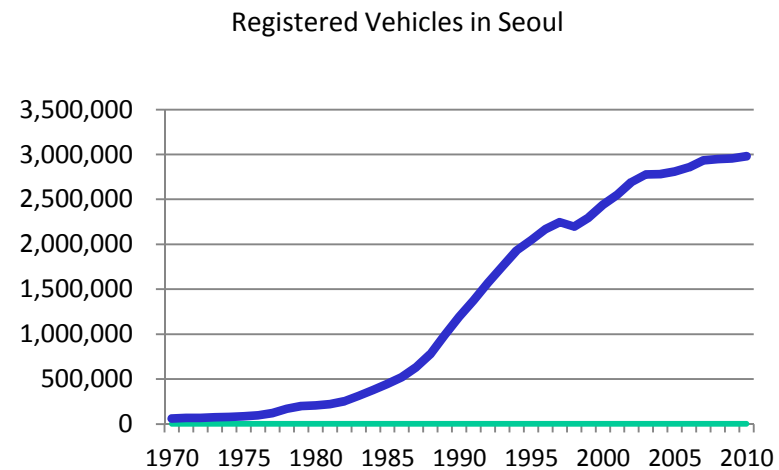
Have we been a good shopkeeper?

- Public transport market : Seller should provide better goods or service for buyer than others (private car)

- Number of passenger per bus per day :
1000 (mid 80's) to 500 (early of 2000's)

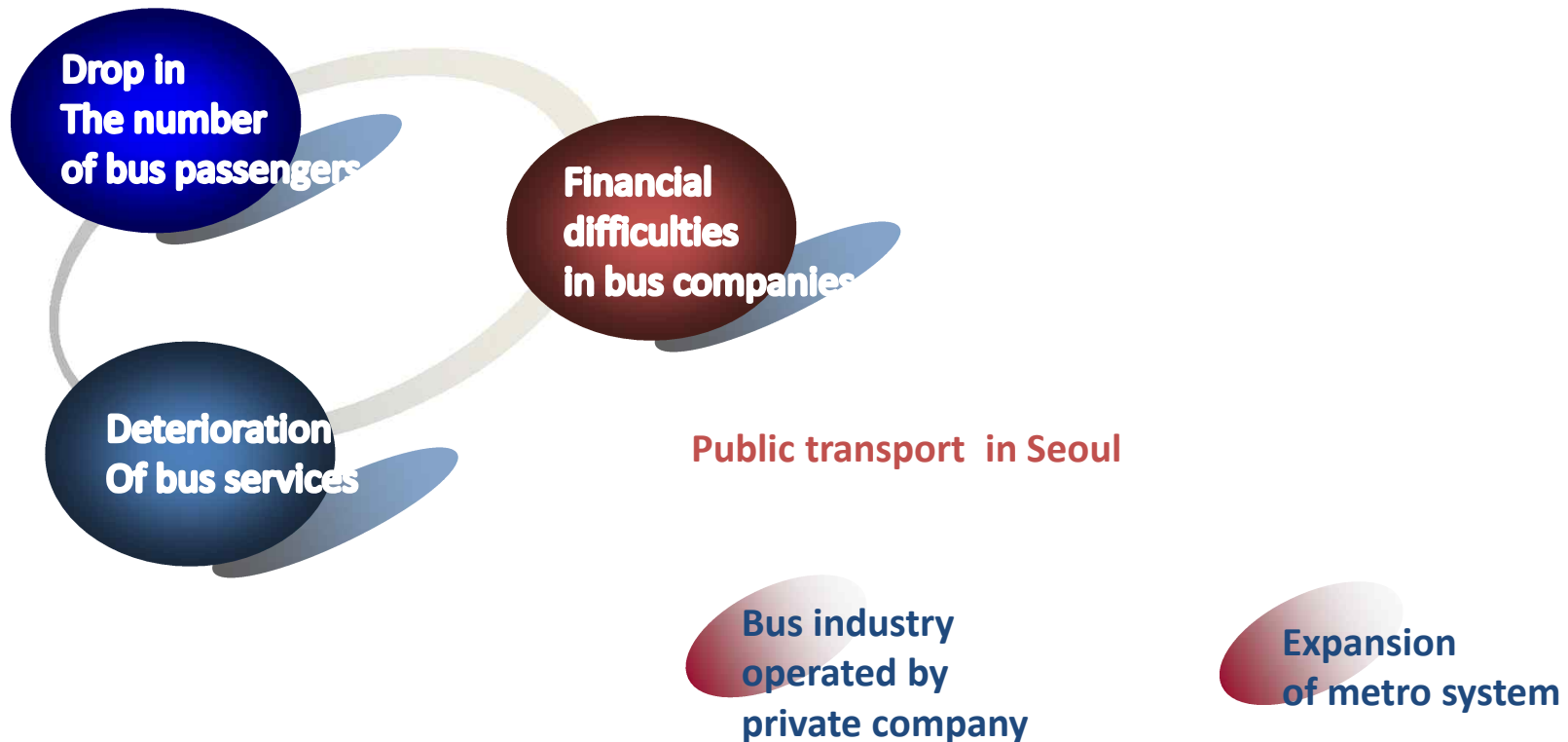


- Registered vehicles:
49 times
1970 : 60 thousands
2010 : 2.98 millions



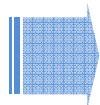
Seoul Public Transport Reform

- Problems in bus system before the reform



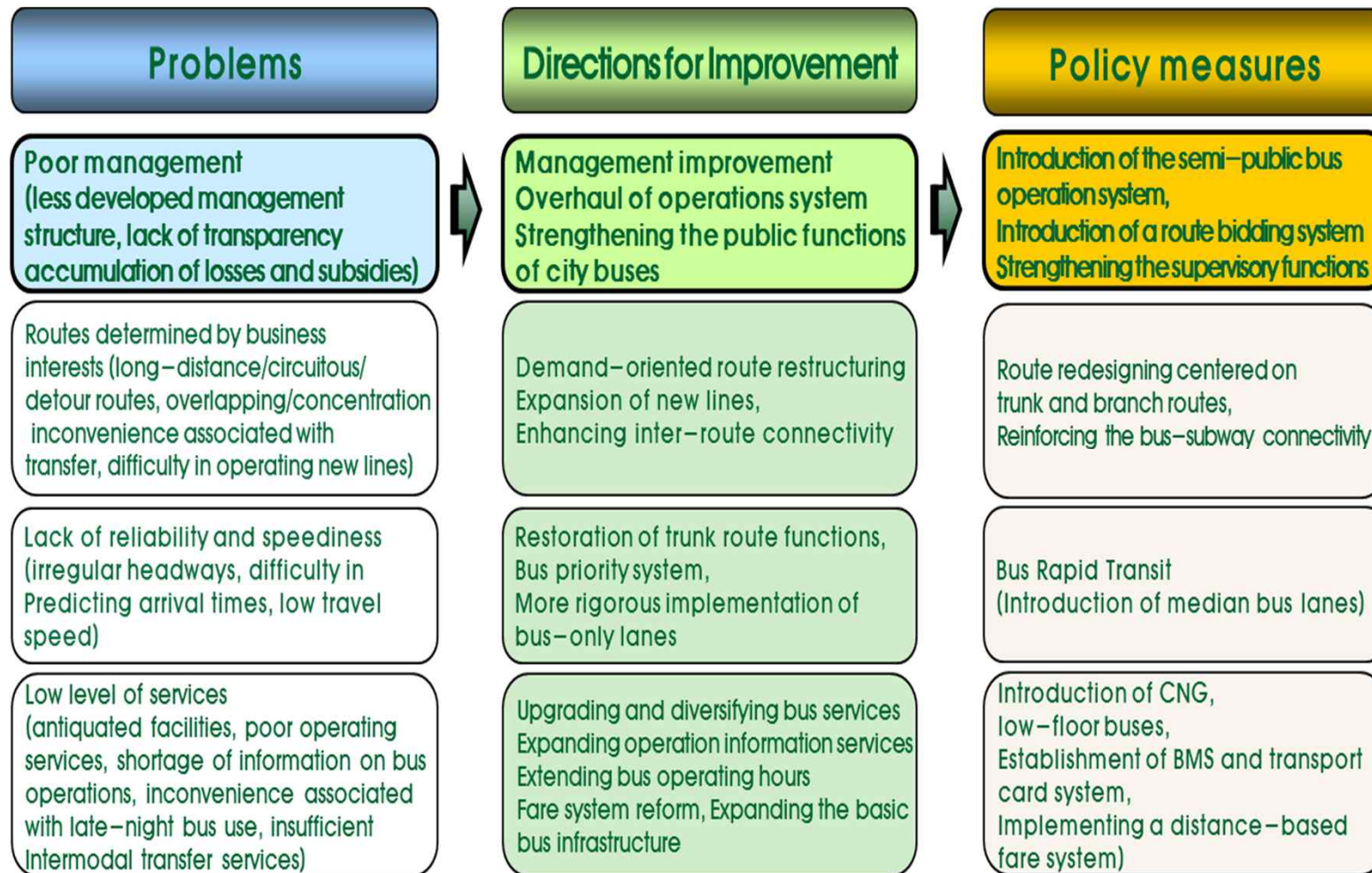
Revitalizing Public Transport Market

- Traffic congestion in urban area and resulted costs are so severe to be globally competitive city
- City can not afford space for new cars
- Increasing energy price can not be accommodated by ordinary people
- People's desire for more livable and sustainable city has increased

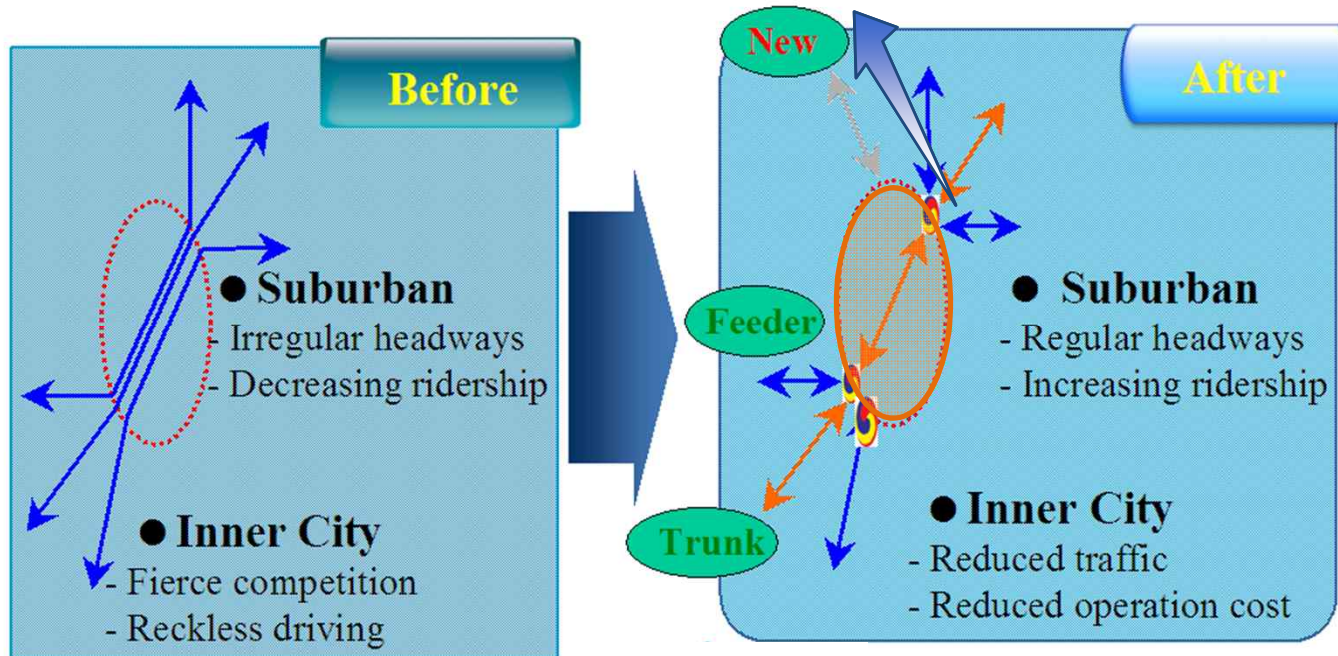


Public transport is only option for above requests ; making better public transport to invite users left

