Urban Transportation Policy for Sustainable Transportation in Korea

December 12, 2006

Ministry of Construction and Transportation, Republic of Korea
Contents

I. Facts and Figures of Urban Transport

II. Urban Transportation Policy System

III. Urban Transportation Policy – 4S Strategy

- Sustainable urban transportation
- Smart urban transportation
- Safe urban transportation
- Silver urban transportation
I. Facts & Figures of Urban Transport

- Small area: 99,538 km$^2$
- High urbanization rate: 89%
- High population density: 492 person/km$^2$

- But
  - High increasing rate in cars
  - Decrease in public transportation uses

- As a result
  - Decrease in auto speeds
  - High congestion cost
  - Lack of parking lots
  - Air pollution
Present Status

Population Growth

- has Increased at annual average 0.43% during the last 10 years in 7 metropolitan areas
Present Status

Comparison of population densities

Rapid Urbanization

<table>
<thead>
<tr>
<th>Year</th>
<th>Seoul</th>
<th>Busan</th>
<th>Tokyo</th>
<th>London</th>
<th>Paris</th>
<th>New York</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Present Status

Vehicle Growth

- has Increased at the rate of 5.8% annually last 10 years from 8,469 thousand in 1995 to 14,934 thousand in 2004
Share of Public Transport

- Ride share of bus have decreased during 10 years
- But, ride share of passenger cars have steadily increased
Problems

Auto speeds in central business districts

24km/h
13.5
24.8
25.7
24.8
31.4

Seoul
Busan
Daegu
Incheon
Gwangju

Increase in Congestion Cost

<table>
<thead>
<tr>
<th>Year</th>
<th>Nation</th>
<th>Big Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>7,000</td>
<td>3,000</td>
</tr>
<tr>
<td>2000</td>
<td>18,000</td>
<td>7,000</td>
</tr>
<tr>
<td>2001</td>
<td>23,000</td>
<td>9,000</td>
</tr>
<tr>
<td>2002</td>
<td>27,000</td>
<td>10,000</td>
</tr>
<tr>
<td>2003</td>
<td>29,000</td>
<td>12,000</td>
</tr>
<tr>
<td>2004</td>
<td>30,000</td>
<td>13,000</td>
</tr>
</tbody>
</table>
Problems

Parking lot shortage

- No. of cars
- Building and House Parking Lots
- Public Parking Lots
- Roadside parking spaces

Share of emission gases

- CO
- NOx
- PM10
- VOCs
- SO2

Others
Industry
Commercial & Housing
Energy
Generation
Mobile
II. Urban Transportation Policy System

**Organization**
1 HQ, 1 Director General, 10 teams, total 91 staff members

**Budget**
19 projects including urban railroad construction with an annual budget of about $1.86 billion

**Laws**
- Urban Transportation Improvement Promotion Act
- Act on Promotion of Public Transportation
- Act on Improvement of the Transportation Vulnerable, etc.

**Local govts.**
- Implement policy
- Construct & operate public transportation
- Appeals, complaints, etc.

Transportation Bureaus at large area local governments and Transportation Divisions at smaller local governments carry out policies
III. Urban Transportation Policy

- Sustainable
- Smart
- Safe
- Silver

4S Strategy
1. Sustainable Urban Transportation

- Promotion of the Public Transportation
- Transportation Demand Management
- Green Transportation
1. Promotion of the Public Transportation

- Public Transportation Master Plan
  (5-year plan by central & local governments)

- Expansion of public transportation facilities
  - consider public transport facilities when planning large-scale land development

- Subsidy to public transport service improvement projects such as BRT system, low floor buses, etc.

