9/6/2020

Pricing: fare setting, ticketing and revenue management

UITP Online Course on Marketing and Communication in Public Transport

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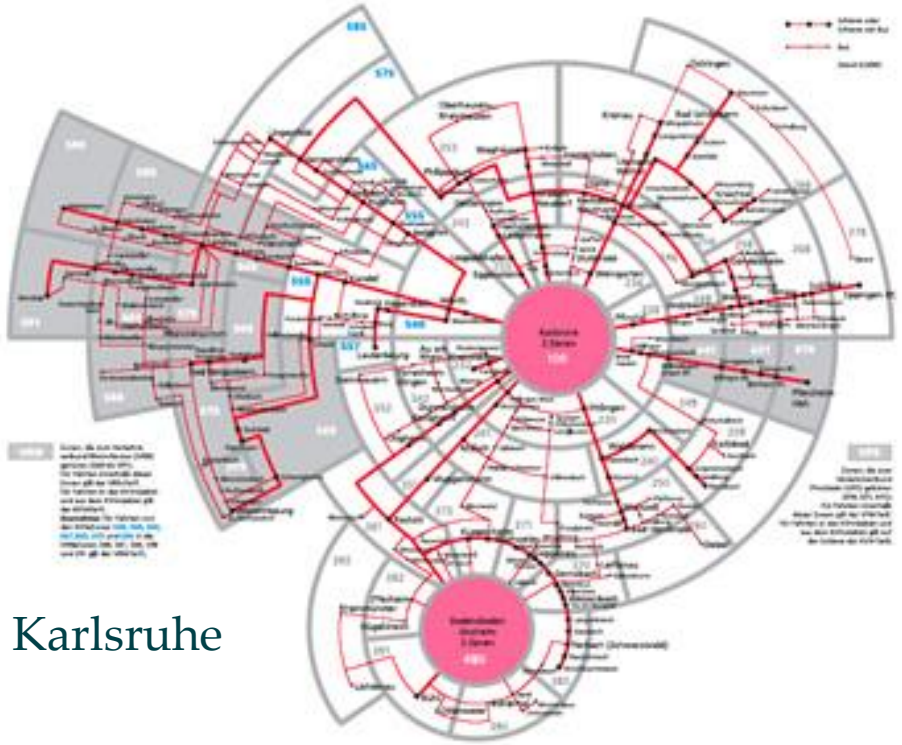
Why do we need Ticketing for Public Transport?

TICKETING >< PRICING

- Ticketing is a tool for the implementation of a pricing policy with the consideration of operational, commercial and social objectives.
- The ticketing system is the translation of tariffs into concrete means of payment (for the passenger) and fare collection (for the operator)



Karlsruhe

Rwanda

PRICING AND TARIFF

- Pricing policy - all actions to influence and set prices
- Tariff - an overview of all the different prices that one network offers
- Price elasticity - the quotient of the demand change in percentage and the price modification in percentage
- Fare Revenue = Tariff x Number of passenger journeys

PRICE DISCRIMINATIONS

- **Journey-based price discrimination**
  - price depends on characteristics of the journey (such as time of travel; distance travelled; or mode)
  - cost-reflective pricing: some modes cost less to operate than others; off-peak services are cheaper to provide than peak services; it costs less to cater for short trips than for long ones.
- **Passenger-based price discrimination**
  - price depends on characteristics of the passenger (such as their age or social status)
  - often socially driven (concessionary fares) rather than commercially motivated – at least in the case of discounts for captive passengers such as children and elderly people.

JOURNEY BASED PRICE DISCRIMINATION

- ***Flat fare***
  - all passengers are charged identical fares regardless of route, distance travelled, or type of passenger. This system fits well in a situation where a majority of passengers travel approximately the same distance
  - more equitable cities where richer passengers live nearer the city centre and poorer people farther out, since the former would pay a higher rate per kilometre than the latter
- ***Route fare***
  - each route has its own fare. This system is often applied in cities where franchises are granted per route. The challenge is to ensure equity between city areas and according to the length of routes
- ***Zonal fare* (network based or route based)**
  - the network is divided into zones - with a flat fare within each zone - and the price is determined according to the number of zones crossed by the passenger. It is not equitable for passengers travelling short distances across two zones as they have to pay for two zones
- ***Distance-based fare***
  - Usually, each route is divided into fare stages, with a clearly identifiable boundary point for each stage. The spacing of the fare stages may be varied to reflect differences in operating costs or different demand characteristics, on different sections of a route.
  - Considered to be reasonably equitable, since the fare for each journey is related to the distance travelled. The finer the fare scale, the more equitable it becomes, provided that the distances between fare stages are consistent.

PASSENGER-BASED PRICE DISCRIMINATION

- **Concessionary fares include fares for:**
  - Children
  - Pupils and students
  - Elderly people and pensioners
  - Disabled
  - Unemployed people
  - Police and army
- **Offering concessionary fares is often a legal requirement in many countries. In some cases, there are restrictions on the times when concessionary fares are available. For example pensioners may not be eligible for the concessionary fare at peak time.**

PRICING AND TICKETING CONSIDERATIONS

- Ease-of-use for passengers
- Equity (types of users, types of trips)
- Simplicity of revenue collection
- Ease-of-control for operators
- Attractiveness to passengers
- Inter-modality
- Simplicity of clearing and sharing revenues between operators
- Maximising farebox revenues
- Reducing fraud

Pricing: fare setting, ticketing and revenue management

TYPES OF PUBLIC TRANSIT SYSTEMS

Open Systems – Trust / Penalty based

Closed Systems – Turnstiles or fare-gates

On-board fare collection

Pre-board fare collection

DESIGN OF FARE SYSTEMS

- Avoid unnecessary complexity of the tariff systems
- Encourage personalisation of payment media
- Collection of robust data and development of measurement tools
- intelligent data analytics

PRODUCT CATEGORIES

- **Service products - Operational**
  - Routes, vehicles, comfort, punctuality
  - Less flexibility to change
  - Higher investment implications
  - MaaS – Mobility as a service

- **Ticketing products – Marketing**
  - Fares, passes, value-added
  - More flexibility to change with changing dynamics of the market
  - Low risk

TICKETING PRODUCTS

- **Historic preference**
  - Simple, easy to understand, technology agnostic, cookie cutter approach
  - Journey based
- **Current preference**
  - Customised / individualised, technology driven
  - Engagement based - account based ticketing
  - Value-added / packaged products (2+2 = 5)
  - Measurement of customer loyalty – Customer relationship management (CRM)

