



From Dumb Wallets to Smart Phones

1

MOBILE PHONE ARCHITECTURES FOR FARE SYSTEMS

MARTIN P. SCHROEDER, P.E.

CHIEF TECHNOLOGY OFFICER
AMERICAN PUBLIC TRANSPORTATION ASSOCIATION



Mobile Phone Application Features



2

Mobile Self-Service	Mobile Advertising	Mobile Payments
<ul style="list-style-type: none">• Purchase fare, check balances, and perform other functions directly from a smart phone• Leverage all mobile channels: SMS, web browser, apps• Better customer experience• Cost savings from reduced number of calls to customer service center• Replace the TVM	<ul style="list-style-type: none">• Deliver advertisements, coupons, and offers to patrons (opt-in) through mobile channels• Leverage unique transit data to personalize and target offers• Generate additional revenues to support transit operations• Deciding who owns the customer and the data	<ul style="list-style-type: none">• Leverage Near-Field Communications technology• Bank card in a mobile wallet• Transit app in a mobile wallet• Reduce the number of cards issued, replacing with mobile• Open architecture vs. Open Payment• Payment choice

NFC (Near Field Communications) fits transit well because of its similar interface to ISO 14443 protocols, now in all smartcards.

Seeing worldwide use of bar codes and security images on smart phones for ticket purchase.

