

City and Infrastructure

Case on Experience of Seoul

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Importance of infrastructure in the city



1. What is city

City is a place that contains large number of people in relatively small area

- Hub of people, capital and activities / not hub of structures

Space that human beings created and defy natural order

- Concentration and specialization \Rightarrow increasing scale of economy
- Exchange of ideas and imitation \Rightarrow spillover effect on ideas

“Driving force of GDP growth is not urbanization itself but concentration from urbanization(Abdel-Rahman, 2006)”

Concentration creates two contradictory effects

- **Positive effect** : need for proximity generates wealth and new values
- **Negative effect** : crowding out from density generates externality cost of congestion and conflicts

2. Infrastructure in city

Definition : Tangible, intangible, and institutional public facilities, from bridges to health care – which are a vital precondition for economic and social wellbeing

Role : raises productivity and quality of life by reducing externality costs

- reduce cost of movement of people, freight and idea

- reduce cost of environment and basic utilities

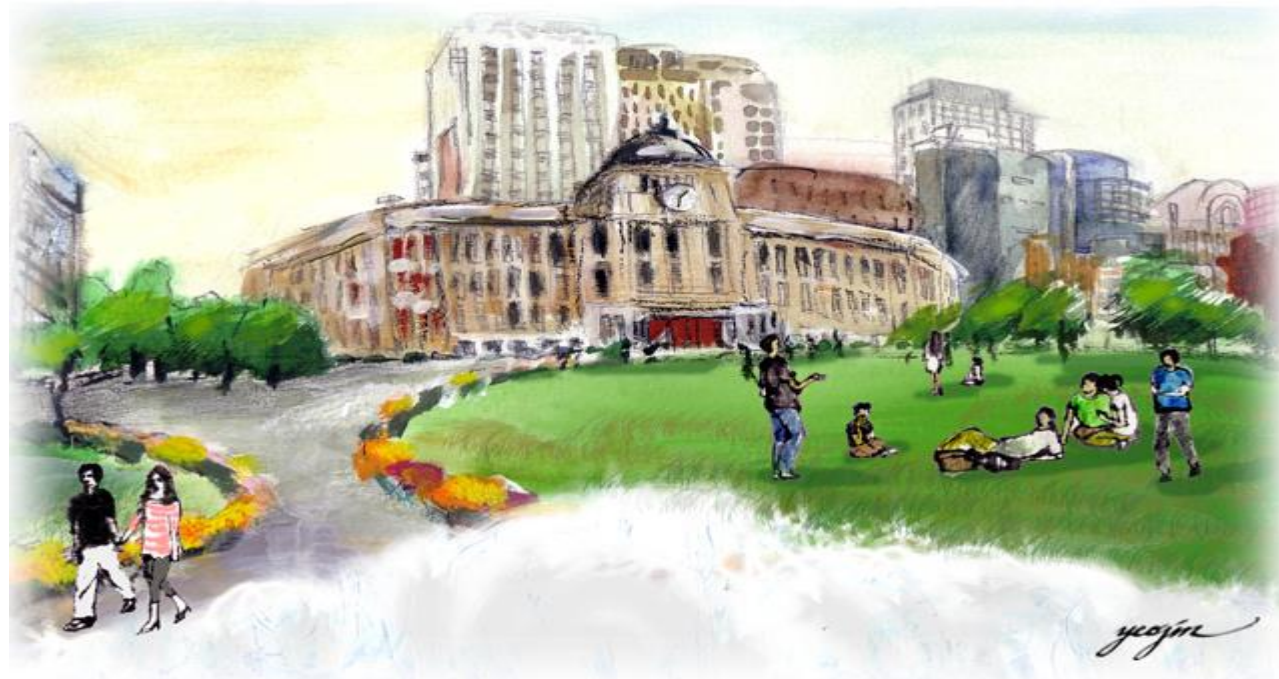
- reduce cost of securing safety and building community

Change in type of infrastructures : Physical, hardware ⇒ Intangible, Soft and human related

Key point of treating urban problems: **how to provide timely, necessary and affordable infrastructures**

“The hallmark of declining cities is that they have too much housing and infrastructure relative to the strength of their economies.”(E. Glaeser, Triumph of the city)

Seoul Experience



I. Introduction

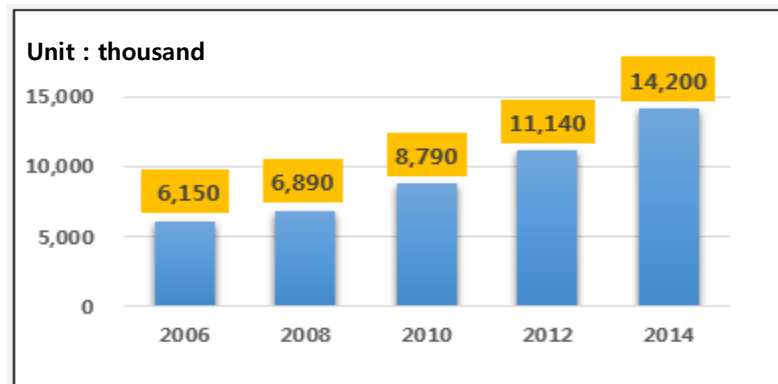
1. Seoul is

Attraction to foreign tourists : **“convenient and dynamic city”** (Seoul survey, June 2016)

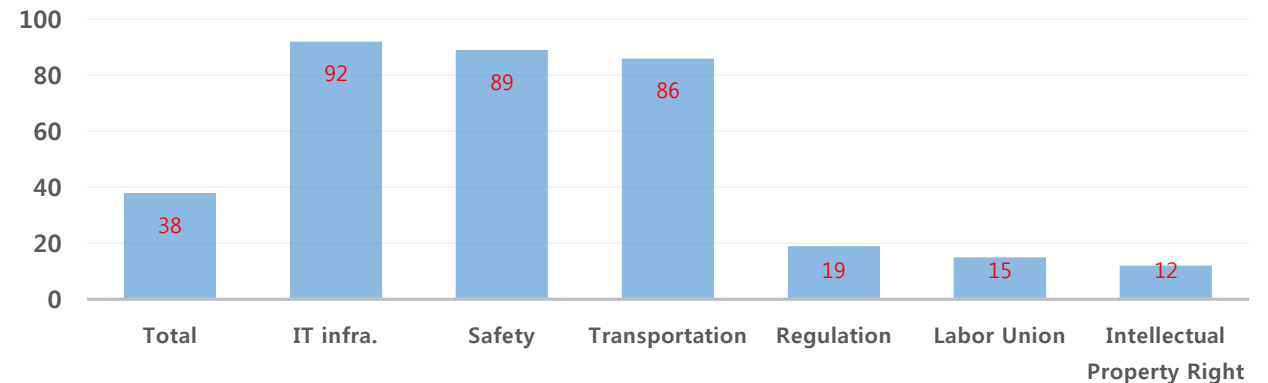
- **mass transit system** / internet access / quick delivery service / convenient shops

Business Competitiveness surveyed by foreign people living in Seoul (McKinsey report, Nov. 2011)

- **strengths** : **transportation infra.** / IT infra. / safety



Foreign tourist



Business Competitiveness

2. Concentrations in Seoul area

Geography : Hub of commerce, politics and social activities / **History** : capital city since 1394



| | Area (2013) | | Population (2010) | | Density | GRDP(2010) | |
|----------------|-----------------|-------------|-------------------|-------------|------------------------|-------------|-------------|
| | km ² | % | thousand | % | People/km ² | billion USD | % |
| Seoul | 605 | 0.6 | 9,631,482 | 20.1 | 15919.8 | 318.6 | 22.3 |
| Capital Region | 12,115 | 11.8 | 23,459,570 | 48.9 | 1983.7 | 696.9 | 48.7 |
| Nation | 106,102 | 100 | 47,990,761 | 100 | 478.5 | 1,430.2 | 100 |