- Assessment of transport services and incentives to quality service providers
Public Transportation Master Plan

- **Nation’s long-term blueprint for public transportation**
  - is an administration plan for public transportation-oriented transportation system in the urban area
  - is guidelines and directions for local government’s public transportation policies

- **Goals**
  - is to provide mobility and access to be safely and conveniently
  - is to promote public transportation use to reduce traffic congestion, air pollution, and energy consumption
Expansion proper public transportation facilities considering city’s population and characteristics

<table>
<thead>
<tr>
<th></th>
<th>Bus</th>
<th>BRT</th>
<th>LRT</th>
<th>HRT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Right of way</strong></td>
<td>Common use</td>
<td>Exclusive, partly common</td>
<td>exclusive</td>
<td>exclusive</td>
</tr>
<tr>
<td><strong>Capacity (person/car)</strong></td>
<td>60~80</td>
<td>80~150</td>
<td>50~120</td>
<td>120~160</td>
</tr>
<tr>
<td><strong>Car (car/locomotive)</strong></td>
<td>1</td>
<td>1~2</td>
<td>2~6</td>
<td>6~10</td>
</tr>
<tr>
<td><strong>Traffic volume (time direction)</strong></td>
<td>1,600~2,500</td>
<td>1,600~10,000</td>
<td>5,000~30,000</td>
<td>Over 30,000</td>
</tr>
<tr>
<td><strong>Interval (minutes)</strong></td>
<td>7~9</td>
<td>5</td>
<td>0.5~2</td>
<td>2~3</td>
</tr>
<tr>
<td><strong>Maximum speed (km/h)</strong></td>
<td>100</td>
<td>100</td>
<td>60~80</td>
<td>80~130</td>
</tr>
</tbody>
</table>
1. Promotion of the Public Transportation

Expansion of urban rail transportation

- First subway, a 7.8 km line, constructed in 1974
- 596.5 km of subways in operation in 2004
- Subway projects status as of 2006

<table>
<thead>
<tr>
<th>New Lines</th>
<th>Extension of Existing Lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Seoul No. 9 – 25.5 km (2001-2007)</td>
<td>- Seoul No. 3 – 3.0 km (2003-2009)</td>
</tr>
<tr>
<td>- Busan No. 3 – 29.5 km (1996-2007)</td>
<td>- Seoul No. 7 – 9.8 km (2003-2010)</td>
</tr>
<tr>
<td>- Daejeon No. 1 – 22.6 km (1996-2006)</td>
<td>- Incheon No.1 – 6.5 km (2003-2007)</td>
</tr>
</tbody>
</table>
1. Promotion of the Public Transportation

Expansion of metropolitan transportation facilities

**Railroads**
- Subway’s transport share in capital region: 23.6% (2002) → 40% (2020)
- 286.5 km by 2015 in the capital region and other metropolitan areas

**Roads**
- Eliminate 12 major bottlenecks (56.7 km) in the capital region by 2008
- 12 bottlenecks (79.6 km) in major cities by 2010

**Transit facilities**
- Build 1 transit center and 4 transit parking facilities by 2007
### Promotion of the Public Transportation

**Light rail transit**

<table>
<thead>
<tr>
<th>Cities</th>
<th>Lines</th>
<th>Length (km)</th>
<th>Construction periods</th>
<th>Costs (million US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gimhae</td>
<td>Busan - Gimhae</td>
<td>23.9</td>
<td>2003 – 2008</td>
<td>1,080</td>
</tr>
<tr>
<td>Busan</td>
<td>Minam - Bansong</td>
<td>12.7</td>
<td>2003 - 2007</td>
<td>805</td>
</tr>
<tr>
<td>Yungin</td>
<td>Gilheung - Everland</td>
<td>21.3</td>
<td>2002 - 2006</td>
<td>597</td>
</tr>
<tr>
<td>Uijeongbu</td>
<td>Jangam - Songsan</td>
<td>10.3</td>
<td>2001 - 2007</td>
<td>396</td>
</tr>
<tr>
<td>Jeonju</td>
<td>Songcheon-Samcheon</td>
<td>14.19</td>
<td>2003 - 2008</td>
<td>-</td>
</tr>
</tbody>
</table>
1. Promotion of the Public Transportation

Bus rapid transit

- Urban rail systems
  - Huge investment costs
  - Long construction periods

- Conventional bus operation systems
  - Irregular intervals between buses
  - Uncomfortable rides
  - Violent driving by bus drivers

- Bus Rapid Transit
  - Exclusive bus lanes, level boarding, bus information system (BIS)
  - Bus priority signal, regular intervals, reliability, speedy, free transfers
Plan drawn up in 2004 to build **22 BRT routes** measuring 540.4 km by 2012 in Seoul metropolitan area (2004)

