Introduction of Fare Systems and RF Cards of Seoul Metropolitan Subway

2003. 4.

KORAIL

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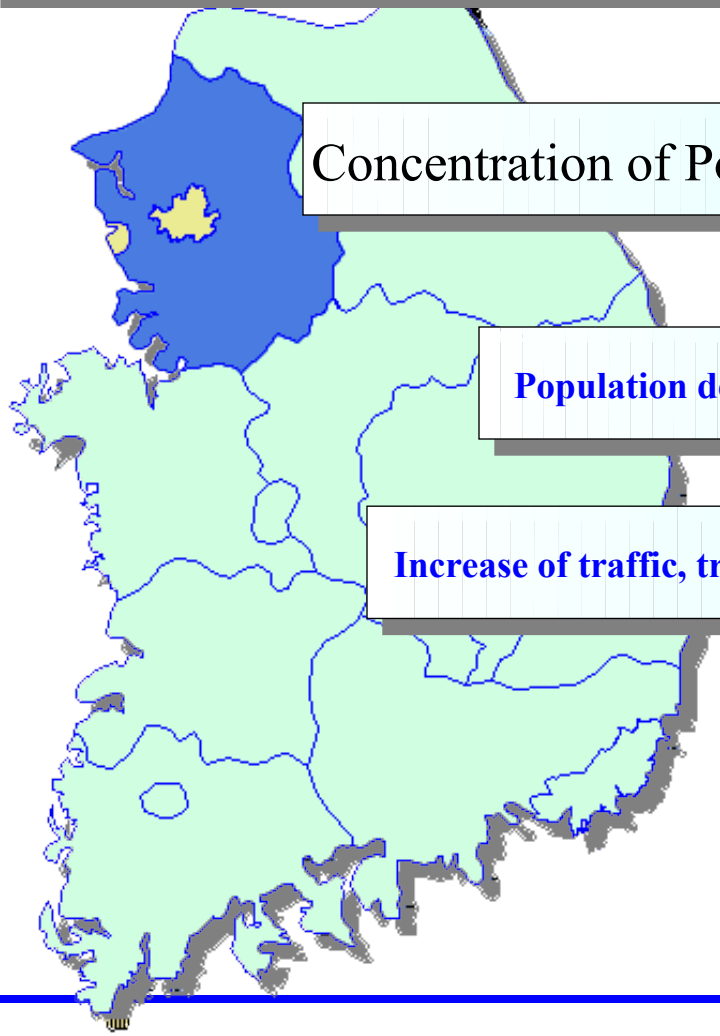
Traffic Environment of Seoul Metro City



Concentration of Population: 46% (12% of whole country)

Population decrease in SMC and increase in Gyeongi and Incheon

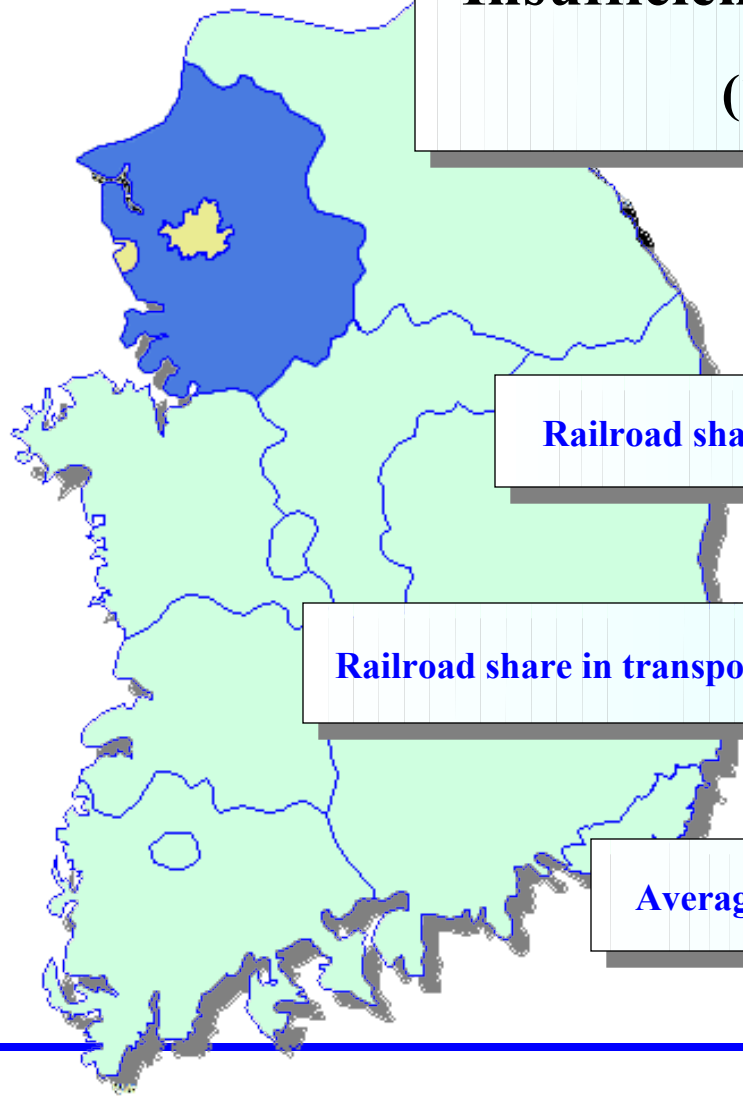
Increase of traffic, travel distance and time in crossing boundary of SMC

