

# Smart Bankcards in Asian Transit: Lessons Learned

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Who we are  
Crowded Asian City Life  
Seoul, Korea  
Japan  
Asia's Characteristics  
ALPS System  
ALPS Fare Processor  
Chargeback Cases  
Objections to Postpaid Cards  
Public Transit Challenges Some Banking Norms



**2012 FARE COLLECTION WORKSHOP**

# Smart Systems Innovations

## Who we are

### Automated Fare Collection

- Fare collection technology
- Patented methods for authorizing bankcards and other media *offline*

### Financial Solutions

- Credit/debit card solutions
- Transit terminals
- Contactless card micropayment acquiring
- Transit clearinghouse software
- Patented card technologies to integrators:
  1. Negative list
  2. "Learning" negative list
  3. Positive list
  4. Fare processor
  5. Heuristic security for offline transactions (tricks to stay one step ahead of hackers, fraudsters, the Mafia, etc.)
- Alternative media, NFC, mobile phones, etc.



# Crowded Asian City Life



# Crowded Asian City Life 2



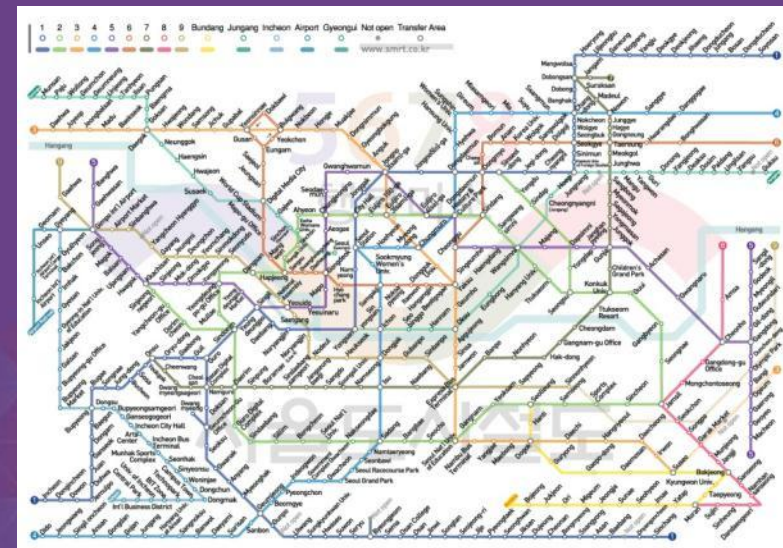
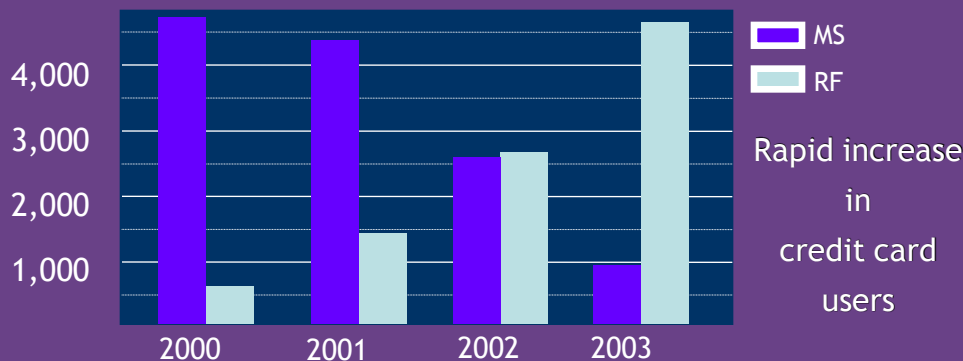
Tag-in tag-out eliminates the need to purchase exact fare tickets in advance. This is important in large systems.



# Seoul, Korea

- 3rd largest transit system in the world,  $\sim 2x$  New York
- Largest smart bankcard system in the world with longest operating history
- First deferred-payment transit system in the world
- Daily ridership: 12.7 million
- 6,772+ gates, 18,447 bus fareboxes
- 30 million credit cards from 8 banks
- Working successfully since 1996
- Today: 7 million transactions per day with only  $\sim 142$  bad tx/day (0.002%!)