DISCOUNTING

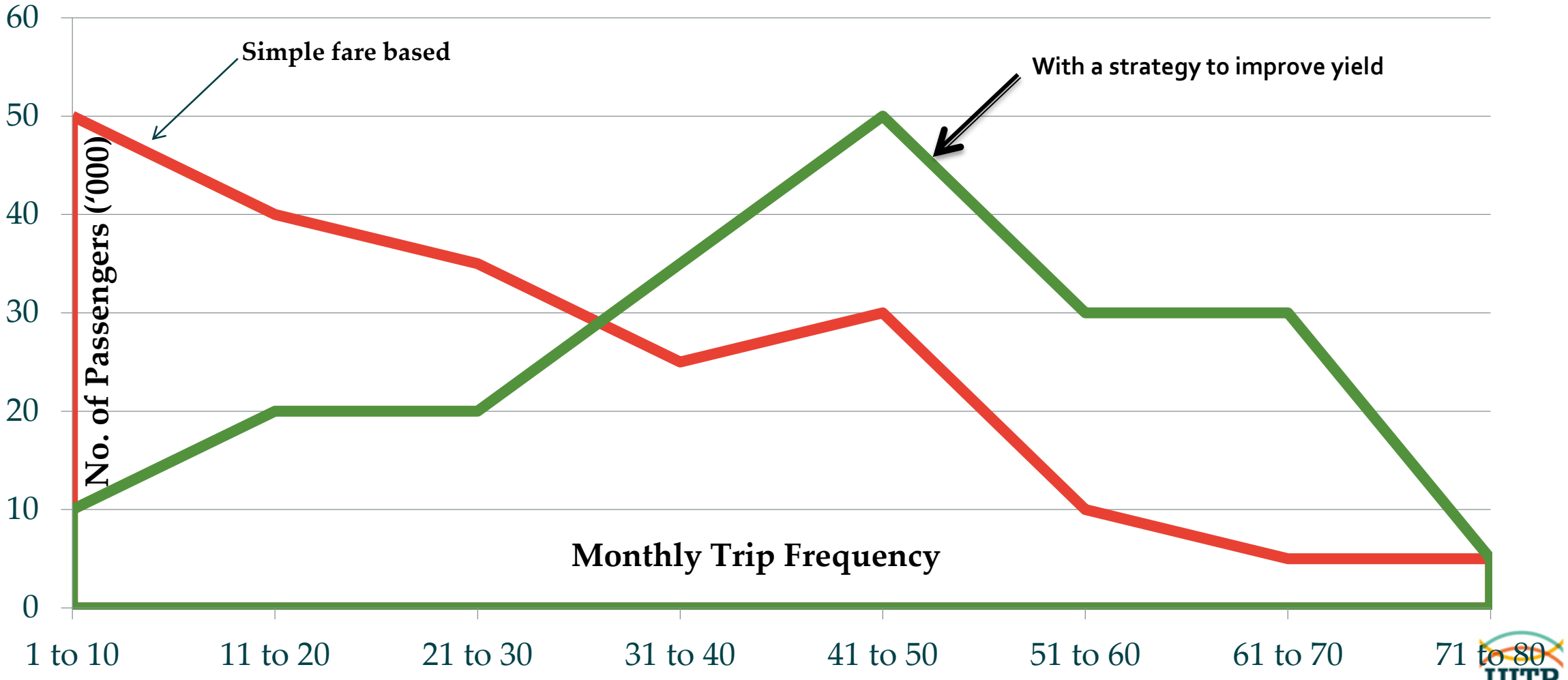
- **One of the most misunderstood concept in public transport**
- **Most operators believe that discounting means a loss of revenue**
- **Can it be a means to generate more revenue?**

- **Yield Management –** every piece of incremental revenue without increasing the cost goes to the bottom-line
- **Basket of Fares**

VALUE TRANSFER

- **What are the advantage of public transport systems**
  - High traffic
  - Strategic locations
  - Wide coverage
  - Face-to-face interaction
  - Captive ridership
  - All pervasive
- **Many other industry segments spend billions to get same advantages**
  - Imagine if these billions can be transferred to public transport
  - Win-Win proposition

IMPROVING THE YIELD



FOCUSING ON THE CUSTOMER

Target market is quite finite not in terms of trips but in terms of customers

Right strategies for the right customer segment to maximise revenue yield

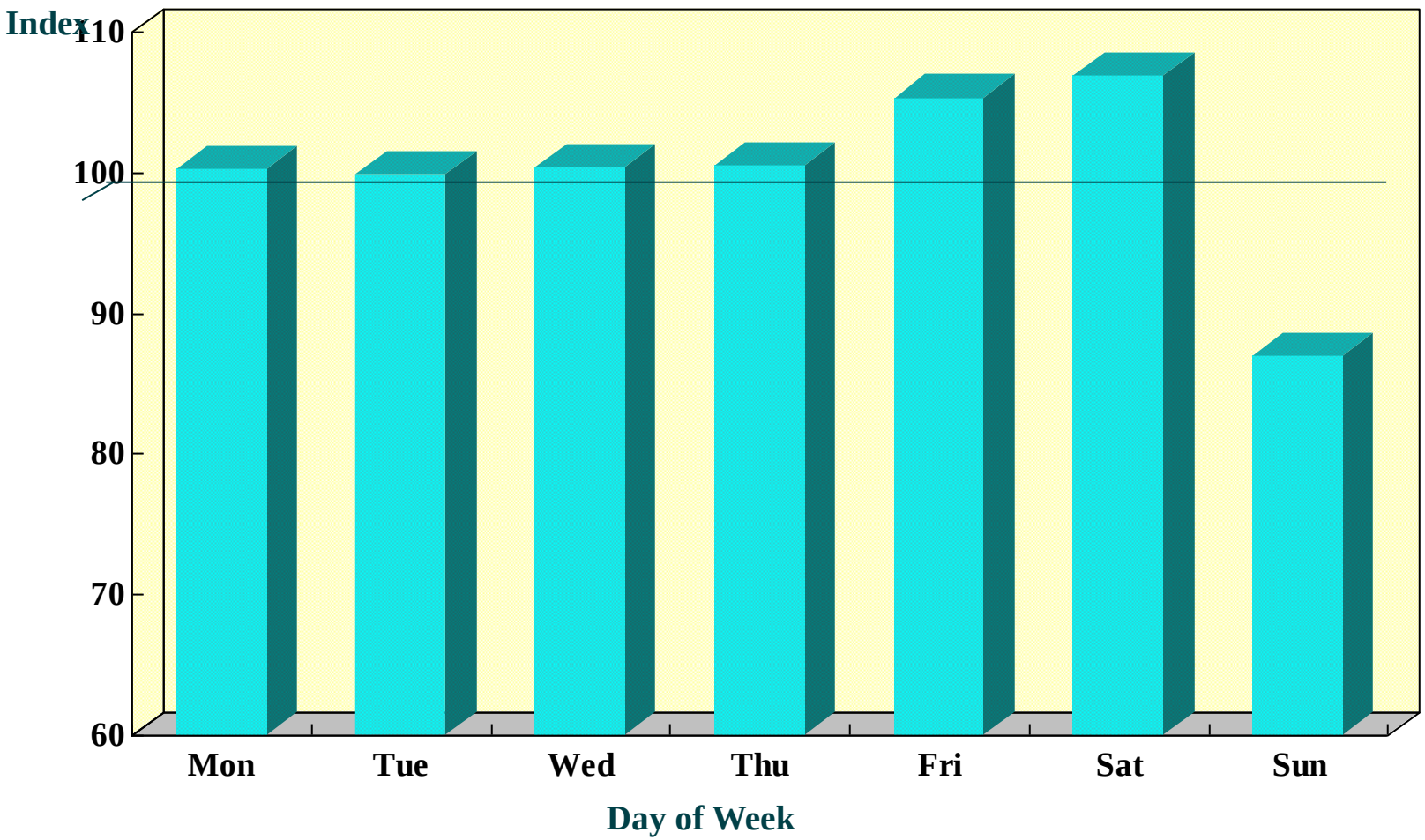
Target the customer to maximise the trips