Increase of Congestion cost in SMC

Weakening of national competitiveness

Insufficient Rail Facilities in Seoul Area

(1/3 of Tokyo, Paris, etc.)

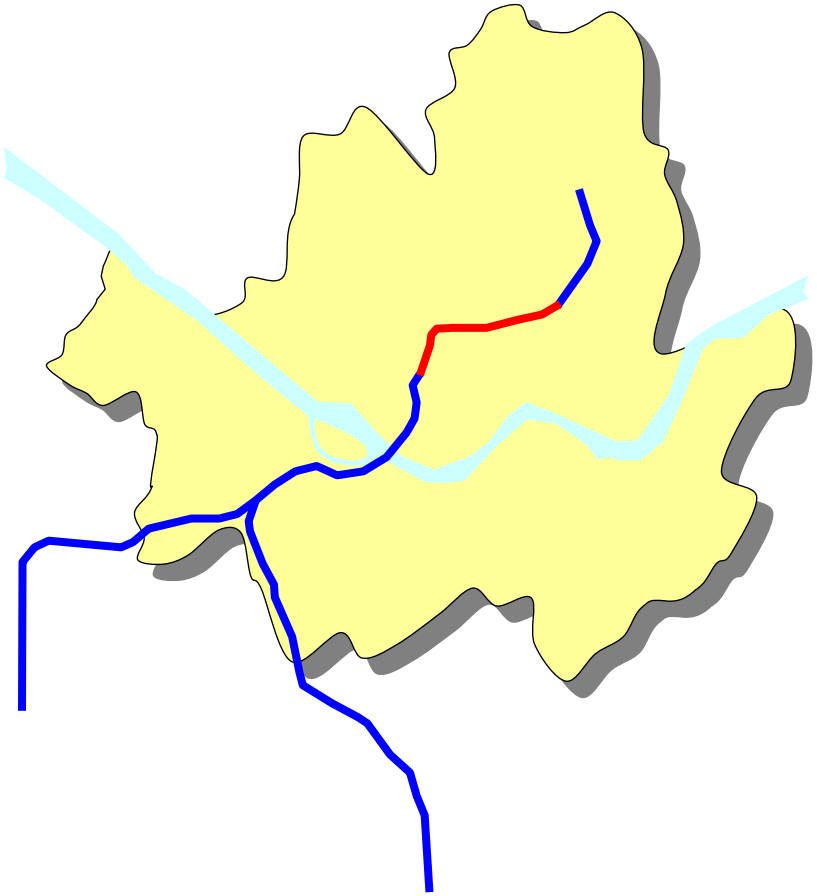


Railroad share in transport : Around 21%(Tokyo 56, Paris 35%)

Railroad share in transport in and out of SMC : 33%(Tokyo 92%, Paris 68%)