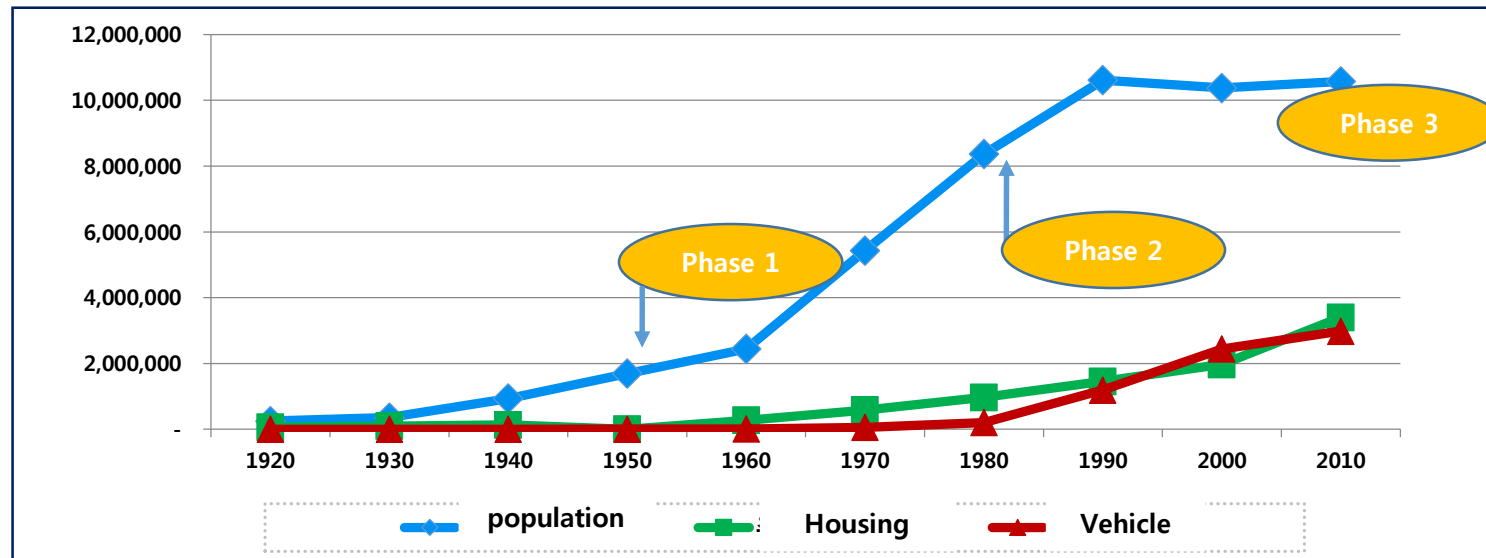
70% of major company headquarters are located in Seoul

3. Path that Seoul has followed to achieve infrastructures

Struggle under Expansion : 1950 – 1979

Meet the Challenge : 1980 – 1999

Lead the Change : since 2000



4. Start from ruin

Under colonial rule

structures in Palace : 509 → 40 units



Korean war destroyed

48% of housing
80% of factories

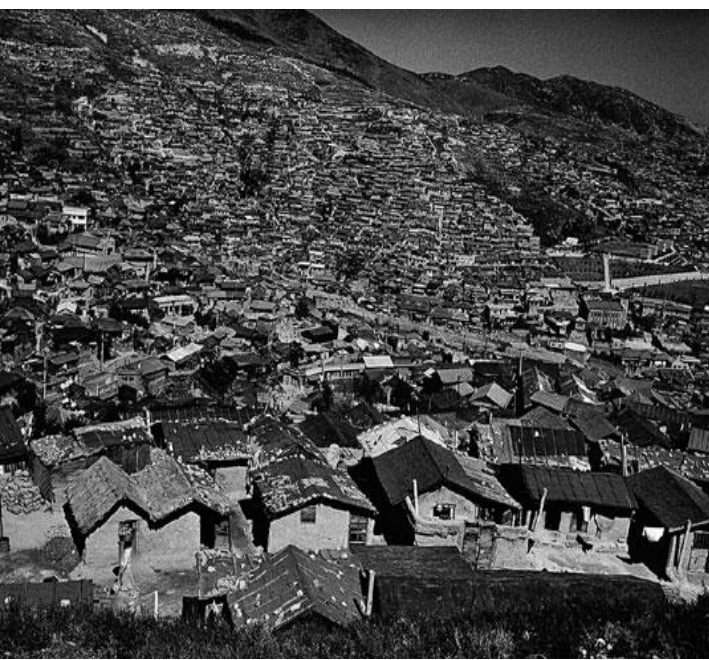


II. Struggle under expansion

1. Major Challenge : population

1 million(1953) → 5.4 million(1970) → 8.3 million(1980) / increasing rate : 8.6%(60s) / 5.4%(70s) / 2.6%(80s)

how to manage city function to support economy reconstruction

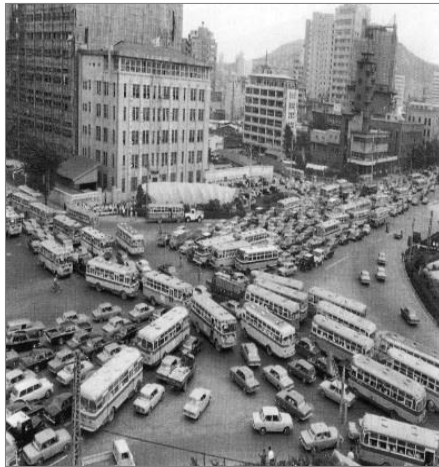


2. Major Challenge : Traffic and Mass Transit

No systematic management : lots of bottlenecks caused traffic jam

Insufficient mass transit : overcrowded buses(bus modal share : 74% in 1974)

- Bus : 600 buses(1950) → 7,138(1979) / allowed unlimited increase of private buses
- Subway : first plan(1965) / start construction of line 1(9.8km) in 1971/ operation : Aug. 1974



3. Response 1 : Relocation of population

First Urban Plan(1966) : one center(CBD) and 6 sub-centers

Territory expansion : 288 km^2 (1949) \rightarrow 605 km^2 (1973)

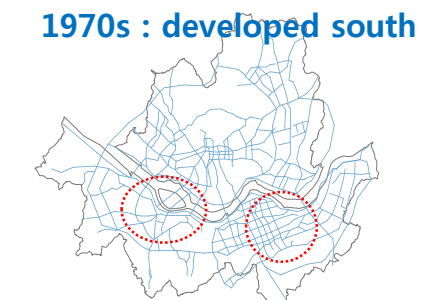
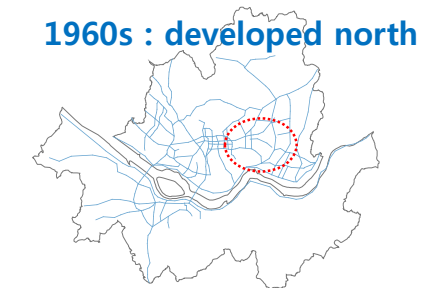
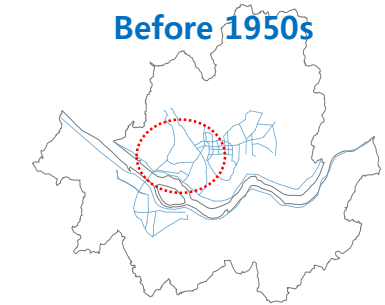
Since 1973 : spurred the development of southern area(gangnam)



CBD redevelopment



Gangnam redevelopment



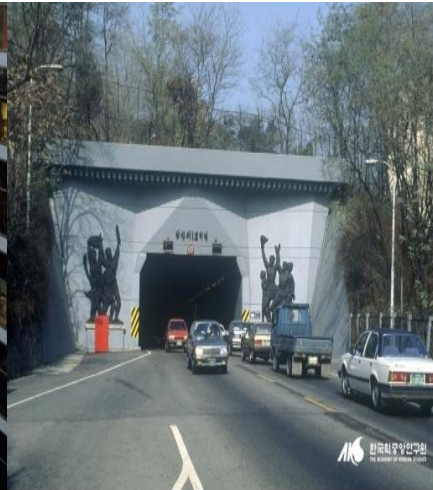
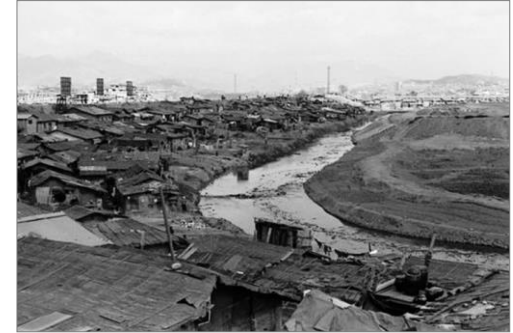
4. Response 2 : Road Construction

