Reformation of Mass Transportation System in Seoul Metropolitan Area

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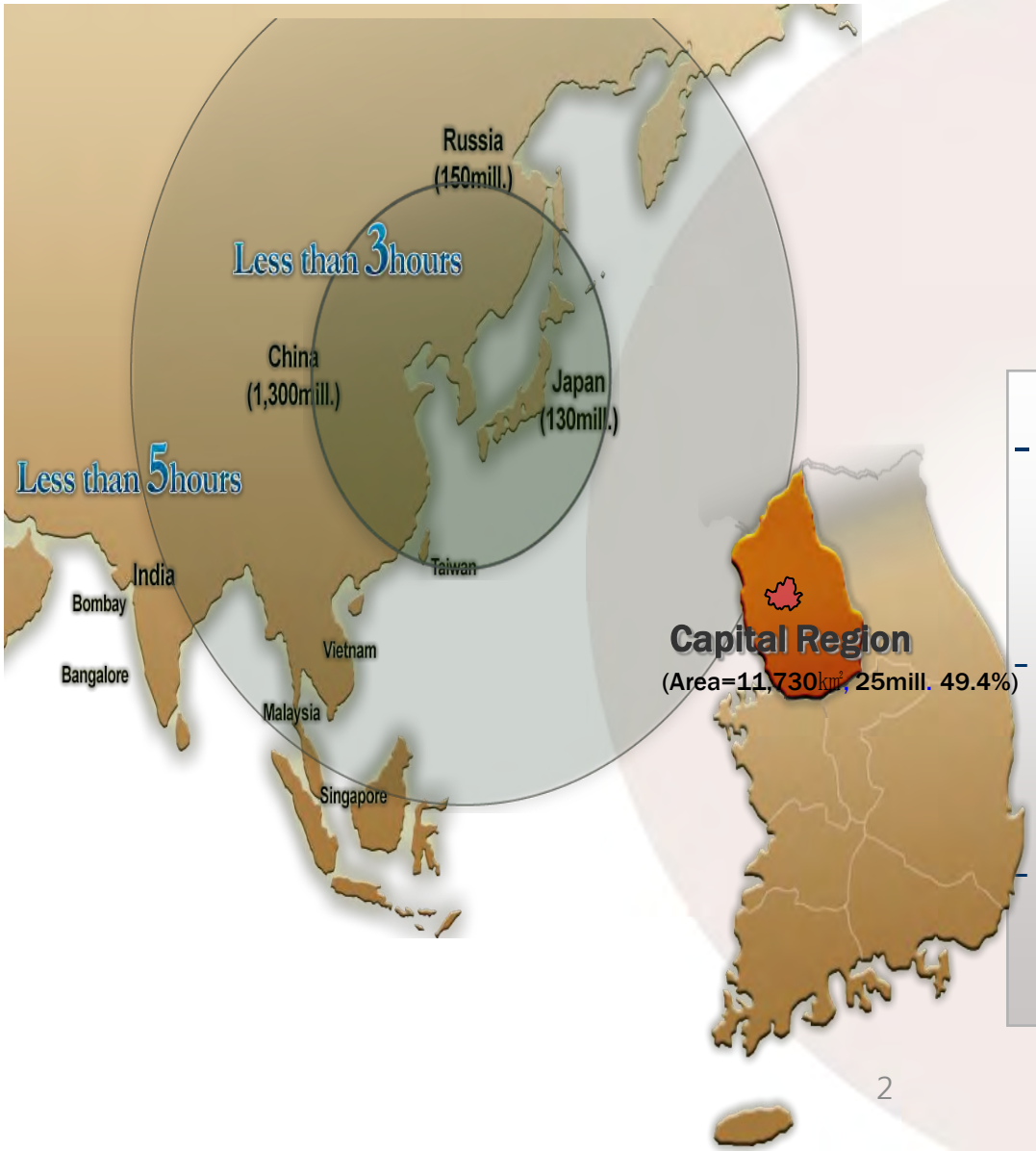
General Information



- Population of South Korea :

  51.8 Million ('13)

- Size of South Korea :

  99,990.5 ㎢

- South Korean Capital : Seoul

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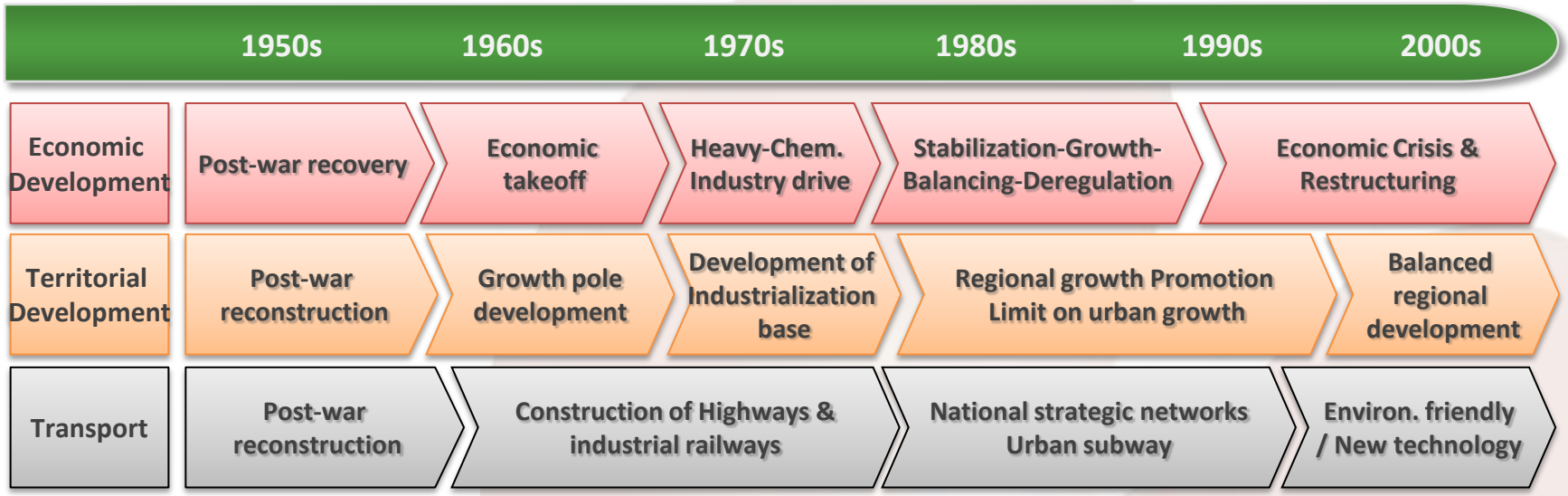
Korea's Pathways at a glance



