The University of Queensland
Australia

Fares and Ticketing Strategies Where Everything is Possible

What are we seeing in practice?

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Introduction

Technology can now support most fares policy setting and it should become even more cost effective to do so with the next generation of fare collection systems

	Operators	Customers	Government
1970s – 1980s **Electro-Mechanical with Paper Tickets**	‣ Productivity improvements ‣ Faster throughput	‣ New Sales channels ‣ Faster loading	‣ Reduced subsidies
Mid 1980s – 1990s **Magnetic Stripe Ticketing**	‣ Productivity improvements ‣ Faster throughput ‣ MIS ‣ Reliability	‣ New Sales channels ‣ More product options	‣ Reduced subsidies ‣ MIS ‣ Transit Integration
Mid 1990s – 2000s **Transit Smartcards**	‣ Faster throughput ‣ MIS ‣ **Fares Flexibility** ‣ Non-transit apps ‣ Reliability	‣ **Convenience of e-cash** ‣ New Sales and payment options ‣ “It's modern”	‣ Non-transit apps ‣ **Transit Integration** ‣ Fares Flexibility ‣ MIS
Mid 2000s ➔ **Emerging Electronic Payments (Banks and NFC)**	‣ Multi-apps and sharing of costs ‣ Payment Flexibility	‣ Convenience ‣ Convergence ‣ Common payment	‣ Convergence ‣ Cost sharing ‣ Market appeal

My specific area of interest today is the key policy developments we are actually observing against this background

- A fare system comprises four components
  - Fare structure
  - Fare products
  - Fare levels
  - Fare media
- I will consider the fare structure and fare product reform we have seen in the smart card era and endeavour to provide some context/explanation of these trends
- In addition I will consider some of the trends we are observing around smart card penetration and use of sales and distribution channels

In doing so I will draw on a fares policy survey directed at capturing emerging policy trends in the smart card era

- Is there an overall fare system policy or strategy?
- What are the primary drivers of fare system settings?
- How often are fare system settings reviewed?
- What role has the procurement of smart card fare collection systems had on fare system settings to date?
- What has been the market and operator experience with fare system innovations introduced in conjunction with smart card fare collection systems?
- Is there anything you would change with the benefit of your experience or the experience of others?
- What future fare system changes are contemplated?

- This will allow high-level comparison with results from two earlier surveys:
  - Gutknecht (1971)
  - Beasley and Grimsey (1991)

While the survey is global in nature I will only draw on European evidence today

Questionnaire respondents

- The UITP fares survey was conducted across most continents
- Questionnaires were sent to public transport authorities / agencies, operators, and/or regional governments

Included in this presentation

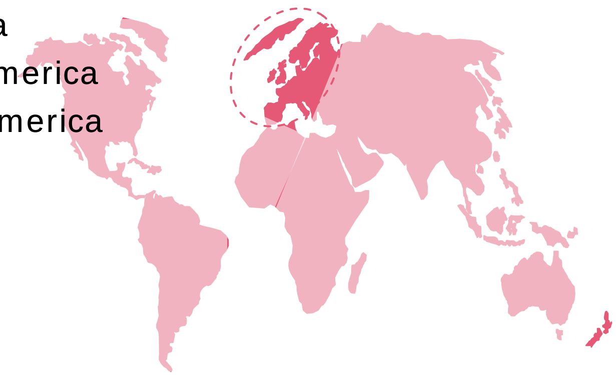
Survey Regions Not Included

European Cities/Regions (25 responses in total)

- Barcelona
- Berlin
- Brussels
- Budapest
- Cologne
- Copenhagen
- Dusseldorf
- Frankfurt
- Germany (Verkehrsverbund Rhein-Rhur)
- Hamburg
- Helsinki
- Lisbon
- London
- Manchester
- Milan
- Munich
- Nottingham
- Paris
- Prague
- Rome
- Scotland
- Sofia
- Stockholm
- Vienna