Most of city road was built as a [postwar recovery project](#)

- Sejongno : 53m → 100m
- Length of road : 1,337km(1960) → 5,272km(1970)

Focused on tunnel, overpass and bridge [to eliminate bottleneck](#)

[First urban highway](#) : Cover the Cheong-gye stream : 5.6km (1958 – 1977)

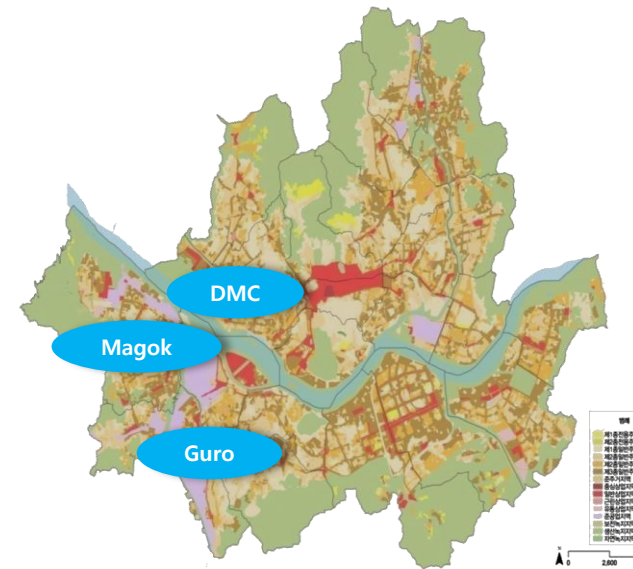


5. Response 3 : Cluster the Industries

Guro industrial park : constructed from 1965 to 1974 (area : 2million m^2)

- major products : textile, toy and wig
- 1977 : achieved 10 billion export(occupied 10% of nation's export)

It is converted into **Cluster of Information Technology** : 12,000 IT companies



III. Meet the Challenge

1. Major Challenges : boom of "my car and my house" and political transformation

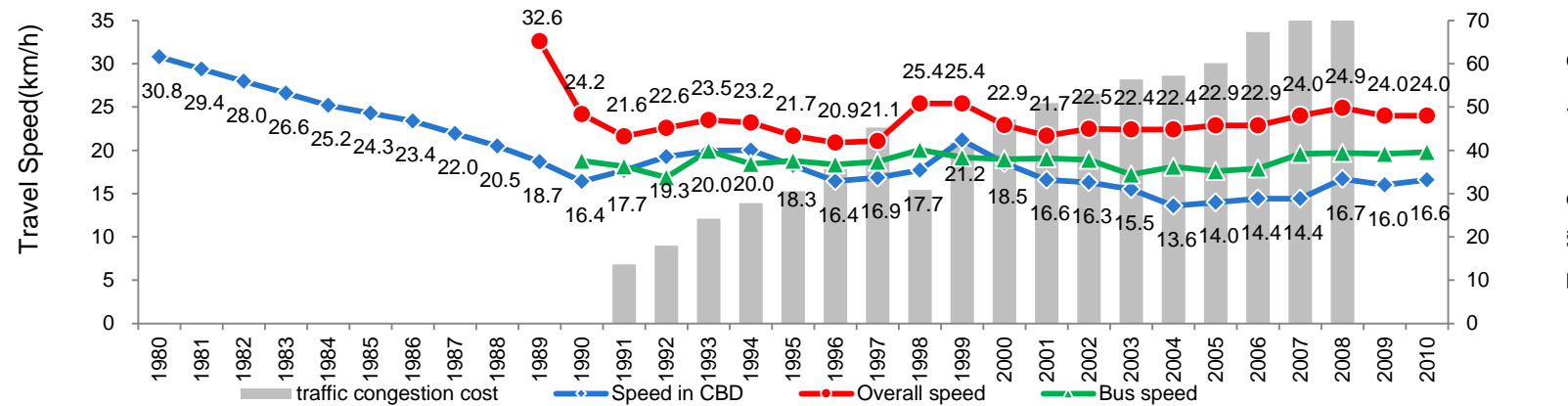
vehicles(thousand) : 207(1980) → 1,194(1990) → 2,093(1995) / demand for affordable apartment

more democracy and local autonomy : city counsel open in 1991 / elected mayor in 1995



2. Major Challenges : Worst traffic situation

complex and entangled problems : lack of mass transit / traffic jams / parking disorder



3. Response 1 : Housing

Large apartment complex in suburban area

- Mokdong, Sanggye, Goduck, Gaepo town

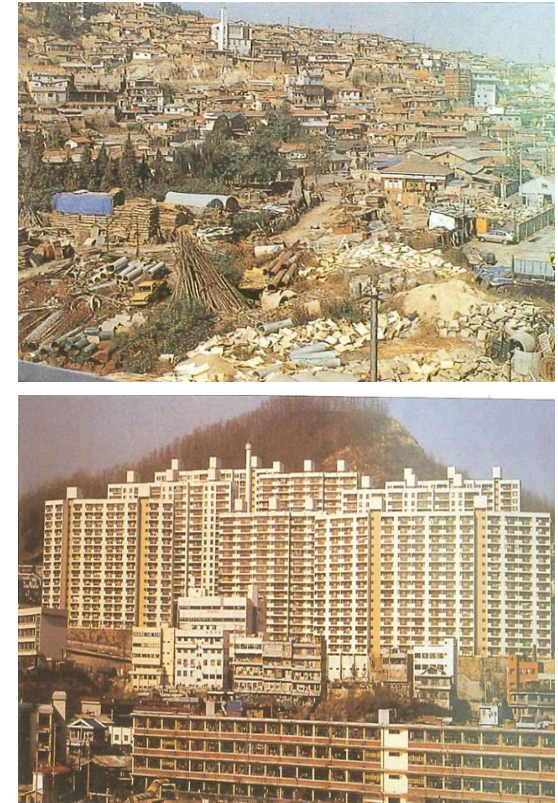
Renewal of shanty towns : Oksu- dong

- 2 million housing project carried out by national government
- 100,000 housing averagely were supplied every year during 1990s

Housing redevelopment(상계동)



Housing renewal(옥수동)



4. Response 2 : Transportation

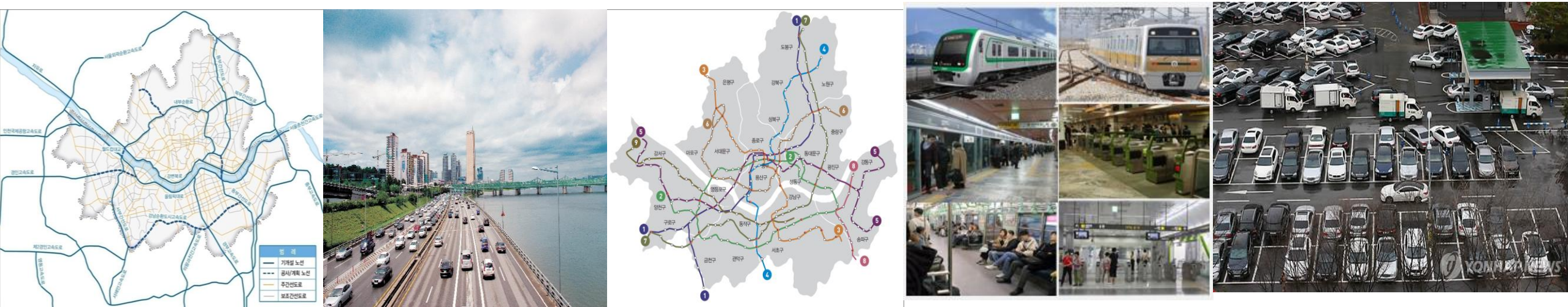
Subway Construction : start line 2 construction in 1978 / completes 8 line in 2001(300km)