Directions for Bus System Reform



1) Network: Trunk & feeder & circular



Increase

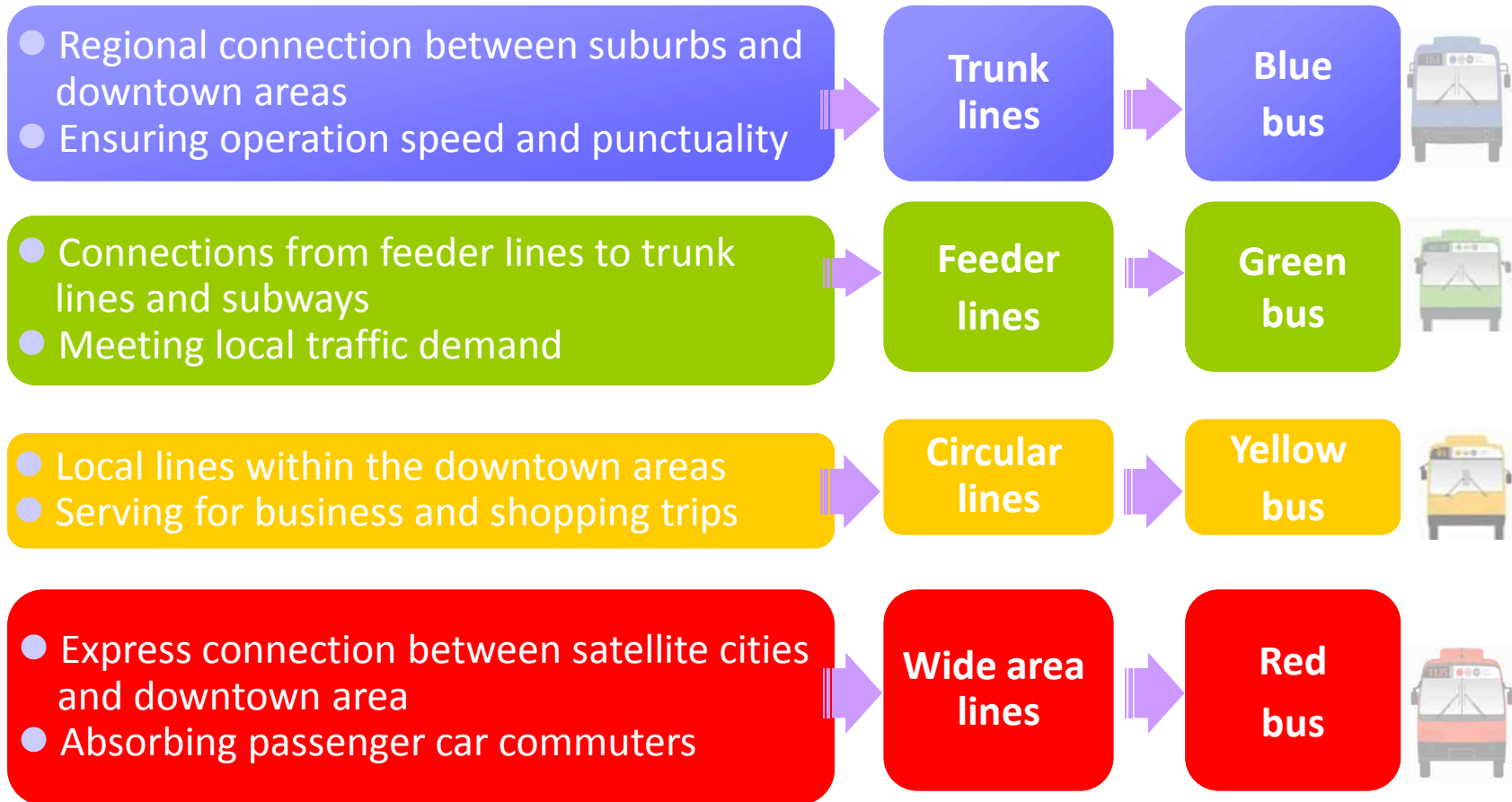
- Network Capacity (new Bus Route & BRT)
- Bus ridership
- Bus Frequency (Keep Interval)
- Bus Company Revenue

Decrease

- Total Bus Operation Cost
- Subsidy of SMG

II. People-centered public transport

1) Network : Trunk·Feeder·Circular· Inter-city Lines



II. People-centered public transport

1) Network : Operation of Four Types of Buses

- Trunk Lines · Feeder Lines · Circular Lines · Wide Area Lines



Red
Downtown to major sub-centers



Blue
Major trunk roads



Green
Subway to nearby residential areas

Four Types
of Buses



Yellow
Circular in downtown or sub-centers

Re-routing Effect

- Bus routes before and after reform

Categories	Before reform (base)	After reform	Effects of bus route restructuring Difference
Curvature	1.3	1.2	0.1
Shortest distance	29.7	29.7	-
Average route length (km)	38.6	35.9	2.7
Travel time (minutes)	128.0	119.0	9.0

- Effects of bus route restructuring

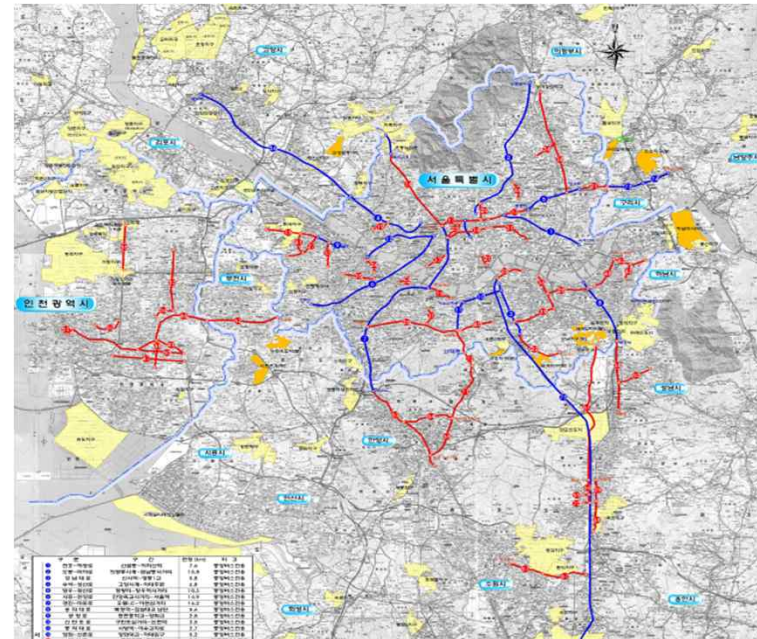
Goal	Achievement indicators	Goal achievement rate
Mobility	Bus travel speed (km/h)	17.2 (2003. 11) → 18.1 (2004. 11)
Accessibility	Number of connected stations per route	9.66 (2002. 10) → 10.3(2005. 6)

2) Bus priority facilities for Bus Rapid Transit

- **Introduction of Bus Rapid Transit (BRT)**
 - Introduced in 2004 by the Seoul City Government
 - Transit Network of Median Exclusive Bus way
 - * Seoul Metropolitan Area: 13 corridors, 157km (2011)
 - Provides faster and reliable travel within the service area



Median exclusive bus lane



BRT Network In Seoul

II. People-centered public transport

Route Map of Median Exclusive Bus Lane



II. People-centered public transport

Improvements achieved through median bus lane operation

Goals	Achievement indicators	Goal achievement rates
Speed	Travel speed (km/h)	16.7 (2003. 12) → 22.0 (2004. 12)
Punctuality	Distribution of operation intervals	0.69(2004. 7 curbside) → 0.56(2004. 7 median) → 0.50 (200.6 2 median)
Transport efficiency	Number of passengers	Up 26.8% (2004. 12 → 2005. 12)
Cost reduction	Travel cost reduction benefits	Saving of about 225.1 billion won

II. People-centered public transport

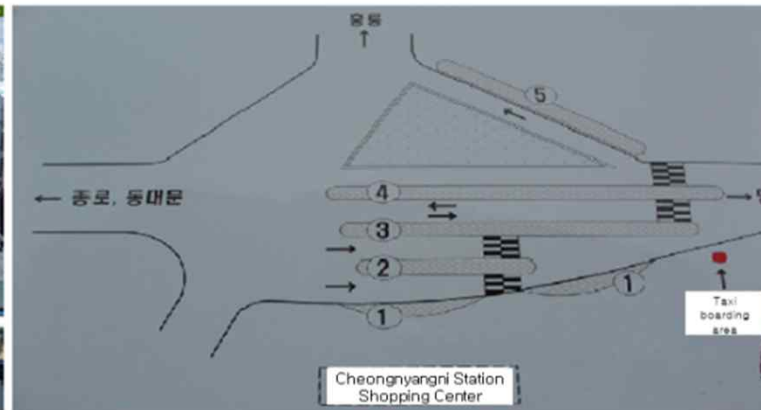
2) Bus priority facilities : Bus & Bus & Metro Transfer Center



II. People-centered public transport

Transfer Center

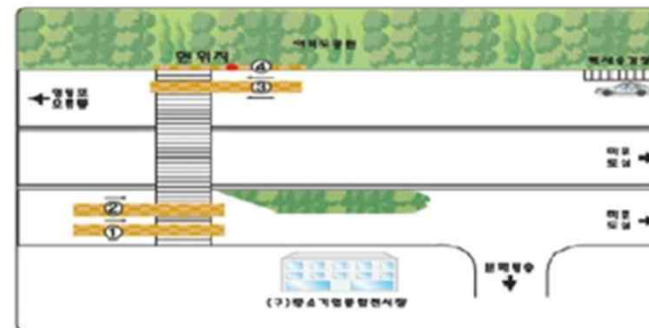
- Cheongnyangni Transfer Center



- Yeouido Transfer Center



A guide on Yeouido Transfer Center platforms and bus routes



3) Adaptation of ITS in Public Transit Reform

- ITS (Intelligent Transportation System) for Public Transit

Traffic Information



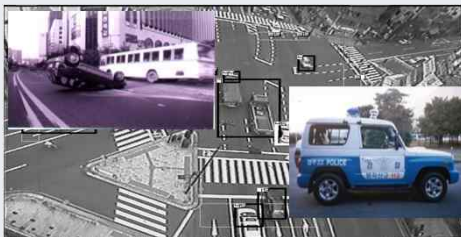
Traffic Management



Electronic Payment



Safety Management



Public Transport Information



Traffic Control Center



3) ITS : Fare Collection

■ Transportation Card

- Smart Card, etc.



■ Benefits

- Distance-based Fare
- Free Charge for Transfers



3) ITS : Changes in Fare System

■ Distance based fare

- Subway single trips
 - : fare according to distance-traveled
 - basic fare: 800 KRW up to 12km;
extra fare of 100 won for every additional 6km
- Bus single trips
 - : single fare of 800 KRW

■ Free of charge for transfers

- For transferring trips
 - : accumulated distance-based fare system
 - basic fare up to 10km;
extra fare for every additional 5km

[Subway]



[Bus]



Effect of fare reform

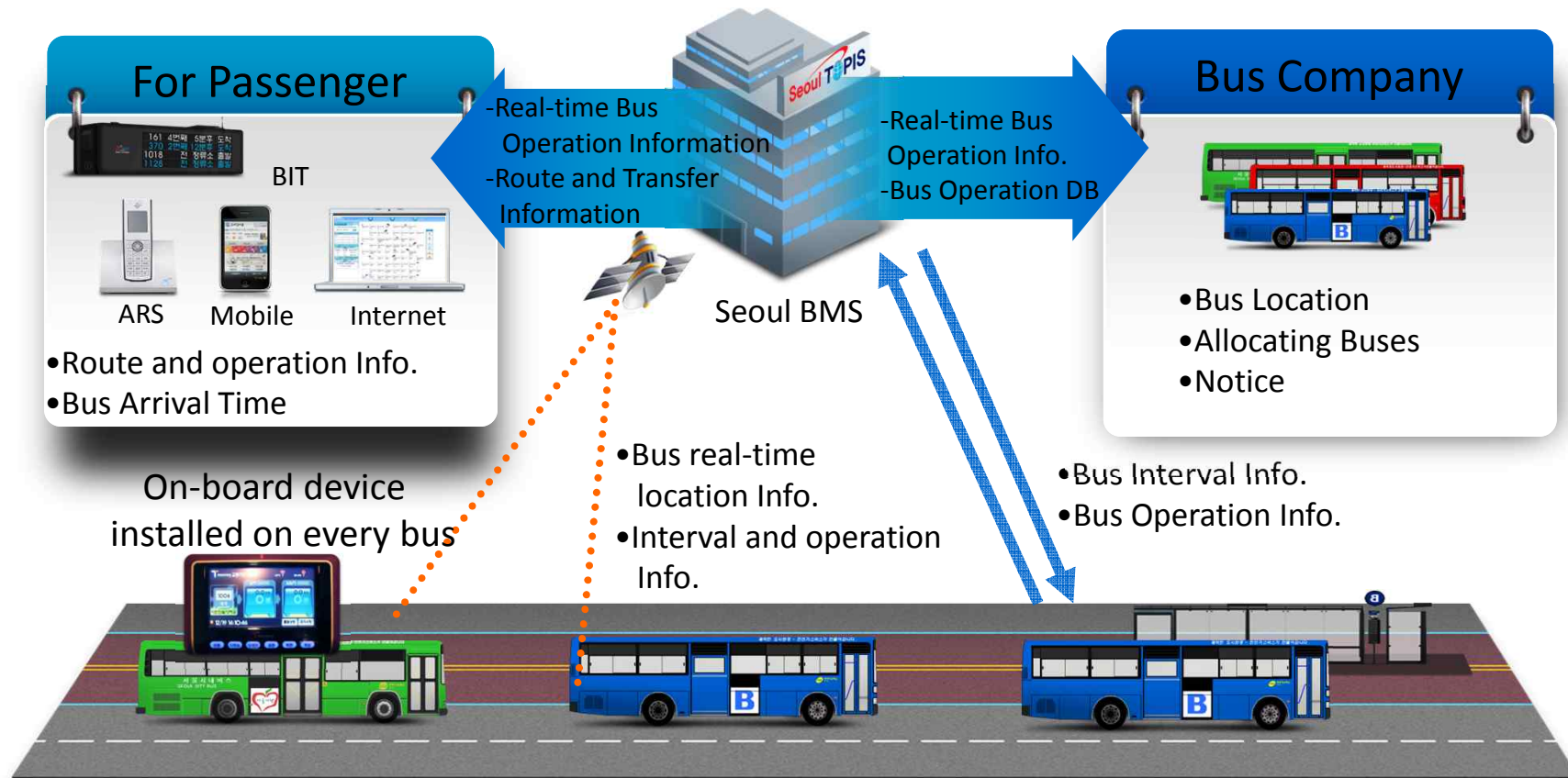
- Change in per-trip fare before and after fare reform