	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

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Population and Size

- Seoul-Metropoliotan Area

· Regions : Seoul, Incheon, Gyeonggi

· Radius : Seoul City 11~16 km

Metro Seoul 48~72 km

	Population (million)	Size (㎢)	Density (per ㎢)
Seoul	**10.36**	**605.3**	**17,115**
Incheon	**2.66**	**1,002.1**	**2,654**
Gyeonggi	**11.11**	**10,183.3**	**1,091**
Total	**24.13**	**11,790.7**	**2,047**

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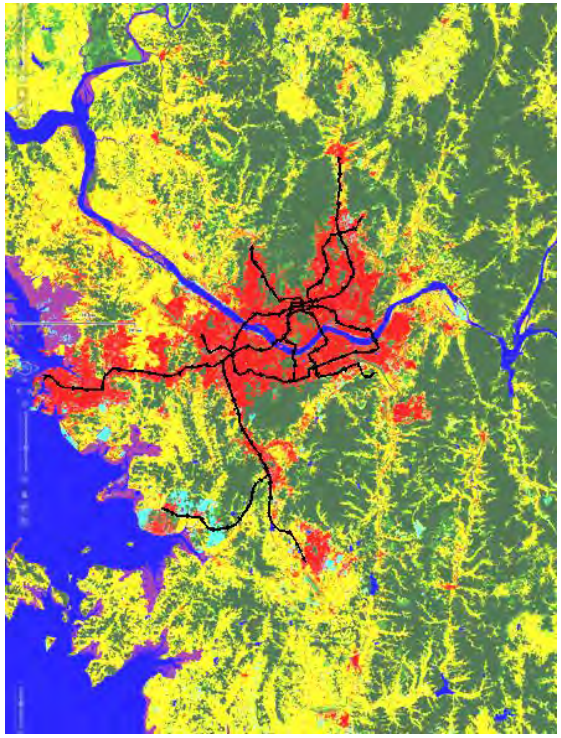
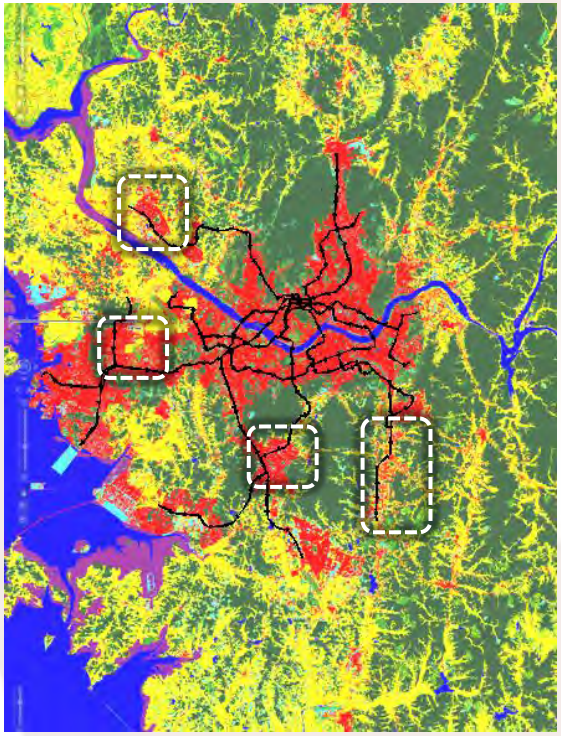
Changes of Urban Development