- cost : 16 billion USD (subsidy from nation government : 22% / debt : 30%)

Urban highway : 300km(two rings and radiant roads)

Public Parking Lots(thousand) : 74(1981) → 1,124(1995) → 3,760(2013)

- constructed 20 facilities in CBD with PPP



Construction of housing, road and parking : meet the basic demand

Housing : 2.74 million

supply rate : 50%(70s) → 65%(90s)

apartment rate : 59% of total stock

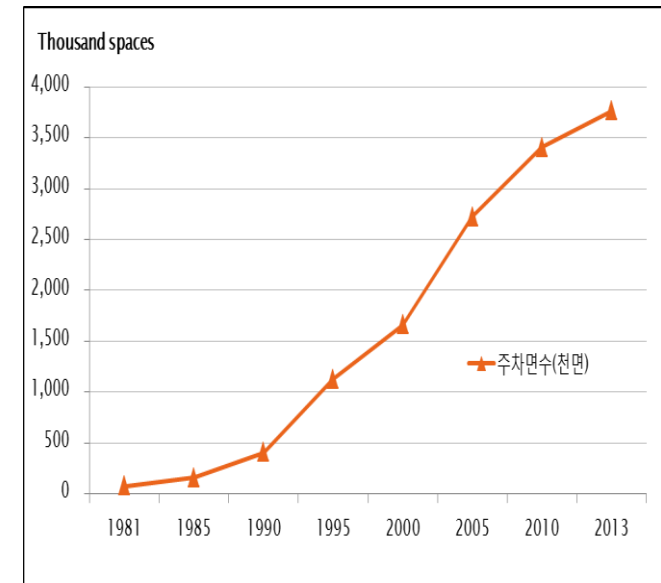
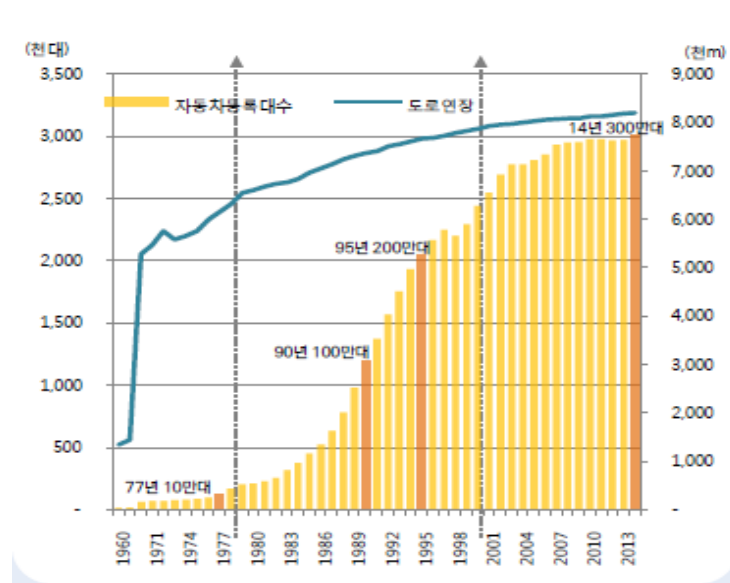
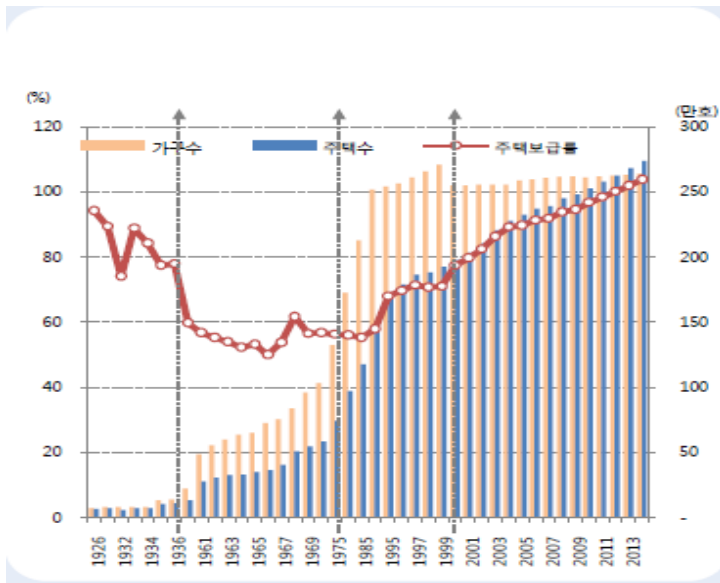
Road ratio (%)

3%('81) → 15%('95) → 22%(2014)

※ Tokyo 24.4 / New York 21.9

Public Parking Lots(thousand)

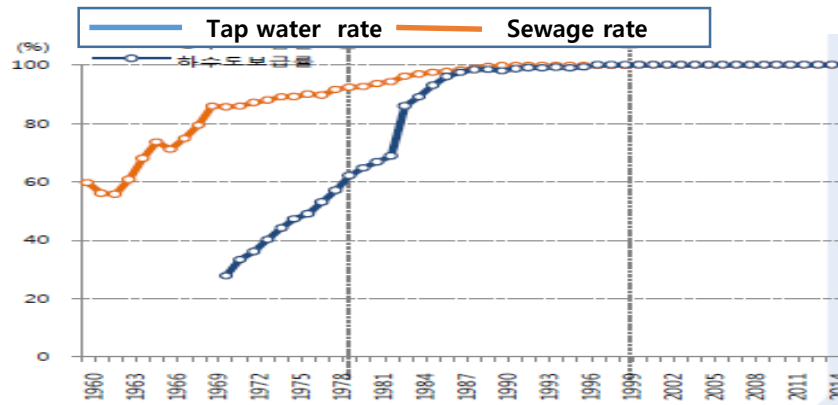
74('81)→1,659('95)→3,760(2013)



5. Response 3 : Other Utilities

Tap water : achieve 100% supply rate in 1991(6 filtration facilities)

Sewage : achieve 100% treatment rate in 1997(4 facilities)



6. Things that should avoid : Tragic Accidents

From hasty construction and compressed growth, city paid high price for big accidents