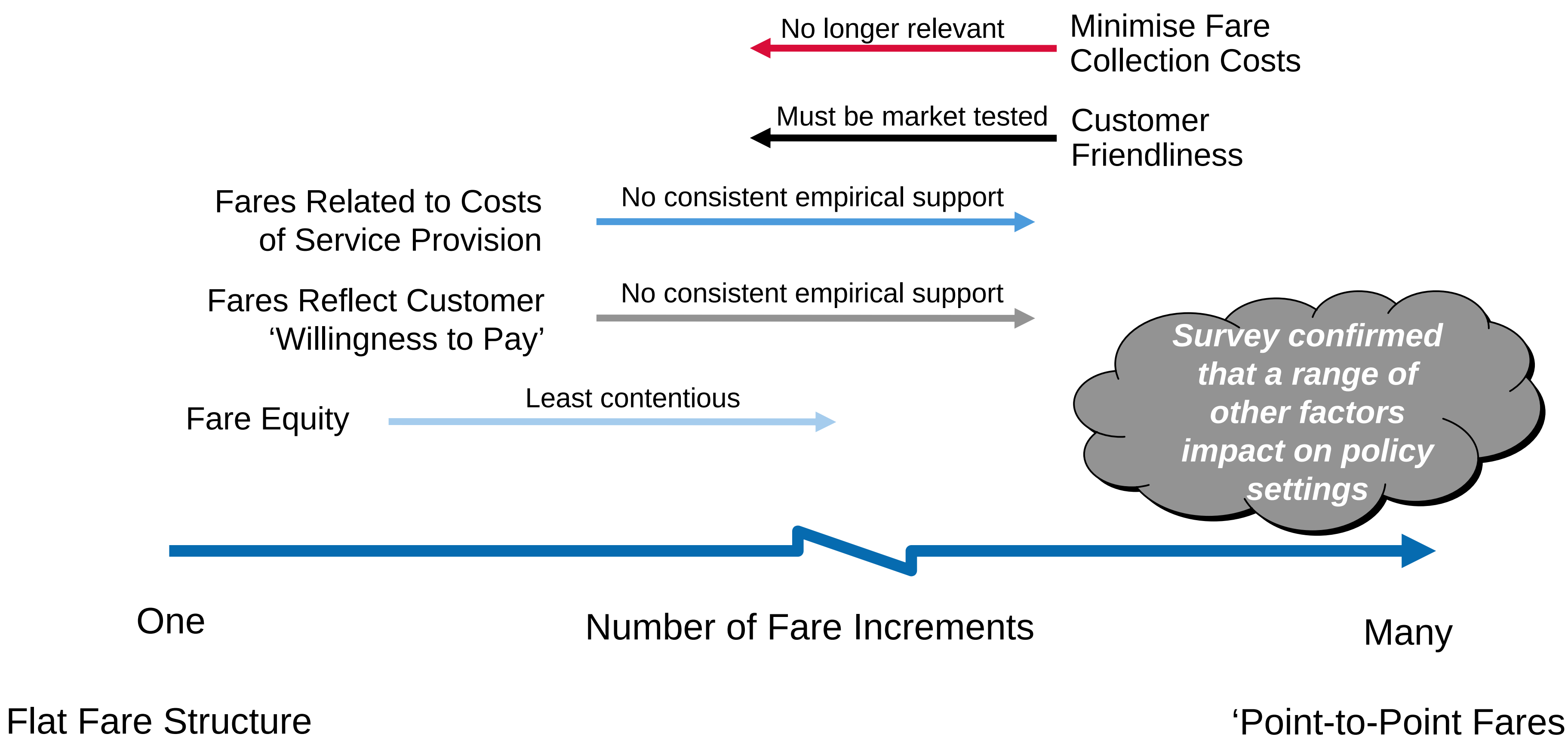
Other Regions

- Asia
- Australia
- North America
- South America
- Africa



Fare Structures

The enhanced capacity to close the fare collection system has focused attention on the relationship between fare levels and distance



While technology is supporting greater complexity we are seeing a general increase in the number of cities adopting simpler fare structures in the western world

United States / Canada

- Process of implementing fare system reform in the US is often very difficult requiring transit agency board approval and sometimes the city (i.e. Mayor) and social equity concerns (i.e. protecting the transport disadvantaged) are paramount
- Many agencies have sought to simplify their fare structures in recent years (e.g. WMATA)
- For example, between 1994 and 2000 the proportion of bus and heavy rail operators with zonal or distance-based fares declined by 7% and 13% respectively

Europe

- A number of European cities including London, Paris and Barcelona have pursued fare simplification in pursuit of so-called ‘marketability benefits’
- Informal discussions with those responsible for implementing the London reforms suggested that the suite of initiatives had added 5% to underlying London bus and tube demand over the past two decades
- The London Buses fare simplification initiative also highlights the potential importance of non-fares related issues in driving the fares policy agenda (i.e. bus boarding times)

Asia / Australia

- Many smaller Australia/NZ cities (Newcastle, Canberra, Adelaide and Christchurch) have either maintained or migrated to flat fare structures and Melbourne has recently moved from 3 to 2 zones
- The complexity of the current Sydney fare system has continued to be closely scrutinised and is currently under review
- Asian cities (e.g. Hong Kong, Singapore, Guangzhou, Seoul) continue to support distance-based pricing for their rail systems

Seoul Metro provides an example where a new smart card fare system supported the re-introduction of distance-based pricing

Pre Mid-80s	A distance-based structure (i.e. fixed fare for first 8 kilometres plus a distance component for each additional kilometre) was used	Paper
Mid-1980s to Mid-2004	Technical limitations with the fare collection system in place at the time necessitated that the metro employ a zonal-based structure that divided Seoul up into seven districts	Magnetic stripe
From Mid-2004	The functionality provided by the new contactless smartcard ticketing system (i.e. 'T Money') was employed to re-introduce a distance-based fare structure	Smart card

We can draw a number of conclusions regarding the impact of state-of-the-art fare collection systems on fare structures

- The effective closure of the fare collection system (i.e. ‘touch in – touch out’) afforded by new fare collection systems has increased the practicality of distance-based pricing

- While a number of economic arguments can be made to support a distance-based fare structure, the equity argument is probably the strongest

- Although some examples can be identified where new fare collection equipment has facilitated a migration to distance-based fares (e.g. Seoul Metro), there is no dominant trend from a fare structure perspective