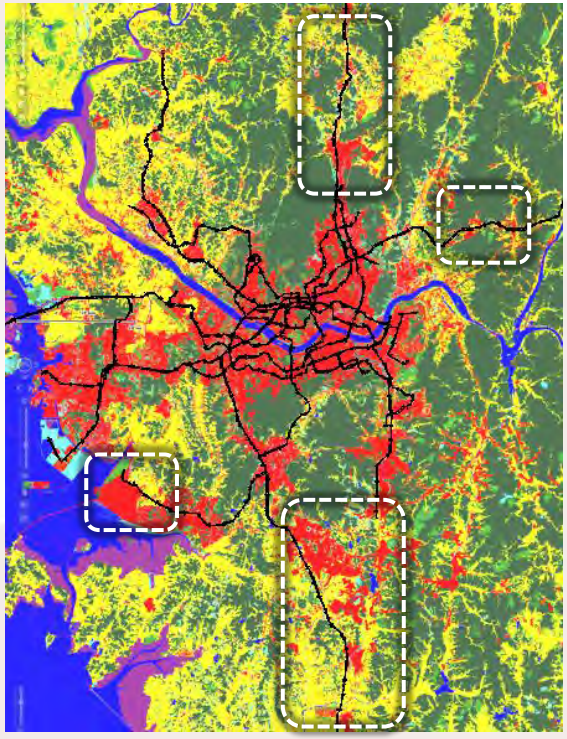
1980s

- Concentration in the city of Seoul



1990s

- 1st Generation of Suburbanization



2000s

- 2nd Generation of Suburbanization

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Efficiency

Equity

Sustainability

Policy

New town development

1960 | 1970 | 1980 | 1990 | 2000 | 2010

70s : Housing Construction Promotion Act

88-92 : 200M Housing Policy

2008 : 150M Affordable Housing Policy

Ulsan

Seongnam

Gwacheon

Mok-dong

Five new town

Nine new town

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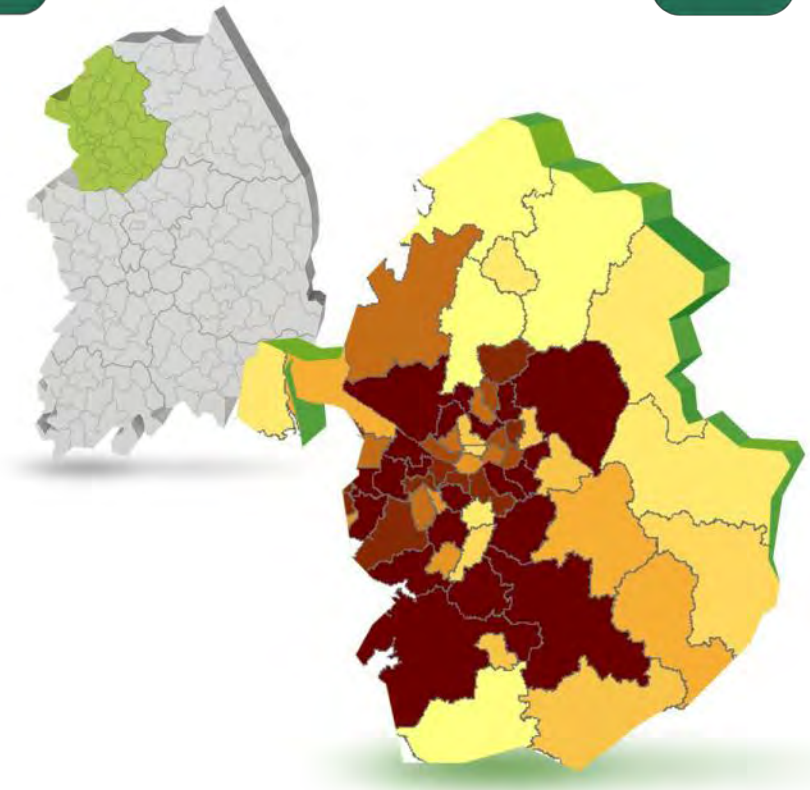
Efficiency | **Equity** | Sustainability

Seoul Metropolitan Area

1990 | 2000 | 2005

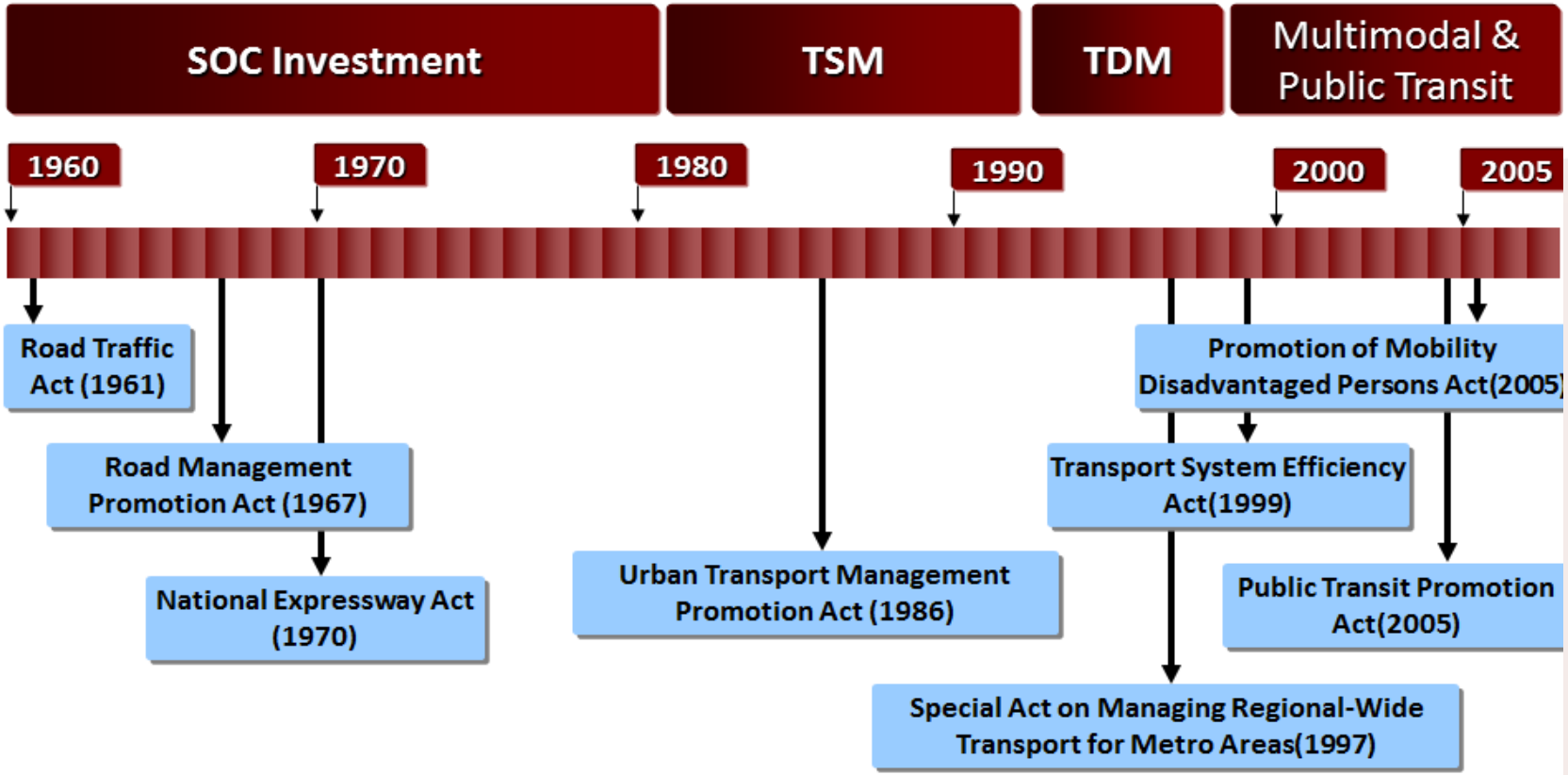


Legend

- 0 to 100,000
- 100,000 to 200,000
- 200,000 to 300,000
- 300,000 to 400,000
- More than 400,000