Goals	Achievement indicators	Goal achievement rates
Inexpensive fare	Fare per trip (won)	620 (2003, second half) → 592 (2004, second half)
Revenue transparency	Card usage rate (%)	77.4% (2003. 1) → 88.9% 2004. 12)

II. People-centered public transport

3) ITS : Bus Management System

- BMS: Key role for efficient management of bus services



II. People-centered public transport

3) ITS : Bus Information System

- Information Display at bus stop



- Smart Phone Application



4) Mobility Rights : Barrier free & Environment

- **Expansion in Low Floor Buses and Convenient Facilities to secure Mobility of the Transport Vulnerable**
 - As of 2011, 3,999 Low Floor Buses are on service (adopted as a part of intra-city bus in 2004)
 - * Supply Rate in 2011: Seoul 22.1%, Nationwide 12.1% → Goal in 2016 : Seoul 55%, Nationwide: 41.5%
 - Promoting Expansion of Convenient Facilities for the Transport Vulnerable
- **Replacing Intra-city Buses with Eco-friendly Buses**
 - 100% CNG Bus Operation in Seoul as well as 6 Other Metropolitan Cities
 - 95% of Licensed City-bus(30,359) changed to CNG bus (as of 2011)



Low floor bus



CNG bus

5) Key Practices Favorable to Public Transport

- **Reliability and Frequency of Transit Service**
 - Increase operating speeds
 - Prepaid tickets, Smart cards
 - Low-floor buses with wide doorways

- **Comfort, Safety, and Convenience of Service**
 - Amenities at transit stops
 - Sidewalks leading to stations
 - Uniform and simplified fare structures, Discount for transfer
 - color-coded buses and lines

- **Transit Priority Policy**
 - High automobile taxes & fuel taxes
 - Parking limits, Restrictions on driving in certain areas

II. People-centered public transport

5) Achievements of the public transport reform in Seoul (1)

Categories	Achievement indicators	Goal achievement rates
Speed	Operation speed (km/h)	16.7 → 22.0
Service supply	Operation rate (%)	82.5 → 96.4
Operation safety	Accidents (number)	659 → 493
Punctuality	Distribution of operation intervals	0.69 → 0.56
Affordable fares	Fare per trip (won)	620 → 592
Revenue transparency	Card usage rate (%)	77.4 → 88.9
Public transport promotion	Modal split (%)	61.2 → 62.3
Improvement of the atmospheric environment	Particulate matter ((PM10) Carbon oxide (CO)	69 → 61 0.7 → 0.6
Cost reduction	Travel cost-reduction benefit	Saving of about 225.1 billion won

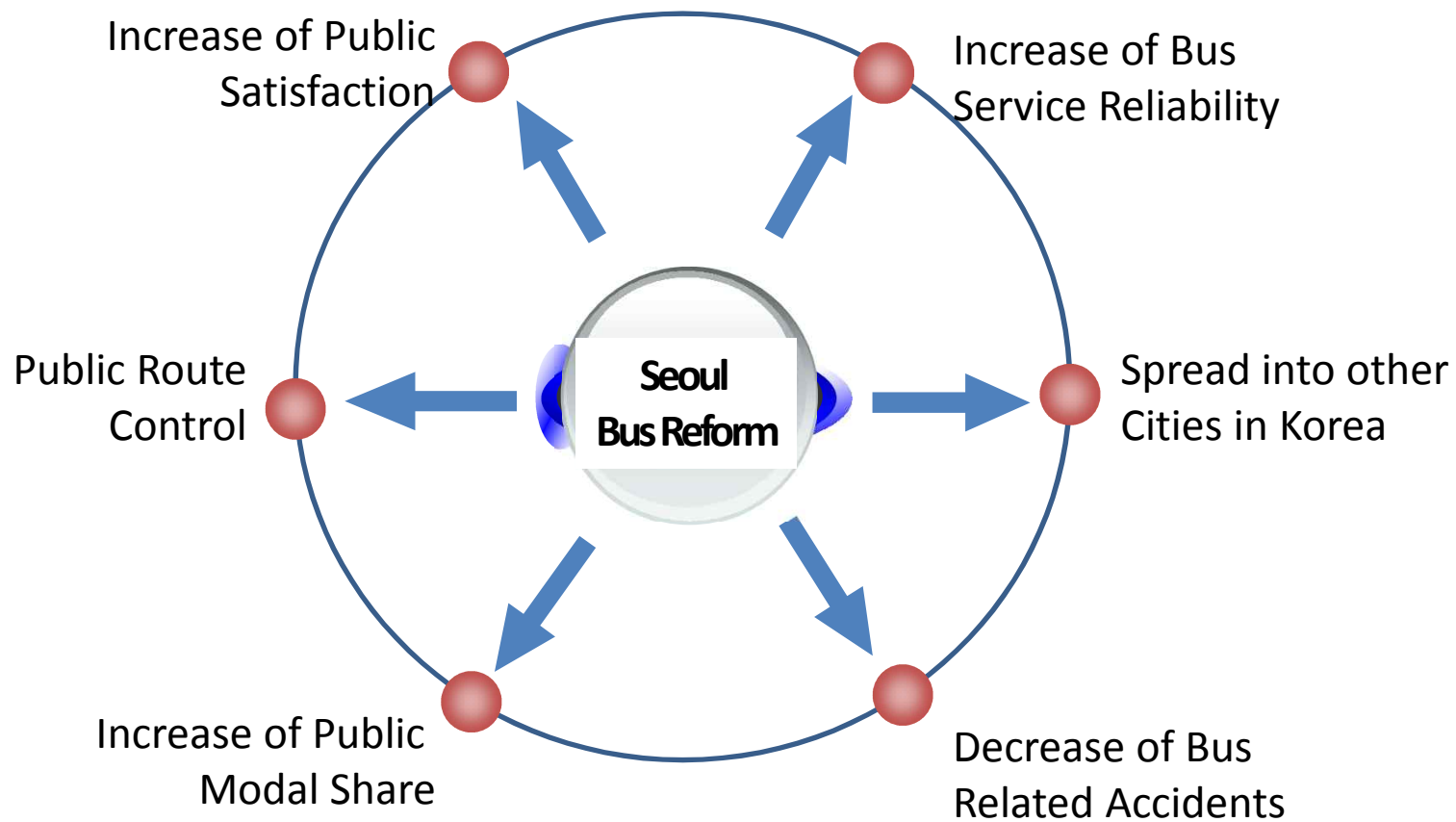
II. People-centered public transport

5) Achievements of the public transport reform in Seoul (2)

Categories	Units	Year 1996	Year 2002	Year 2003	Year 2004	Year 2005
Seoul population (population of the capital area)	1,000 people	10,470 (21,065)	10,281 (22,877)	10,277 (23,240)	10,288 (23,527)	10,297 (23,782)
Ridership	1,000 trips/day	27,800	29,680	29,375	30,344	31,004
Modal splits Public transport	%	59.5	60.6	61.2	62.0	62.3
(Buses)		(30.1)	(26.0)	(25.6)	(26.2)	(27.5)
(Urban railways)		(29.4)	(34.6)	(35.6)	(35.8)	(34.8)
Taxis		10.4	7.4	7.1	6.6	6.5
Passenger cars		24.6	26.9	26.4	26.4	26.3
Other modes		5.5	5.1	5.3	5.0	4.9

5) Achievements of the public transport reform in Seoul (3)

- Effects of New Bus System



5) Achievements of the public transport reform (Summary)

- In parallel with Passenger Car TDM, Transition to Public Transport-oriented Transport System
- With User-oriented Fare System Reform, Fare Equity Promoted
- Improvement in Accessibility and Mobility with Bus-Subway Route Integration
- Saving Competitiveness of Bus Travel by Operating Bus Priority Policy
- Setting a Scientific Foundation for Public Transportation Operation Management
- Minimizing High Costs Transport Facility Investment Demands and Social External Diseconomy
- Public-Private Partnership (PPP) Promotion
- Setting Foundation for Sustainable Transport System

5) Future Public Transportation Strategy and Vision

- **Expansion in Bus/Urban Railway-oriented Public Transportation**
- **System Construction for Intermodal Planning and Operation with Focus on User accessibility, Convenience and Immediacy**
- **Transport Welfare Policy to Expand Transport Service Provision at place where transportation is underserved**
- **Modal Integration System Construction not only for Intra-region, but also In Inter-region**
- **Integrated Governance System Construction for Modal Integration Plan and Operation**

5) Principles and Directions for Public Transport

Physical Continuity

- ▶ Securing seamless transport in terms of transport facilities
- ▶ Establishing an integrated transport system between KTX, rail and long-distance bus

Time Minimization

- ▶ Rationalizing operation schedule and headway to minimize transfer, access and waiting time
- ▶ Securing connectivity between hub and spoke

Economic Utility

- ▶ Securing a competitiveness of public transport fare (transfer discount, seasonal pass, and other various fare policies)
- ▶ Maximizing a payment convenience by one card all pass system in the nation

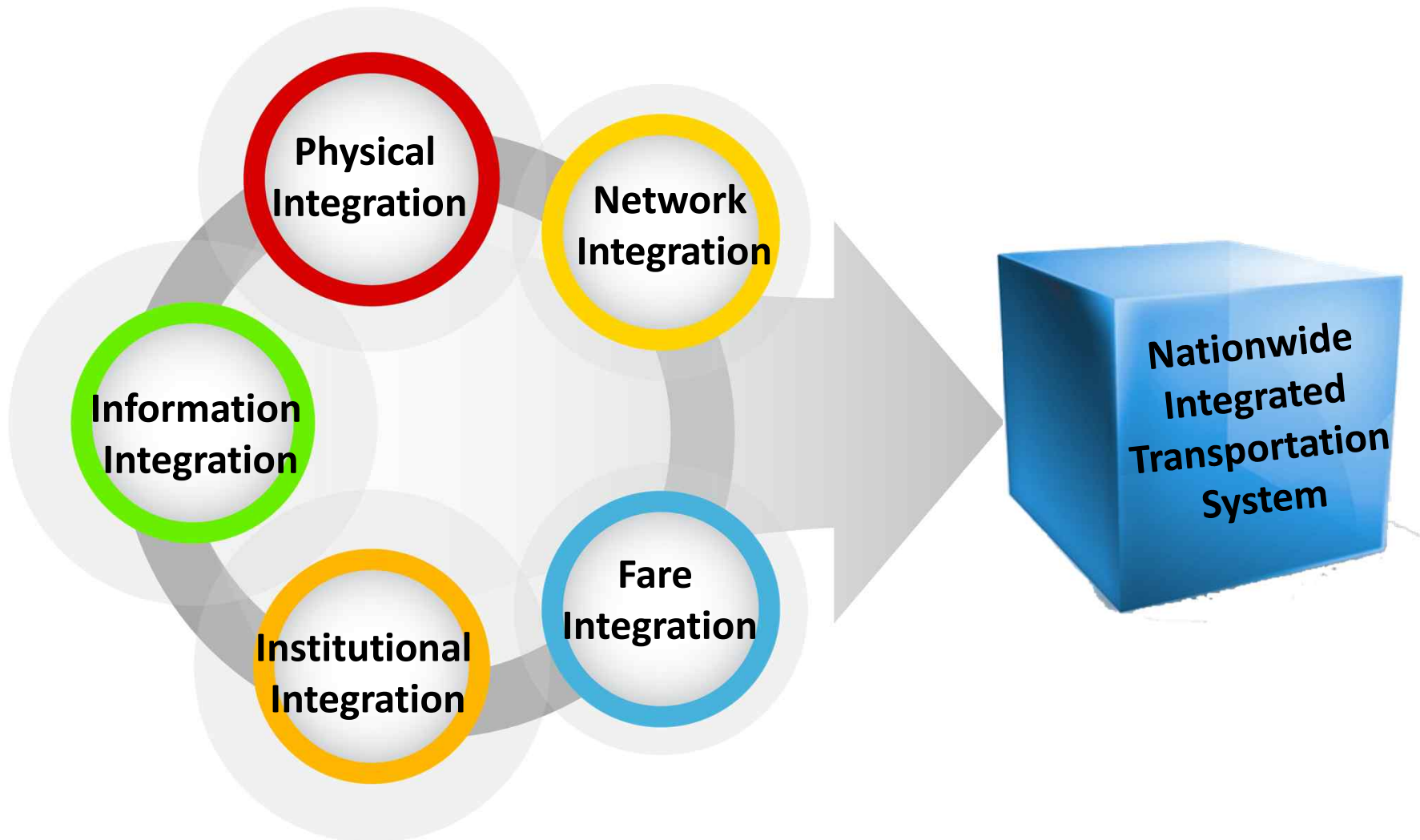
Informative Convenience

- ▶ Increasing user convenience by providing information on transport modes, transport facilities and transfer stations
- ▶ Providing real-time information on transport operation and transfer stations

