Automated Fare Collection System

Automated Fare Collection System is an electronic payment technology that allows passengers to pay public transportation fares using a contactless card in either prepaid or postpaid form.

Transit cards are widely used across subways and buses nationwide, offering convenient travel options. Discounts are provided based on transfer distances between subways and buses, making it cost-effective. This increases public transportation usage, reduces traffic congestion, and lowers carbon emissions.



▲ A citizen taps a transit card on a terminal to pay for subway fare upon entry.

Issues to Tackle

- ☑ The need to purchase a new ticket for every subway ride or to prepare exact change for bus rides slows boarding times and increases operational burdens for drivers.
- A unified fare payment system is required to make public transportation more convenient and provide benefits for citizens using various transit options.

Expected Benefits

- ☑ A single prepaid or postpaid transit card (linked to credit cards) enables payment for buses, subways, and taxis, as well as seamless transfers between them.
 - * Example: After introducing an integrated transit system, card payments increased from 68% to 99%, and transportation-related administrative costs were reduced by 51.9 billion KRW annually (2014).
- Promotes public transit usage and reduces environmental impact by offering better incentives and integrating transit networks

Kev Services

- · A single contactless transit card (linked to credit cards) enables payments for buses, subways, and taxis, as well as refunds for unused balances.
- · Provides usage history and receipt printing services through smartphone apps and internet websites.
- · Distance-based fare systems adjust charges based on boarding and alighting locations.

্টে Use Cases

- Seoul introduced integrated public transit services in 1996, connecting buses, subways, and taxis with regionally unified fares and transit systems.
- T-Money began exporting its system to New Zealand in 2008, starting with buses in the Wellington region, and expanded to include the Automatic Fare Collection (AFC) system for railways in 2022, laying the foundation for New Zealand's integrated public transit system and diverse fare structures.
- · Korea's transit system has been exported to cities worldwide, including Kuala Lumpur (Malaysia), Bangkok (Thailand), Bogotá (Colombia), and Athens (Greece).

Key Components



Configuration

AFC Management System (Automatic Fare Collection)





1. Boarding



Receives location and time information via GPS stores it in the terminal along with fare details.



2. Alighting



Stores alighting location and time information in the terminal and records the alighting time on the card.



Applies transfer discounts when switching to a different route or another mode of transportation.



4. Boarding



Checks the alighting time information recorded on the card and applies transfer discounts.



5. Alighting



Stores alighting location and time information in the terminal and records the alighting time.





Subway Operators (Transmits operational data, boarding and alighting information, and fare details.)



Bus Operators (Transmits operational data, boarding and alighting information, and fare details.)

Key Technologies

1. IC Chip-Embedded Transit Cards and Devices (Cards, Mobile Apps, Readers)

· Media used by passengers to pay fares for various public transportation systems.

2. Fare Payment Terminal (Common)

· A terminal used for paying transit fares by tapping on entry/exit points of buses and subways, generating payment and refund information.

3. Driver Terminal (Bus)

· An electronic terminal that integrates card verification, fare confirmation, passenger count tracking, and stop announcement functions for bus drivers.

4. Integrated Bus Terminal (Bus)

· A terminal that transmits data, such as transit usage history, payment details, bus location, and operational information, to a related center (integrated with BMS, BIS systems).

5. GPS-Based System (Bus)

· A GPS device for verifying the location of buses in operation.

6, Exit or Entry Terminal (Common)

· A terminal for tapping transit cards when exiting buses or subways to process distance-based fare adjustments.

7. Contactless Transit Payment System

· A near-field communication system based on Bluetooth 4.0 that detects beacons for automatic payment without the need to tap a transit card.

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