KRIHS Korea Research Institute for Human Settlements

History of Urban Transport Policies



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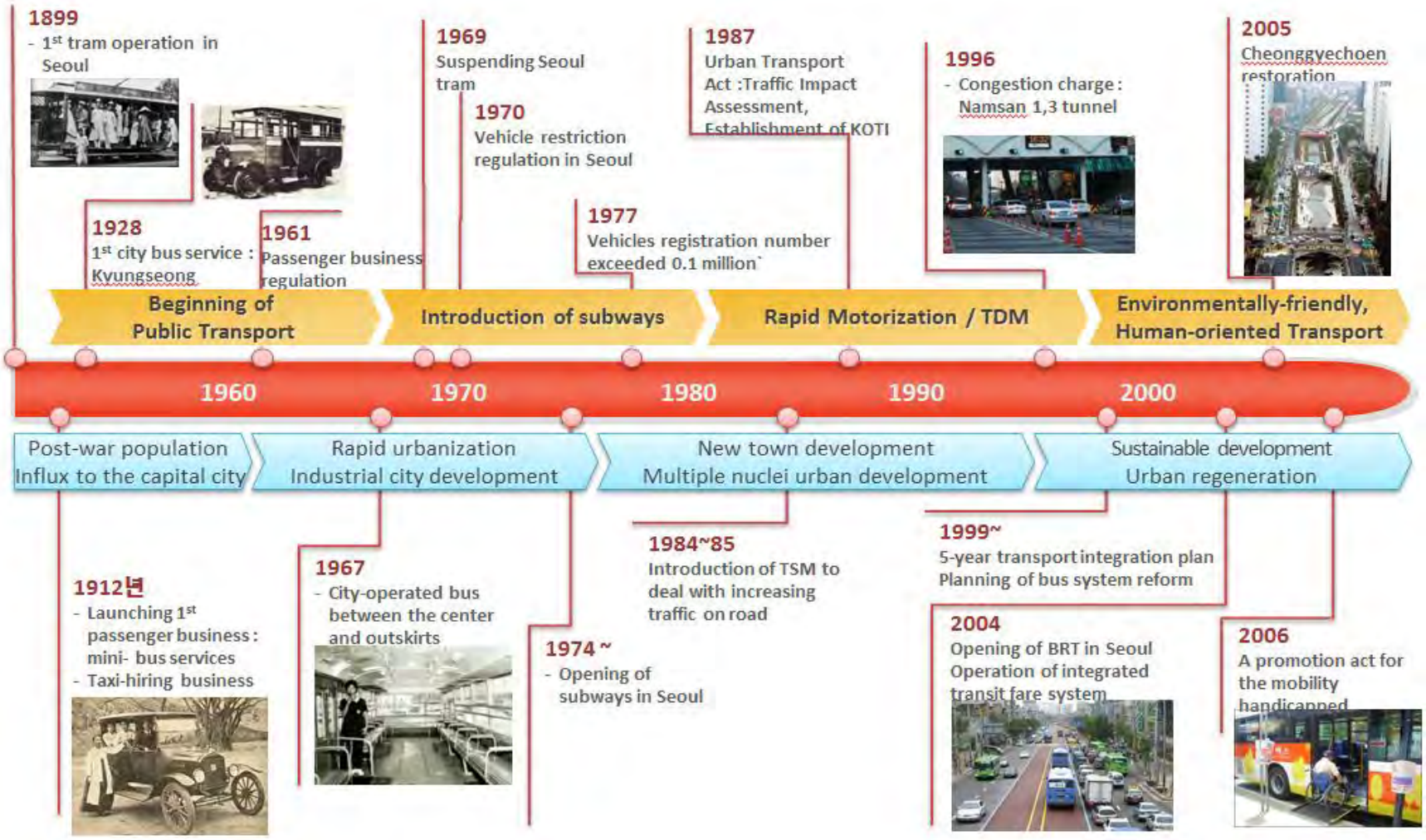
Transport Timeline : Urban Transport



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1980's : Chaos of Public Transportation

- **Explosive urban population growth ☞ Increase in # of Trips**
- **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.