Average speed(including stopping time) : Less than 40km/h

1974.8.15 : Opening of SMS

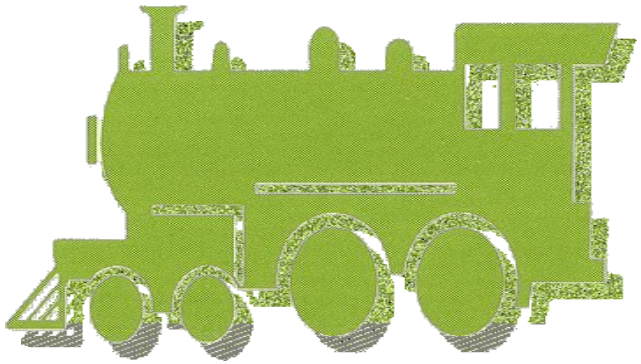


Fare System : distance-proportional

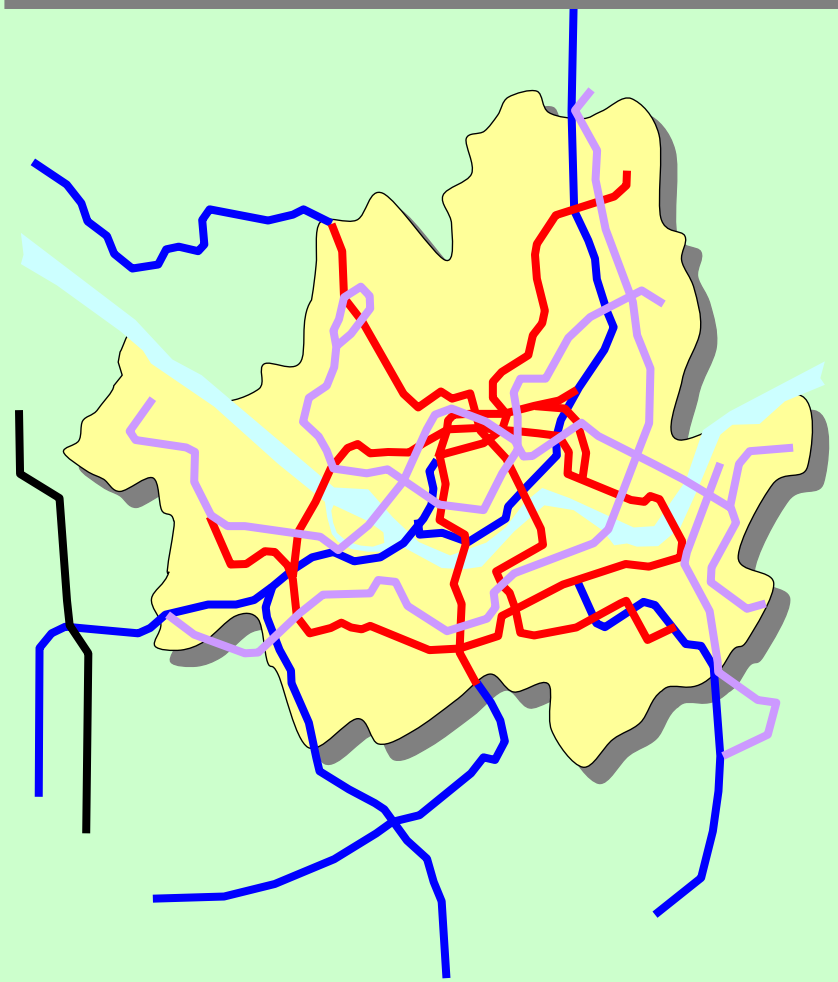
- ✓ Up to 8km : 30 ₩ (Basic fare)
- ✓ Every additional 1km : 3 ₩

Lines : 4(38 stops)

Total Length : 82km



Present Situation of SMS



✓**Operators : 4**

Korail

SMSC

SMRT

IRTC

✓**Lines : 16(389 Stops)**

✓**Total Length : 487km**

→ 2020 : 1,491km

✓ **Passengers/Day**

Around 6,255 thousand(2002)