Bridge collapse ('94. 10) : 32 dead / 17 injured



collapse of department store('95. 6) : 502 dead

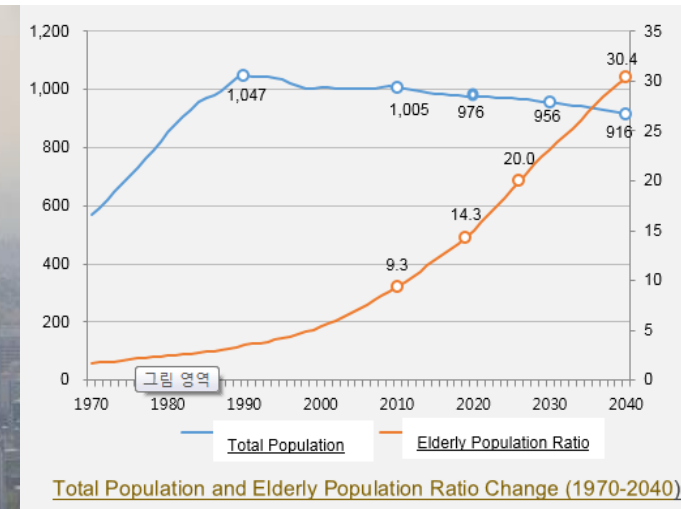
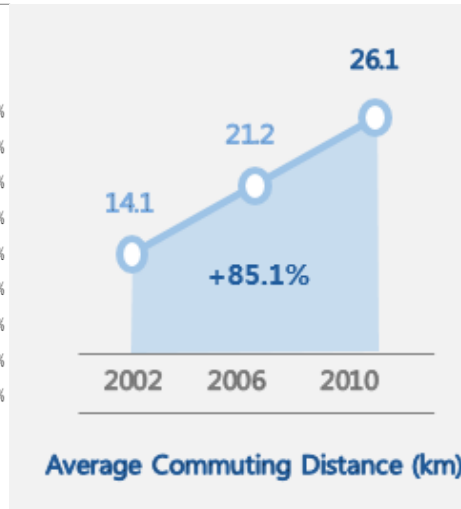
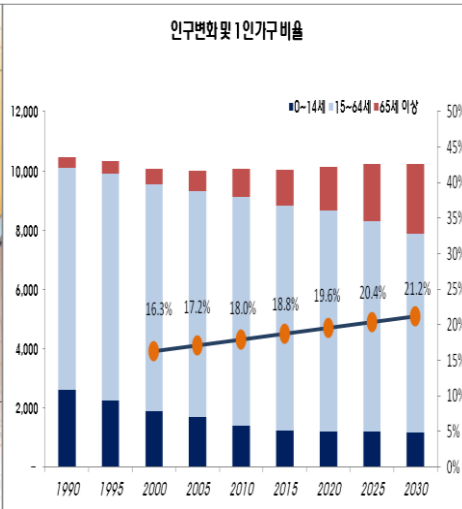
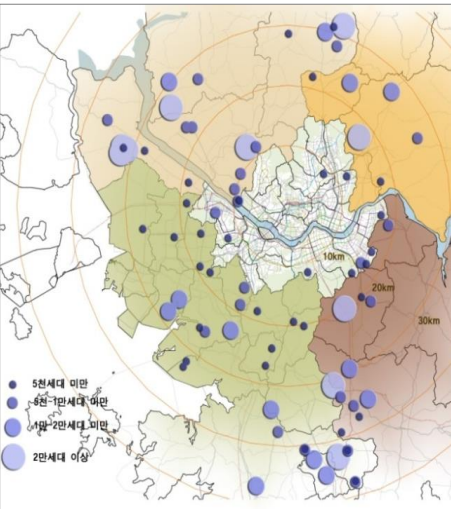
IV. Lead the Changes

1. Major Challenges

urban sprawl : longer commuting and influx of vehicles

sustainability : climate change / pollution(fine dust)

population change : declining population / elderly population : 12%(2013) → 23.2%(2030)



2. Response 1 : Transportation

More focus on mass transit and service quality

Subway construction

Service area required(catchment area) : 41% → 60%

LRT plan : 8 lines(73.7km) / Extend Metro-lines : connecting Seoul with satellite cities

Convenience and sustainability

Replacement with CNG engine : 7,500 buses(2002 – 2014) / 350 million USD

Low-deck bus : 35% of buses were converted(subsidy of 50% of bus purchasing price)

Night time bus service(Owl bus) : 8 routes(from 00:00 – 05:00) / Sept. 2013

Bus stop renovation : shelters / arrival information



3. Response 2(system infrastructure) : Bus Reform

A. Background

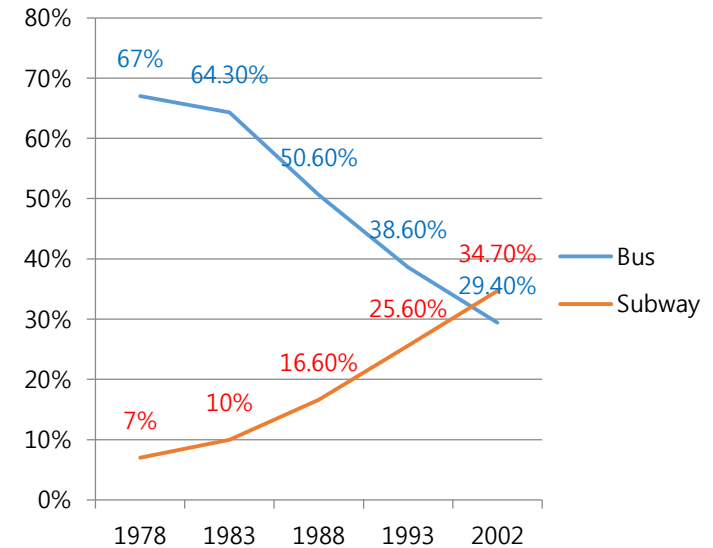
Since middle of 1990s, subway became major mass transit

Business condition around 2002

- No. of company : 103(1990's) → 58(2002)
- No. of passengers per day(million) : 9.5(1995) → 7.2(2002)
- ※ 39 company out of 58 showed deficit

B. Target : **establish the integrated mass transit system**

Trend of modal share of mass Transits



Persons that bus carries a day

| year | 1976 | 1990 | 2002 |
|---------|-------|------|------|
| persons | 1,131 | 791 | 514 |

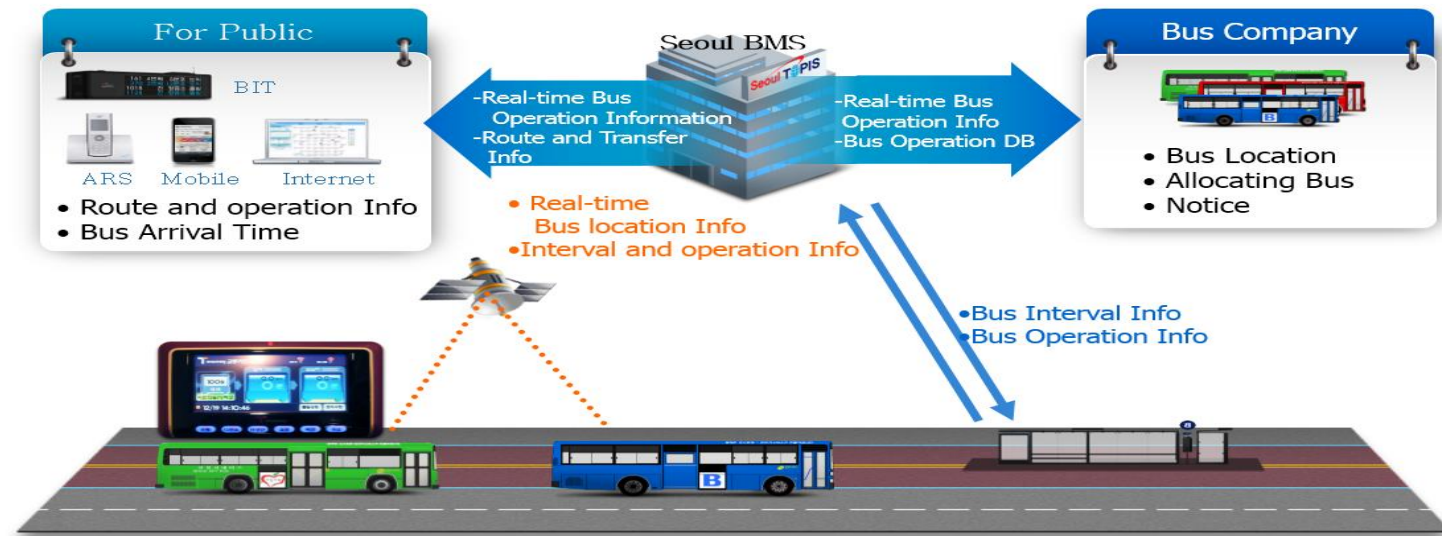
C. Major projects

Bus Management System : private → public

Government : Authority of oversight for operation, of routes designing

Bus company : Operation and maintenance

BMS system : monitoring of bus operations(collect and distribute information)