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

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Gridlock in Seoul in 90's

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Gridlock in Seoul in 90's

- **Air Pollution and Energy Consumption**

  - Car centric Society

- **External Effects and Costs**

  - Traffic Accidents & Discomfort

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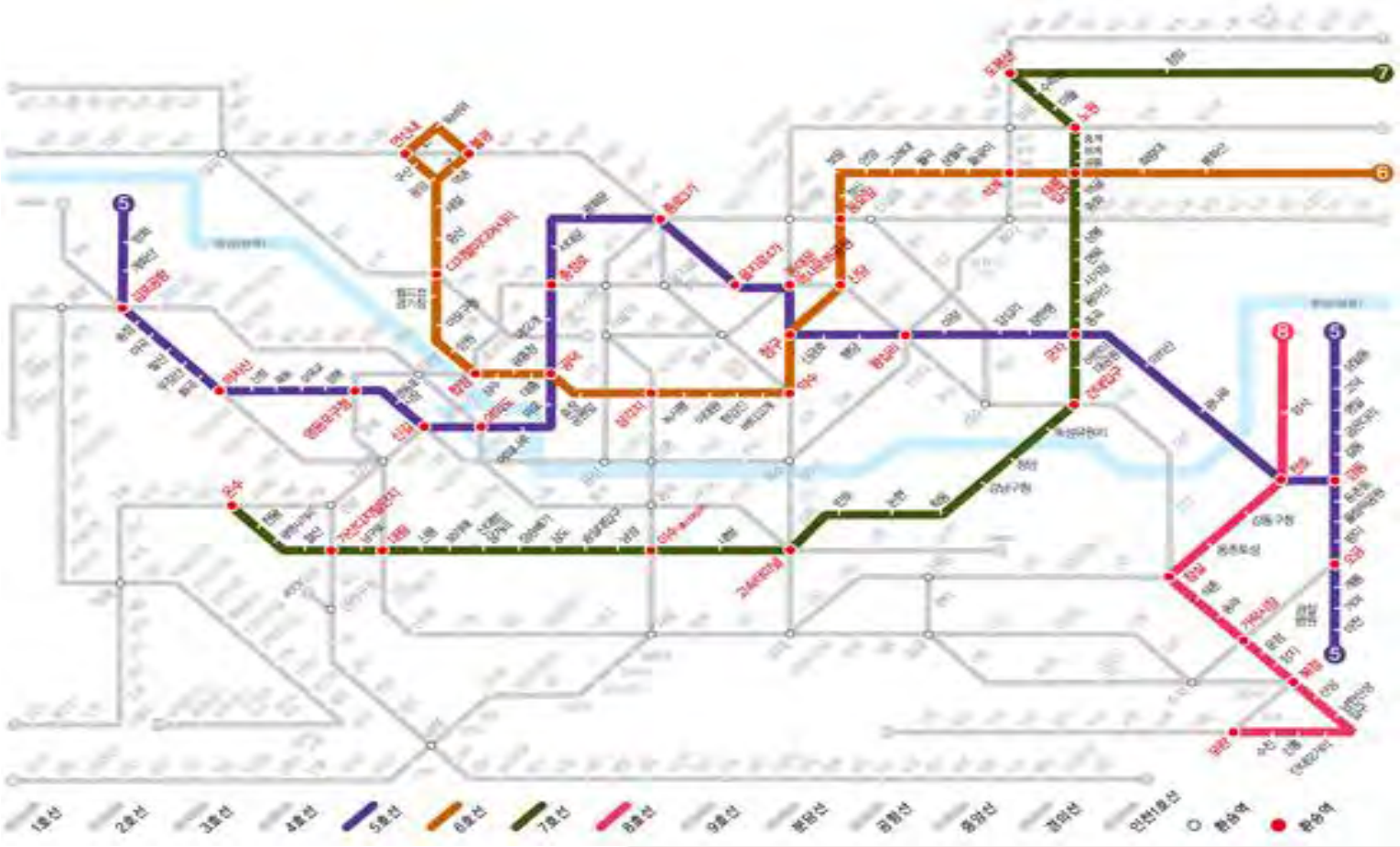
1985: Completion of Lines #1,2,3,4 of 135km

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

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



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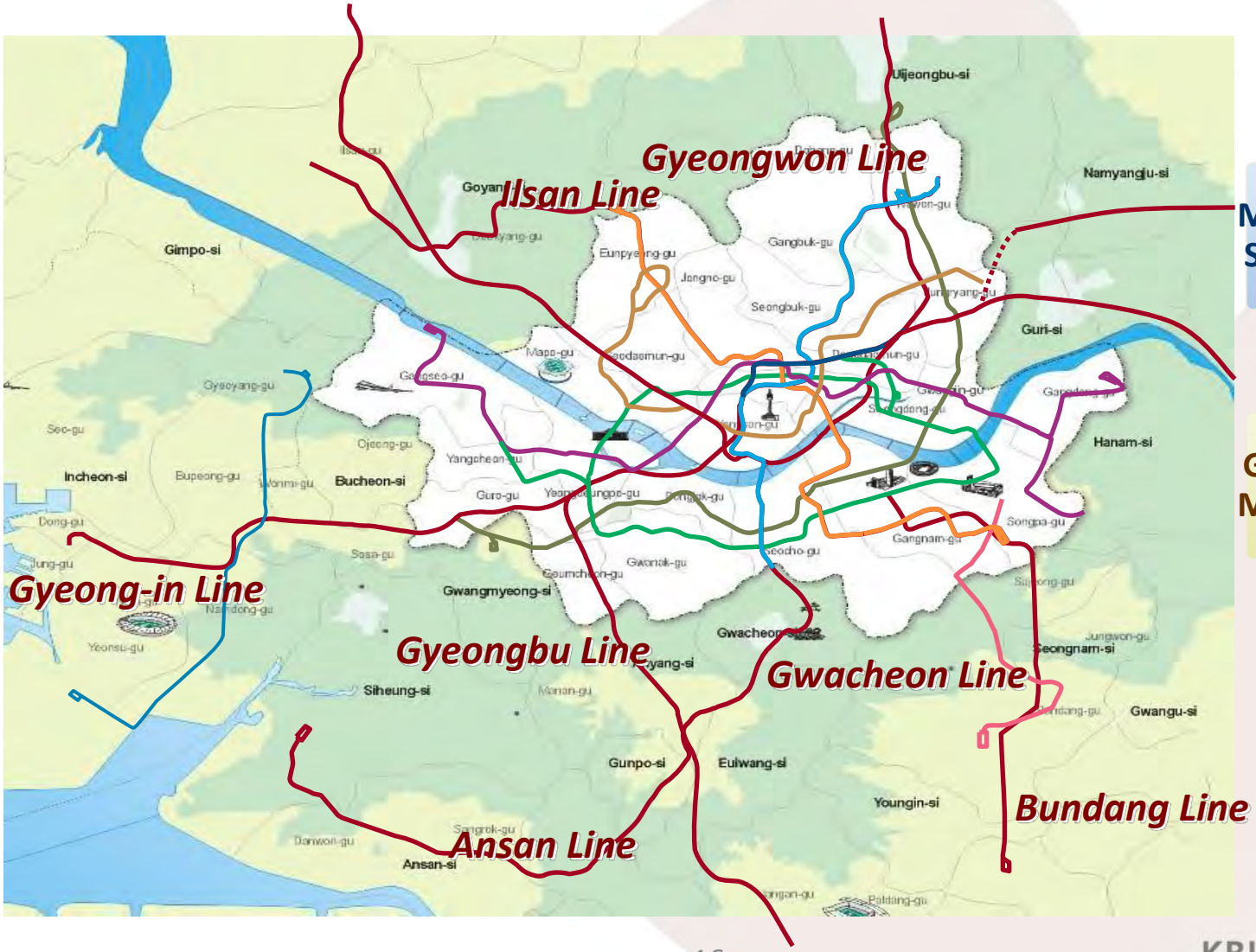
2010: 540km of Urban Railway in Metropolitan Area