Fare Systems of SMS

Types of Fare System

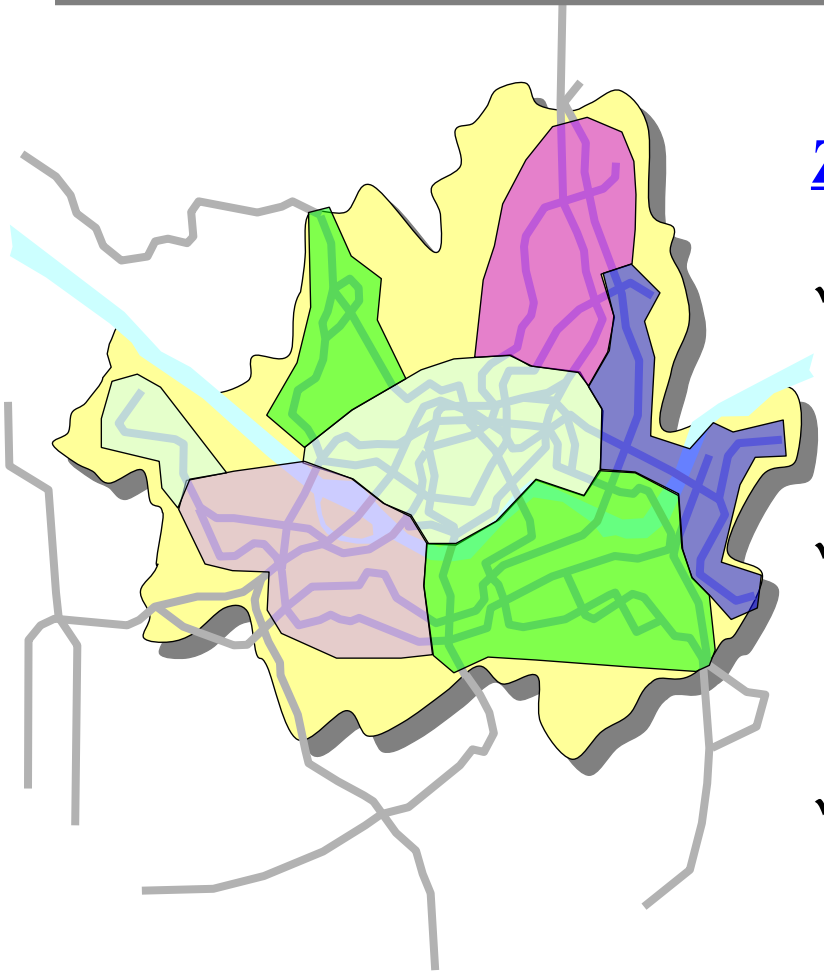
- ✓ **Flat or Uniform Fare**
- ✓ **Fare by Distance of Ride**

  : Distance-basis fare, Section Fare,

  Zone Fare System, etc.

- ✓ **Fare by Travel-Time**
- ✓ **Fare by Services Provided**
- ✓ **Fare by Class of Passengers**

Fare Systems of SMS



Zone and Floating zone system

✓ Within Zones(7 zones)
- Up to 2 zones : 700 ₩ (basic fare)
- More than 3 zones : 800 ₩

✓ Outside of Zones : Floting zone system
- Up to 10km : 700 ₩ (basic fare)
- Every additional 5km : 80 ₩