**2 Pilot projects** are being implemented: 14.8 km Hanam-Gunja and 12.3 km Cheongra-Hwagok routes

<table>
<thead>
<tr>
<th>Route</th>
<th>Lane</th>
<th>Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pungdeokchun ~ Yangjae</td>
<td>6~8</td>
<td>21.8</td>
</tr>
<tr>
<td>Gyeongbu Expressway</td>
<td>6~8</td>
<td>26.5</td>
</tr>
<tr>
<td>Cheonhodaero</td>
<td>8~10</td>
<td>12.6</td>
</tr>
<tr>
<td>Gyeongchun Hwy</td>
<td>4~6</td>
<td>21.2</td>
</tr>
<tr>
<td>National Hwy 47</td>
<td>4</td>
<td>17.6</td>
</tr>
<tr>
<td>National Hwy 3</td>
<td>4~8</td>
<td>28.9</td>
</tr>
<tr>
<td>Tongillo</td>
<td>4~6</td>
<td>17.9</td>
</tr>
<tr>
<td>Susaengno</td>
<td>6</td>
<td>16.9</td>
</tr>
<tr>
<td>Jayulo</td>
<td>8~10</td>
<td>19.9</td>
</tr>
<tr>
<td>National Hwy 48</td>
<td>4~8</td>
<td>19.8</td>
</tr>
</tbody>
</table>
1. Promotion of the Public Transportation

New bus system adopted by Seoul since July 1, 2004

Policy and Assessment will be presented by Ph. Kim From SDI of Seoul Metropolitan City
2. Transportation Demand Management

1. Congestion pricing

- Congestion toll (about $2) charged at Namsan Tunnels 1 and 3 in Seoul since 1996
- Buses, taxis and HOVs are exempted from the charge

[Graph showing collected amount and speeds of cars from 1996 to 2003]
2. Transportation Demand Management

Traffic Impact Assessment (TIA)

- TIA minimizes side effects caused by developments of large-scale projects and construction of big facilities
- TIA Committee proposes the extension of road or other alternatives to the developer to mitigate traffic impact

Cases for TIA

![Bar chart showing cases for TIA from '00 to '04]
2. Transportation Demand Management

3. Traffic Inducement Charge (TIC)

- City government imposes TIC to owners of facilities that attract trips to their facilities ($109 million in 2004)

- Applicable facilities
  - Buildings in city areas with minimum population of 100,000 and with total floor area measuring at least 1,000 square meters

- Reduction/Exemption of TIC
  - Reduced or exempted in cases of mitigating traffic demand
  - Reduction/Exemption amounts

- Non-driving day system (10~30%), operation of commuter buses (10~20%), charged parking lots (10%), carpooling (5~15%), etc.
2. Transportation Demand Management

4. Limitation on parking spaces

- Upper limit guidelines of parking space in the commercial areas of central business districts
- Expanded to include semi-residential districts in 2004
- The system in operation in major cities

<table>
<thead>
<tr>
<th>Region</th>
<th>Seoul</th>
<th>Busan</th>
<th>Daegu</th>
<th>Gwangju</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>2.1%</td>
<td>1.1%</td>
<td>0.3%</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

(The percentage indicates the whole area of the cities with ceiling on parking spaces)
3. Green Transportation

1. Extension of car-free streets
   - 27 car-free streets exist in 9 cities
   - Each local government is expected to have at least one car-free street.

2. Extension of bicycle facilities
   - Bicycle-Use Facilitation Act enacted in 1995
   - 5,684 km of bicycle roads, 249,000 bicycle racks in 2005
   - 10,000 km of bicycle roads, one million bicycle racks by 2010
3. Green Transportation

Supply of CNG buses

- 2,910 diesel buses (9.2% of all urban buses) replaced with CNG buses since 1998
  
  Note: MOE subsidizes the bus companies $21,600 for every replacement

- Replace 20,000 diesel buses (65% of all urban buses) with CNG buses by 2007
2. Smart Urban Transportation

- Transportation Smart Cards (TSC)
- Intelligent Transportation System
- Bus Information System
- Ubiquitous Transportation Information
1. Transportation Smart Cards (TSC)