4/2003 usage of smart cards  
in Seoul subway



# Seoul, Korea

## Riders

- Convenience: no need to carry currency, go to vending machine
- Card secure against theft, passenger can pay later, earn miles
- Rapid transaction time – reduced commuting time
- Single card multiple purpose, no need to take out of wallet or purse

## Agencies

- Eager adoption of new payment method by riders
- The ultimate interoperability
- Excellent reporting features
- Can integrate transit benefits
- Rapid entry increases throughput
- Decreased maintenance costs
- Decreased cash handling



# Japan

National railway was split into regions

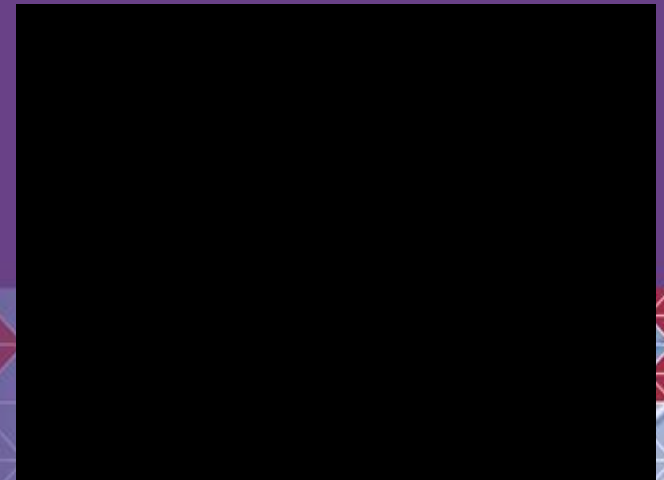
- Imagine Amtrak breaking up like the 7 Baby Bells from the old AT&T
- Seamless transfer from one region to the next
- Reserved seating and open seating cars on most lines

JR East issued Suica 11/2001

- Issued credit cards called Suica View 10/2006
- Became a national bank (!) in order to issue credit cards
- Automated reserved seating; you can check in with your card on some trains
- Fantastic marketing