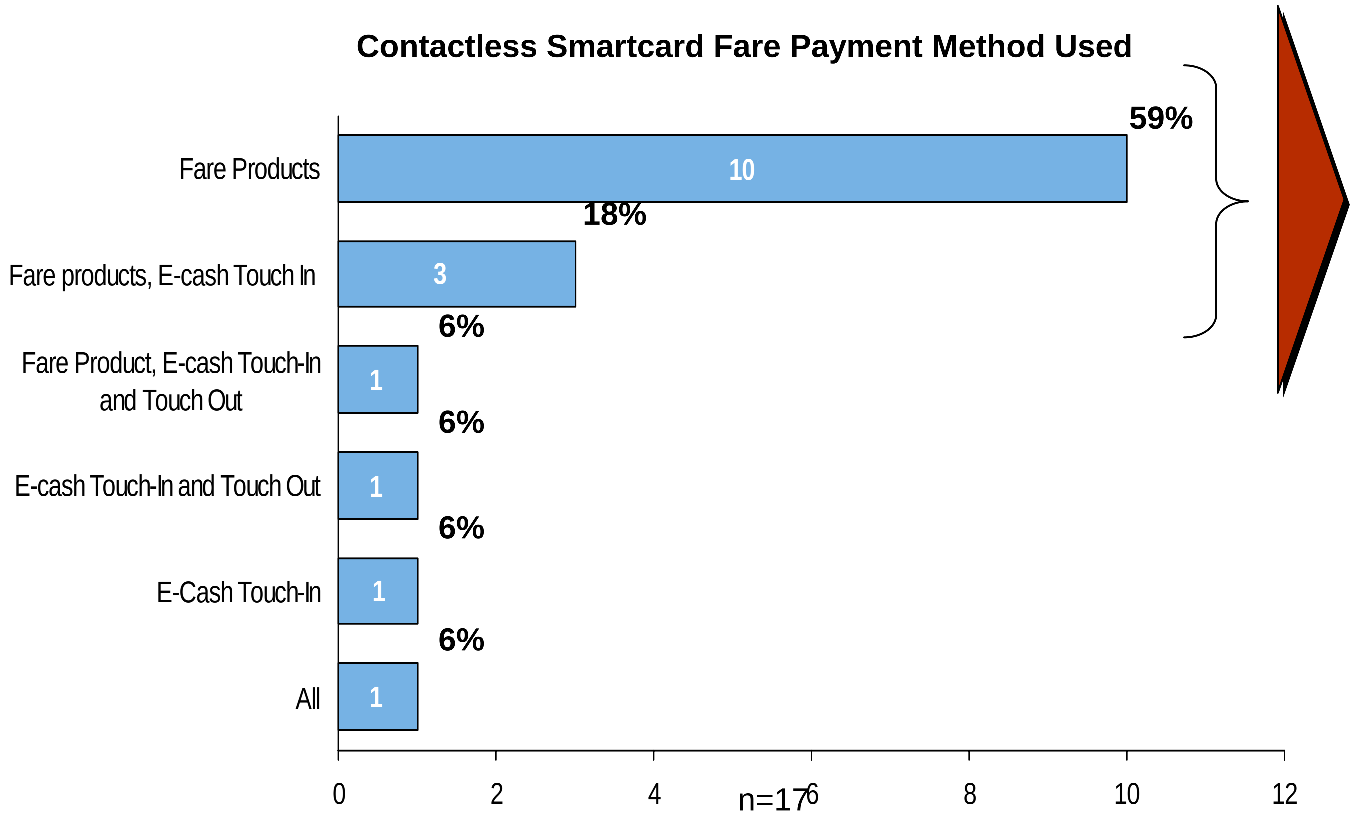
- More generally, a number of cities in the western world have either retained or simplified their fare structures rather than embrace the full capabilities offered by contactless smart card fare collection systems

Fare Products

Although not without risk, there are a number of options apart from simply translating legacy fare products to a smartcard system

		Example Locations
Fare Capping	▪ Rewards the user by ensuring that they pay no more than the fare associated with traditional periodical product concepts via the establishment of daily, weekly and monthly fare caps	London
Frequency-based discounts	▪ The smart card user is rewarded through receipt of free journeys or discounted journeys once they have made the necessary number of threshold journeys in a specified period	Toronto SEQ
Sales channel incentives	▪ The smartcard user is rewarded with a discount for adding value to their smartcard via the most cost effective channels (e.g. direct debit, internet) as opposed to third party sales outlets and on board	Perth
Time-of-Day Pricing	▪ Not a new concept but significantly greater flexibility for innovative pricing schemes compared to traditional fare media where discounts needed to be hard wired to specific time periods	London

Most European systems have or will have fare products loaded onto the smart card with a small number combining this with an e-cash option



Observations

- Fare products are offered on 15 systems in total (88%)
- Although there is a school of thought that the smart card may result in the demise of the traditional product concept in favour of e-cash, there is no emerging trend in this direction
- The retention of traditional product concepts has clearly been the path of least resistance (i.e. simply transferring product from one ticket media to another) but in some cases augmenting this with e-cash options

Q: What fare payment system is used?

Fare Capping

London’s Oyster card is and example of fare capping (“best value”) guarantees

- With London’s ‘Oyster’ card, TfL has provided a ‘Daily Price Cap’ guarantee
- Applicable across bus, Tube, tram, DLR, London Overground and some National Rail services
- Price Caps are divided into ‘Peak’ and ‘Non-Peak’ caps

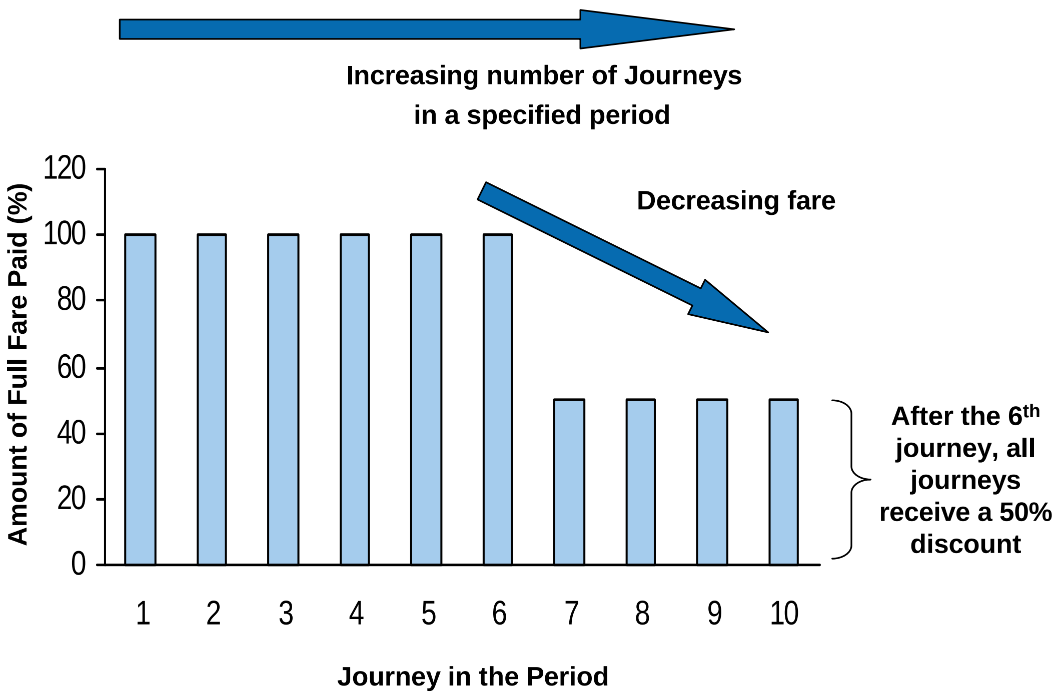
	Cash single fares	Oyster single fare
Tube/DLR (Zone 1 travel)	£4.00	£1.50
(Zones 1-2 travel)	£4.00	£2.00 (Monday-Friday 0700-1900) £1.50 (All other times including public holidays)
Tube/DLR/ London Overground (Zones 1-4 travel)	£4.00	£2.50 (Monday-Friday 0700-1900F) £2.00 (All other times including public holidays)
Bus/Tram	£2.00	£0.90