Administrative Efficiency

- ▶ Integrating administrative service by securing inter-regional transport modes and transport service facilities
- ▶ Securing a capability to cope with unified management of fare, discount, financial resources and conflict and a fast decision-making process

One Nation, One Transport City with Integration





III. People-centered Transport Policies

1. Transport Eco-system Restoration
2. Transport Demand Management (TDM)
3. Public Bike Sharing System
4. Transit-oriented Development (TOD)



1) Transport Eco-system Restoration for People

Cheonggyecheon Stream Restoration

- Building a road & flyover to deal with travel demands



Covering the Cheonggyecheon stream
in 1961~1965



Cheonggyecheon flyover in 1967

Cheonggyecheon Stream Restoration



Cheonggyecheon Stream After 30 years

- **Low Quality of Life in the city center**

- Traffic Congestion, too much through traffic
- Air pollution, Noise
- Relatively Low land value
- Loss of historic legacy



- **Decline of the CBD**

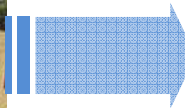
- For 10yr: pop. 40,000, emp. 80,000 reduced
- Headquarters: 63% of Gangnam sub-center
- Old buildings & narrow streets
- Outdated industries



Goals of Cheonggyecheon Stream Restoration

- TDM for people
- Environment for Human
- Rehabilitation for City

Before



After



Impacts on Traffic & Environment after Restoration

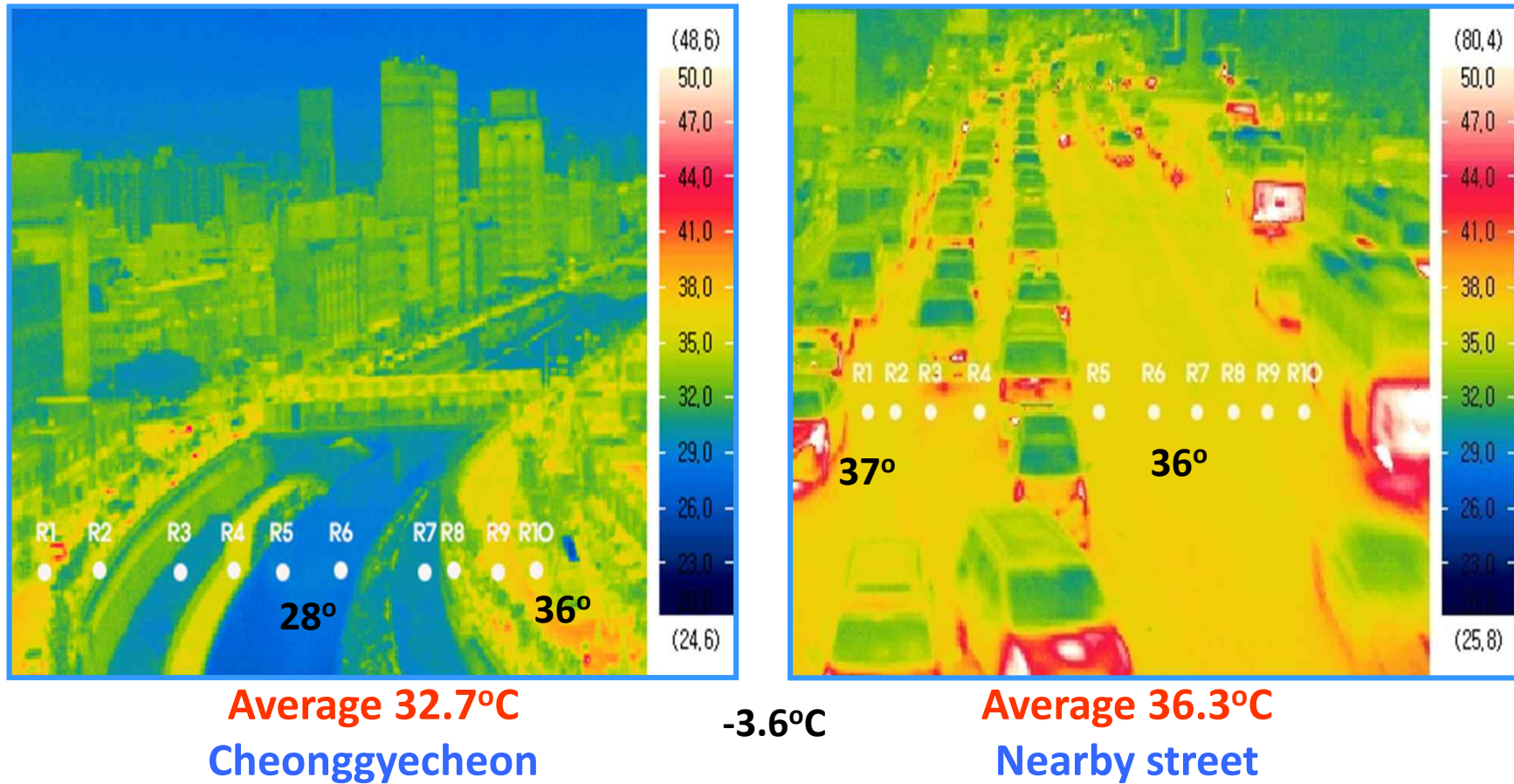
- **Car in/out flow**
 - 1.56M \Rightarrow 1.27M (-18.6%)
- **Public transport ridership**
 - Bus: + 6~10 %
 - Subway: + 6~9 %
- **Heat island effect relieved**
- **Air**
 - NO_2 : 69.7 \Rightarrow 46.0 ppb (-34%)
 - PM10: 74.0 \Rightarrow 60.0 $\mu\text{g}/\text{m}^3$ (-19%)
- **Noise level reduced**
- **Wind corridor created**

III. People-centered transport policies

Cooling effect

Thermal image

July 27, 2005



Cheonggyecheon Stream Restoration

■ Monitoring Results

Traffic

- No serious drop in LOS level
- → no difference in travel speed
- Subway and bus users increase, auto inflow drop

Real Estate

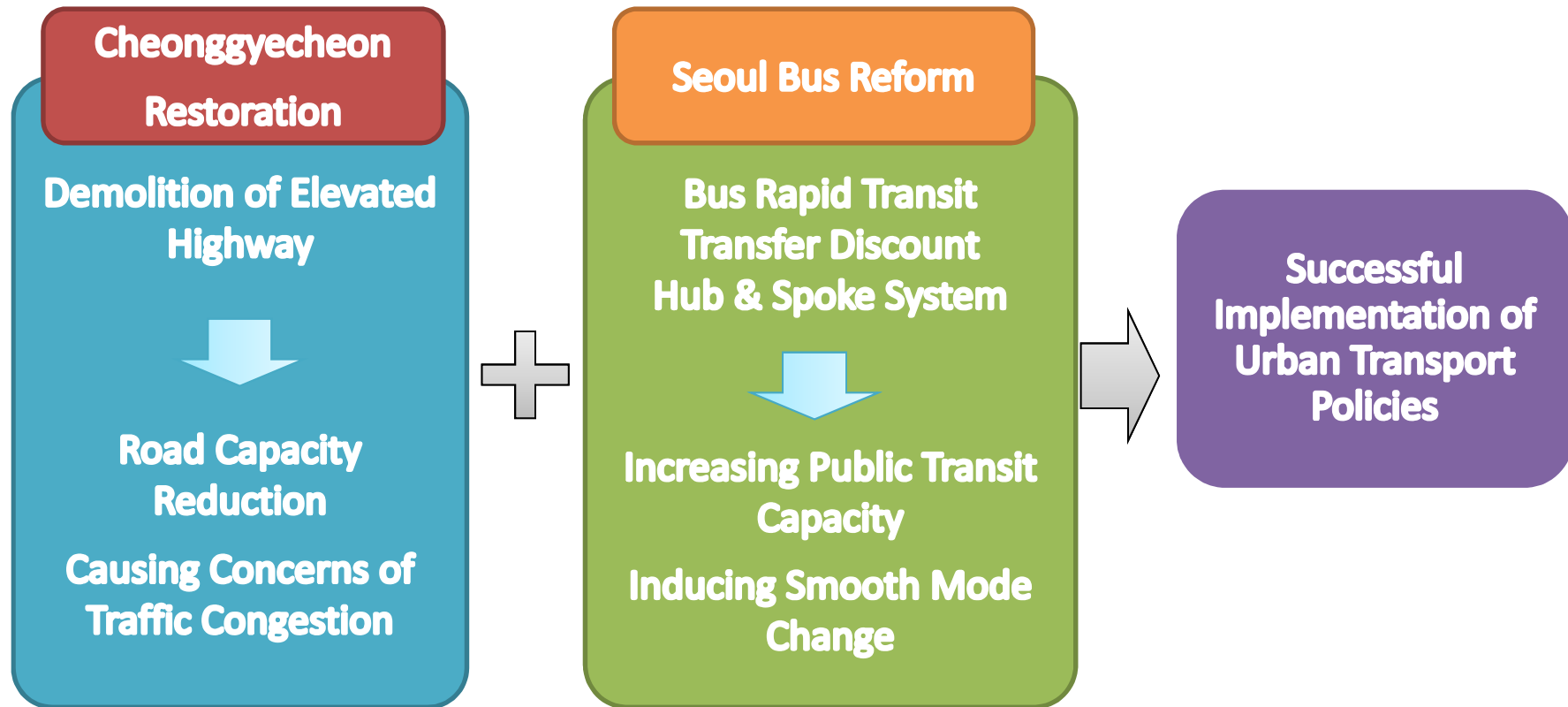
- Over 30% increase of land value since 2002.7
- → rents increased in spite of construction
- High demand on redevelopment sites

Environment

- Temperature drops
- → traffic reduction, stream restoration
- Reduced noise level

Cheonggyecheon Stream Restoration

- Successful combination with Seoul Bus Reform



Having Fun in CBD



- Flyover Demolition: Human-oriented Urban Transport Ecosystem and Environment Restoration
- Expansion of Flyover Demolition to Seoul and the other cities in Korea



2) TDM for people

Passenger-car Reduction Policy

- **Reform of Seoul Plaza**
 - Opened in May 1, 2004 → Restrained Traffic Flow
 - Square only for pedestrians



TDM: Car Reduction Policy

- Reducing parking lots at city hall (400 → 50)
 - Car-free day, mass transit using day (Bus + Subway)
 - Reducing parking lots, increase parking fee



From Car Space to Transit Facilities

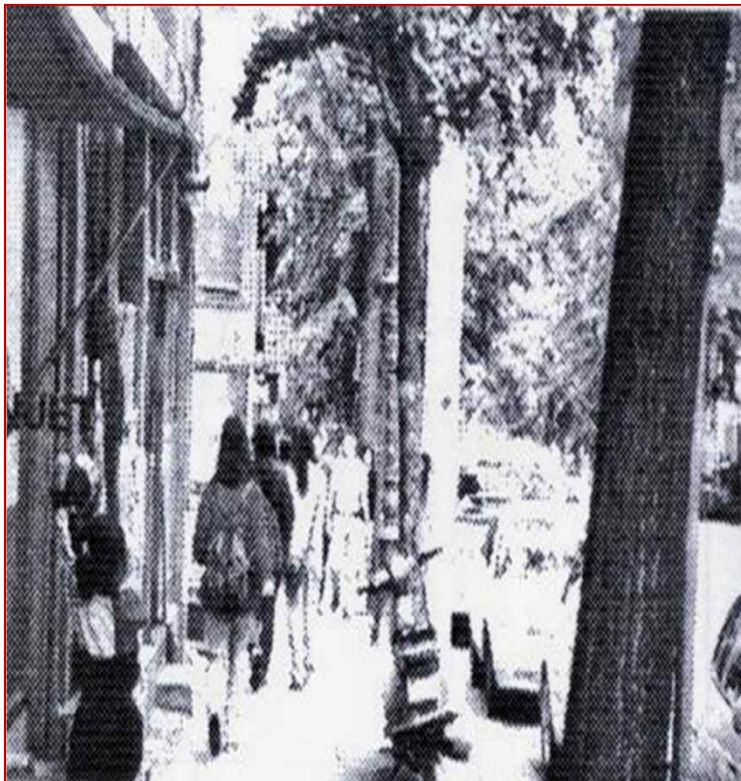
- Transfer terminals for downtown and suburban areas
- Improvement in street furniture design with increasing private investment



Car Space Reduction

- Traffic demand management: Two way → One way

Before



After (2005)