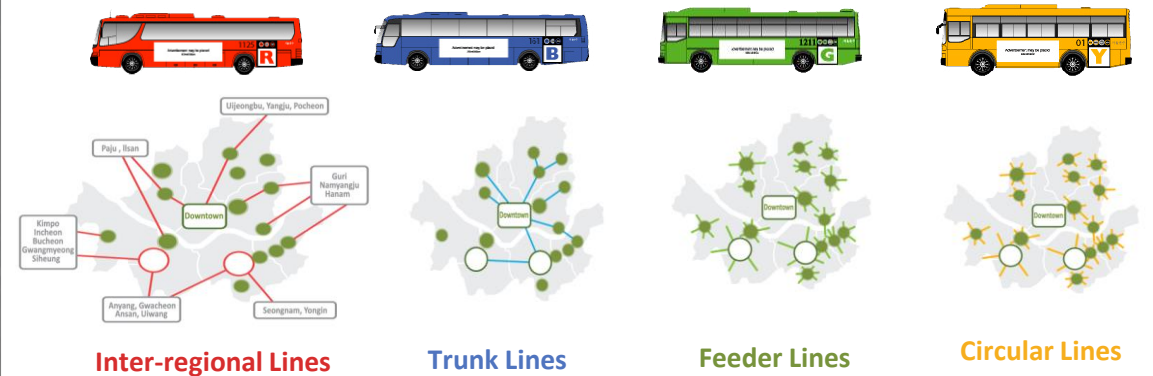
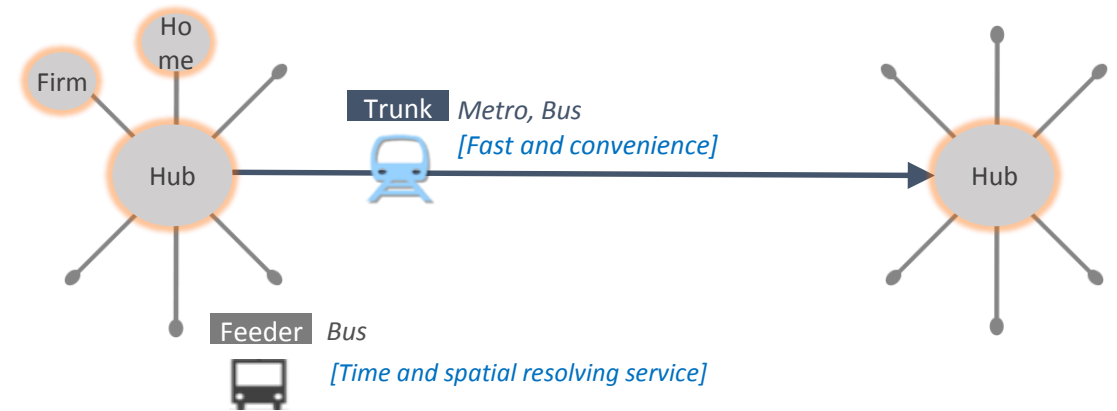
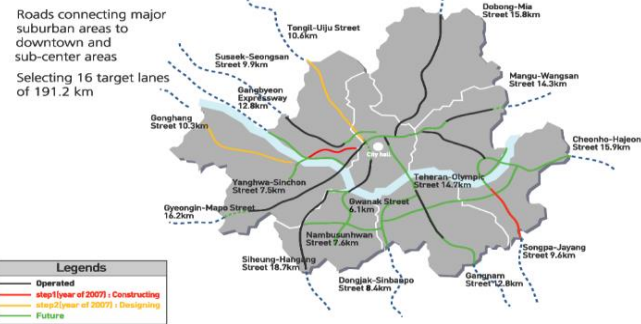


Introduce BRT system

Hierarchize Bus Route (main-feeder system)

12 Corridors 119.3km

- Establishing a 117.6km network of 12 lanes by 2010 -



Integrated fare system

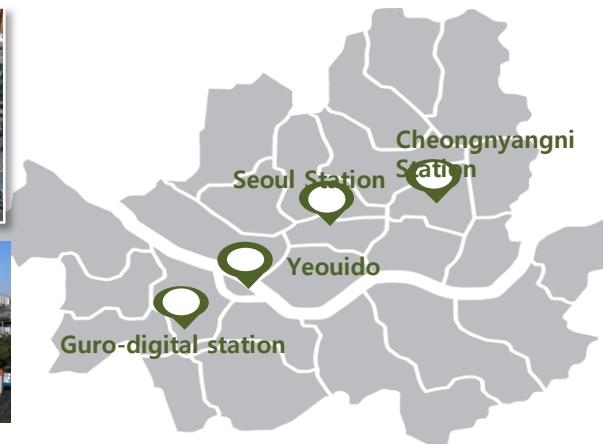
Free transfer between bus-bus and bus-subway(maximum 5 times)

Created T-money card system : handles 30 million transactions a day

KSCC : operates system, settles fares, and issues T-Money card

※ Adopted by foreign cities : Wellington, Auckland, Kuala Lumpur and Ulan Bator

Transfer Centers : 4 (80,000 per day / transfer time : 12min. → 3min.)



4. Response 3(system infrastructure) : Intelligent Transportation System

A. History

First ITS

1998 : Implement in Nam-San area(10.6km)

2000 : Traffic management system in expressway

ITS 2.0

2008 : Install Bus Information Terminals (BIT)

2009 : Mobile Service

1998



2008



2004

ITS 1.0

2004 : Open TOPIS / Smart Cart System

2005 : Unmanned Surveillance System

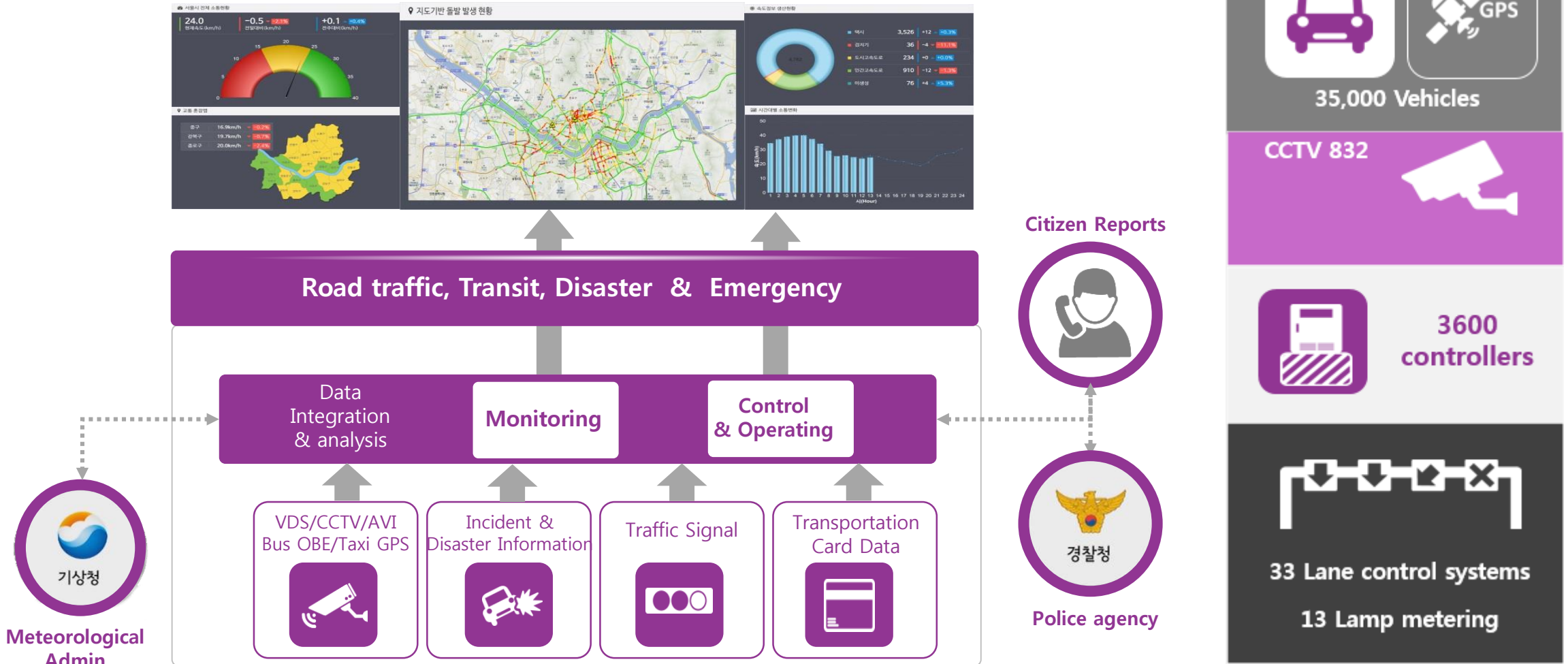
2013

ITS 3.0

2013 : Open integrated control center

2014 : Share the TOPIS Platform (ITS Solution)