Source: www.TfL.gov.uk

London’s ‘Oyster’ Card Benefits and ‘Best Value’ Guarantee

- **Pay as you go has several advantages over paper tickets:**
  - Oyster single fares are generally cheaper
  - Credit can be used as you need it and doesn't expire
  - Daily price capping automatically calculates the cheapest fare for the journeys you make in a single day
- **The stated aim is to ensure that Oyster always charges the lowest fare. Where it doesn't, TfL will refund the difference.**

Loyalty schemes can be designed in such a way that frequent travel is rewarded with volume-based discounts or free journeys



SEQ 'Go Card' Loyalty Scheme

- Principle: The levels of discount, journey thresholds and time-frames can be manipulated as required
- Example: The SEQ 'Go Card' scheme offers a 50% discount on fares after the 6th journey within a one week period

Add value discounts are consistent with incentivising customers to use the most cost-effective reload channels

Add Value using Autoload (e.g. Direct Debit, Credit Card and Internet)

20% Off Travel

Add Value through other means (e.g. Newsagents)

10% Off Travel

On-board

0% Off Travel

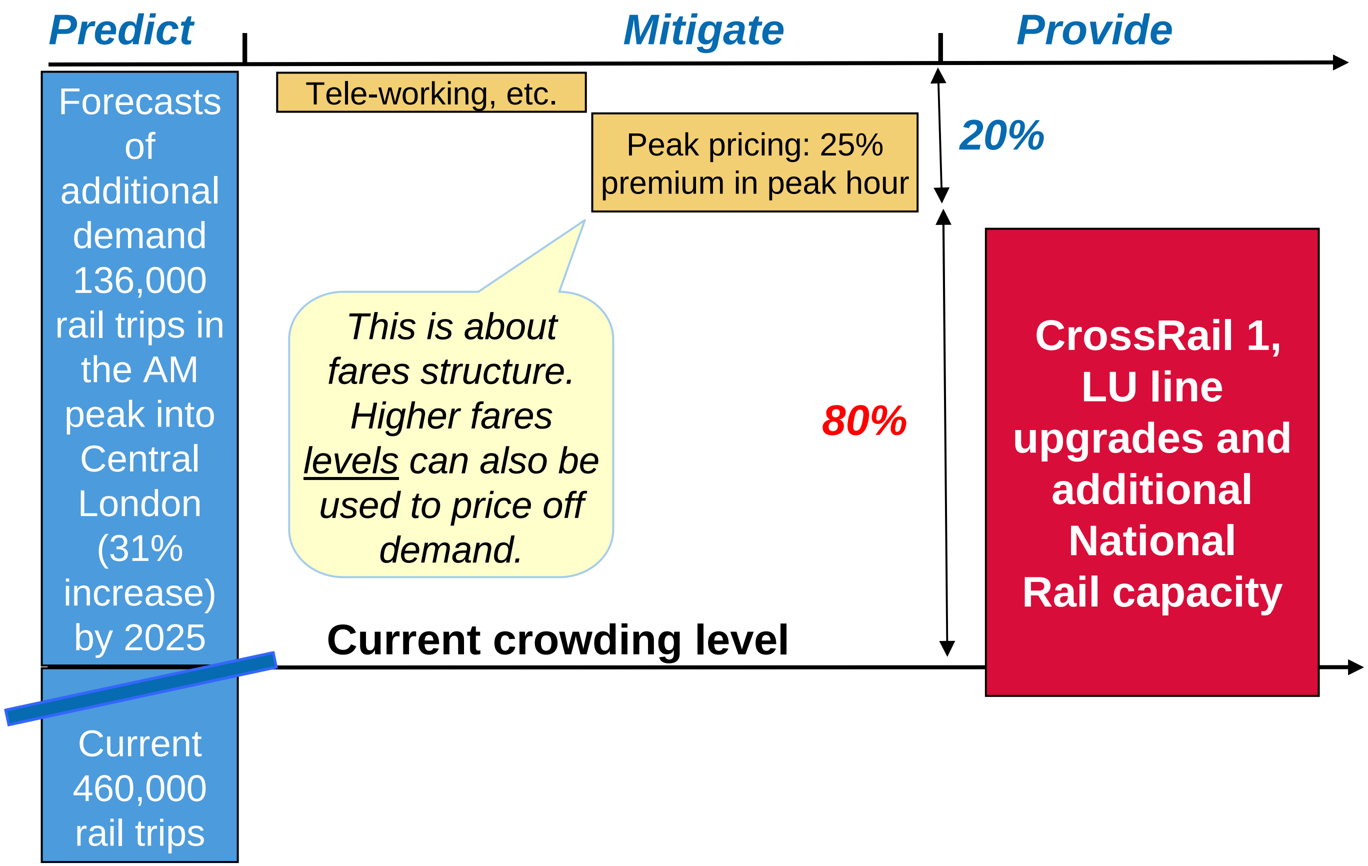
Perth's 'SmartRider Application

- All users of SmartRider receive discount on their travel in comparison to cash fares
  - The level of discount depends on the "Re-charge" channel