Fare System Integration Opportunities

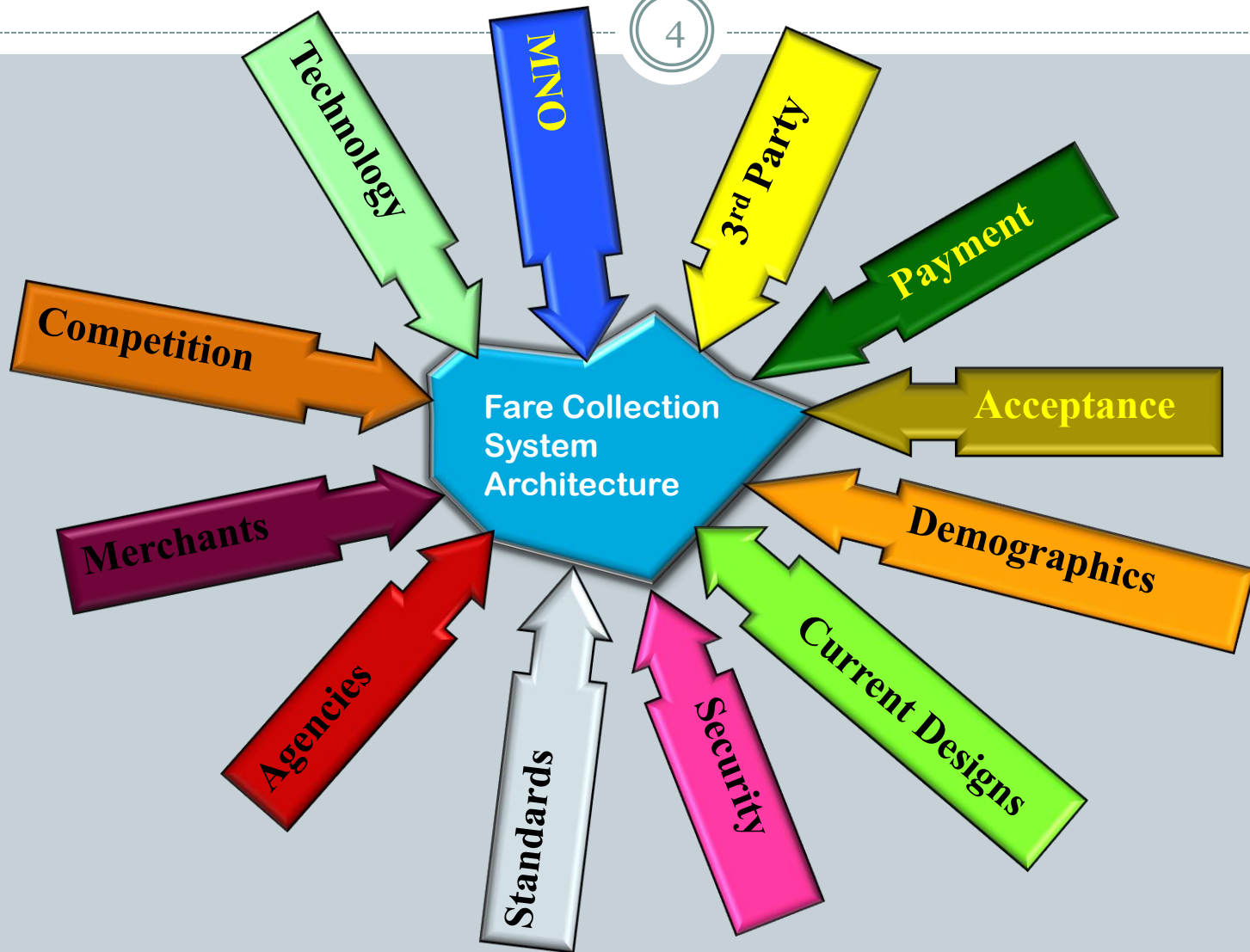


3

- Mobile devices may be the linchpin to interoperability across modes and across transit systems
- Smart phones with NFC are finally starting to appear, but...
- Many new players are emerging that will affect the system architecture
- Many new payment channels will provide competition to lower transaction costs and provide choice to riders – think MCX & CurrentC
- But, design and implementation of fare systems involves many stakeholders

Influencing Forces

4



Future



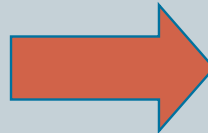
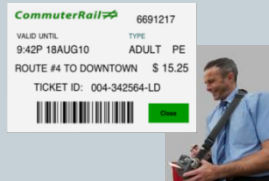
5

- A bit of uncertainty – but that's OK
 - Role of banks and new payment providers
 - Security of transactions on mobile
 - Influence of merchants
 - Role of transit in defining its own brand & owning its data
 - Role of wallets – think of PayPal
- Working with existing systems
- Addressing the needs of smaller agencies
- Innovations
 - Cloud-based and account-based systems
 - Third party provisioning – TSM
 - New security schemas – OSPT (CiPurse) and AES
 - Use of credentials

From Tickets to Mobile

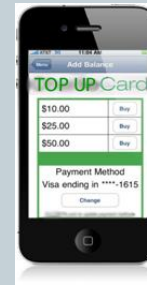
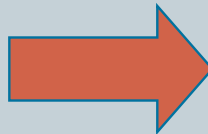
6

PAPER TICKETING



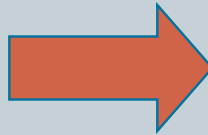
MOBILE TICKETING
2007

SMARTCARDS &
TVMs



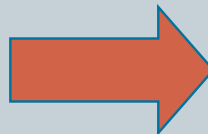
MIFARE ON MOBILE
2009

OPEN PAYMENTS
(Banks)



MOBILE WALLET
2011 / 2014

OPEN ARCHITECTURES
& FLEXIBLE PAYMENTS
Expanded power of
mobile



NEED FOR
DEVELOPMENT

How Will We Get There?



7

- Solutions will be multiple and variable – no one solution as of yet will meet all demands or levels of necessity within transit or should it
- Mobile phones will help integrate systems so that varying architectures including device-based & account-based systems can participate and evolve
- Faster processing due to improved communications permits use of account-based systems – media can serve as a token
- Competition for payment is of bedrock importance in defining a payment architecture
- Technology and business models continue to evolve making things a bit messy with many diverse applications for foreseeable future – think PayPal

- Establish common interface at POE or POS
 - e.g, banking format, or uniquely identified architecture (mobile phone industry and ISO)
 - ISO 8583 conformance (messages, data elements, provisioning)
 - Media is credential in an account-based system
- Standard format allows multiple media form factors
 - Bankcards
 - Debit instruments
 - Mobile phones
 - TSM
 - Tolling

MCX - CurrentC



9

- Work on any phone – new or old, iOS or Android.
- Integrate coupons, loyalty and payment into a seamless transaction.
- Provide consumers with multiple ways to pay at their favorite merchants, including merchant gift cards, credit cards, debit accounts and personal checking accounts.
- Work seamlessly across multiple technologies and use cases including QR codes, Bluetooth and others.
- Merchant motivation? Save on interchange fees of bank credit cards.

Summary



10

- Look for architectures that build-in capitalistic models of competition and are open to new innovations
- Avoid simply going with the flow and the simple extension of credit cards on phones
- Mobile is here, but how we define the interface and payment options will determine its benefit to transit authorities, riders and the community for many years
- Consider the role of merchants and their motivations – is transit simply a merchant?
- Consider special needs and limitations of smaller agencies and of demographics

Further information

11

MARTIN P. SCHROEDER, P.E.

CHIEF TECHNOLOGY OFFICER

AMERICAN PUBLIC TRANSPORTATION ASSOCIATION

MSCHROEDER@APTA.COM

202.496.4885