Seoul Metropolitan Subway Line No. 8

+

7 Central Government Metropolitan Lines

=

Total Length 540KM

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Gridlock in Seoul in 90's

- **Air Pollution and Energy Consumption**

  - Car centric Society

- **External Effects and Costs**

  - Traffic Accidents & Discomfort

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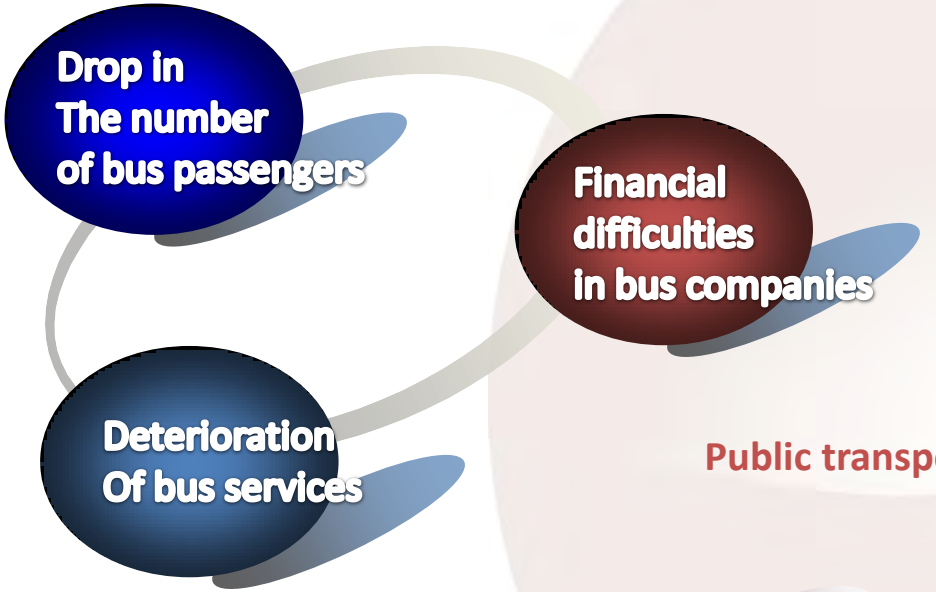
Seoul Public Transport Reform

- Problems in bus system before the reform



Public transport in Seoul

Bus industry
operated by
private company

Expansion
of metro system

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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

Problems	Directions for Improvement	Policy measures
Poor management (less developed management structure, lack of transparency accumulation of losses and subsidies)	Management improvement Overhaul of operations system Strengthening the public functions of city buses	Introduction of the semi-public bus operation system, Introduction of a route bidding system Strengthening the supervisory functions
Routes determined by business interests (long-distance/circuitous/ detour routes, overlapping/concentration inconvenience associated with transfer, difficulty in operating new lines)	Demand-oriented route restructuring Expansion of new lines, Enhancing inter-route connectivity	Route redesigning centered on trunk and branch routes, Reinforcing the bus-subway connectivity
Lack of reliability and speediness (irregular headways, difficulty in Predicting arrival times, low travel speed)	Restoration of trunk route functions, Bus priority system, More rigorous implementation of bus-only lanes	Bus Rapid Transit (Introduction of median bus lanes)
Low level of services (antiquated facilities, poor operating services, shortage of information on bus operations, inconvenience associated with late-night bus use, insufficient Intermodal transfer services)	Upgrading and diversifying bus services Expanding operation information services Extending bus operating hours Fare system reform, Expanding the basic bus infrastructure	Introduction of CNG, low-floor buses, Establishment of BMS and transport card system, Implementing a distance-based fare system)

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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

Four Types of Buses

Green

Subway to nearby residential areas

Yellow

Circular in downtown or sub-centers

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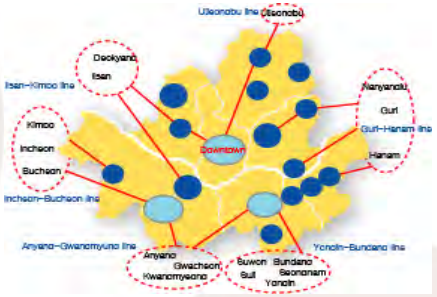
1) Network : Trunk · Feeder · Circular · Inter-city Lines

(sub)Urban areas ↔ (sub)Center cities
Meet the demand of private car.

Inter-regional Lines



Connecting suburban areas and center cities
Punctuality and speediness.

Trunk Lines

Link trunk line buses or subways for easy transfer
Satisfy the local needs and securing accessibility.

Feeder Lines

Circular bus service for business and shopping in urban areas.

Circular Lines

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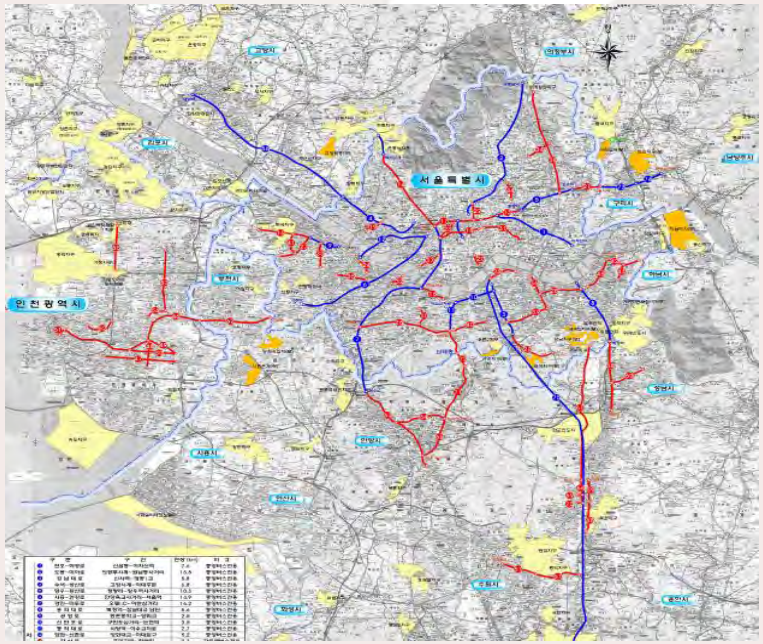
2) Bus priority facilities for Bus Rapid Transit

- **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

Route Map of Median Exclusive Bus Lane

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

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

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Establishment of public transport transfer centers in Seoul (draft plan)