B. TOPIS : Center for 24 hour monitoring and surveillance



C. TOPIS 3.0 : Information Forecast

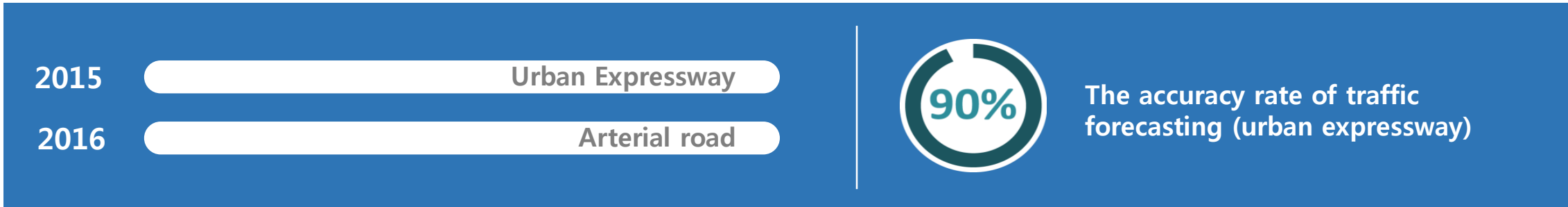


Traffic forecasting

- 1) Traffic forecasting within 1hr.
- 2) Traffic prediction within 30days
- 3) Traffic Forecasting in normal condition
- 4) Traffic Forecasting in accident situation



Traffic forecasting Service on web (Urban expressway)



5. Response 4(Human being oriented) : Road Diet

A. Pilot Project : Restoration of Cheong-gye stream(2003 – 2005)



B. Major Projects : Transit Mall / Demolish overpass / Rebalance the road space

Transit mall



Demolish overpass



Convert into plaza



6. Response 5 : Soft and New infrastructures

Library : 5(1961) → 10(1980) → 23(2000) → 111(2010)

Park area per capita(1980 – 2014) : 4.59 → 14.26 m^2

Waste Treatment : From landfill to incineration

- Nanji landfill : changed into ecological park
 - construct 4 incineration facilities
- ※ landfill : 67 → 8% / recycle : 30 → 65% / burning : 3 → 27%

Design : Dongdaemun Design Plaza



Conclusion



1. Achievement : Traffic improvement

Mass Transit oriented Transportation

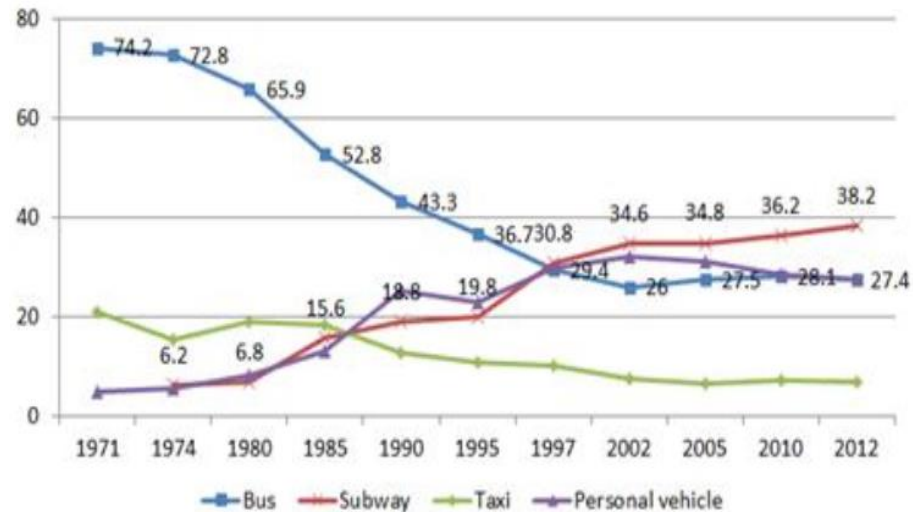
No. of trips : 31.1 million

Mass Transit carries 20 million passengers

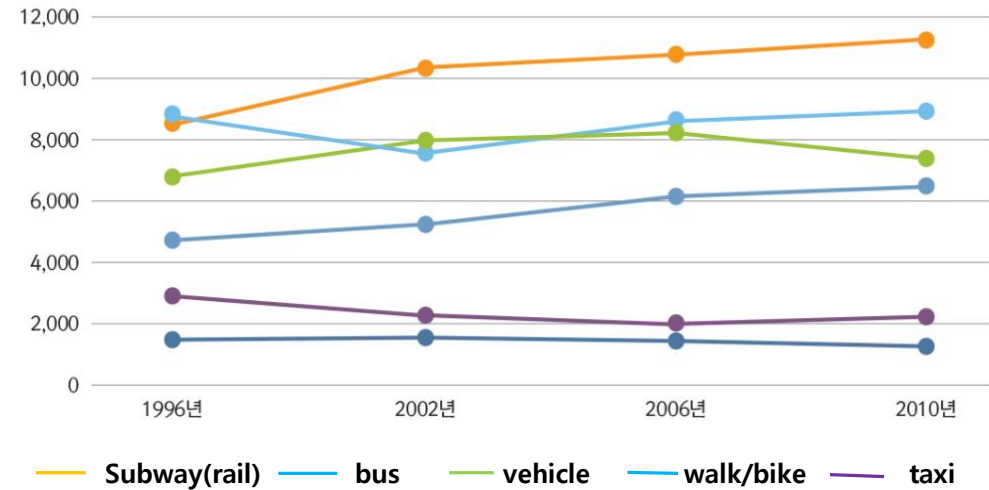
Improvement in modal share of walk and bike

4.3million('96) → 6.5million(2010)