Learn from other industries and exploit the technology

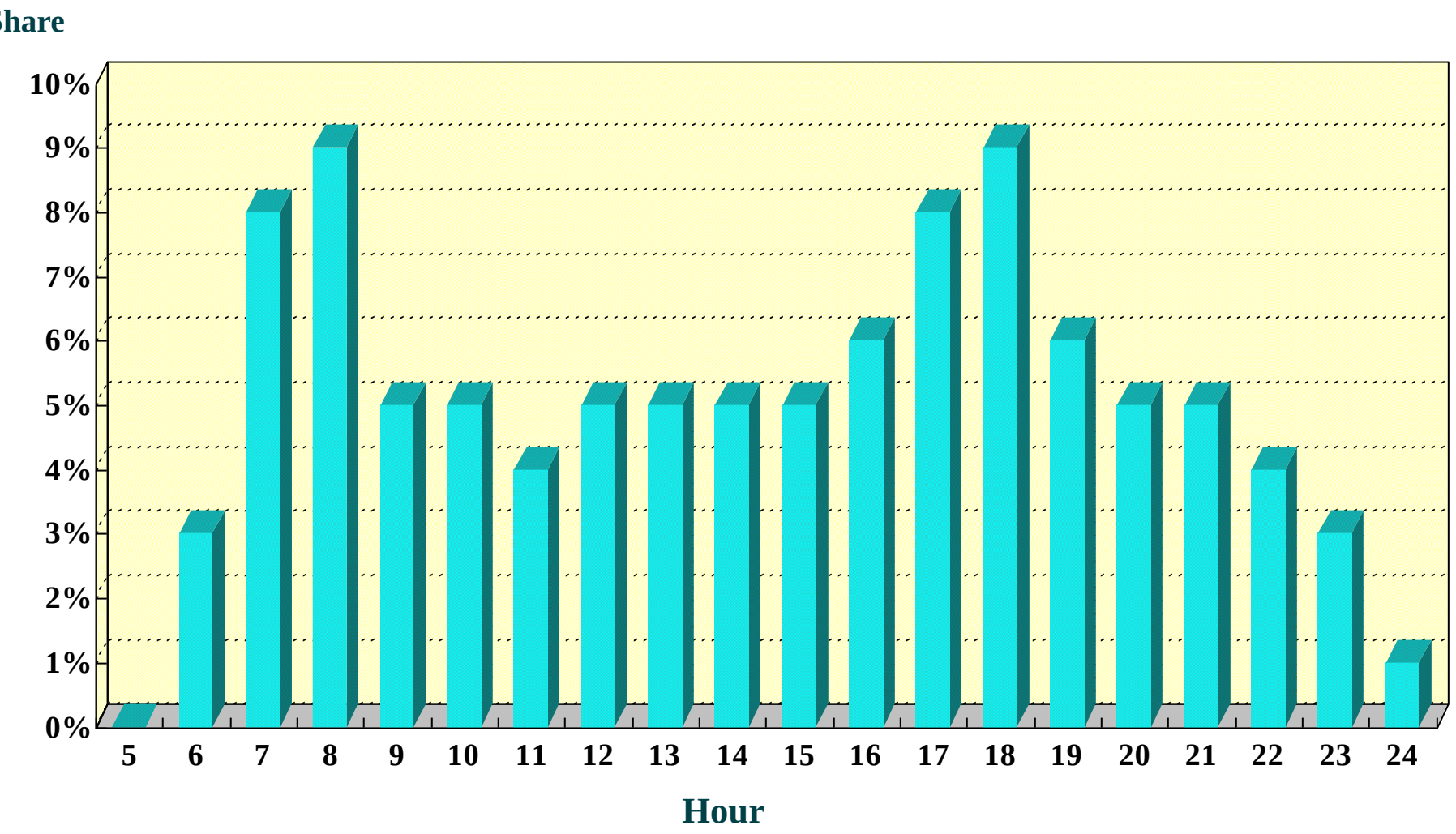
- Think monthly billing / pre-paid / post-paid

Not just fares but basket of fares

WEEKLY VARIATION



HOURLY PROFILE



Ticketing Typology

TYPES OF TICKETS

- **Single ticket**
  - One journey (no time limit)
  - Zonal single ticket
  - Origin-Destination single ticket
- **Single ticket: several journeys within a limited duration**
- **Single-mode / Single-operator ticket**
- **Multi-mode / Multi-operator ticket**
- **Return ticket**
- **Multi-journey ticket**
- **Season ticket (day, week, month, year)**
- **Value ticket (Pay-as-you-go)**
- **Off-peak ticket / Night ticket**
- **Combined ticket (ex: Park & Ride)**
- **Group ticket / Family ticket**
- **Special event ticket**

WHY ELECTRONIC TICKETING?

- ☑ Increase boarding speeds by reducing transaction times
- ☑ Reduction of operating and maintenance costs
- ☑ Reduction of fraud
- ☑ Implementation of new (innovative) fare policy
- ☑ Increase of passenger loyalty
- ☑ Need for integration between modes, regions, operators
- ☑ Need to improve the image of public transport, enhance customer experience
- ☑ Convenience and customer experience

CONTACTLESS E-TICKETING - BENEFITS

Fastest throughput at the gate

Form factor independence

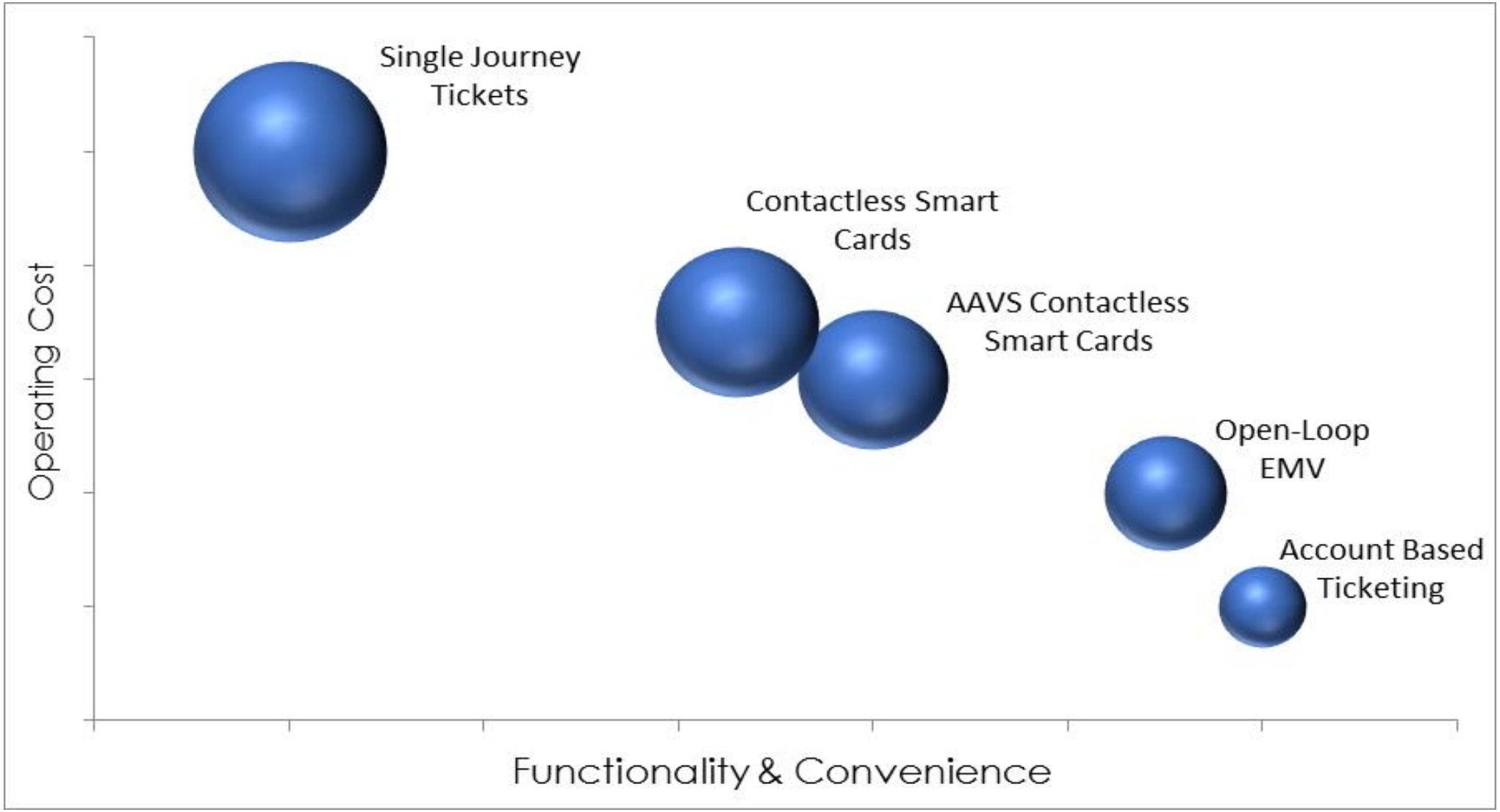
Cost Savings

- Maintenance Costs
- Eliminate Handling Of Cash
- Fare Evasion / Fraud Protection