Leadership in BOGOTA



**Trying to solve traffic jam
by building more roads
in downtown is like
trying to put out a fire
with gasoline.**



3) Public Bike Sharing System in Korea

Problems with Old Paradigm



Energy crisis & climate change

- Oil-dependent economy & transport system
- Greenhouse gas emissions



Auto-oriented transport system

- Congestion, air/noise pollution
- High energy consumption

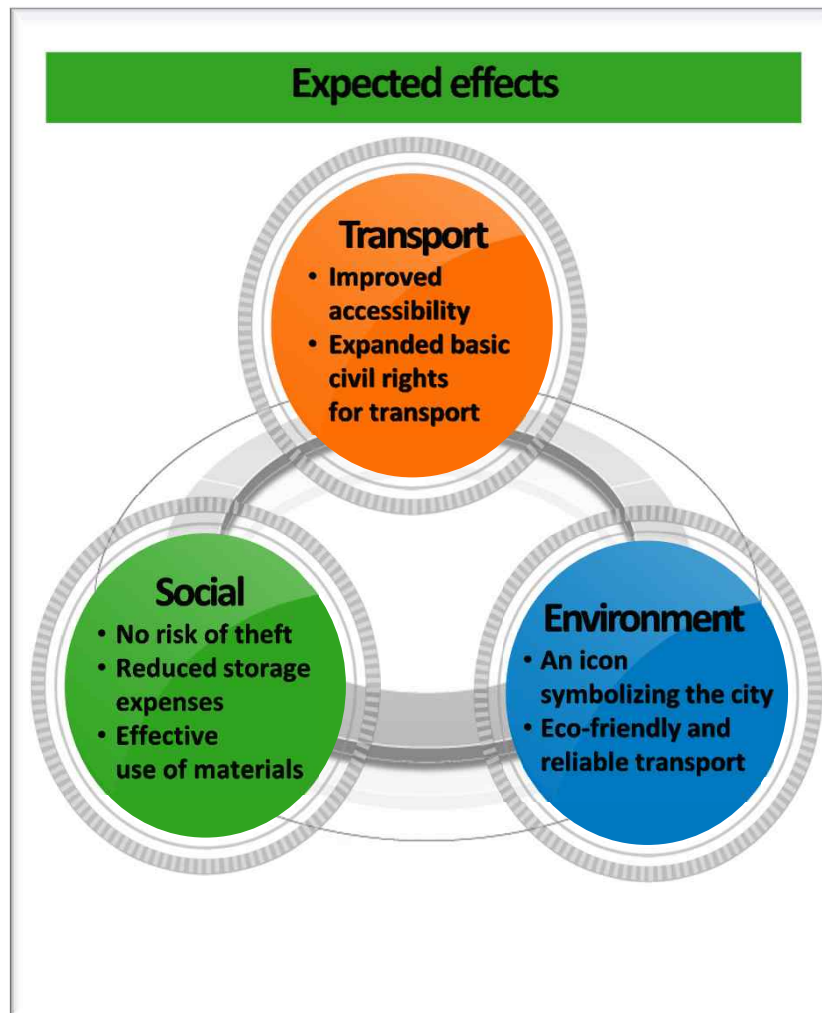
**Non-motorized transport as a bridging strategy towards
“Low Carbon and Green Growth”**

Paradigm Shift: Sharing Society

- **Urban automobiles of future will be**
 - From car-oriented to green transport-oriented
 - Associated with environmentalism and smart technology
 - Making driving enjoyable experience
- **Demand for efficient use of resources**
 - Maximize both social & private benefits
- **Car sharing system**
 - Small electric cars
 - Providing short-distance transportation services in urban traffic grid (Mitchell et al.)
- **Bike Sharing**
 - Less costly alternative to car sharing for provide mobility for relatively short- distance trips



Expected effects



Transport side

- Easily available throughout the city at stations located at 300-meter intervals
- Accessible at user's convenient time
-> Convenient
- Accessible by anyone
-> Improved public benefit

Social aspect

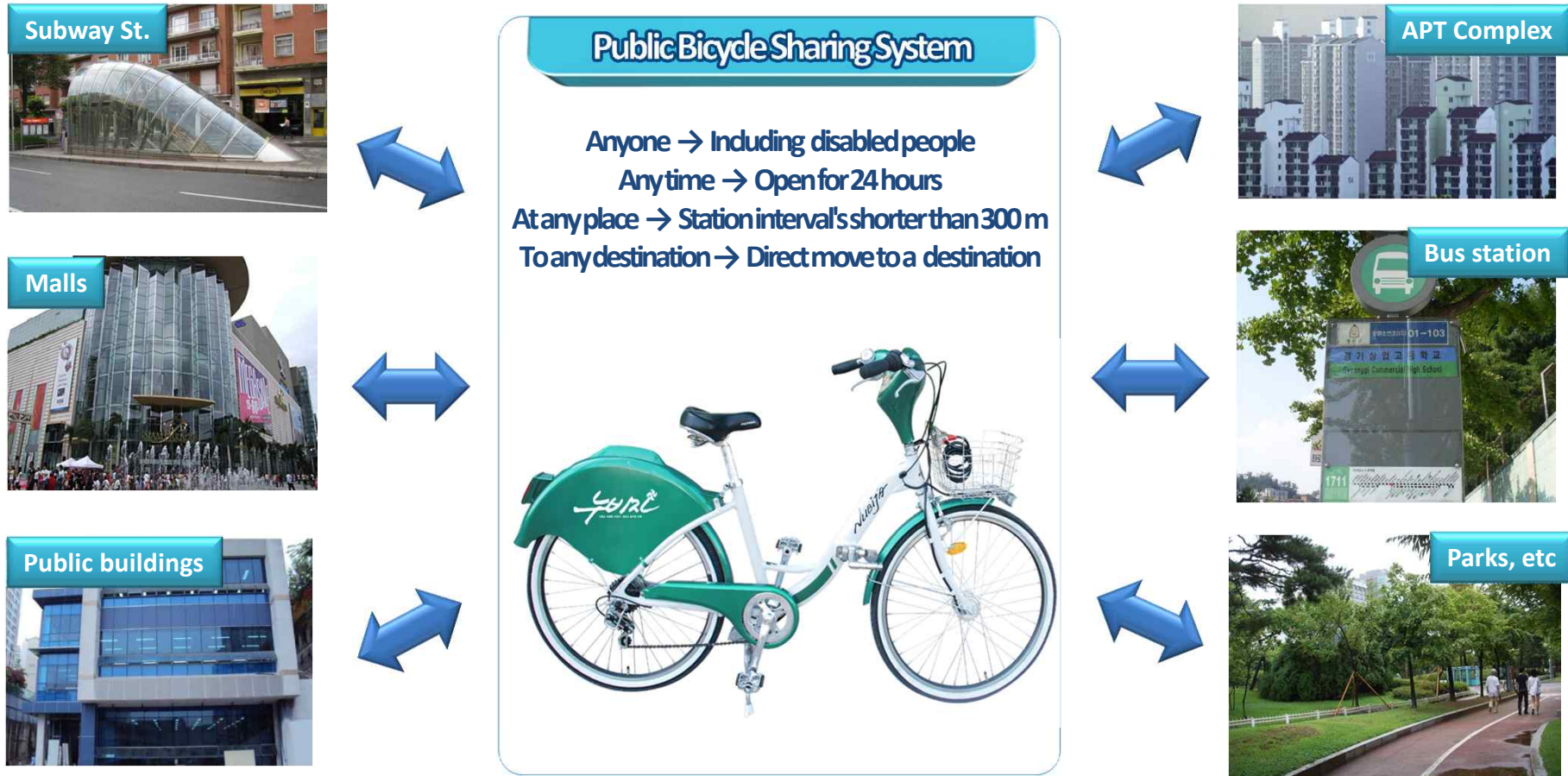
- Real time monitoring the stations to prevent theft
- One public bike plays the role of 15 privately- owned bikes
-> High efficiency storage
- Effective use of limited resources
-> Expanded sharing culture

Environmental side

- Located near the life of citizens and urban image design
-> Improved city's view

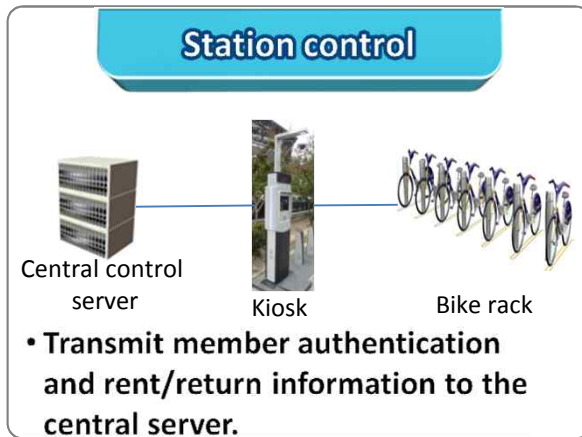
III. People-centered transport policies

Definition of a public bicycle sharing system

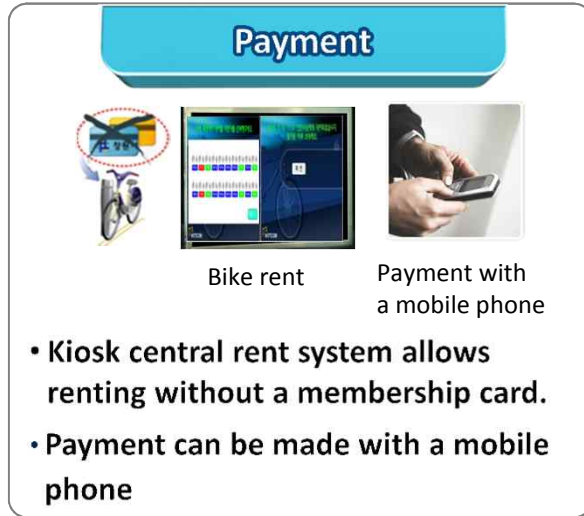


☞ A system that can innovate the traffic culture fundamentally.

Components of public bicycle sharing system



Bike station - Kiosk



III. People-centered transport policies

Bike Sharing: World Wide

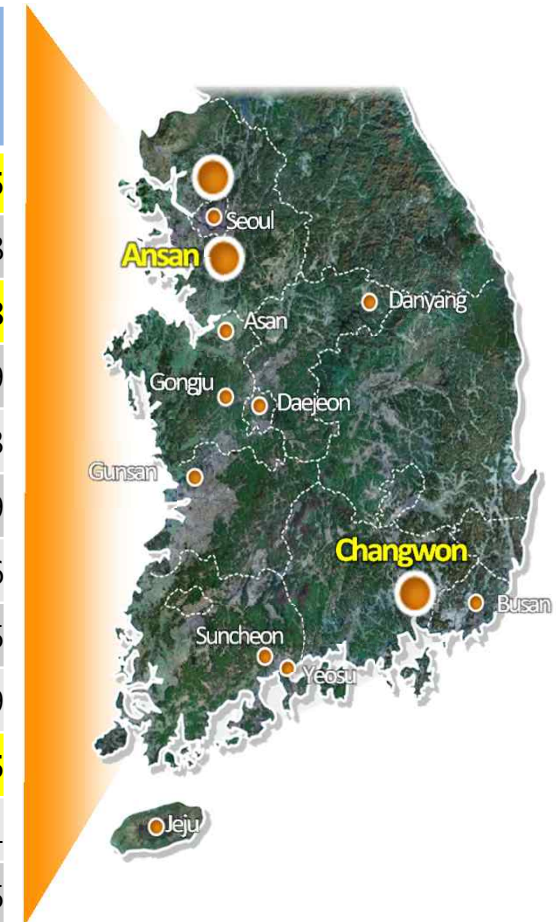
- Bike Sharing Systems have been introduced all over the world
- About 300 bike Sharing services are active around the world



III. People-centered transport policies

Bike Sharing in Korea

City	Population	System size			People per bike
		Station	Rack	Bicycle	
Goyang	976,722	125	3001	3000	325
Seoul	10,176,560	44	570	440	23,128
Ansan	714,285	46	1,155	1,155	618
Asan	284,329	11	130	90	3,159
Gongju	116,773	11	141	120	973
Daejeon	1,529,655	115	1,553	1,000	1,529
Gunsan	278,642	3	-	100	2,786
Suncheon	274,521	20	333	300	915
Yeosu	291,924	16	250	200	1,459
Changwon	1,088,046	235	5,184	4,630	235
Busan	3,534,500	16	620	300	11,781
Jeju	588,618	6	-	72	8,175



Bike Sharing Operation in Korea

City	Operation Type	Condition
Changwon	Direct Management	<ul style="list-style-type: none"> - Operator: Changwon Cycle Racing Corporation (Public Agency) - Budget: About 5 billion KRW/year subsidized by Changwon City Government
Seoul	Direct Management	<ul style="list-style-type: none"> - Still in pilot stage - Pilot Project Sites: Yeouido and Sangam
Daejeon	Direct Management	<ul style="list-style-type: none"> - Pilot Project for 200 bikes - Planned to increase the number of bikes to 1,000 by this year - Expansion Plan: Up to 5,000 bikes
Goyang	Special Purpose Company including Goyang City Government	<ul style="list-style-type: none"> - Operator is ECO-Bike - 4 billion KRW/year requested

