

Mobile Transportation Card System & Advanced Public Transportation System

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- 1. Korean ITS Service
- 2. Overview of Bus Information System
- 3. Overview of Automatic Fare Collection System (AFCS)





Korean ITS Service

Traffic Management

- Traffic control & providing traffic information
- Manage traffic incidents
- Real-time adaptive control
- Automatic enforcement



Traffic Information Center

- Integrated management ITS
- Monitoring real-time traffic condition and Providing traffic information(VMS, Internet, App)
- Exchange traffic information with related centers







Intelligent vehicle & Road

- C-ITS
- Autonomous driving & road
- Adaptive Cruise Control(ACC)



Commercial Vehicle Operations

- Manage freight vehicle
- Manage hazardous materials



Public Transportation Provide Bus Information

- Manage bus operation
- BRT system
- Bus priority signal



Traveler Information

- Car navigation
- Provision of traffic information for drivers



Electronic Payment

- ETCS(Electronic Toll Collection System) : Hipass
- AFCS(Automatic fare collection System) for public transportation





Data Provided

Bus user

- Provision of expected arrival time
- Route and fee search
- Bus stop information and transfer

Bus driver

- Interval with vehicles ahead and behind
- Bus operation information

Bus manager (public office, company)

- Bus operation monitoring
- Analysis of history of bus operation
- Delivery of emergent messages









Definition of BIS/BMS		
Division	Bus Information System (BIS)	Bus Management System (BMS)
Purpose	Provision of information, user services (macroscopic concept)	Operation control, overall supervision and operator services (microscopic concept)
Means	Guidance to bus stops as well as internet and mobile services to offer guide to passengers	Operator terminal, company terminal, bulletin and on- board equipment (OBE)
Subject	Bus users	Bus drivers, companies, local governments
Information	Real-time position coordinates (fixed-time data)	Data such as arrival at stops and passage of crossroad (event data), total distance covered and frequency of operation (driving history)
Major Tools		
Common Aspects	 GPS, wireless communication system and on-board terminals Center system (electronic equipment, network, annexed facilities, etc.) Operation terminal (application program) 	
Differences	Methods and management of operation as well as operators (purpose of use)	











Recent trends in Korea



- · Build an independent center
- The OBE and the center communicate
- Providing information through BIT and mobile



- Integrated management of multiple centers on cloud servers
- Provides information through BIT and mobile communication networks



- Collecting and providing information with mobile apps
- · Cloud-based center sharing

Characteristic

- * Excellent information provision reliability
- Provide real-time information through BIT, web, app, and ARS
- Large budget
- Expertise necessary

Characteristic

- * BIT only displays center information
- 50~60% reduction compared to independent center operation and maintenance costs
- BIT installed only at main stops(Reduce installation costs)

Characteristic

- Can be built at a cost of about 12.3% compared to a independent center type BIS
- * Research and development in progress



Recent trends in Bus Information System (BIS)



- Implemented and operating in 147 cities (2020, S. Korea)
 - Special cities/provinces/metropolitan cities(10), Gyeonggi province(31), Gangwon province(18), Chungcheong(19),

Gyeonsang province(33), Jeolla(31)

- Operating TAGO platform on consignment in 57 cities out of 147 (2020)
- Cloud-based integrated center (DTG + OBE integrated terminal applied)







Citizens' Satisfaction

An analysis of effects of bus information system (Suncheon city case, 2011)

- Many of the bus users are satisfied with the bus information services (per local government, on average 70~80% or more)
- Most preferred are bus arrival time and bus stop information.
- Among ITS areas, it is an area that offers most direct public services, which always result in the highest satisfaction.



Timeliness/Accident Reduction

Seoul Special City

• Timeliness 35% improved in bus arrival times, bus accidents decreased by 24%.

Ulsan Metropolitan City

• Complaints decreased ('04 : 499 → '06 : 242), including bus not operating, untimelessness for operation and failure to stop at stations.









Overview of Automatic Fare Collection System (AFCS)

- AFCS is a payment service that allows to pay for all the public transport modes with one card
- Improve convenience of public transport by using Electronic Transport Card to pay fare
- It supports automated and optimized processes for full-fledged internal/external handling of automated fare clearing
- In Seoul, smart card use for Bus is 98.9% and for subway is 100% (as of '20)





One Card All Pass

- One Card All Pass; an integrated card for not only taxi, bus and subway fares, but also train expressway tolls and even parking system was developed and introduced in 2014
- The first electronic payment system for public transportation was introduced in 1996, Seoul, Korea
- Based on the reform of the Seoul bus system in 2004, with just one transportation card, users can pay for most public transportation modes including taxis, buses, and the subway
- Over 95% of bus passengers and 100% of subway passengers in Seoul use this transportation card







Overview of Automatic Fare Collection System (AFCS)





User

- Change is not required
- Convenient to carry & quick to process



Transportation Service Provider

- Automatic calculation of transportation revenue
- Rational management & increased revenue with the management data provision



Government

- · Incorporation of various public transportation initiatives using widely collected data
- Rational transportation policy making



Financial Institute

- Reduction of cash management cost by restraining unnecessary bank note issuance
- · Offered the Revenue model







MaaS-Seoul Implementation Plan

Integrated Mobility Platform Initiative

- All modes of transport available in Seoul are integrated, managed and provided as a single service
- An integrated management system collecting all the data from buses, subways, taxis, railways, bicycles, and shared vehicles
- User customized optimal route guidance algorithms (reflecting weather, individual travel patterns and preferences, real-time congestion information, events, etc.)
- An integrated payment platform in connection with the private sector (integrated reservation and payment)
- Future service development analyzing pedestrian, personal mobility, C-ITS collected data, and predicted traffic information)







MaaS-Seoul Implementation Plan

- Transport mode and data to be integrated for MaaS-Seoul (Vision)
- Mode : Integrate the currently available public transport modes with the future mobility like autonomous vehicles
- Data: Integrate current public transport data with shared car, weather, event, and individual preference







Thank You

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