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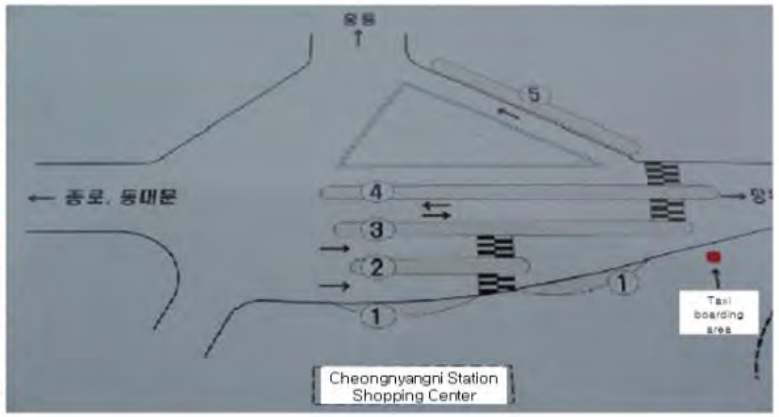
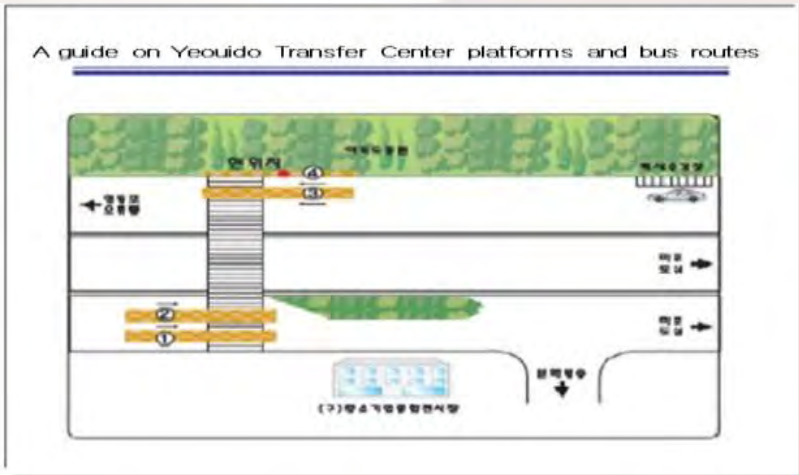
Transfer Center

- **Cheongnyangni Transfer Center**



- **Yeouido Transfer Center**



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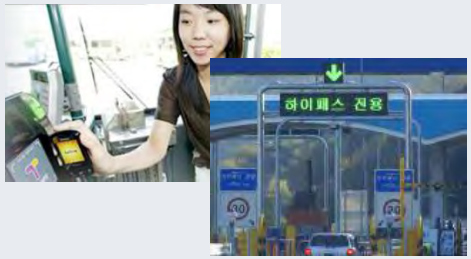
3) Adaptation of ITS in Public Transit Reform

- **ITS (Intelligent Transportation System) for Public Transit**

Traffic Information

Traffic Management

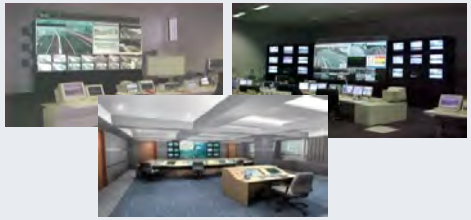
Electronic Payment



Safety Management

Public Transport Information

Traffic Control Center



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3) ITS : Fare Collection

- **Transportation Card**

  - Smart Card, etc.

- **Benefits**

  - Distance-based Fare
  - Free Charge for Transfers

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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**

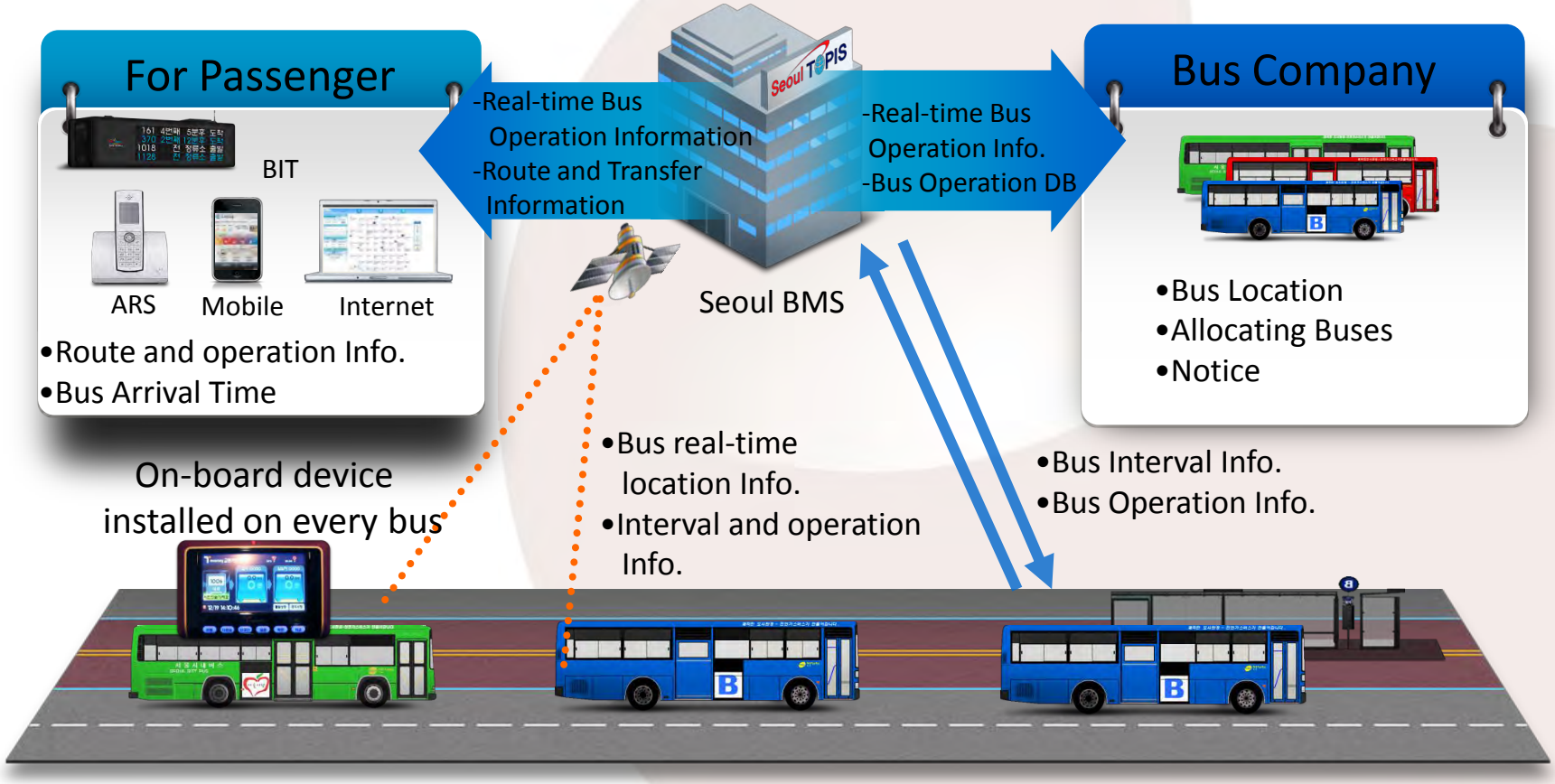
- For transferring trips
  : accumulated distance-based fare system
  → basic fare up to 10km;
  extra fare for every additional 5km