25% Discount	Autoload
15% Discount	Add-value machines On board buses and ferries BPAY Transperth InfoCentres Authorised SmartRider Retail Outlets

Transperth SmartRider A smarter kind of ticket

Differential time of day pricing (hard demand management) is also attracting greater attention in the smart card environment



- Peak pricing is being used as a way to help solve endemic capacity problems in London
- Stated preference research says a 25% peak premium could reduce peak hour demand by 4% for short-distance rail commuting
- Varies by types of market, including journey purpose (commuting, business, and leisure), income, occupation and journey distance
- Switching requires there to be spare capacity in shoulder peak!

We can draw a number of conclusions regarding the impact of state-of-the-art fare collection systems on fare product strategies

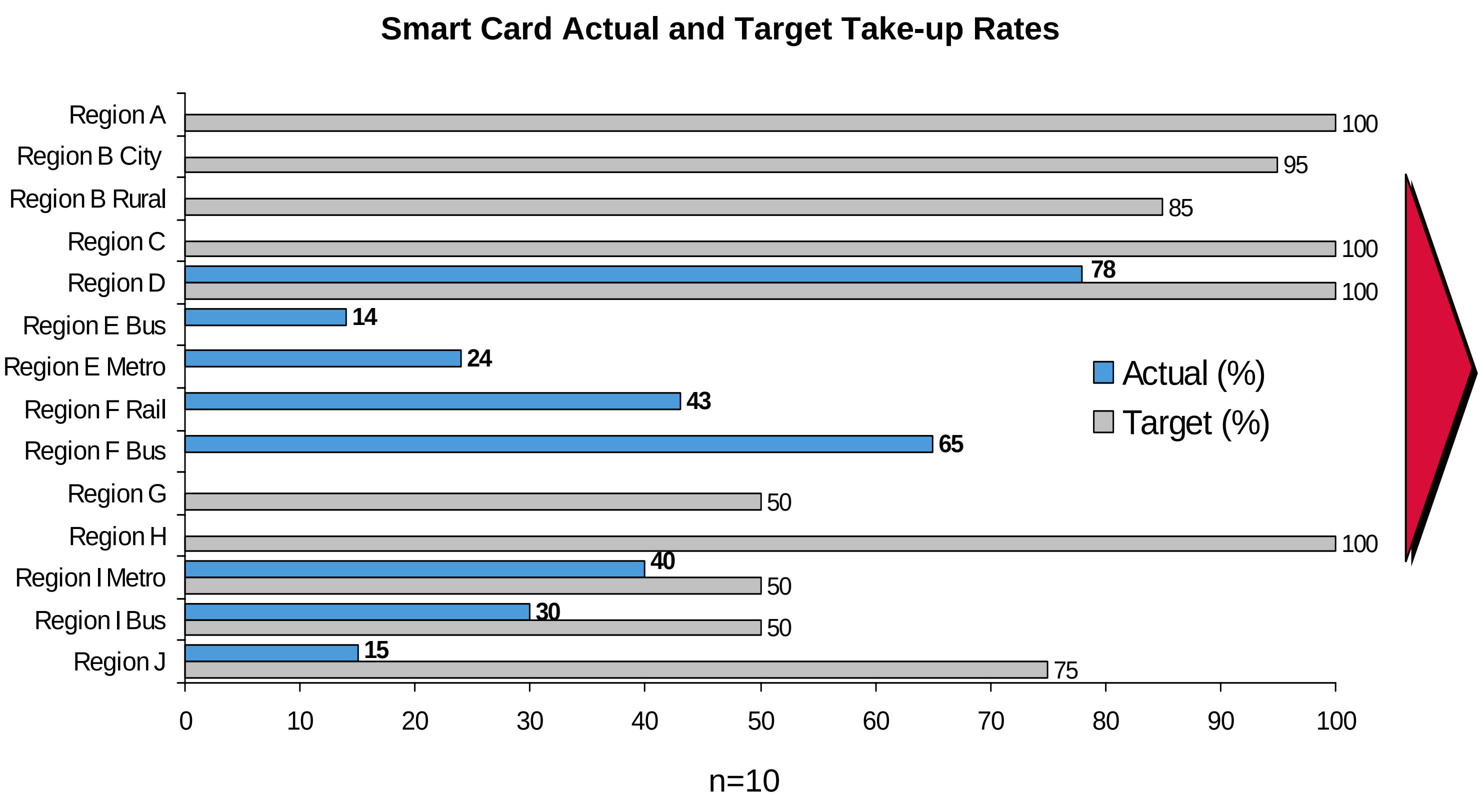
- The expected demise of the traditional fare product concept with the introduction of contactless smart cards has not been matched by the reality

- While e-cash is now extremely important in some systems, it often sits alongside traditional product concepts
  - In some cases this has required the on-going parallel operation of legacy fare media and fare collection systems

- There are a number of drivers of this outcome
  - Desire to retain products that are popular and well understood
  - Regions served by multiple operators and fare collection systems (i.e. lowest common denominator)
  - Requirement to support visitors and infrequent users
  - Political imperative not to impose fare increases on the market via fare system reform