III. People-centered transport policies

Usage of Bike Sharing in Korea

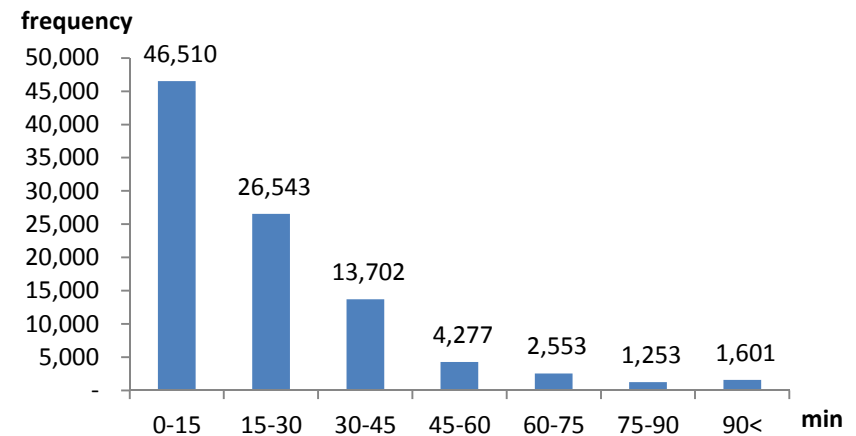
Usage of Sharing Bikes

Categories	Total trip/day	Average trip/bike/day	Average trip/station/day	Service density(capita/bike)
Nubija	9,399	4.9	57.7	151
Fifteen	5,537	3.8	44.3	317
Ta-shu	1,295	6.8	64.8	7,593

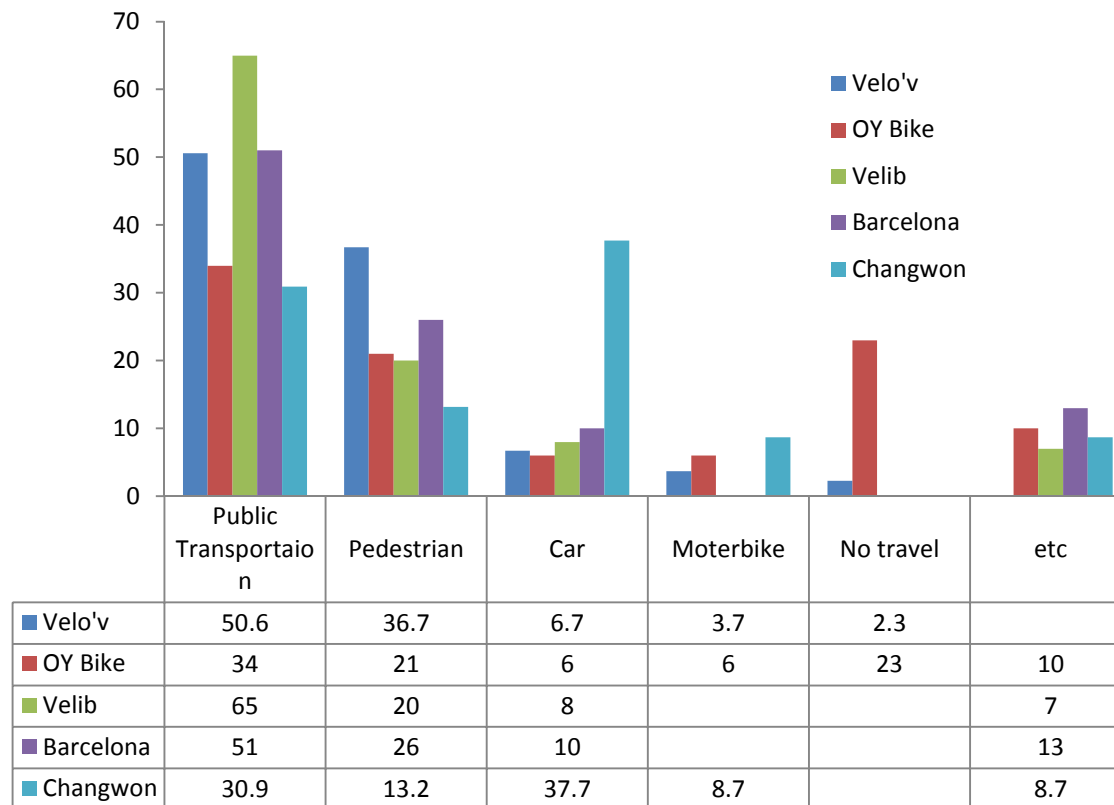
Fifteen Usage per person for a month

Categories	Trips
Average/person	4.2
Min/person	1
Max/person	326

Fifteen Time Frequency



Transfer to Bicycle Mode



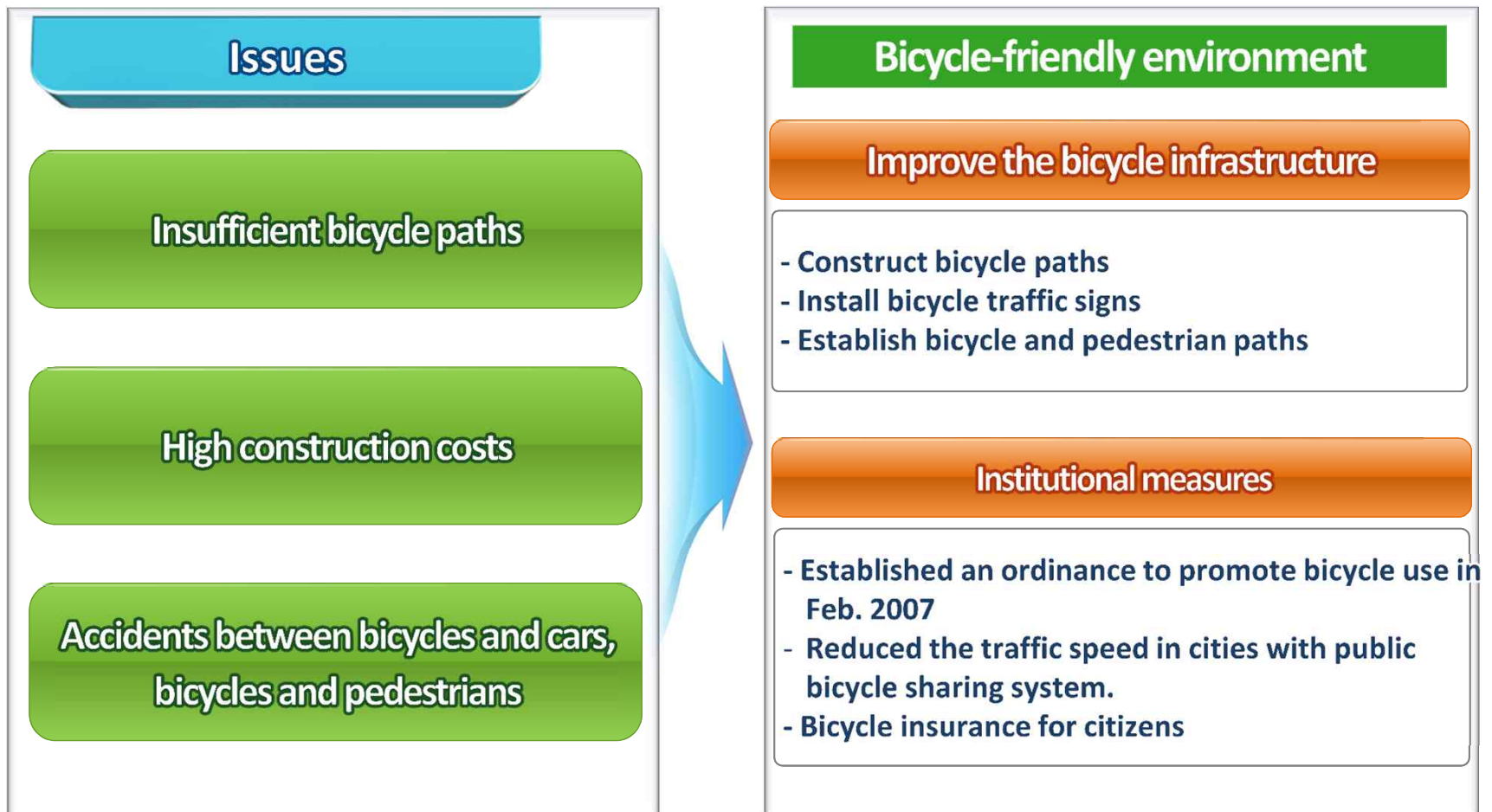
Source: Lee, "Bike Sharing System: Role and future", Policy Seminar for Bike Sharing, KOTI, 2011.

- Major mode change is from public transportation
- About 80% are from public transportation and pedestrian
- Changwon has unique phenomenon (major from cars)

III. People-centered transport policies

Issues occurred during establishing the system and cases that have overcome such issues

Infrastructure & environment



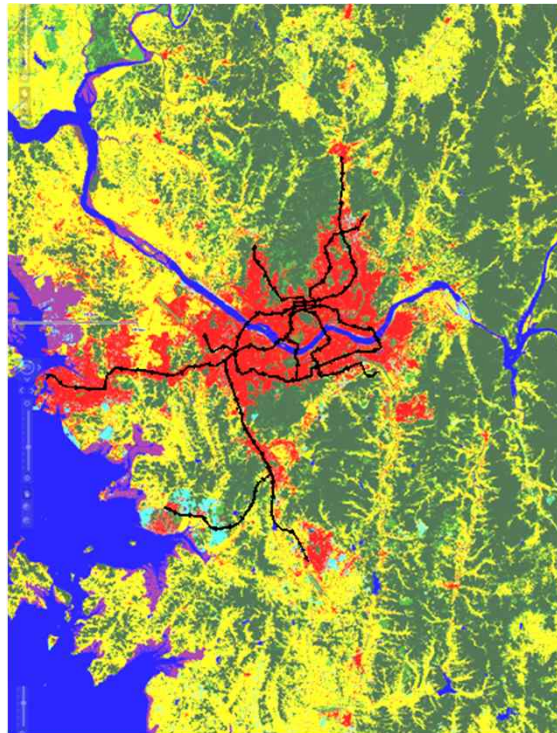
Bike Sharing Systems as a Public Transportation

- Improve accessibility to public transportation such as bus and subway
 - Complement mode for areas that have weak public transportation service
 - Can be used during midnight
- Bike Sharing System is a kind of public transportation
- Subsidies must be considered



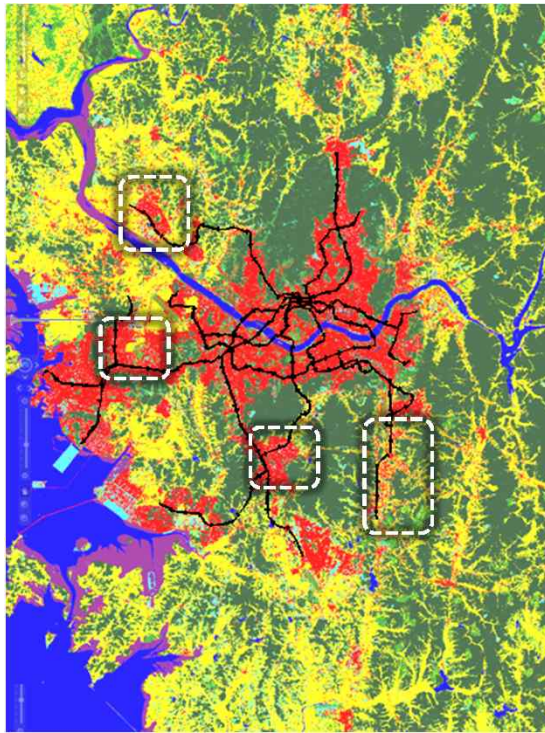
4) Transit Oriented Development in Korea

Changes of Urban Development



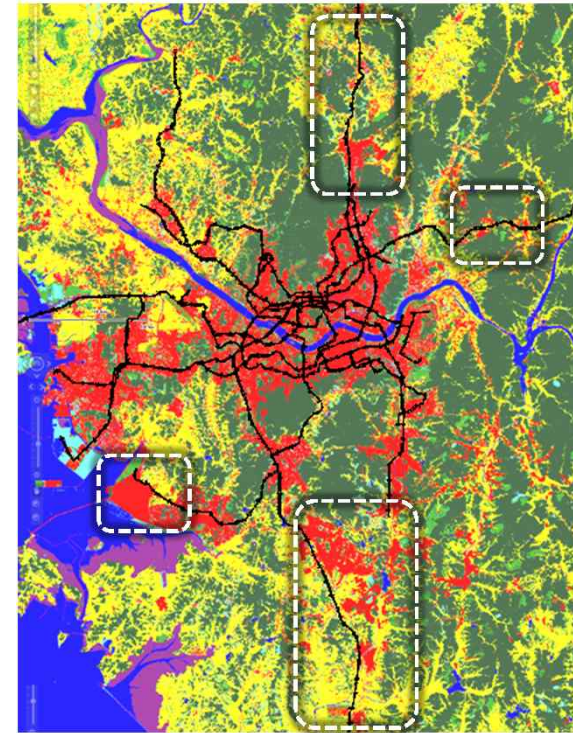
1980s

- Concentration in the city of Seoul



1990s

- 1st Generation of Suburbanization



2000s

- 2nd Generation of Suburbanization

1. Definition and Importance of TOD

- **Integrated development method for both of transport and land use / Cooperation Instrument for both of Transport Specialists and Urban Specialists (Life Style Hub(Where People Gather = Economic Center))**
 - Efficient Financing of Public Transport Financial Resources
 - Transport Investment Efficiency Increase along with Public Transport User Concentration
 - Expanding the Range of Transport Modes
 - Providing Safe Movement
 - Increase in Public Transport Ridership, Decrease in Passenger Car Use
 - Households' Disposable Income Increase
 - Decrease in Pollution and Energy Consumption
 - Decrease in Land Use Area Causes Larger Areas for Open Space
 - Reducing Infrastructure Costs with Compact Development