Extendable Infrastructure

- Contactless Bank Cards
- Multi-application cards
- NFC Enabled Mobile Devices

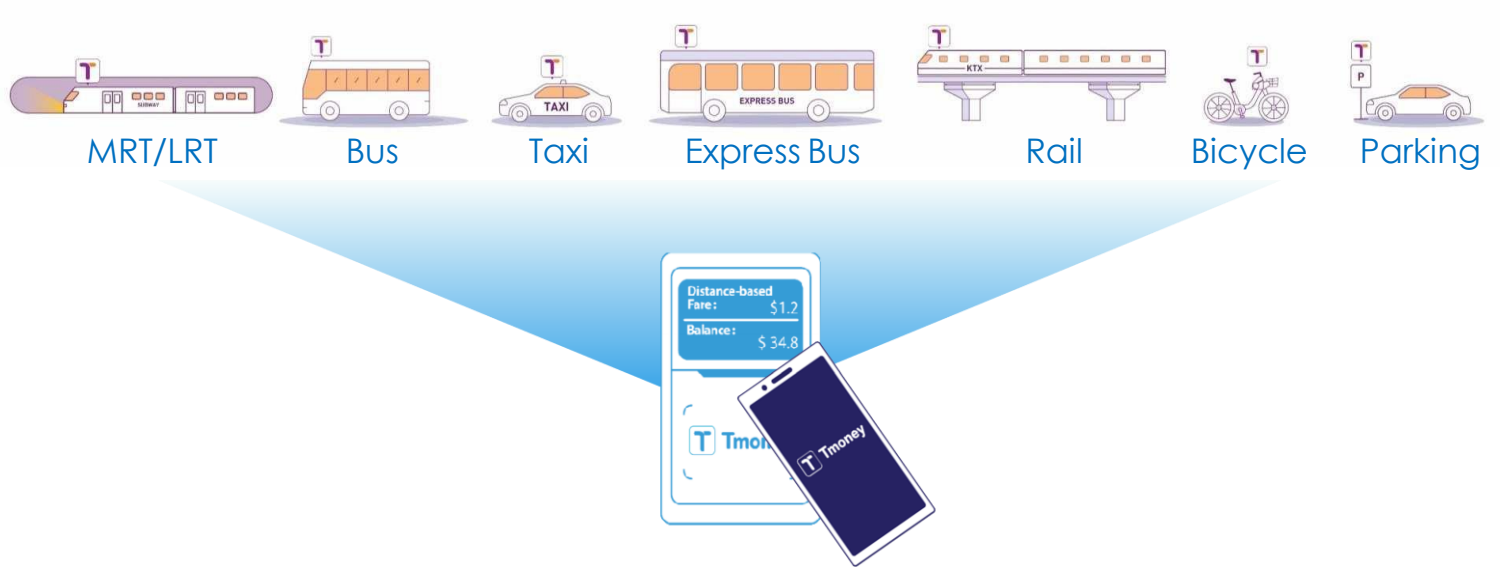
VALUE PROPOSITION



KEY TRENDS & SUCCESS FACTORS

Multi-operator **Multi-modal** **Interoperability**

Seamless Travel



KEY TRENDS & SUCCESS FACTORS

- **Many Card Holders**

  Diverse Media + Benefits to Card Users ❾ O/D

- **Many Places to Use**

  Transit (MUST) + Non-transit

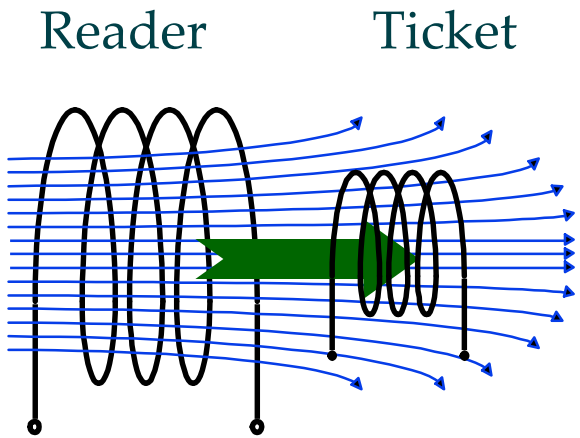
- **Usage Framework (Banking and Legal Framework)**

  Convenient & Safe Transport Environment + Policy

HOW DOES CONTACTLESS TICKETING WORK?

Typical Reader features

- Communication to the ticket
- Transaction processing
- Secure Key storage for offline operations (SAM)
- Connection to the backend



2 way communication

Typically based on a ISO 14443 protocol

Typical Ticket features

- Unique ID
- Memory (e.g. file system)
- Security (e.g. 3DES or AES cryptography)
- Common criteria certification
- Privacy features

ONE SIZE FITS ALL

The passenger experiences the e-ticketing system through the interaction of a reader with his card...

