Future of Smart Card Ticketing in London

5th June 2013

Sebastien Losq
Transport for London
Fare collection system at a glance

- Oysterland
  - 8,000 Buses
  - 350 Tube stations
  - Tram, DLR, Overground
  - 375 National Rail stations
- 6.5m journeys per day on London Buses
- 4m journeys per day on Tube and Rail
- 15m transactions per day
- 22m Oyster cards issued
- 4bn revenue collected in financial year 12/13
Back in the 90’s

London Resident Population

Source: Transport for London
Enquiries: 020 7918 3439
Oyster was launched 10 years ago

- 2003: Pay As You Go
- 2004: Pay As You Go
- 2005: Daily Capping
- 2008: 
- 2010:
Oyster has delivered the business case
Oyster has delivered the business case

---

Revenue lost on London Underground due to irregular tickets, %

- 2.5% reduction in fraud = £40 million in 07/08
What’s the future of Oyster?
Oyster is a card centric system

Card ID
Up to 3 Season Tickets
PAYG Balance
8 most recent taps
Running Totals
(no personal Data)

Read card attributes
Valid card?
Valid Season Ticket ?
PAYG?
Update PAYG

BUS JOURNEY

Flat Fare
One tap, One Journey, One fare
Oyster is a card centric system

Card ID
Up to 3 Season Tickets
PAYG Balance
8 most recent taps
Running Totals
(no personal Data)

Read card attributes
Valid card?
Valid Season Ticket ?
PAYG?

UNDERGROUND JOURNEY

Distance Based Fare
Fare depends on Origin, Destination, Route
Oyster is a card centric system

Card ID
Up to 3 Season Tickets
PAYG Balance
8 most recent taps
Running Totals
(no personal Data)

Read card attributes
Card Valid
Valid Season Ticket?
Calculate Fare
Apply Capping
Update PAYG Balance

UNDERGROUND JOURNEY

Distance Based Fare
Fare depends on Origin, Destination, Route
A complicated PAYG fares structure

<table>
<thead>
<tr>
<th>Zone</th>
<th>Multi Operator</th>
<th>Zonal</th>
<th>Routing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>£££</td>
<td>££</td>
<td>£££</td>
</tr>
<tr>
<td>2</td>
<td>££</td>
<td>££</td>
<td>£££</td>
</tr>
<tr>
<td>3</td>
<td>£££</td>
<td>££</td>
<td>£££</td>
</tr>
</tbody>
</table>

Key to rail services in London

Website tfl.gov.uk 020 7222
Oyster is a complex system to manage.

There are around 20,000 of these billing engines, on all the stations, buses and tram stops.
Future Ticketing Project emerged from a simple idea.

Our reader technology is similar to contactless retail.

This will provide better security without the need for developing proprietary technology.
The Contactless Retail Model
The Retail Model is not suitable for urban transport fare collection

<table>
<thead>
<tr>
<th>General CP rules</th>
<th>Challenges implicit in transport PAYG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price is known before the card is presented</td>
<td>Price not known until rail journey is completed (or end-of-day if capped)</td>
</tr>
<tr>
<td>Use of card counters to manage risk &amp; occasionally fall-forward to Chip &amp; PIN</td>
<td>• Throughput needs set maximum acceptable transaction time of 500ms</td>
</tr>
<tr>
<td></td>
<td>• No PIN pads on transit infrastructure</td>
</tr>
<tr>
<td>Terminal field is activated manually by store staff</td>
<td>Neither staff nor time to manually activate terminal field for each customer</td>
</tr>
</tbody>
</table>
Challenges of the PAYG Transit Model

- Price is not known at entry point
- It is not possible to write information on the card
- Reader generates a “Zero Value” payment transaction
- Fare collection must be Back Office centric
- Migrate to a post payment system introduced new risks
- Implement a risk and liability model satisfactory for TfL and the banking industry
- Back Office system processing increase information processing latency
- Improve infrastructure network technology
- Ensure high throughput of back office systems
- Develop online Customer Experience
From Card to Back Office Centric

Front Office
- Customer information
- EMV Construction
- Fare Calculation
- Capping

Back Office
- Oyster Central System
  - Revenue Allocation
High level system view

- **Middle Office**
  - Assess Risk
  - Take Payment

- **Payment**

- **Back Office**
  - Conrtact Journey
  - Calculate Fares
  - Apply Capping
  - % Revenue

- **Daily Spend**
  - Entry Tap
  - Exit Tap
Take full advantage of a Back Office System

Payment Back Office

Customer Contact

Service updates
- Bakerloo: Good Service
- Central: Good Service
- Circle: Good Service
- District: Good Service
- DLR: Good Service
- Hammersmith & City: Good Service
- Jubilee: Good Service
- Metropolitan: Good Service
- Northern: Good Service
- Overground: Good Service
- Piccadilly: Minor Delays
- Victoria: Good Service
- Waterloo & City: Good Service
Benefits of FTP

• The ticketing logic is totally independent from the front office technology

• The reader is only a payment reader based on open standards and becomes a convenience asset

• Back office based system simplifies systems management, enables better time to market for new products and delivers better on-line services to customers

• Increase mobility as it is no longer necessary to purchase a travel entitlement before travelling

• Enables wider product integration and the creation of a single Customer Contact System
Thank You.
Ticket purchase is still an obstacle to mobility
Online proposition far from being perfect