Fare Media

Targeted smart card take up rates ranged from 50% to 100% but actual take up rates range from 14% to 78%



Observations

- Achieving 100% take up was seemingly a "stretch target" in most cases
- Maximising take up rates is contingent on a number of factors including supporting attractive smart card based pricing concepts, withdrawing products supported on traditional media and discouraging the use of cash fares

Q: Indicate target smart card take-up rates (i.e. proportion of boardings made on smartcard)?
Note: Actual city names have been replaced by 'Region' and a letter to present the data while maintaining confidentiality

To drive smart card take-up rates a variety of “carrot-and-stick” approaches are being adopted

“Carrot” approach

- Incentives for frequent users
- Linked to credit card
- Fare promotions / discounts
- Single tickets on smart card
- Promotion of off-system sales channels
- Marketing campaigns to create awareness around ease-of-use and security aspects
- Discounts to concession market (students, seniors)
- Loyalty programs
- Smart card giveaways
- Affinity offers
- Discounts for leisure activities (e.g. music, cinemas, food)

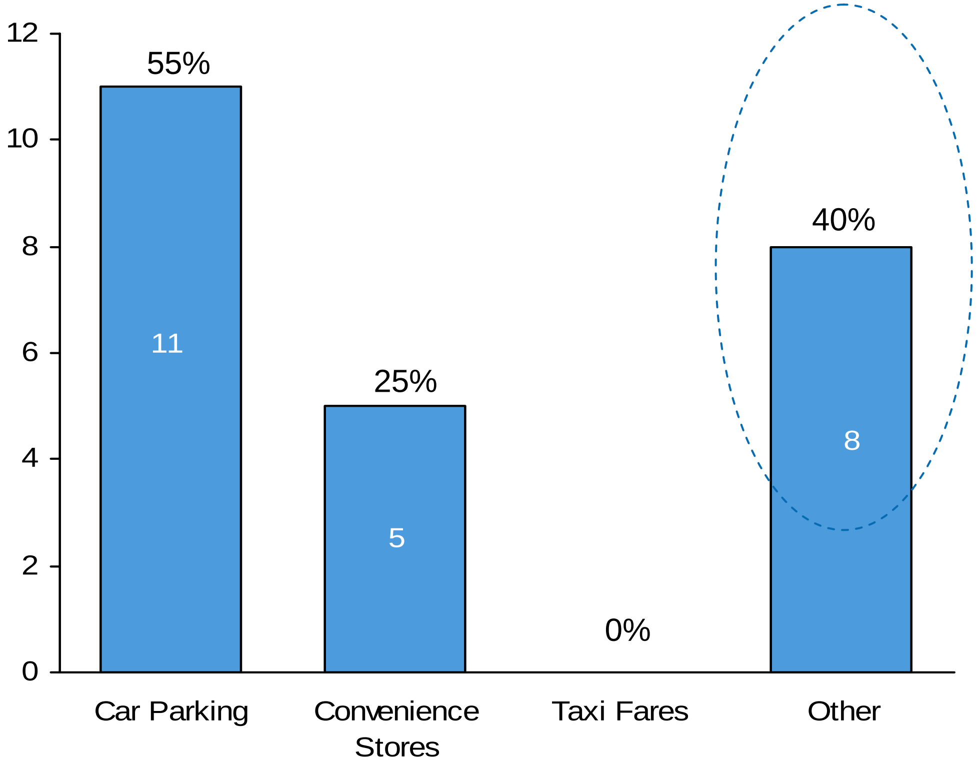
“Stick” approach

- Removal of ticket offices
- Phase out old media / stop selling other ticket types

Q: What strategies have been implemented or might be implemented in the future to drive smart card take-up rates?

Car parking appears to be the most popular non-transit application although a number of other applications were also identified

Active and Proposed Non-Transit Applications



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Other 'Active'

Other Active Applications

- Credit card partnership
- Library
- Discounts on leisure activities
- Toll Roads

Other 'Proposed'

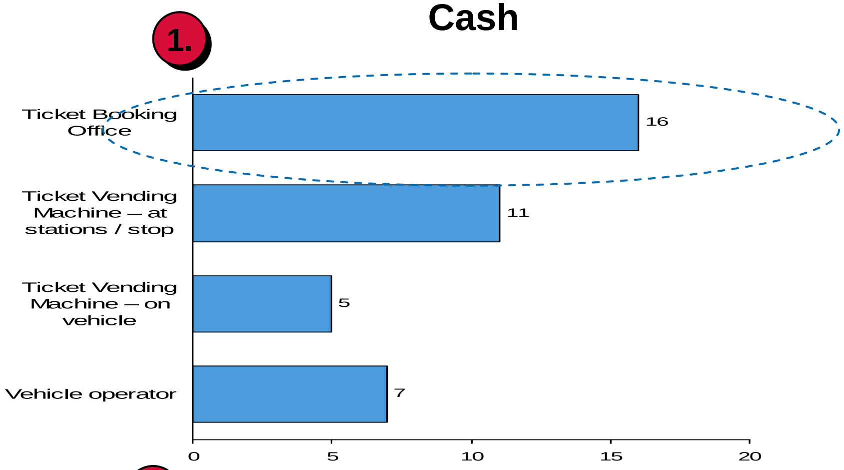
Other Proposed Applications

- Car sharing
- Community bicycle program

The key interoperability issue was finance and banking regulations where licences are often necessary to operate such applications