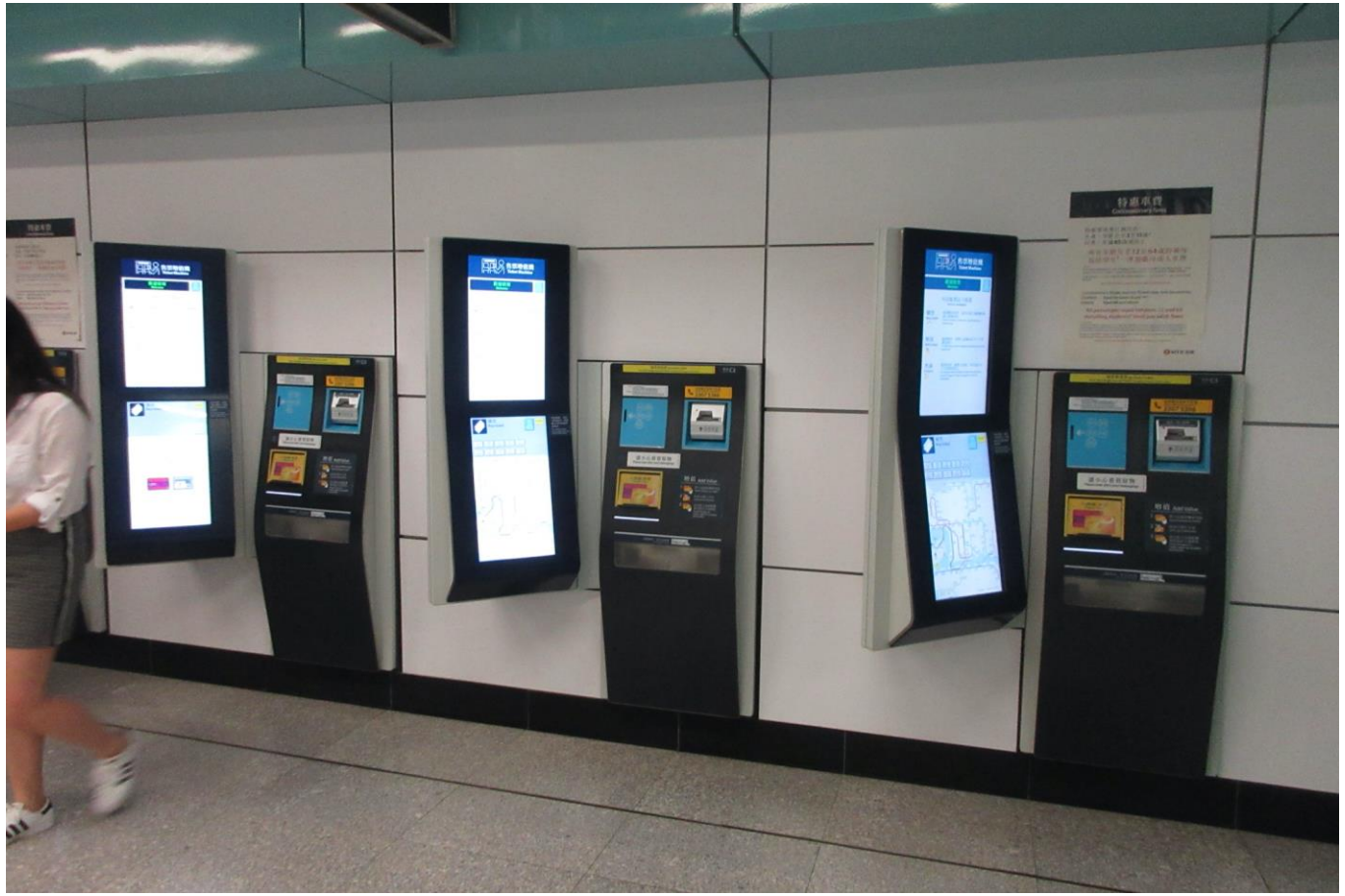
...or a different form factor

DIFFERENT GATE SYSTEMS

- **Un-gated**

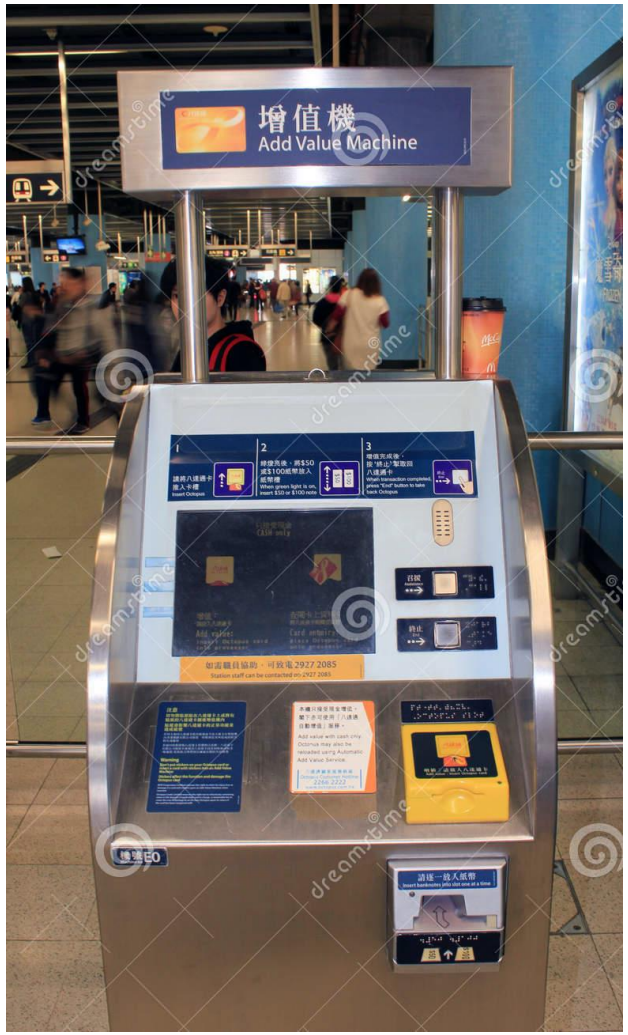
- **Turnstiles / Gated**

OTHER INFRASTRUCTURE - TVM



Ticket Vending Machines

OTHER INFRASTRUCTURE



Add-Value Machines

Transaction Enquiry Machines

ADVANTAGES OF ELECTRONIC TICKETS

Advantages	Operators	Authorities	Customers
Lower maintenance cost of gates	✓		
Less down time of gates	✓		✓
Increased passenger throughput	✓		✓
Data for exact cross modal fare consolidation	✓	✓	
Exact usage information for schedule optimization	✓	✓	✓
Higher security – lower fraud levels	✓	✓	✓
Top up management with vending machines	✓		✓
Reduced cash handling	✓		
Increase customer loyalty	✓		

WHAT MATTERS?

Agility and flexibility of the system

- Ensuring the scalability of the system
- Ensuring a high level of security
- Implementing fare policies
- Be able to accept new mobility providers

ACCOUNT BASED TICKETING

ACCOUNT BASED (BACK OFFICE CENTRIC) TICKETING

- Fare Calculation to the Back Office
- Rapid Fare & Topology Update
- New & More Flexible Fares
- Real-time data
- Yield Management
- Reduced CAPEX and Operational Costs
- New Business Rules and Risk Acceptance
- Fare media becomes a Secure Token
- Customer Service Changes
- Concession / Welfare Schemes

ABT VS EMV

EMV in transit is managed in ABT mode

- No transit data is written on the EMV card.
- The fare processing is managed centrally.
- The key information is the unique identifier of the card

However, when used in transit, the EMV cards provide the following specific features

- An implicit post-payment mode : the travel price can be charged on the card it self
- The acceptance of not-registered travelers: no need to register to travel in ABT mode with an EMV card

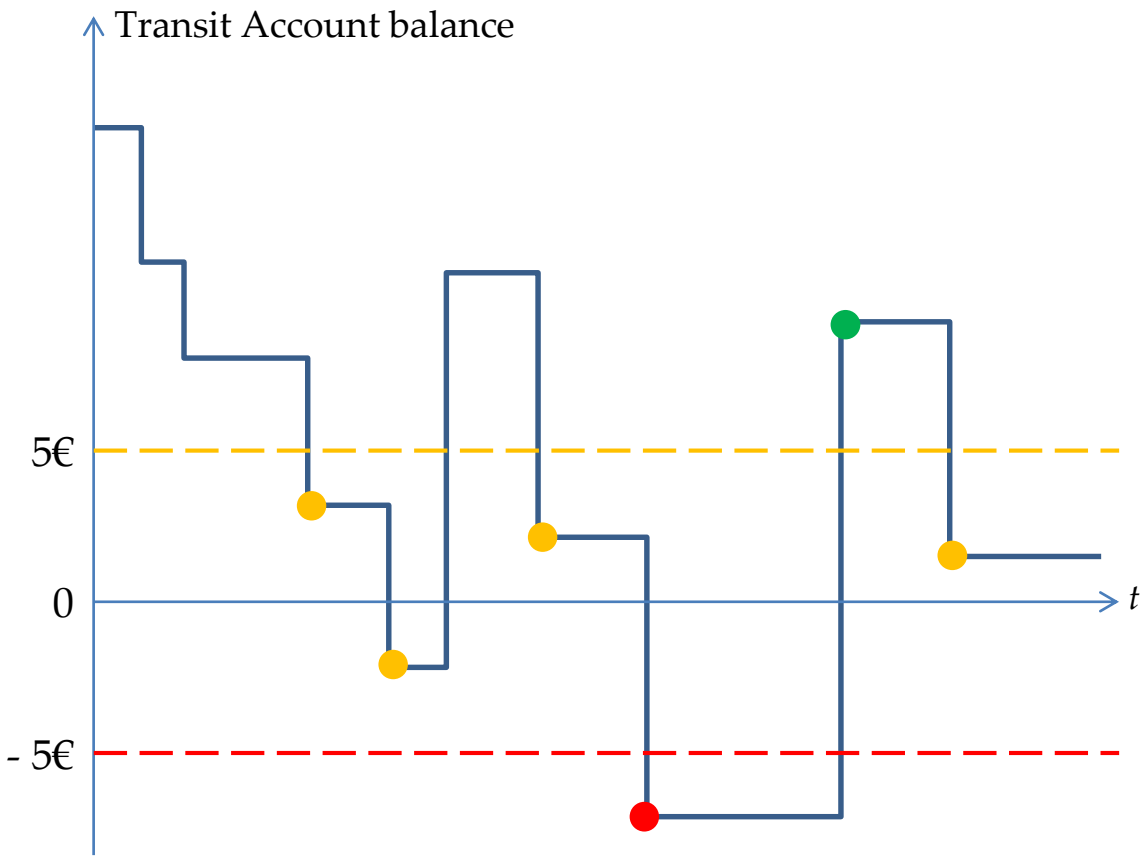
KEY FEATURES

- Independence of the fare media.
- Central Transit Account
- Centralized Journey Building and charging
- On line Customer Services
- Flexible Risk Management

RISK MANAGEMENT

- **The purpose of the risk management is to manage the risk of non-payment of the delivered transport service.**
- **A key element in the ABT risk management is whether transit account is associated to a post-payment. This leads to two types of risk models:**
  - Pre-paid model : Transit Account pre-loaded with products or funds.
  - Post-paid model : Post-payment agreement signed-off by the traveler