1. Definition and Importance of TOD

■ Goal of TOD

- Using public transportation, bicycle, and walking, improve accessibility between residential areas and commercial areas, vitalize the use of public transportation, and curb urban sprawl and inner city decline

■ Effective Ways to Pursue TOD

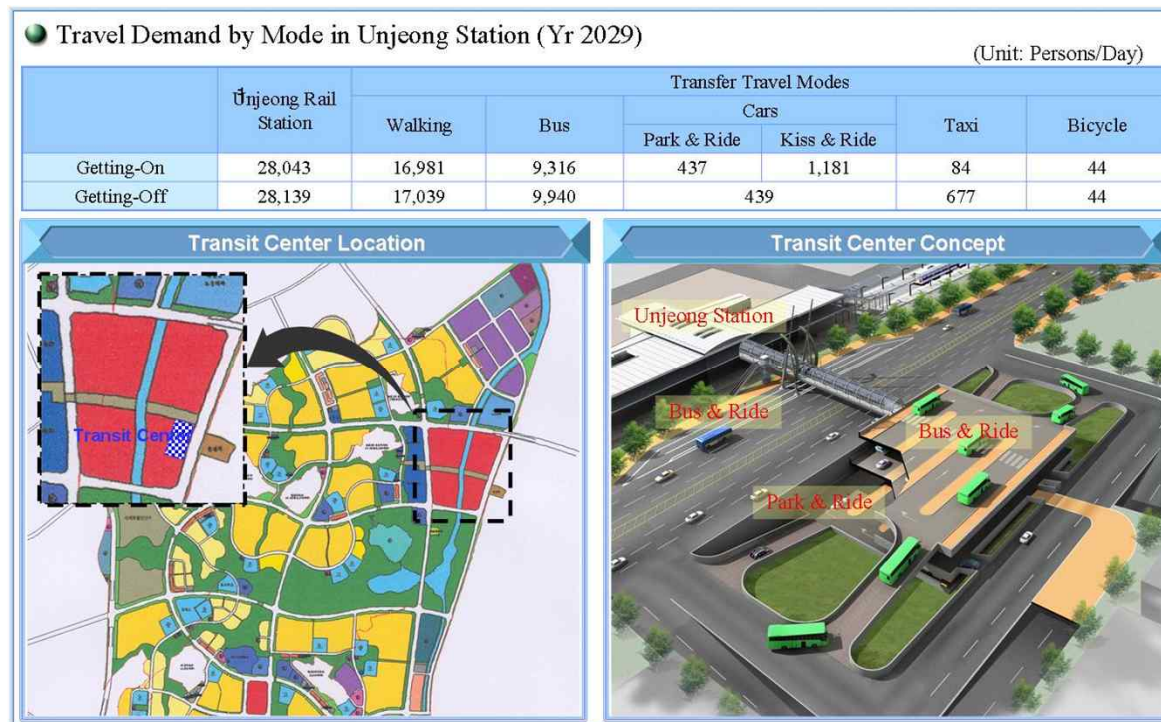
- To link transportation plan and land use
- Flexible land use coping with traffic handling capacity
- Public-transport centered transport system operation
- Pedestrian-oriented transport environment making
- Expansion of bicycles transport and bicycle dissemination
- Strengthening TDM methods by curbing passenger car use, etc.

III. People-centered transport policies

2. TOD Policies in Korea

1) Intermodal Transport Center in New Town Development

- Proposed for sustainable new town development in Korea
- Initiated as a measure to overcome the limitations of the car-oriented development in Korea



III. People-centered transport policies

2. TOD Policies in Korea

2) Intermodal Complex Center at KTX

- Transport center for better connectivity among travel modes and shortened transfer distance and time, and convenient transfer.
- Plus, mixed-use high-density land development at transfer hub.



[Conceptual Design of Transit Center]



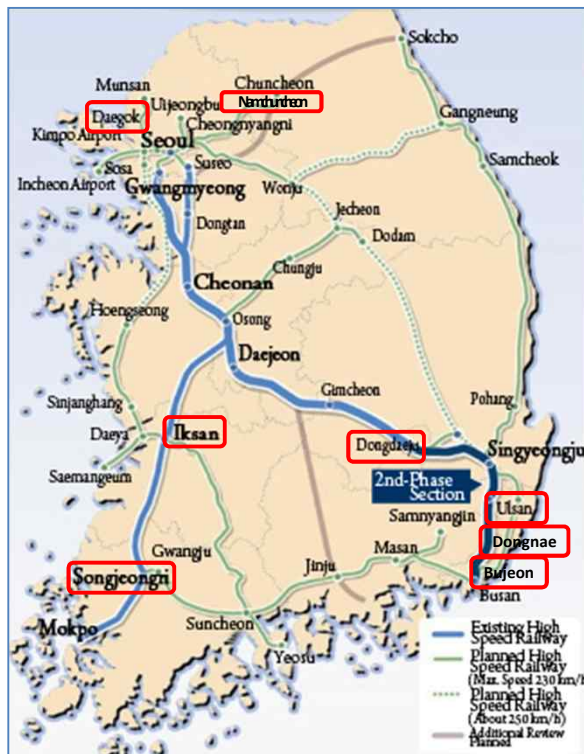
[Conceptual Design of Yongsan Station in Korea]

III. People-centered transport policies

2. TOD Policies in Korea

3) Acts & Implementation of Intermodal Complex Center

- In 2009, National Integrated Transport Systems Efficiency Act
- In 2010, 8 Pilot projects for Intermodal Complex Centers Chosen



< KTX network and 8 Pilot Projects >

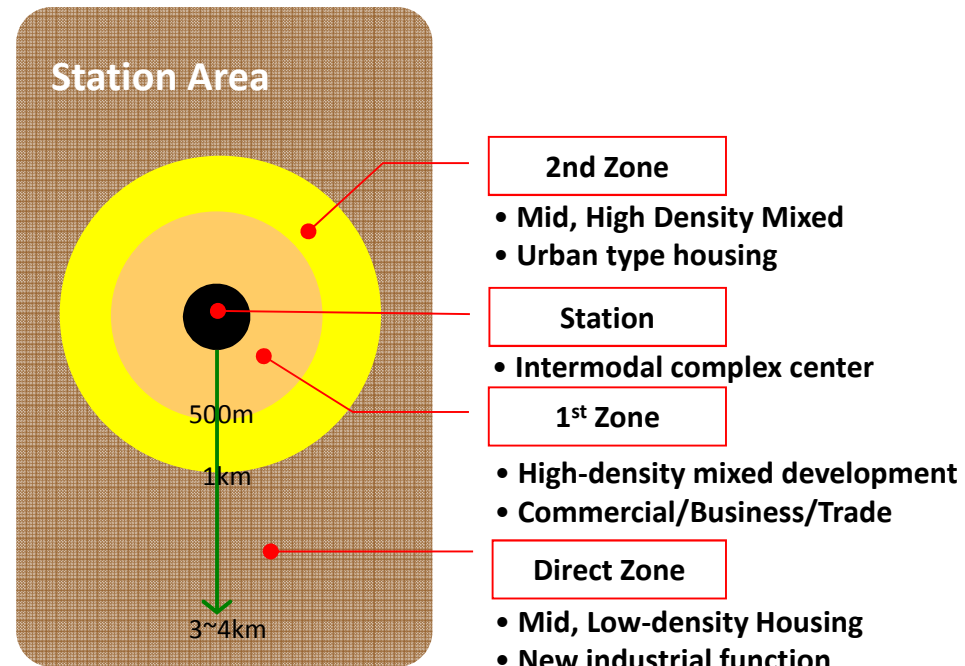


< Planned Dongdaegu Intermodal Complex Center >

2. TOD Policies in Korea

4) TOD Design Guidelines

- Classify Station Area
- For better use of public transport system



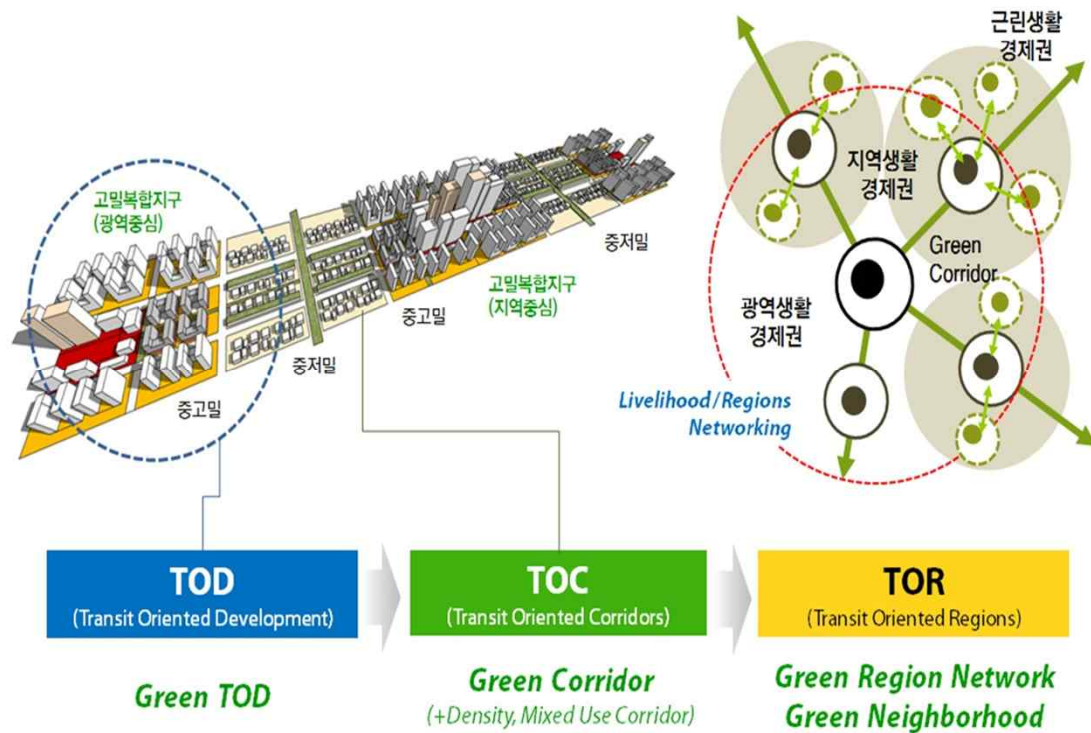
Source: KTX Economic Forum

III. People-centered transport policies

2. TOD Policies in Korea

4) Mixed-Use Development

- Diversity is one of the key elements for successful TOD
- Include commercial, business, housing, cultural, etc.

