Bringing New Tech to Large Infrastructure
- experiences with fare collection in transit

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Masabi Experience: >10 years of successfully delivered innovation

Set UK Rail mTicketing standards

>25 Global clients including New York, Boston, Las Vegas, LA and in UK, France, Holland, Greece, Australia

All modes: Train, Subway, Bus, Tram, Light Rail, Ferry

Investors include global payments and transit experts Mastercard and Keolis
So many different ticket media options to prioritise

**Transit Issued Media:**
- Tokens
- Mags
- Smartcards

> usually retailed through transit infrastructure

**Bring Your Own Media:**
- Mobile
- Print your own & retailer print
- Emv bank cards
- ID cards from other issuers (student/corporate/senior etc)

> can be sold without physical transit infrastructure
Fare Collection – two major activities

1: Sell & Issue Media:
- Physical infrastructure:
  - Sales Windows, TVM’s, on-bus
  - Fareboxes
- Custom Physical media:
  - Smartcards + Mag Stripe

2: Inspect & Validate:
- Validation locations:
  - Handheld, on bus, fare gates
Fare Collection – two major activities

1: BYOT sales via cloud

Dematerialized Sales:
Mobile, Web (concession) self-print, contactless payment cards

Cash Riders:
Barcode on receipt paper from convenience stores

2: Inspect & Validate:

Validation locations:
Handheld, on bus, fare gates [has to be multi-format]
How? Media Agnostic Validators

• Mobile / Smartwatch:
  – Visual
  – Barcode
  – NFC
  – Bluetooth LE
  – EMV

• Web:
  – Self print
  – Send-to-phone
  – Account Based association with other tokens (e.g. corporate card)

• Receipt Paper
  – 7-Eleven, ACE Cash Express

• Contactless Payment Cards
Validation – go multi-format

Hand-held

Subway Gates

Bus & Tram

Multi-formats supported: Barcode (paper & mobile), NFC, EMV Contactless Payment, Bluetooth, ISO14443 id cards
Magazine Reader Survey highlights (mostly North American readership)

Top challenges reported by Fare Collection teams:
- 76% fare evasion
- 69% cash handling and cash operations
- 66% passenger satisfaction
- 52% operating cost (inc maintenance)
- 39% waiting in line for tickets
- 28% sales capacity

Within 5 years paper tickets expected to be mostly replaced by new digital fare technology

87% of surveyed agencies have implemented or plan to implement mTicketing.

Mobile expected to be leading sales channel 2021

Account Based Ticketing - ticket in the back office

<table>
<thead>
<tr>
<th>Traditional:</th>
<th>Account Based Ticketing (ABT):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carry: “Proof of Payment”</td>
<td>Carry: Identifier only</td>
</tr>
<tr>
<td>Ticket entitlement written onto or into the media</td>
<td>Ticket entitlement in back office</td>
</tr>
<tr>
<td>Stored Value Account Balance in the card</td>
<td>Stored Value Account Balance in back office</td>
</tr>
</tbody>
</table>

[EMV Contactless cards/phones can be a special form of ABT token because they can auto-sign-up a top-up and payment mechanism with first tap.]

*Built for the world before great comms*

*Best with great comms*
Account Based Ticketing - a panacea?

**Pro’s:**

Can provide ability to change fares and offering from the back office without changing ticket media and simplifies logic inside validation equipment

Can allow huge choice of ticket media

**But Hang On -**

Will it appeal to all rider groups?
Will it work with all ticket types? Long Distance?
What are the issues with account based for all?
How to deal with Unbanked and Network issues?
EMV and Mobile - competing or completing?

For this discussion contactless Apple Pay and contactless Android pay are considered as being included within the EMV stable.

Should agencies think about only doing just the one best matched to their demographic and products, or are there reasons to do both?

**Mobile great for:**
- Unbanked or areas with low EMV contactless
- Last minute top-up and go!
- Can cope with A to B without tap-out
- Open systems (no validators)
- Customers that often go to zero balance

**EMV great for:**
- Banked in EMV deployed areas
- Simple ticketing (flat fare)
- Tap in and Tap out
- 100% validation
- Low value
- No booking
Mobile First - or big AFC?

Major rip & replace vs smaller staged updates?

Are AFC system upgrades and overhaul programmes generally “update legacy sales systems first, add mobile last?”

Should agencies think that mobile will likely be the smallest sales channel, after smart and cash sales taking the majority of sales?

Or can an agency just add mobile, and then set timetables and agenda for other upgrades afterwards once impact of faster to rollout mobile is understood?

What makes a software project “big”? Bespoke?

$Millions to rip and replace AFC

60% of MBCR single tickets sold by mobile

Zero CapEx!
Spec the solution wanted or the outcome needed?

**Primary Need:**
“I need to get to town”  
*(solution-neutral)*

**Solution Want:**
“I want a car”  
*(states a preferred solution)*

**Procurement based on Wants:** (meta-problems)
- Vehicle spec (lease/buy, cupholders, engine sizes, trim, color, wheel design)
- Insurance
- Driving training
- Maintenance
- Refuelling
- Parking in town
- Parking at home

**Outcome based procurement:**
I will pay to arrive safely and happily in town

Q: if the car turns out to be the wrong solution because gasoline is banned from the city next year – who picks up the tab for making the wrong solution choice?
RFP’s – want vs need? Solution vs outcome?

Example RFP listed 25 “MUST HAVE” priorities, including:

* Provide a solution to dispense Smartcards in-station

* Convert to a Back-Office Account-based AFC system with NO requirement to "Read/Write" all transactions onto the Smartcard

Are these solutions required for the actual needs of public transit; or wanted to solve meta-problems of historic Fare Collection approach?

Do increased numbers of priorities enhance focus on delivering the primary needed outcomes?
If an RFP includes a detailed solution specification, how can we ever avoid the cost of customisation, and how can there be innovation, other than on the fringes of a procurement?

How would an RFP be written to avoid heavy customisation?

Maybe in the world of SaaS, RFP’s should have a detailed OUTCOME specification, rather than a SOLUTION specification

Then vendors can leverage SaaS and bring their A-Game quickly at a great price. 80:20 rule – why spend 80% of budget on the lowest value 20%?
What’s the real outcome needed here?

Recover money from riders (sell)

Check that riders have paid (validate)

Keep each major demographic of riders happy (SLA’s)

Cost the agency as little as possible in time, space & money while doing so (efficiency)

So – why not write an RFP that *rewards* those *outputs*:

<< OUTCOME BASED PROCUREMENT >>

Note: the *outputs* tend to be long-term unchanging things, as opposed to *technology specific solutions* which may be short-term. An *outcome based* contract insulates the agency.
Suggestion: Set the desired outcome. Leave the detail to the bidders to propose

RFP Outcome Targets:

1. Halve the all-in cost of fare collection from 15% to 7.5% over 5 years.

2. Maintain ticket purchase & use satisfaction ratings for each major demographic category.

3. Financial reward linked to achieving or beating the above.

Note: This approach leaves far more room for off-the-shelf, and innovation throughout the contract as a particular custom approach solution isn’t baked in.
Key Presentation Take-Aways

The new world of outsourcing and SaaS is different

Procure what you *need* with less guesswork through Outcome Based Procurement, not big RFP specs

Being open to off-the-shelf and SaaS can lead to faster deployment, lower risk & cost.

BYOT can *halve* the cost of your fare collection

The future is >80% self service, but the key question is how to efficiently serve the final 20%