PRE-PAID MODEL



Warning threshold

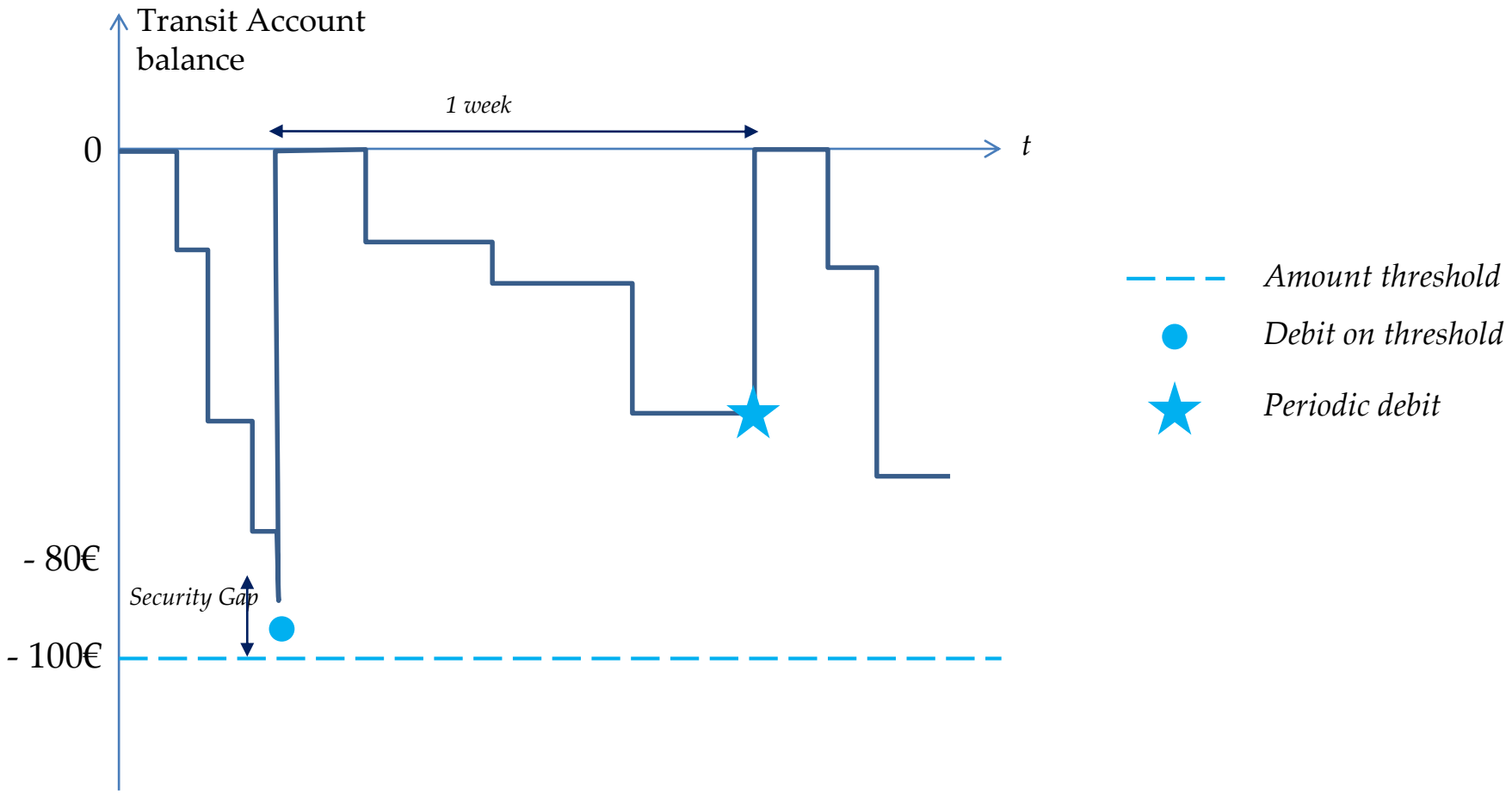
Notification sent to Customer

Deny threshold

Notification sent to Customer
Media added to Deny List

Media removed from Deny List

POST-PAID MODEL



KEY BENEFITS

Reduced maintenance cost of devices

- The devices are less complex since the logic is centralized

Flexibility and innovation

- The move of the business logic to the central system fosters customer oriented innovations

Interoperability

- The simplification of the AFC systems and especially of the devices facilitates the integration of other transit systems and vendors.

Ability to integrate 3rd party media

- The limited requirements on the card (just a distinctive identified) allows the easy integration of new media

KEY BENEFITS

Openness to mobile ticketing

- The ABT media can be a mobile app interacting with the gate typically via NFC or barcode

Enhanced commuters purchase experience

- Through the extension of on line retail channels

Reduced total cost of ownership

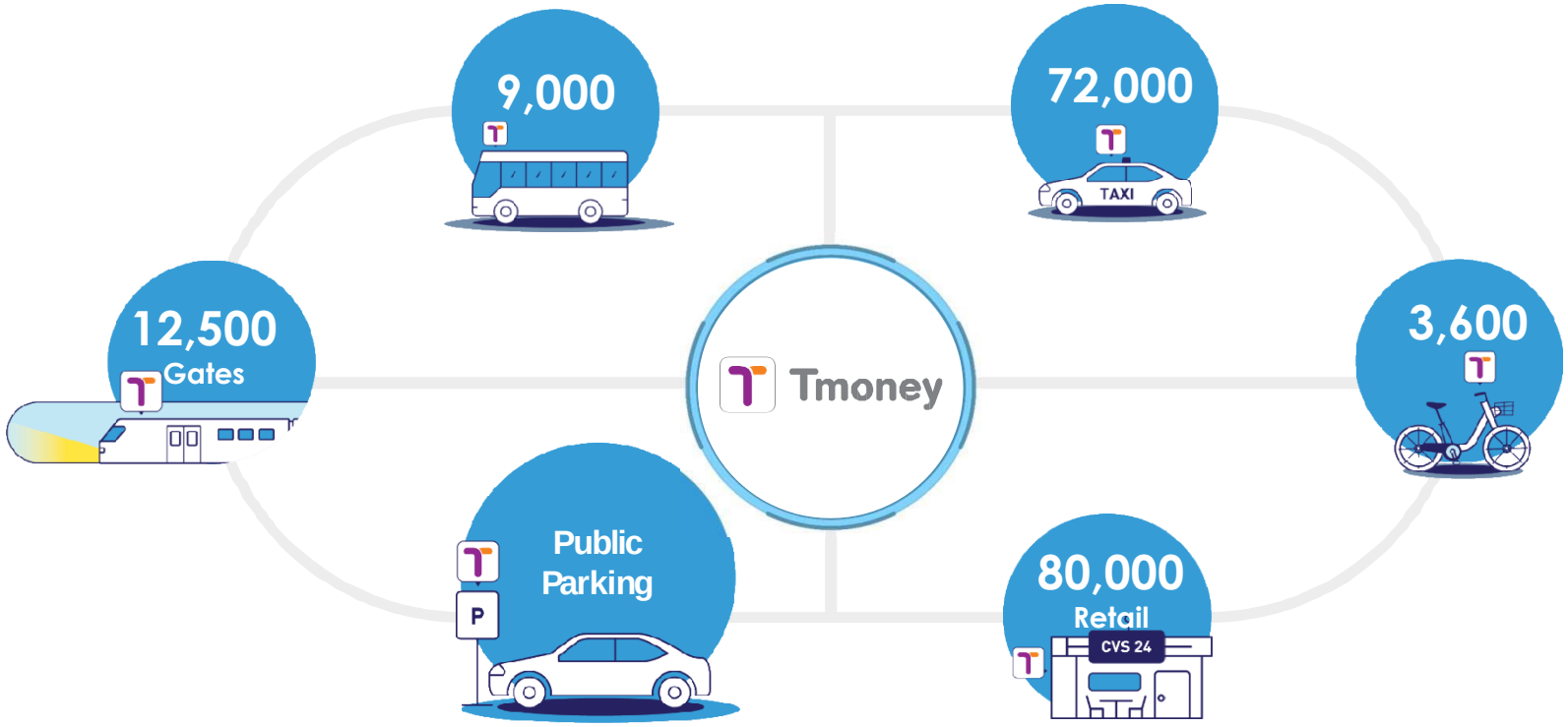
- Thanks to the simplification of the devices and the flexibility

Improved overall performance

- The near real time exchanges with the devices allows the move to the connected world: data is immediately available to the commuters and the stakeholders

Seoul's T-Money

INTEROPERABILITY IN SEOUL



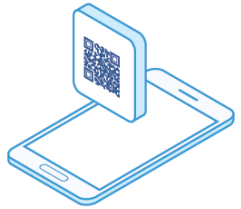
PAYMENT SOLUTION

Tmoney

Tmoney Card
(Pre-paid)

Bank Card
(Post-paid)

Tmoney Mobile
(USIM)

