Overview of the Trend to Open Architecture and Open Payments in Public Transit Payment Systems

Tim Weisenberger
US DOT John A. Volpe Center
Evolution of Transit Fare Payment

Today:
- Contactless Smartcards
- Magnetic Stripe Cards

Tomorrow ????

Cash/Coins
Tokens
Magnetic Stripe Cards

2011 Fare Collection Workshop
Contactless Is the Key!

• Transit Use Case Required Contactless
  – High speed, high volume
  – Convenient and flexible for consumers
• Transit Agencies gained efficiencies
  – Shrinkage/fraud prevention
  – Data capture and analysis
  – Enhanced customer experience
The Traditional Smart Card Fare Collection System

- Cards issued and managed by transit agency (i.e., closed system)
- Used for *transit service* only (and certain concessions)
- Customers pre-pay for transit products
- Electronic purse on card
- Early deployments were AFC *enhancements*
- This was the only approach at the outset of smart card-based systems
  - Financial payment smart cards were *contact* cards
Sample System Architecture

Regional Central System

Transit Agency Central Computer

Local Data Processors

Devices

Data Flows

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Traditional Approach Strengths

• Proven and Reliable
• Addresses agency need to increase operational efficiencies
• Gives customers more convenience and flexibility
  – Multiple avenues for top-up/purchase of fare products
  – Ability to pay for transit and park n’ ride with same card (WMATA)
• Has the “magic” factor with customers
• Represents a generational leap from magnetic technology
Traditional Approach Limitations

• Industry-specific system integrators and vendors

• Proprietary technology limits competition and truly open procurements
  – Standards development viewed as a “silver bullet”

• However, still not fully standardized
  – Security
  – Front-end devices

• Closed system limits partnering, particularly among transportation modes
Smart Card Systems Led to Innovations

- Regional coordination (in Seattle, Bay area, Washington) targeted key benefits:
  - Single card for multiple transit services
  - Enhanced customer experience
  - Cost sharing
- Enhanced institutional programs (Universities, Transit benefits automation, Visitor Passes, etc.)
- Early multi-modal payment programs (WMATA parking)
Traditional Approach leads to Open Approach

- Financial Industry interest in transit market and micro-payments
- Transit Industry desire for non-proprietary, open architectures
  - Solid advocacy for contactless interface by transit industry
  - Idea that fare collection is not a transit agency core competency
  - Active pursuit of pilots for co-branded payment card/transit card, Mobile Payments, etc.
  - Development *by transit industry* of standards for traditional systems
Standards – A Slow Evolution

ISO 14443 did not achieve promise anticipated
ISO 24014- High-level Architecture and Use Cases Only
National AFC Standards- implementations limited
Financial Payments Industry standards- reader, security, business rules

Today

Tomorrow??
Payment App augmentation to national standards and ISO 24014
Mobile App Standards?

2001
Why Standards?

- Enhance competition
- Improve freedom to evolve system, partner, and develop applications (within a transport mode)
- Move to open architecture
- Aid migration from specialized hardware and software to COTS
- Facilitate Interoperability

*Cost constraint is a key misconception*
  - Standards may reduce costs in the long run due to competition
  - In short term, costs often increase due to new development
Open Architecture/Open Payment Systems - Crossing the Chasm

Issues to be addressed include:

• Prove system reliability
• Prove ability to handle all fare types, transit modes, and address issues such as proof of payment
• Show cost effectiveness versus traditional method
• Need widespread availability of contactless payment cards
• Need further education between financial payment industry and transportation industry

Source: Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers, Geoffrey A. Moore
At the Crossroads of Innovation

- Many innovations in fare payments and in the industry in general
  - Open payments
  - Open architecture
  - Account-based approach
  - Multiple form factors for payment devices
  - Mobile payment applications
  - Use of credentials for transit payments
  - Hybrid account-based and card-based approach
What will the Future Hold?

- Trend toward open payment systems in US is clear
- Open Architecture is ESSENTIAL
- Back-office centric approach allows easier migration
- Approaches will be regionally specific
- Each main approach (traditional system and open payment system) and has very strong benefits
- The choice may not be one or the other, but a hybrid
- Can multi-modal payment systems (parking, tolling, transit, HOT/HOV, dynamic pricing, etc.) be achieved?