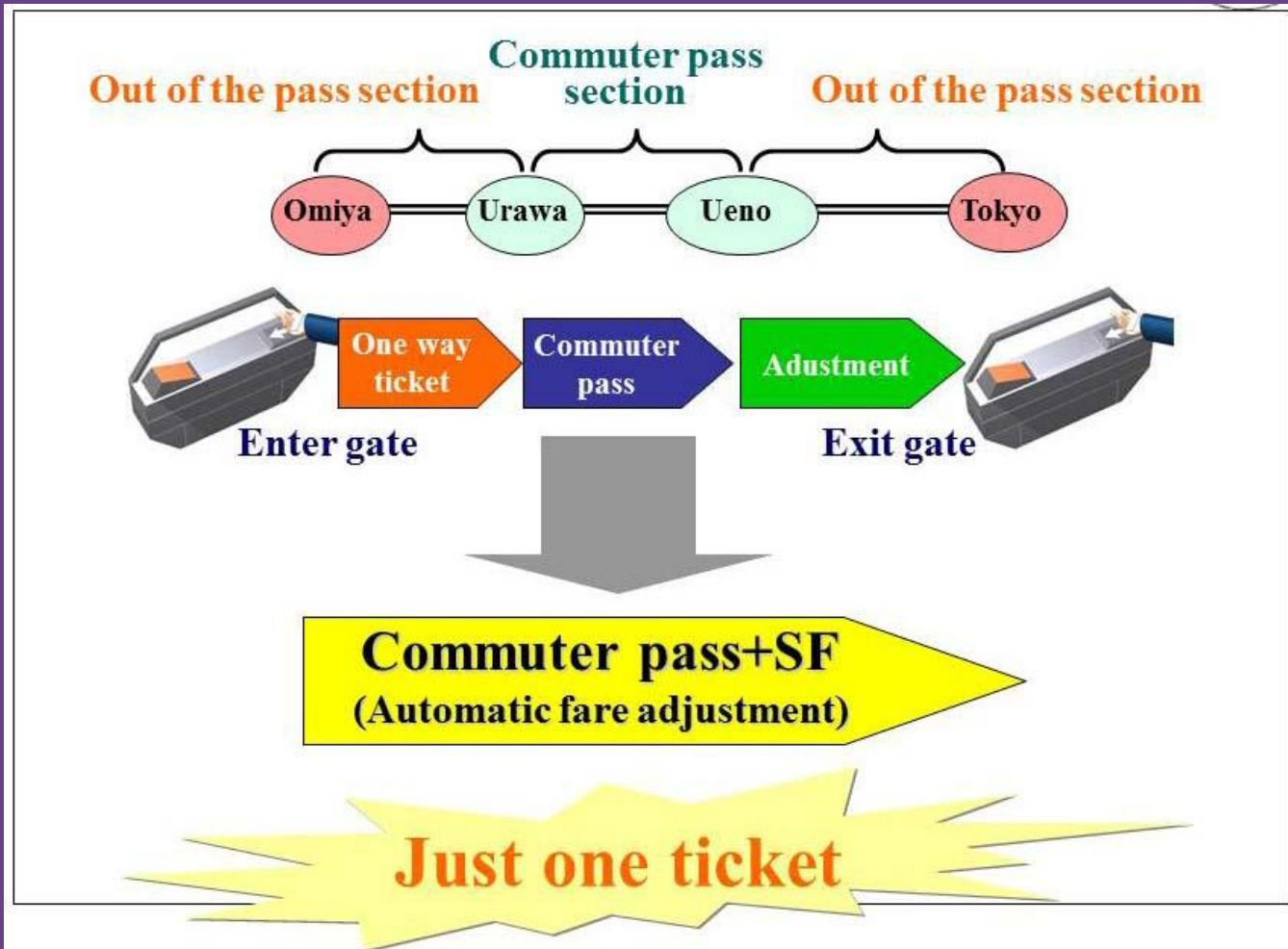
JR West issues IcoCa, JR Central Toica

- Same idea as Suica
- SMBC bank issues PiTaPa, a credit card with a transit app in it
- Local agencies issue local cards like PASMO
- System still accepts mag stripe tickets



# Japan

## Automatic fare adjustment



Rider simply taps on and off but system automatically detects a commuter pass and charges rider for distance to beginning of pass area and distance from end of pass to destination.

Wow, right?



# Asia's Characteristics

Korean issuer's story a super-success

- Fully half of all fares paid by credit cards (7m transactions/day)
- Accounts for transfers, discounts, passes, etc.
- 2-year exclusive on issuing the first cards made #6 bank #1
- This doesn't mean that banks will pay transit agencies for the privilege...

Easy to enforce standards in Asia

- China: everything everywhere directed by the government
- Japan: Everyone uses (the expensive) Felica chip
- Korea has only 8 banks participating

US banks won't allow a transit app on their cards...maybe ever

- 3,000 US banks is too many banks to enforce a transit standard on
- Just because system is "open" *doesn't mean there isn't IP involved:*
  - MasterCard PayPass standard (nearly) universal in US
  - MasterCard EMV/MChip standard universal in Europe, coming to US
  - "Open" systems have underlying technologies that may need licenses

# ALPS System

If issuers won't allow writing to card:

- No application on the chip -> integrators must create new system
- Card is an identity token; can use other tokens to identify account, e.g. government benefit cards
- No storage of last (e.g. 10) transactions -> no feedback at POS

The only choice: Account-Linked Payment Service (ALPS)