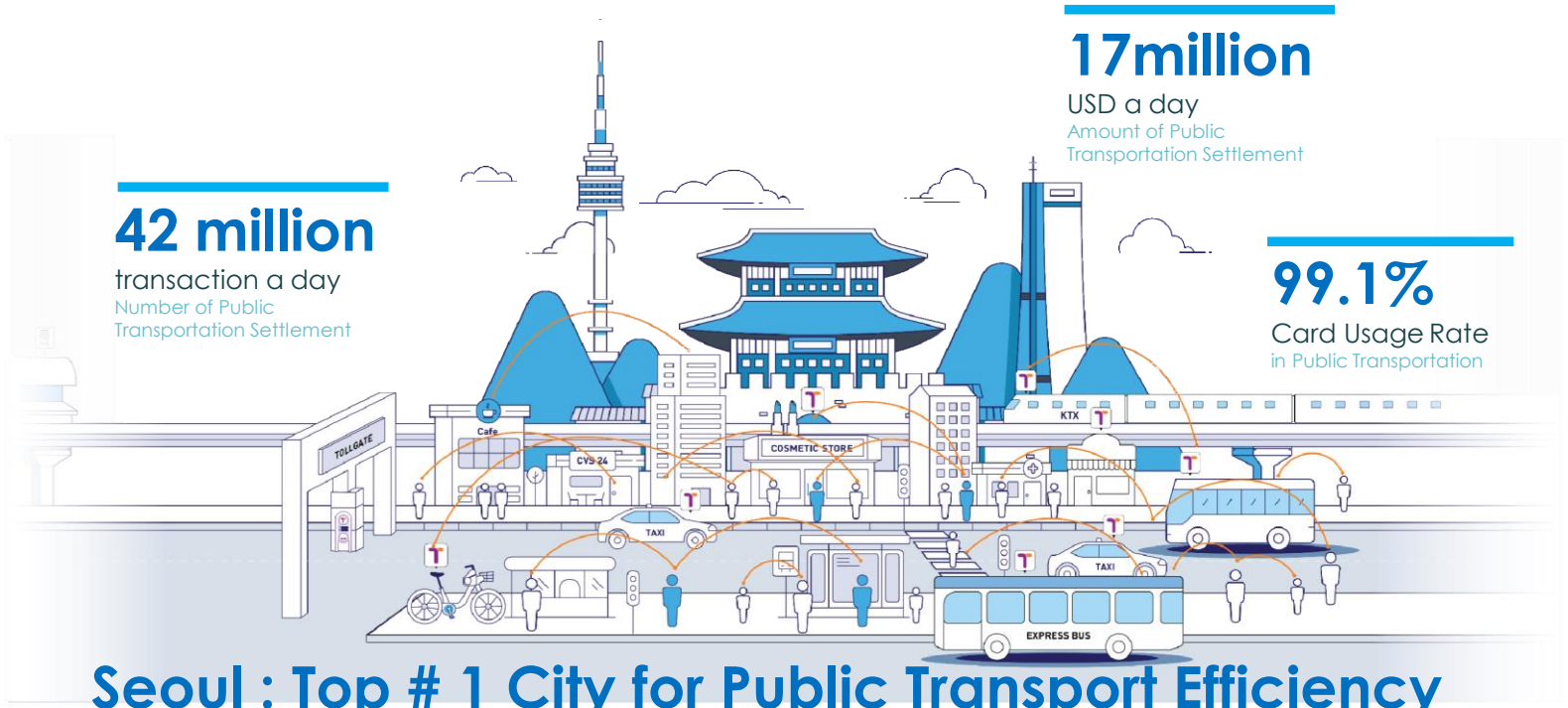


Tmoney Pay
(QR)

Tmoney Cloud
(Cloud)

Other smartcards issued by other card issuers also accepted within T-money Infrastructure

USAGE STATISTICS



Seoul : Top # 1 City for Public Transport Efficiency

(Source : 2018 Urban transportation systems of 24 global cities by McKinsey)

9-12 JUNE
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GLOBAL PUBLIC
TRANSPORT SUMMIT

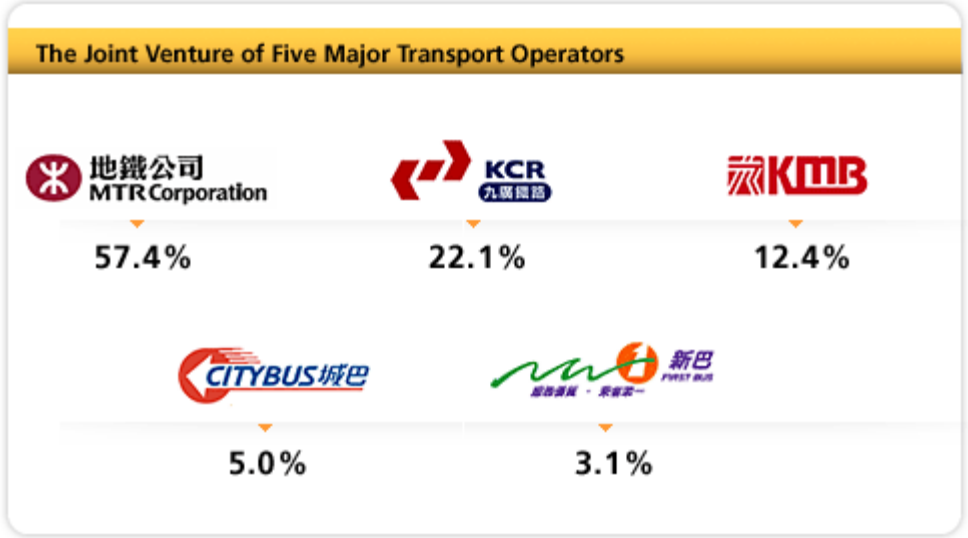
UITP

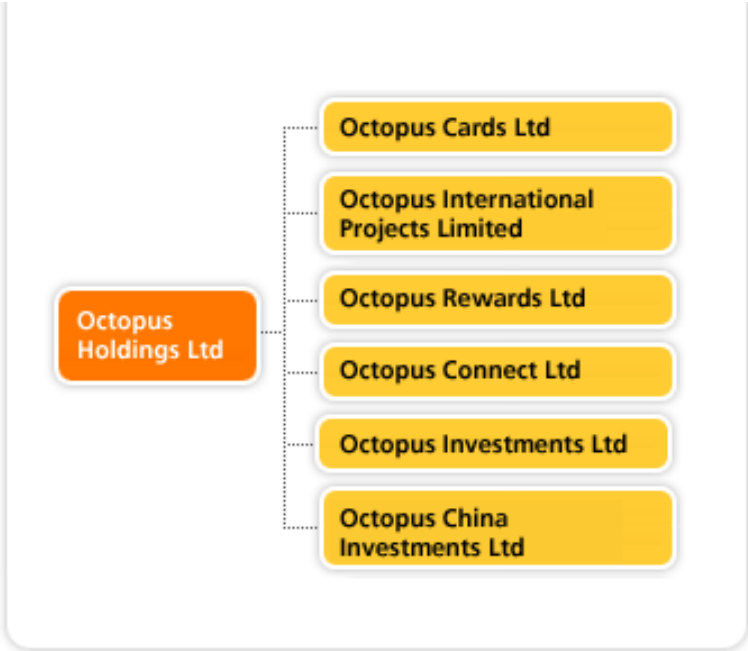
Hong Kong’s Octopus

HISTORY

Owned by major transport Operators in Hong Kong

- Launched in Sept. 1997, Octopus is the world's leading and most pervasive contactless smartcard payment system.
- The holding company was incorporated in 2005 after a restructuring which aimed to spin off Octopus' non-payment businesses into new, separate subsidiaries independent of the Octopus payment business





UITP

INNOVATIVE AND UNIQUE

- **Co-operation within competition**
  - Developed, managed and owned by 5 transport operators which, despite competing for passengers, have worked together in the interests of the public to ensure a seamless payment system.
- **A global leader**
  - The world's pioneering and most extensive contactless smart card system.
- **Multi-application**
  - Designed to accommodate multiple service providers from both the transport and non-transport sectors, allowing multi-application developments

APPLICATIONS - TRANSPORT

Metro

Minibuses

Taxi

Peak Trams

Railway

Light Rail

Tramways

Buses

Ferries

Car Parks

Parking Meters

Cross-border Buses

Launched in 1997

Subsequent expansion

TRANSPORT LANDSCAPE

Hong Kong boasts one of the **world's best public transport** networks. Every day an average of **12.9 million passenger journeys** are made throughout the city on a wide variety of public transport systems.