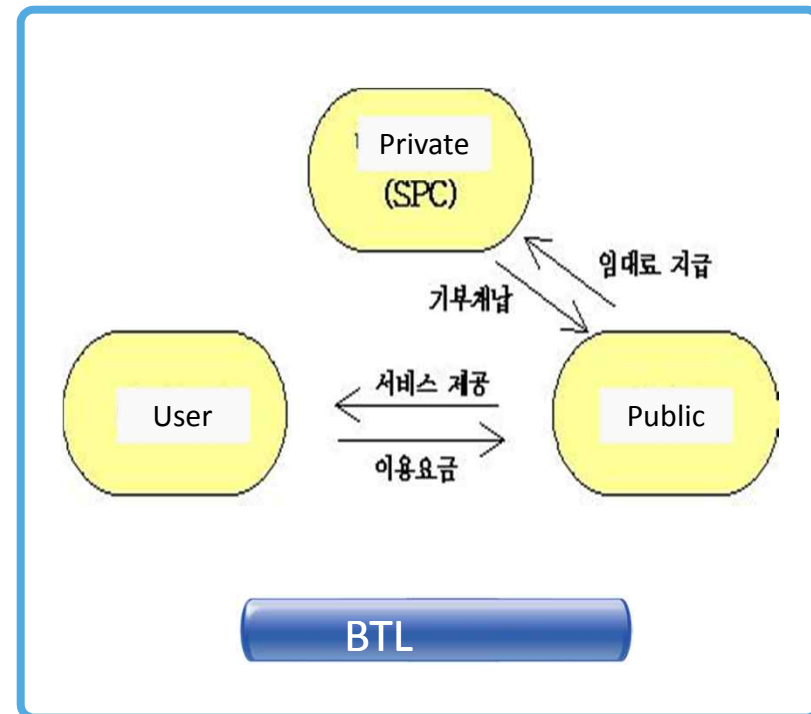
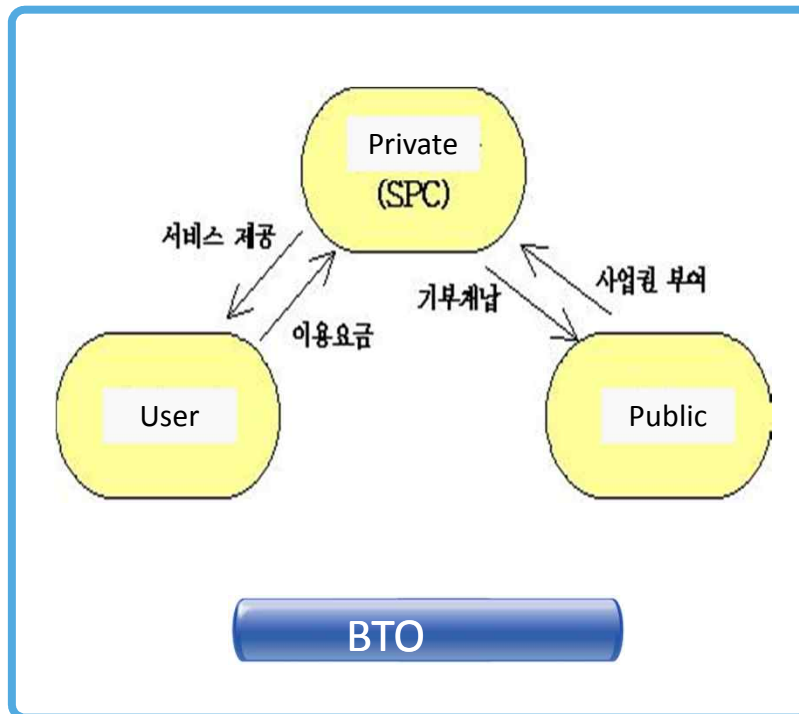


III. People-centered transport policies

2. TOD Policies in Korea

5) Acts for Private-Public Partnership

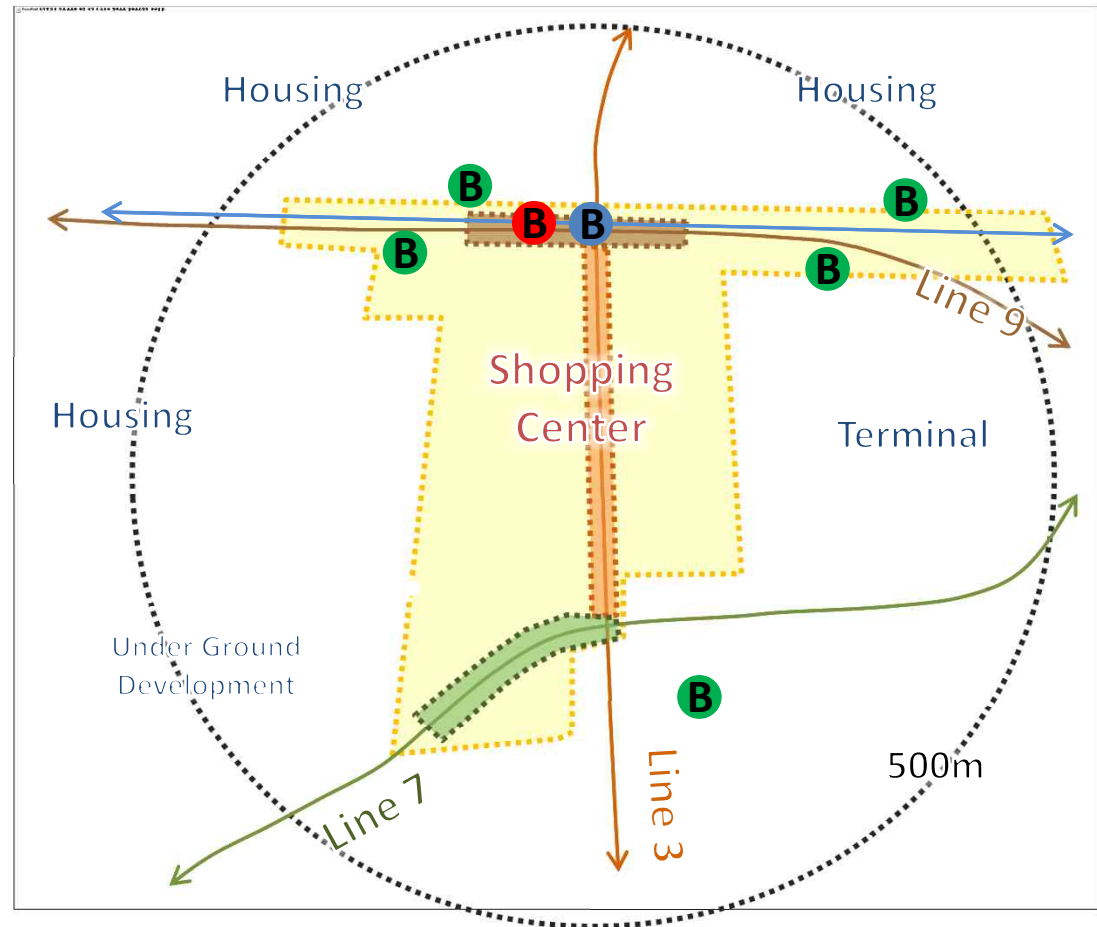
- In 1994, Private Investment for SOC Infrastructure Act
- In 2009, National Integrated Transport Systems Efficiency Act



3. TOD Case

1) Central City

- **Commercial-Housing TOD**
- **High-density Shopping Center, huge underground development**
 - Express-Bus Terminal
 - Department Store
 - Shopping Street
- **Bus-Subway Transit Hub**
 - Subway(Line 1, 7, 9)
 - BRT Sytem
 - (WideBus **B**) , BlueBus **(B)**)
 - Green & Town bus **(B)**



III. People-centered transport policies

3. TOD Case

1) Central City

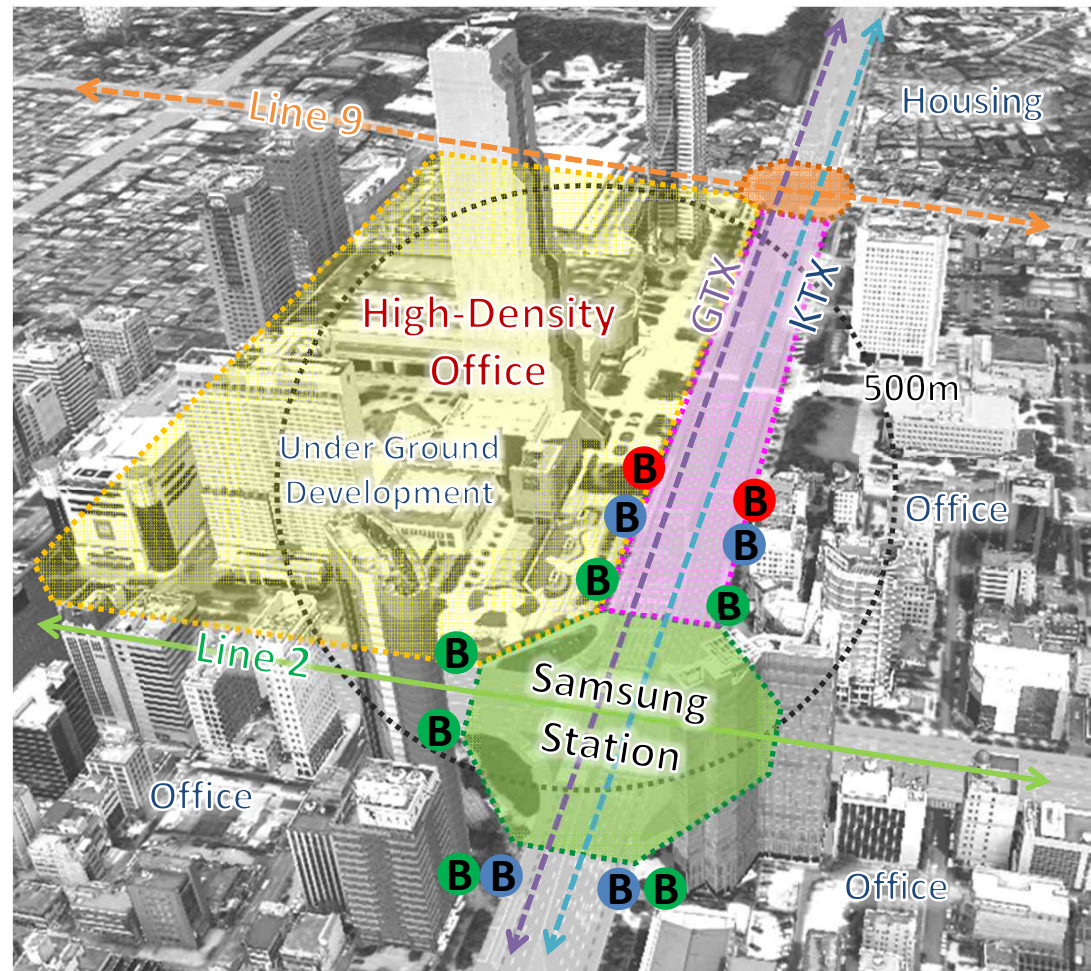
- After 2000, current buildings completed including bus terminal and department stores



3. TOD Case

2) COEX(Korea Exhibition Center)

- **Business Oriented TOD**
- **High-rise, High-density, High underground dev.**
 - COEX Mall
 - Trade Center
 - Convention Center
 - High-Density Building
- **Bus-Subway Transit Hub**
 - Subway(**Line 2**, **Line 9**)
 - KTX** (Korea Train eXpress)
 - GTx** (Great Train eXpress)
 - Wide bus(**B**), Blue bus(**B**)
 - Green & Town bus (**B**)



III. People-centered transport policies

3. TOD Case

2) COEX : Korea Exhibition Center



- 1980s, COEX and Trade center Open
- Induced high-rise buildings surrounding area
- 2000s, COEX Mall Open

4. 3 Key Development Strategies in TOD

Strategies	Contents
Transport hub	<ul style="list-style-type: none">• Improvement of transport connectivity and transfer• Establishing Hub-Spoke structure
Regional specialization	<ul style="list-style-type: none">• Creation of local-based service industry• Link to nearby industry and administrative complex• Brand making for KTX station area
Link to urban development	<ul style="list-style-type: none">• Green growth transit-oriented development• Station area development accord with long-term comprehensive strategy

4. TOD Strategies in Korea

- **Intermodal Transport System is the First**
 - Before land development, transport connectivity and transfer system should be secured
- **TOD Plan should be made at an Early Stage**
 - TOD plan should be started in an early stage of land use and transport planning
- **Government should Invest First**
 - Central and local Government should invest money for regional and local infrastructure
- **Secure Profit for Private Sector**
 - Private sector is basically looking for profits.
- **Strong Organization for Implementation**
 - TOD includes a variety of stakeholders. Strong organization is a key element for successful TOD development.
- **Station should be an Activity Center**
 - Station is not just for riding a train but should be an activity center gathering people.



IV. Concluding Remarks

Key Factors: human

- **What are “True Needs of Customers”?**
 - Who are my real customers? Con-Com.? Vehicles? or VIPs (High-class people)?
 - Have a perspective for minorities Pregnant ladies, children, seniors and captive riders*
 - * Captive rider: The weak people who have no other choice but to ride public transport
 - What are their true needs? Equity (Self-respect)? Economic development? Eco-city?

- **War against automobiles; dancing with transit users Work with public transport users, operators and Gov't**
 - Why public transit rather than private transit? Reduction in social cost and externality
 - Change your budget priorities for people, First is pedestrian safety and bicycle networks
NOT auto networks in a city

- **Consensus on importance of sustainable transport**
 - Urban transport policy to promote green transport and NMT modes & to provide the livable city for the people
 - New way of urban development focusing on public transport use
 - High-density development with pedestrian and public transport system

Suggestion for Sustainable Transport

- **Strategic plans for economic growth combined with transport infrastructure**
- **Public Transit-oriented policy measures for national/regional/urban public transport**
- **Convergence & Integration of Public Transport system with good access and benefit for users**
- **Restoration of Transport environment for people, not car and space**
- **Clearly stated vision**
 - Promote dense development for transit station area (TOD)
 - Lead the urban planning by transport
 - Prioritize the green transport & NMT modes than auto
 - Encourage private car users to change their mode to public transport

Recommendations

- **Korea's Challenge Experience Does Not Necessarily Mean Success.**
- **It Derives from an Attempt to Restore People's Mobility and Sustainable Transport Ecosystem Departing from Road/Motor-oriented City**
- **Set a Policy Priority on Human-orientedness and Sustainable City Ecosystem**
- **Korea's Challenge Will Continue for the Future**
- **Sharing Korea's Experience and Knowledge with the World is Vital.**
 - International collaboration in capacity building
 - In-depth studies to develop policy toolkits for sustainable transport



Thank You.

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