✓ Into or out of Zones
- Zone system first applied
- Add 80 ₩ per 5km

Fare Reduction Systems

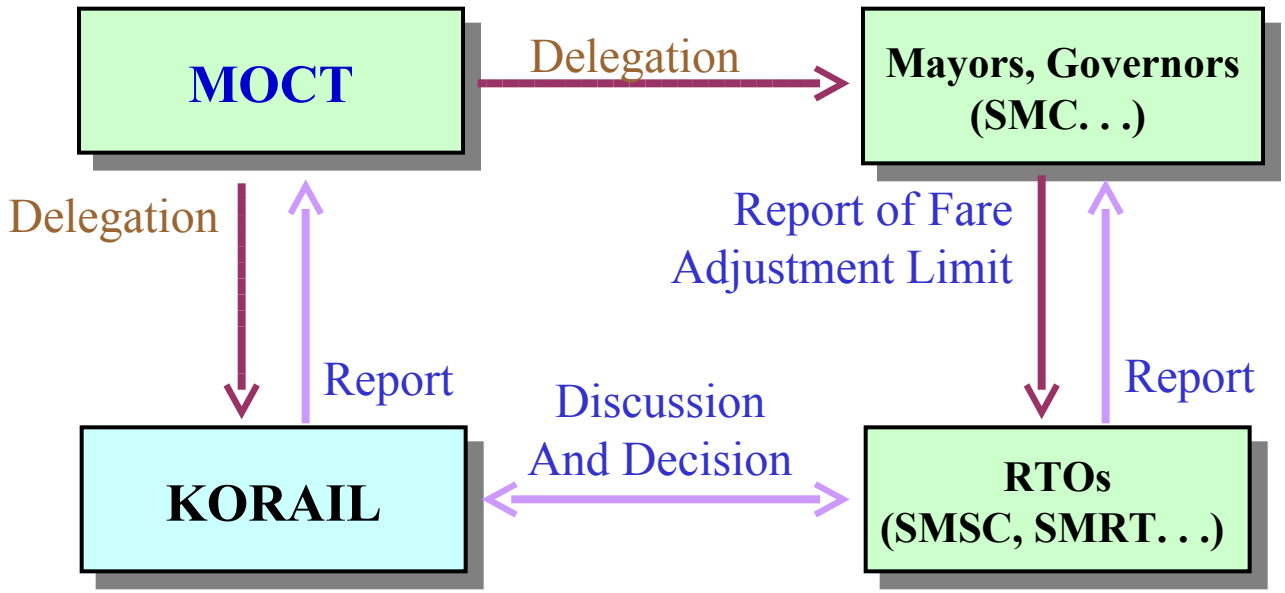
50% Reduction	children (6› 13)
Fare-Free	the elderly, the handicapped, the meritorious
Prepaid Pass	additional ride : adults 10%, students 20% => 11,000 ₩ -worth pass sold for 10,000 ₩
RF Cards	Fare reduction : adults 8%, students 20% (middle and high school)
Group Reduction	Fare reduction : adults 20%, students 30%, children 20%

Pending Issues of SMS Fare Systems

- ✓ **Problems incurred by Using one ticket (multi-operators through several regions)**
- ✓ **Lack of fare-decision principles**
- ✓ **Inequity in fare charge**
- ✓ **Lack of efficient fare application system**
- ✓ **Controversy over establishment of borderline stations**

✓ Problems incurred by using One Ticket Under Multi-Operators through Several Regions

- **Service provision below basic fare**
  - No additional charge by additional operators
- **Difficulty in fare adjustment, policy alteration, etc.**



✓ Deficiency of Fare-Decision Principles

- ❑ **Fare decided below transport cost resulting from political consideration**

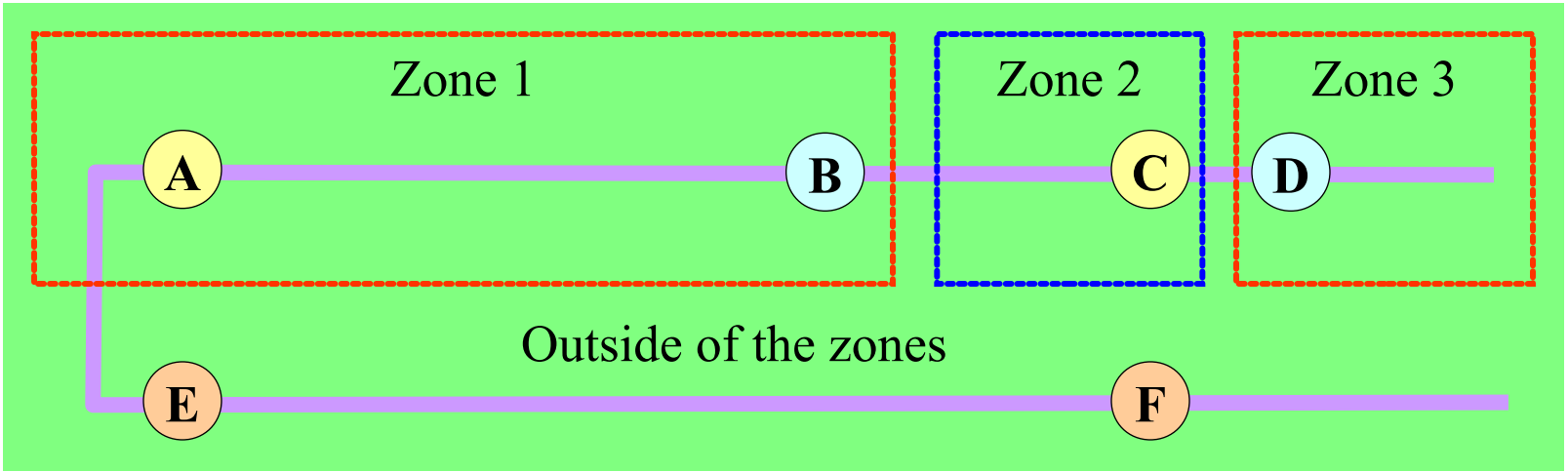
  (1/3 of New York, 1/4.8 of London, 1/2.6 of Tokyo, etc)