[Subway]

[Bus]

3) ITS : Bus Management System

- **BMS: Key role for efficient management of bus services**



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3) ITS : Bus Information System

- **Information Display at bus stop**

- **Smart Phone Application**

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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

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

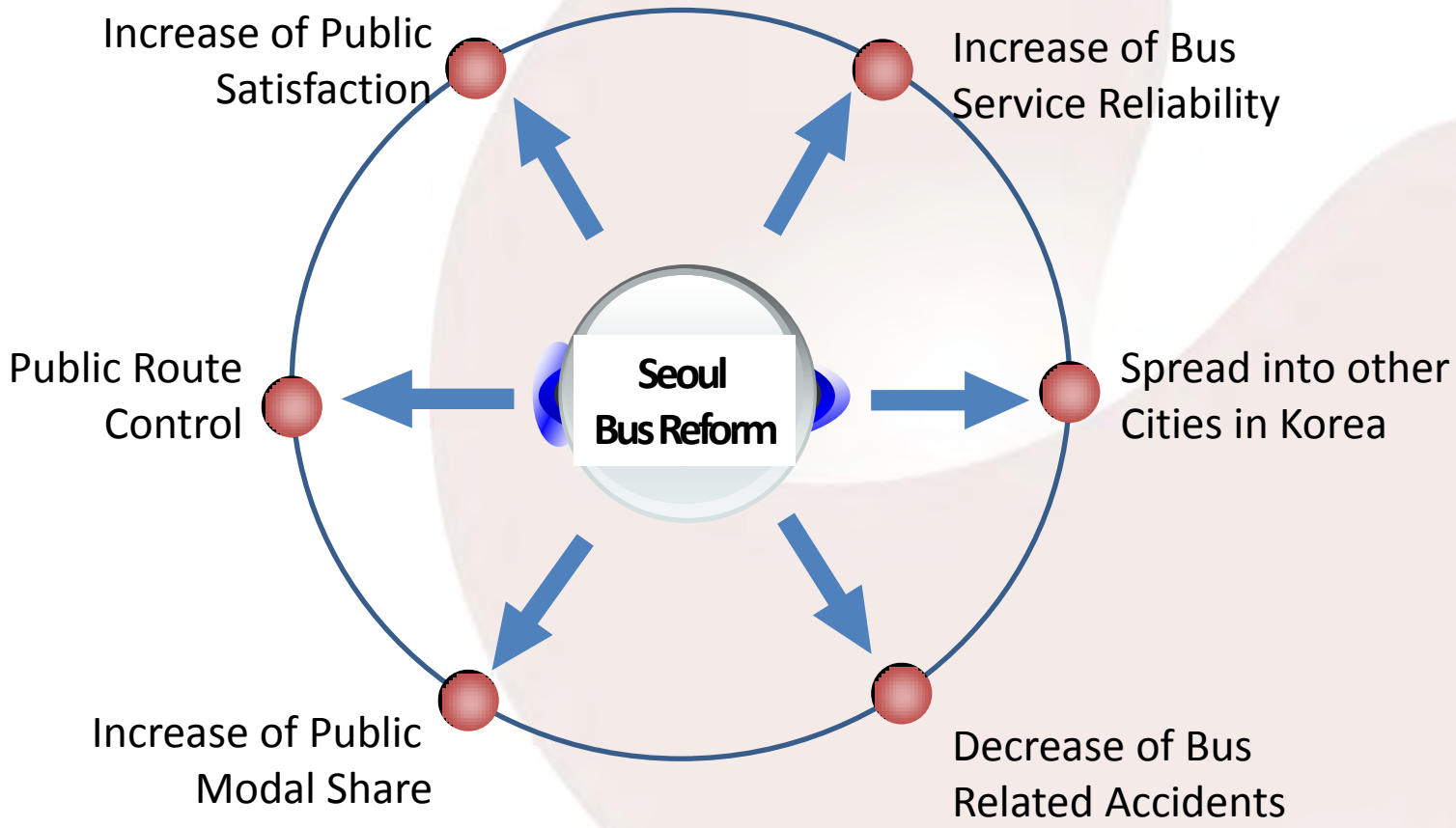
Categories	Achievement indicators	Goal achievement rates
Speed	Operation speed (km/h)	16.7 → 22.0
Service supply	Operation rate (%)	82.5 ⟶ 96.4
Operation safety	Accidents (number)	659 ⟶ 493
Punctuality	Distribution of operation intervals	0.69 → 0.56
Affordable fares	Fare per trip (won)	620 ⟶ 592
Revenue 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

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 capi tal 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**



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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

Thank you so much!!!

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