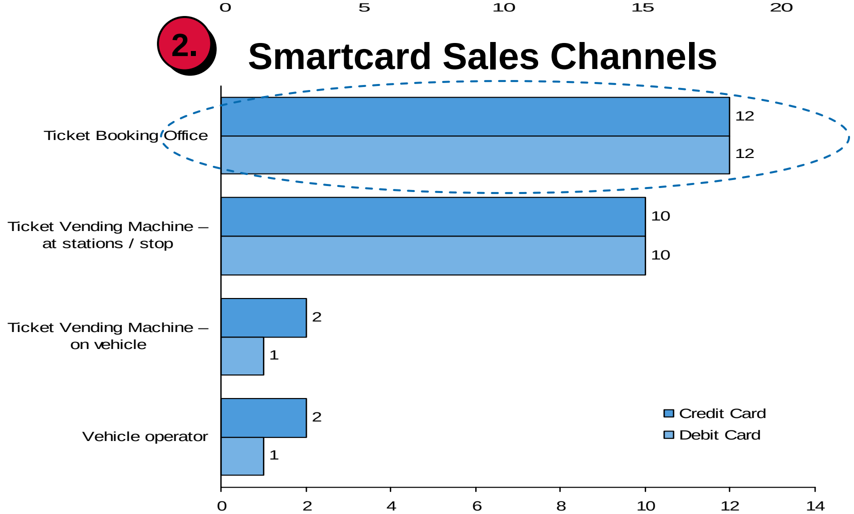
Q1: What non-transit applications are supported by the transit smart card?
Q2: Have inter-operability issues inhibited the development of non-transit applications an / or other initiatives?

Ticket booking offices are the most widely-supported on-system smart card sales and re-load channels



Observations

- Clearly a challenge moving forward is to reduce the reliance on the ticket booking office given that it is the most costly sales and re-load channel



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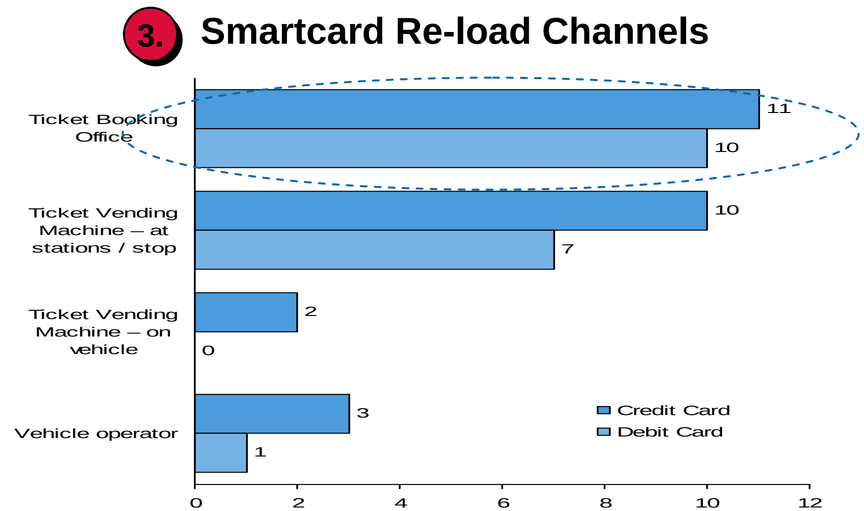


Q: Please indicate the sales channels and re-load channels that were/are included in the smart card system design?

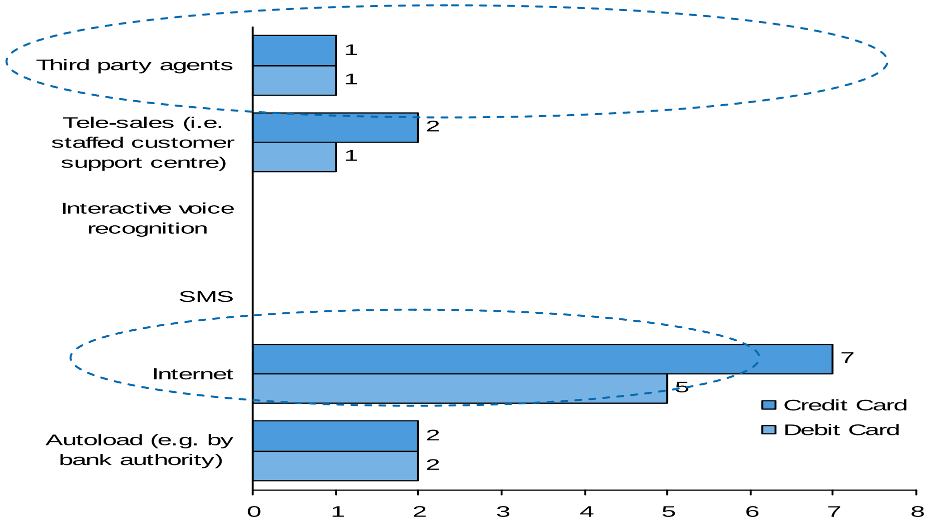
Third party agents and the internet are the key off-system smart card sales and distribution channels and autoload is also a significant reload channel

1. **Cash:** Four off-system cash smart card re-load systems were available

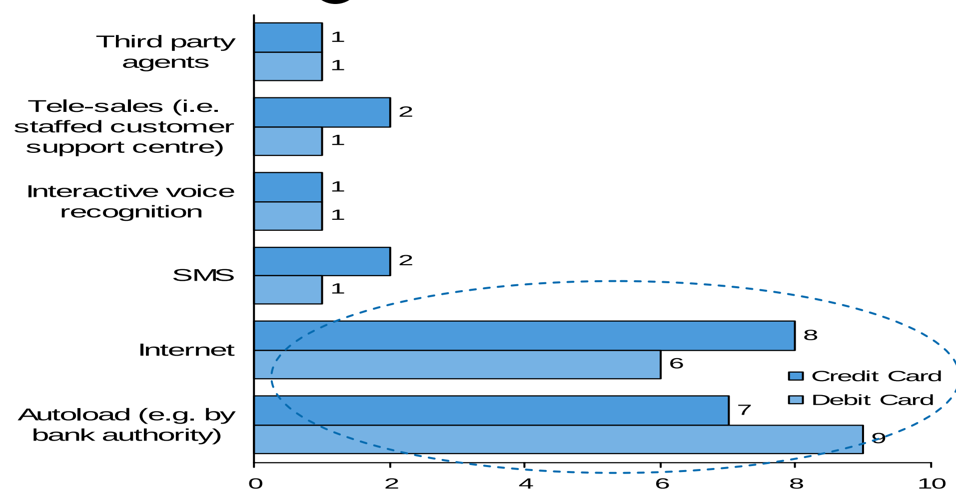
Discussion

- Commission rates associated with third party agents were generally reported to be between 2% and 5%