Over 90% transactions are made through Octopus

APPLICATIONS - RETAIL

Supermarkets
Convenience Stores
Fast food Chains

Personal Care Shops
Apparel Chains
Cinema Counters

Cake shops
Café
Chinese Wet Markets

PAYMENT APPLICATIONS

Public Transport

- Accepted on almost every type of public transport in Hong Kong

Car parks

- Over 400 car parks are now accepting Octopus for payment of parking fees.
- Octopus parking meters have been extended to the whole of Hong Kong.

Retail

- Over 19,000 outlets are now accepting Octopus as a payment option.

Self Service

- Octopus is now accepted at over 9,000 photo booths, photocopiers, kiosks and vending machines.

Leisure Facilities

- Admission to public swimming pools
- Sports facility bookings
- Racecourse admission
- Cinema ticket payment
- Theme park admission
- Payments within private clubs

NON-PAYMENT APPLICATIONS

Access Control

- Many residential estates and commercial offices have adopted Octopus as a security access system, providing added convenience for over 100,000 residents and employees.
- As each Octopus has a unique ID, holders only need to register their Octopus at the building management office and the ID will be stored in the central security system. Authorised holders simply hold their Octopus over the reader at the door/gate to enter the building.

NON-PAYMENT APPLICATIONS

School Campuses

- Octopus has been introduced into the school environment with the ultimate aim of making school life easier. Students can now use Octopus to buy food at tuck shops and kiosks, for roll call and for miscellaneous school payments.
- Students can also use Octopus to complete a number of administrative tasks at school, including library loans.
- Using Octopus in schools benefits everyone.
- **Students:** Fast, efficient, coin-free payment method.
- **Parents:** No need to worry about children carrying too much cash.
- **Schools:** Enhances operational efficiency and reduces administrative work.

THE NUMBERS TELL A COMPELLING TALE



- World's highest acceptance commercial smart card system – **over 99%** of Hong Kong people (aged 15-64) possess an Octopus
- High circulation – over **36 million** cards and products actively in circulation (Hong Kong population: 7.3 million)
- World's most used smart card system – over **14 million transactions a day**, valued at over **HK$250 million**
- World's widest scope of applications – more than **19,000 retail outlets** from over 8,000 service providers. Over 40% of usage from retail.
- 22 financial institutions provide the Octopus Automatic Add Value Service to customers
- Over **75,000 Octopus readers** deployed in the market

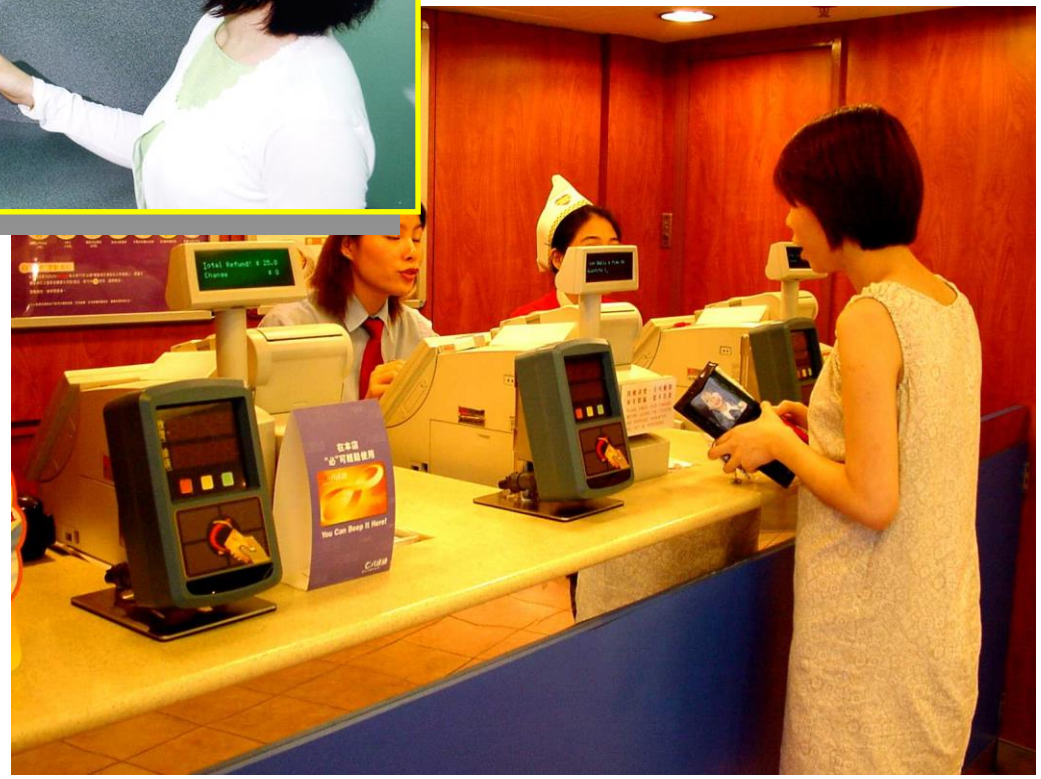
MAKING EVERYDAY LIFE EASIER

- **Octopus** services are now available for virtually all Hong Kong's public transport modes.
- **Octopus** applications also encompass car parks, parking meters, fast food outlets, bakeries and cake shops, convenience stores, supermarkets, household and personal care stores, boutiques, photo finishing services, telecommunications shops, vending machines, self-service kiosks, photocopiers, photo booths, cinemas, school campuses and recreational facilities, as well as access control for residential and commercial premises.

FEATURES

- **Convenient and fast -** Eliminates the need to carry cash or exact fares. Transaction is carried out within 0.3 seconds.
- **Secure and reliable -** High reliability and accuracy with comprehensive measures to safeguard the integrity and security of the system.
- **Efficient and accurate -** Simplifies day-end cash counting activities, reducing human counting errors as well as bank reconciliations.
- **Cost saving -** Lowers cash handling cost.
- **Contactless -** Convenience of operation, without withdrawing *Octopus* from wallets/purses.
- **Multi-usage with one single card/product -** A wide range of applications, including public transport, parking, retail, self-service, leisure facilities, schools and access control.
- **Easy reloading -** Can be reloaded at thousands of convenient locations. Automatic Add Value Service links the holder's *Octopus* with credit card/bank accounts.
- **Discounts/Loyalty programs -** *Octopus* payments can enjoy the discounts/loyalty programs provided by service providers.

INTEGRATION WITH POS



VENDING MACHINES

PARKING METERS

Integrated into different types of parking meters

Data collected via handheld computer

OCTOPUS REWARDS

- The **Octopus Rewards** programme, launched in November 2005, allows customers to earn and redeem Reward$ with their registered *Octopus* regardless of their payment means.
- With this common platform, participating merchants can offer tailor-made discounts or special offers to their customers without having to introduce any new rewards system.
- There are over **3.2 million** registered *Octopus* under the programme, and members can enjoy the benefits at around 700 outlets of 20 participating merchants.

OCTOPUS ONLINE PAYMENT SERVICE

- Launched in February 2014, the "Octopus Online Payment Service" is the first ever mobile payment solution that uses contactless smartcard to process online payments on Near Field Communication (NFC)-enabled mobile devices.
- It provides Hong Kong people with even more convenient, secure and flexible online shopping experiences.

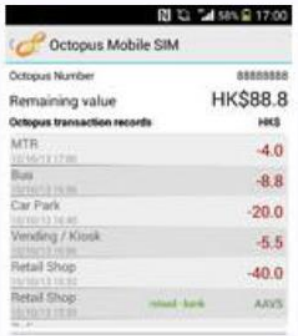
THE OCTOPUS APP

Octopus Online Payment Service

- First-ever solution that allows online payments made by contactless smartcards using NFC-enabled devices

Transaction Enquiry

- Show balance and transactions on Octopus Card and Octopus Mobile SIM



Automatic Refund

- Instant enquiry and refund for incomplete transactions on Octopus

QUESTIONS?

THANK YOU!

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