- ❑ **Excessive PSO due to government policy**

➢ **Incompleteness of systematic measures to comple ment the loss of transportation cost**

- Revenue against transportation cost : 64.5%(2001)
- Government subsidy for PSO : 48.1%(latest 5 years)

✓ Inequity in Fare Charge



- **Within Zones : 25km (A-C) 700 ₩**
  Outside of the zones : 25km (E-F) 950 ₩

- **Within Zones : 25km (A-C) 700 ₩ (2 zones)**
  Within Zones : 15km (B-D) 800 ₩ (3 zones)

Research Assignment for Establishment of Effective Fare Systems

- ✓ **Executive Agency : MOCT**
- ✓ **Participating Agencies : KORAIL, SMG, IMG**
- ✓ **Objective :**

  To establish optimal fare systems in consideration of social equity, public interests, profitability, feasibility, etc.

- ✓ **Future Plan :**

  To be decided after review on details regarding research cost, and cost share among the agencies, etc.

- ❖ **2003. 2. : Discussed at the meeting held by MOCT**

RF Cards

Pass System of SMS

Magnetic Pass →IC Cards

Description of RF Cards

✓ RF Cards Operational Principles

With IC chip and loop antenna installed in a plastic card, fare collection is performed by non-contact methods at RF Automatic Gate Machine through 13.56MHz Radio Frequency.

- **Non-contact method**
- **Automatic fare collection**
- **OFF-LINE management of bad customers and customer with insufficient balance**
- **Real-time data process**

✓ Main Features of RF Cards

- **Multi-Purpose**
  - With one card : Credit transactions, payment for public transports and access control

- **Economical Efficiency**
  - Low cost in system establishment(no need for motor drive)
  - Easy and cheap maintenance

- **Operational Efficiency**
  - No needs for cash and ticketing
  - Shortening of fare collection time
  - Easy analysis and management of demand forecast

✓ Comparison between Magnetic Strip Pass and RF Cards

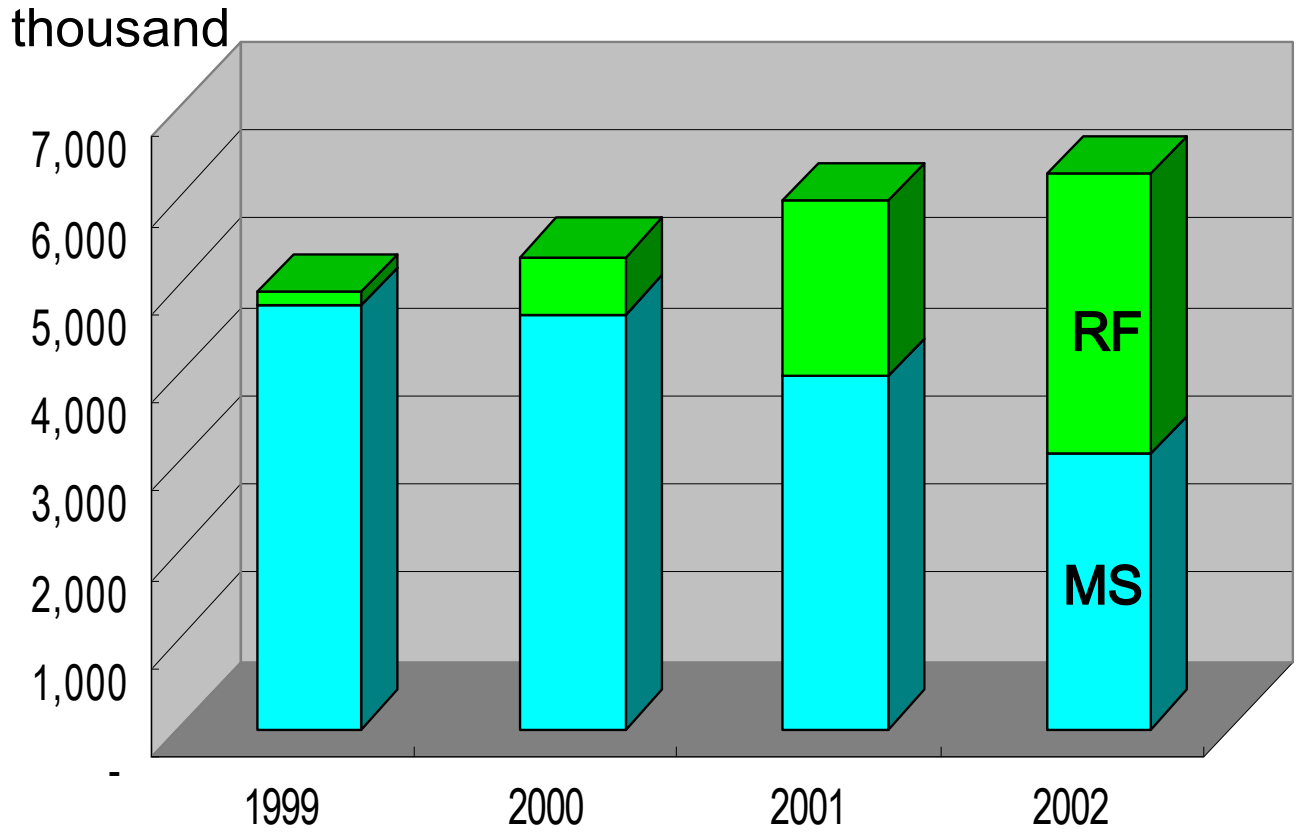
구 분	MS Pass	RF Cards
Types	Edmonton Type	Credit Cards Type
Lifespan	Less than 500 times	Around 100,000 times
Capacity	64 bit	1 KB
Security	Low	High(certification, password, etc.)
Reader	Mechanical motor drive	electronic
Speed	Around 1~2 sec.	Around 0.1 sec.
Processing Method	contact	Non-contact radio communication between built-in chip and terminal