2. **Smart Card Sales Channels**



3. **Smart Card Re-load Channels**



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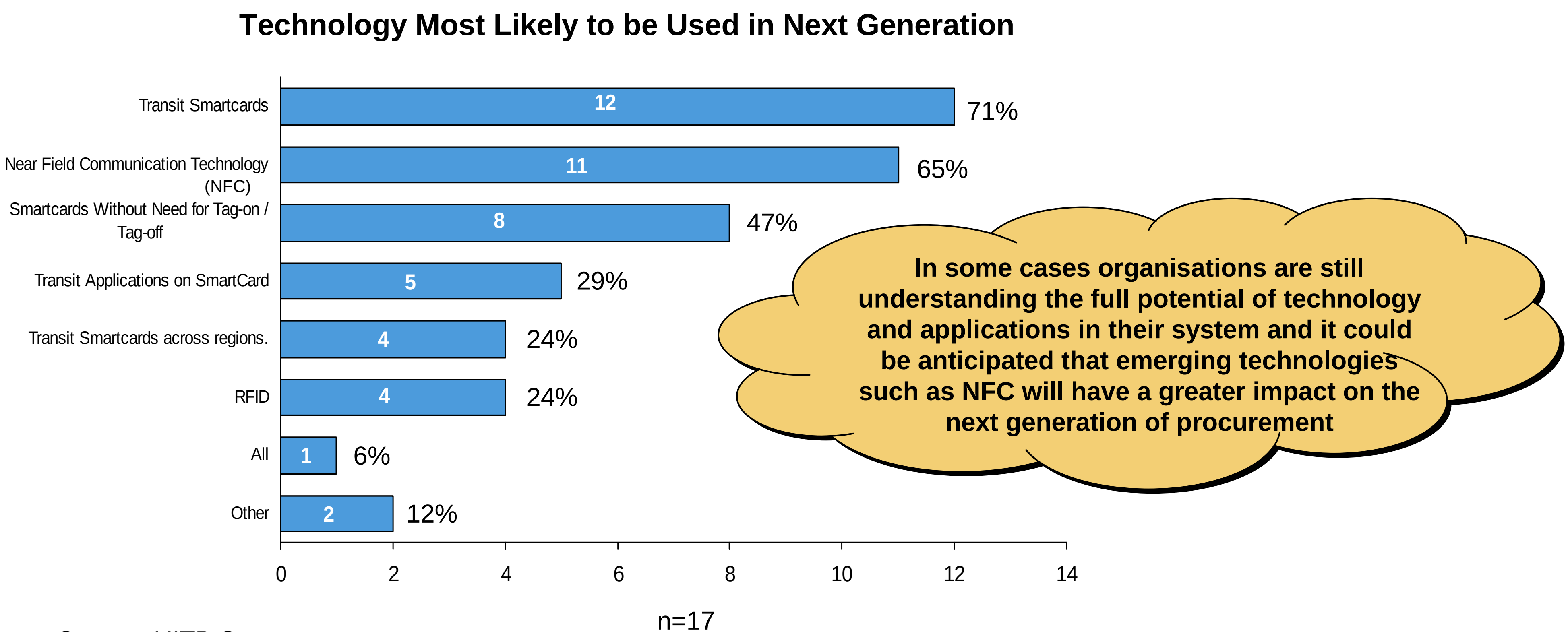
Q1: Please indicate the sales channels and re-load channels that were/are included in the smart card system design?
Q2: What rate of commission is paid with respect to off-system sales?

Emerging technologies will be an important part of next generation fare collection system procurements in Europe



Source: UITP Survey
Q1: What do you consider to be the most likely technology that will be used in your next generation of ticketing system?
Q2: Briefly describe any proposed plan that you have for the next generation ticketing system?

A number of important conclusions are evident from a review of fare media trends

- Actual smart card take up rates have typically fallen short of expectations
  – Both carrots and sticks are being used to drive take up but the primary reliance is on carrots
- Car parking is the most popular non-transit application hosted on transit cards although other applications (e.g. convenience stores) have also proved popular
- Ticket booking offices are the most widely-supported on-system smart card sales and re-load channels
- Third party agents and the internet are the key off-system smart card sales and distribution channels and autoload is also a significant reload channel
- Emerging technologies/solutions will be an important part of next generation fare collection system procurements in Europe

Summing Up

In many cases we continue to remain ‘prisoners of the our past’, where fare collection technology imposed significant limitations

- This drove the need for zonal-based structures to support fares integration with multi-ride and periodical fare products, to operate in ‘open’ fare collection environments
- These fare structure and fare product concepts are often subject to widespread public and political acceptance and support
- New paradigms offered by NFC and bank-issued smart cards opens up new horizons
- This poses challenges to us to rethink how to best deliver customer service and offer different value propositions off the back of these new technologies
- However we must be mindful of our experience to date in the smart card era including take up rates falling short of expectations in many cases
  - This would tend to suggest that an on going evolution rather than a revolution from a policy perspective
- A further implication may well be an extremely pragmatic approach to business case development associated with next generation fare collection systems

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From November 2008

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