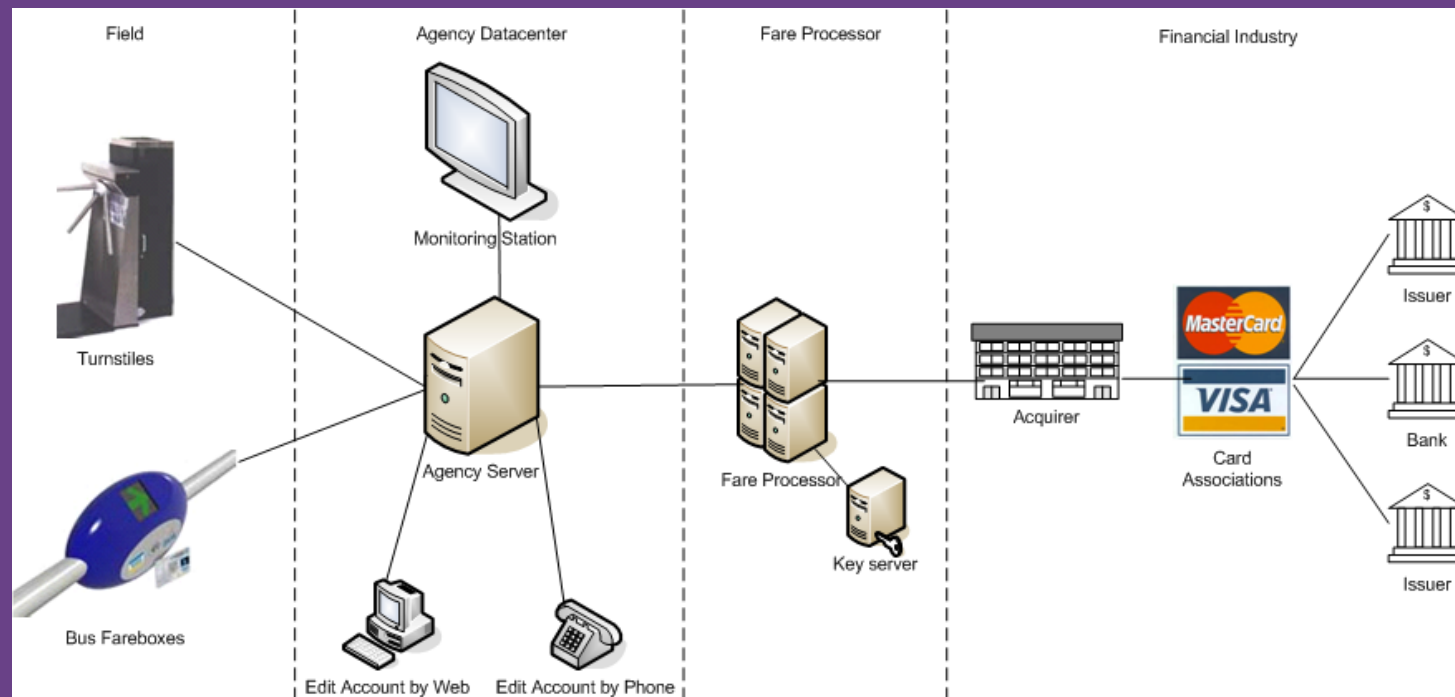
- Creates virtual accounts in a central computer that close out daily
- Offline hotlist pre-authorization in <300ms
  - Integration problem: PayPass is slow
- No pre-registration necessary
- Aggregation of charges possible



# ALPS Fare Processor

In public transit, not every presentation of a bankcard = "charge me"

- Transfer rides, monthly passes, age discounts, etc. don't pay ->
- Need for a business rules processor between POS and acquirer
  - Decides appropriate charge, if any, for each presentation
  - Only one needed per region



# Chargeback Cases

Chargebacks are the biggest risk in offline authorization

- \$35 per incident adds up PDQ
- Distinct chargeback cases need various prevention techniques
  - Negative and positive lists, velocity checks, heuristic analysis, etc.

Chargeback cases:

- Card is good but customer denies charge
  - Family member stole card
  - Card stolen since negative list published
- Card is bad
  - Not on negative list but insufficient funds
  - On negative list but list wasn't updated

No chargeback but funds not collected:

- Card is defective
  - "No such PAN" e.g. from card that changes its PAN with each use
- Card used for time pass duplicated
  - Rides for free even if invalid



# Objections to Postpaid Cards

CFOs can complain about losing their float in postpaid models

- Float = aggregate prepaid amounts stored on fare media
- Float worth ~2 or 3% interest on outstanding value on prepaid cards
- Approximately 0.05% of 1 year's fares
- Float is tiny compared to savings on vending machines, maintenance, no cash handling, rider convenience, etc.

Integrators sometimes say that not having a transit application on the card makes complex products impossible

- Back end accounts have all the information needed
- Fear of "lost transactions" and lost revenue
- Information Terminals or handheld devices can let agents and riders see transaction history, other information from back end account



# Public Transit Challenges Some Banking Norms

## Transit Industry Wants from the FI

- Move to credit / debit / prepaid acceptance with batched offline transaction processing
- Payment network pricing to support micropayments
- Ability through size and scale to gain preferential acquiring pricing: merchant discount ~ 2-2.5%.

## Challenging the FI Norms

- Payment brand rules ought to allow new transaction types
- Reduce interchange / switching fees for low \$ size transactions
- Acquirer needs to be flexible on merchant discount

Transit agencies need credit and debit acceptance in offline mode with good risk management.

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**Thank you!**

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