Overview on RF Cards

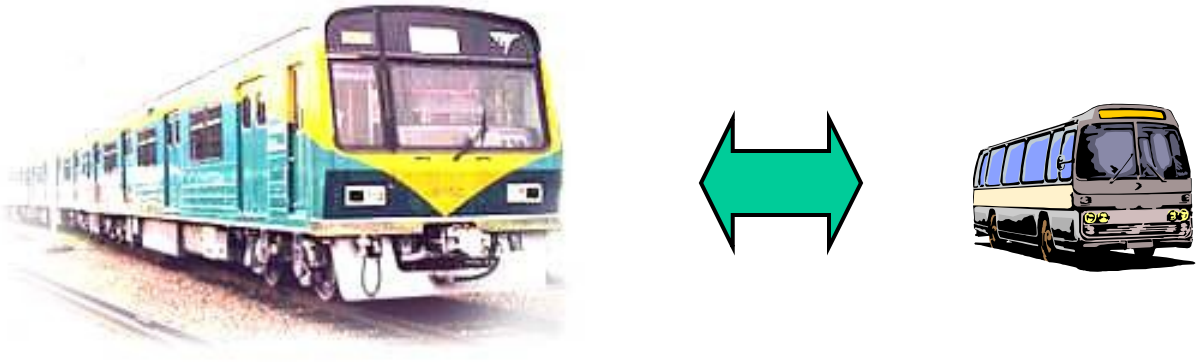
✓ Situation of RF Card Introduction

	SMS	Metro Bus
Introduction	**1996. 2**	1996. 2
Types	**Deferred Payment Card (Double use as a credit card)**	Prepaid cards (Bus only)
Common Use	**1999. 3**	1996. 7
Remarks	**Start of joint use in 2000.1**	

✓ Trend of RF Card Utilization (per day)



✓ Introduction of Fare reduction for transfer(2001.10)



✓ Introduction of various RF cards

Future Objectives for RF Cards

- ✓ **Enlargement of RF Card Utilization Rate to 100%**
  - Minimization of ticketing staff
  - Flexible application of various fare reduction systems
  - Introduction of various RF cards
- ✓ **Maximization of Convenience of RF card utilization & Operation**
  - Realization of Countrywide Common Use of RF cards
  - Construction of Unified Fare Settlement System(VAN)

Thank You !!!