- Promotes use of public transportation, solves inconvenience in public transportation, enhances transparency, improves working conditions
- 40 million cards for urban buses, subways, taxis, and expressways
- Use on all transport modes and anywhere in the country by 2007

Prepaid Card Type

Credit Card Type
Nationwide use of TSC

- Apply national standard in new adoption of transport cards
- Allow use of both national standard cards and cards already in use
- Simultaneous use with credit cards (post-pay) with transport card function

Mediation by Task Force

Nationwide use of TSC on all transportation facilities and modes
2. Intelligent Transport System

- Super high-speed internet, mobile phones, spread of PDA, and designated devices for transport information provide advantages ITS establishment
- ITS projects in Daejeon, Jeonju, Jeju and Gwachon
  - Auto speeds increased 20.3%
  - Waiting time at Intersections decreased 38.8%
3. Wide Area Bus Information System

- Sadang Station, Seoul – Changyong, Suwon
  - Dec. 2004 – Aug. 2005, $5.5 mil. (MOCT $2.5 mil. / local govts. $3 mil.)

- Daejeon – Chungju Location
  - Dec. 2005 – Aug. 2006, $6 mil. (MOCT $3 mil. / local govts. $3 mil.)
4. Ubiquitous Transport Information
(Transport Advice on Going Anywhere)

- Real-time & intermodal transfer information system
- Information on a number of different transportation modes, routes and transit information
3. Safe Urban Transport

- Transportation Safety Act
- Transportation Safety Measures
1. Transportation Safety Act

- First 5-year plan drawn up in 1983, 6th plan (2007-2011) is being prepared
  
  - Comprehensive plan that covers safety matters under the authority of 12 different government agencies
  - Finalized upon approval by the Transportation Safety Policy Committee (chaired by prime minister) after deliberations by the Cabinet

- Annual Transportation Safety Report should be submitted to the National Assembly

**Expected outcomes**

- Fatalities/10,000 cars: 3.4 in 2005 → 1.9 in 2011
- Fatalities: 6,376 in 2002 → 4,350 in 2006
2. Transportation Safety Measures

1. Measures to increase safety belt uses

   - Recent trend of safety belt use

Implementation Plan

   - Promote to use safety belt and **enforce** the violation periodically
   - Make **backseat safety** belt use mandatory
   - Reduced insurance benefits for violators (approx. 20%)
2. Transportation Safety Measures

Drinking & Driving prevention measures

- There were 31,219 cases of drinking & driving accidents in 2003 with 1,110 dead and 55,222 people injured

Goal & Implementation Plan

- Periodical enforcement of drunk drivers
- Stronger punishment for recurrent violators and drunk driving leading to accidents
  - Alcohol detecting engine start lock systems or confiscate cars
  - Heavier punishment for drivers with blood alcohol level of 0.1% or higher who cause accidents for crimes of dangerous and fatal driving
  - Implement self-defrayment system where the insurance company has the claim rights for drunk driving causing accidents
IV. Silver Urban Transport

Act on Promoting Mobility for the Transportation Vulnerable

Expanding Convenience Facilities
1. Act on Promoting Mobility for the Transportation Vulnerable

- Legislated in January 2005
- **Mandatory requirement** of mobility facilitating installations and stricter regulations
- Creating pleasant pedestrian environment including the designation of pedestrian priority zones
1. Supply of low floor buses

- 50% of all buses will be low floor buses (2004 - 2013)
- being researched & developed for standard model

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>592</td>
<td>60</td>
<td>162</td>
<td>370</td>
</tr>
<tr>
<td>Seoul</td>
<td>347</td>
<td>35</td>
<td>102</td>
<td>210</td>
</tr>
<tr>
<td>6 major metropolitans</td>
<td>235</td>
<td>25</td>
<td>60</td>
<td>150</td>
</tr>
</tbody>
</table>
2. Expanding Convenience Facilities

- 694 elevators and 456 escalators will be installed from 2005 to 2007
- Screen doors have been installed at new subway stations since 2004
Thank You!

Urban Transport Division
Ministry of Construction and Transportation
Republic of Korea