Trend of modal share



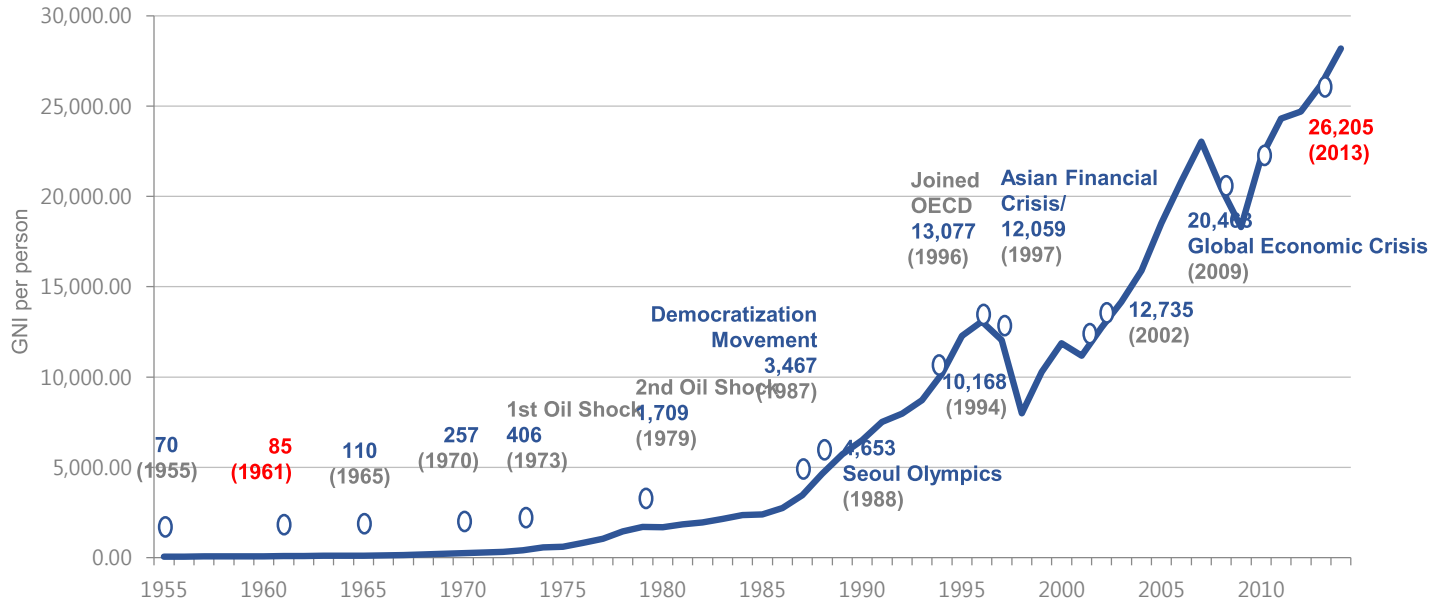
No. of trips by means



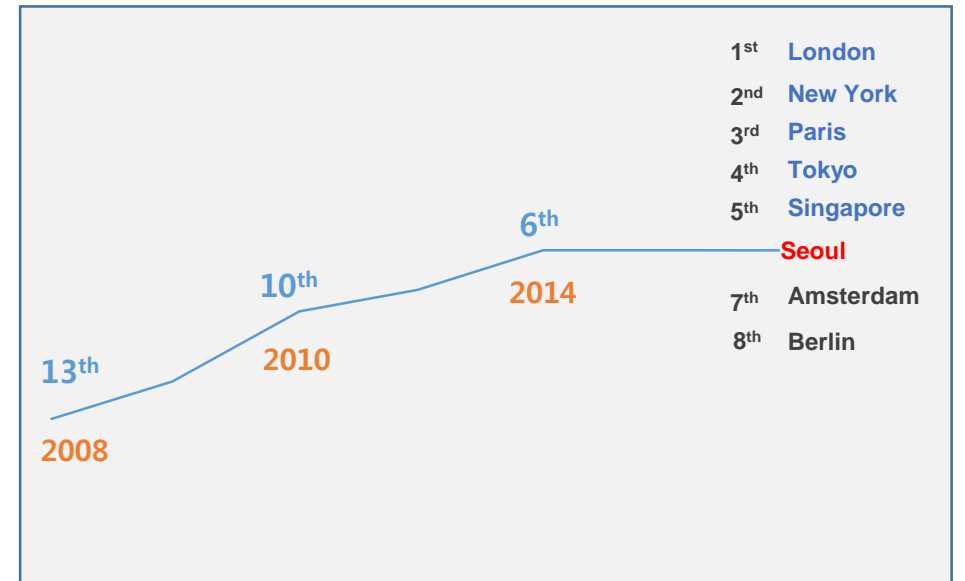
2. Achievement : Toward global city

contribute to nation's economic growth

come up to global city



Economic Grow during past 60 years



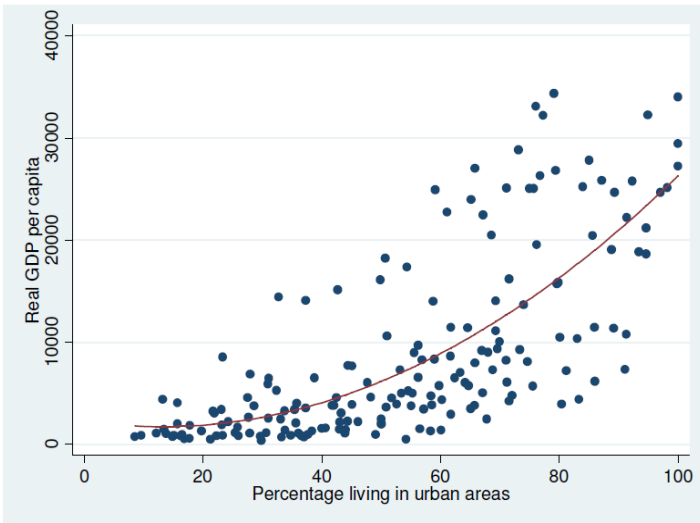
Global power city index (Mori Foundation, 2013)

3. Importance of City Management

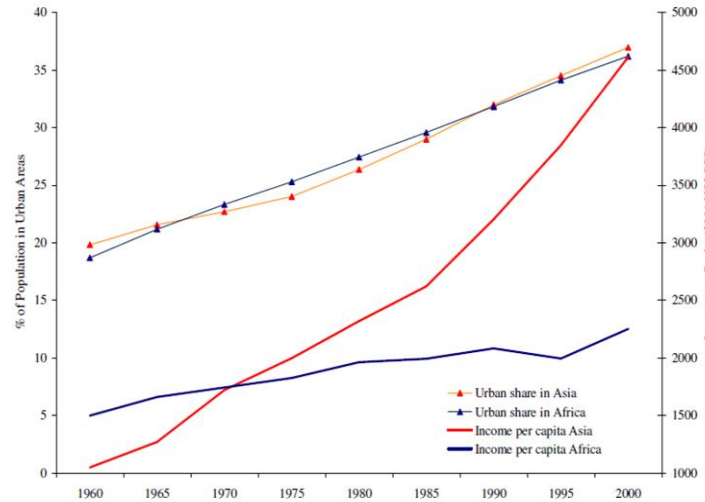
Urbanization and economic prosperity have close relationship (Korea : 0.887)

But urbanization itself does not bring prosperity

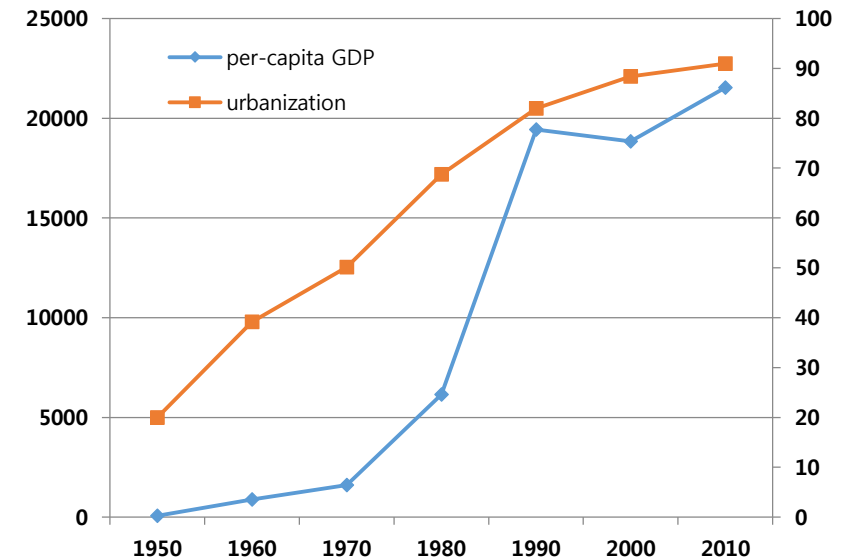
GDP per-capita and urbanization



Difference in two continents



Relationship in Korea



4. Rise and Fall of cities

Global urbanization rate : 50%(2007) → 54%(2014) → 66%(2050)

- 600 cities produce 50% of world GDP today ⇒ they will produce 60% in 2025

As globalization move forward, every city will be exposed to the risk of decline

- Key point is way of response to the challenges

Failure case : Detroit

Response with large scale construction : Cobo Hall('64), Joe Louis Arena('70), People Mover('87)

Success case

Adelaide : attract people to CBD

Pittsburgh : city of steel ⇒ city of robot

Medellin : invest in human capital(40% of public budget)

✘ Implication : success depend not on imitation but on finding it's own way

5. Factors to be considered in Seoul case

A. Success factors

Differentiated strategies

focused strategy on physical infrastructures in 1980s and 1990s

apply different principle

- strong public goods(subway and highways) : full support with public budget
- public good that gain revenue(parking lot, utilities) : beneficiary pays(introduced PPP)

Leadership that match the future demand : mayors vision matched future urban demand

B. Factors to improve

New leadership : cool-headed judgement and insight about the future

New strategy in way of doing : efficient implementation and management