

Contactless Fare Payment Systems

CFMS Standards and the Future of Fare Collection

Talking Technology and Transportation (T3)

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Webinar Ground Rules

- We want this to be dialogue, not a monologue, but...
 - Please be patient- we have a large audience today
- We don't have all the answers!
- Please answer the poll questions as we pose them



Introduction-

What Will We Cover Today?

- Understanding your business needs and how payment system options fit them
- Advancements in contactless fare payment
- How the CFMS Standard fits into the current fare system marketplace
- Upcoming standards development projects
- Your questions

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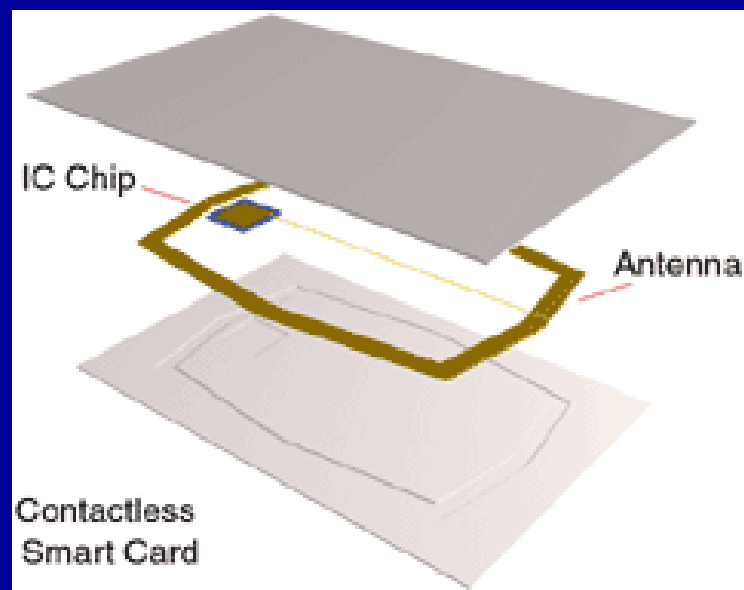


AFC Not Just for Major Metropolitan Markets

- **Smart Card Alliance and APTA**
 - SCA lists over vendor 40 products for use within transit
 - APTA COMPS lists 30 products under fare collection hardware vendors
- **Peripherals to existing hardware**
 - Certified/Proprietary
- **California Transit Association**
 - AFC Pilot Giveaway

What is Contactless?

- ISO 14443 communication protocol
- ISO 7816 commands





Technology Should Follow, Not Lead

- Transit agency manager: We're going to be implementing a smart card fare payment system.
- Taxpayer: Very cool, but why?
- Transit agency manager: What do you mean?



Fare Collection System

TRB Definition

All procedures and devices used to collect fares and to accumulate and account for fares paid.

TriMet Definition

TriMet's Fare Collection System comprises:

- Customers, TriMet personnel, contractors, business partners and other stakeholders,
- Legislation, regulations and applicable standards,
- Policies, procedures and processes, and
- Equipment, software and other supporting technologies.

Purpose of Fare Collection

- Not as straightforward as it may seem.
- Few agencies appear to have prepared a formal purpose statement.
- Should support the overall agency strategic goals.
- Expect that reaching consensus will be difficult.
- Keep it short and to the point.



Implementing Contactless

- *Initiation*
- *Planning*
- *Analysis*
- *System Requirements Development*
- **Implementation**



Analysis and System Requirements Development

- Understanding your business: Your requirements drive your solution
- Numerous technology options, some more established than others



Analysis and System Requirements Development

- Opportunities for reducing cost and increasing revenue
- Improving customer service
- Options for funding payment system investments
- Understanding the basics of new technologies and approaches to fare payment



Analysis and System Requirements Development

- Understanding the complexities of system design and integration
- Business needs evaluation and assessment
- Lessons learned from other agencies both nationally and internationally
- New projects and technologies always under development



Technology Should Follow, Not Lead...Revisited

- Resist the temptation to cut short laying the groundwork for making a technology decision. Time saved early will cost dearly during the implementation.
- Risk tolerance and in-house capabilities are important considerations
- Leading edge, not bleeding edge

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Technology Options

- Traditional fare payment systems
- Traditional payment card industry systems
- Enhanced payment card industry systems
- Basic combined systems
- Enhanced combined systems
 - NFC



Traditional Fare Payment Systems

- Boston - MBTA (Proprietary)
- Philadelphia - PATCO only (CFMS)
- New York - PATH, NY MTA (CFMS, Financial)
- Washington DC - WMATA (Proprietary, Financial)
- Chicago - CTA (Proprietary)
- Atlanta - MARTA (Proprietary)
- Los Angeles - LAMetro (Proprietary)
- San Francisco - TRANSLINK (Proprietary)



Traditional Payment Card Industry Systems

- Agencies large and small accept credit and debit cards for the purchase of fare products.
- Contactless cards now available.
- Card payments continue to make up an ever increasing share of all payments.



Enhanced Payment Card Industry Systems

■ NY MTA

- Citi issued PayPass cards and key fobs
- Readers support ISO 14443 and are certified by payment networks
- Cards pass track I & II magnetic stripe data
- Transactions well under 300 m/s transaction time

■ UTA Pilot

- Moving into Phase II
- ERG to provide Phase II backend settlement and system integration services
- Rollout to include bus and rail



Basic Combined Systems

- BarclayCard
- UTA exploring placing transit application on FIPS compliant DoD Common Access Card
- Taipei



Enhanced Combined Systems

- Not implemented, largely conceptual or under development
- Example 1: Combines traditional fare payment system and enhanced payment card industry system.
- Example 2: Traditional fare payment system and a mobile telephone account based system.



Contactless Fare Media Form Factors

- Traditional full featured smart cards.
- Key fobs, watches, etc.
- Limited use cards
- Mobile phones (Near Field Communications)



Limited Use Ticketing

- MARTA - Consuming 110K per week
 - 75% open
 - Cobb County
 - Parking
 - 1.2MM Mifare 1K cards issued
 - MARTA owns Smart Card Specification Document



On The Fence

- **Systems are not incompatible**
 - **Hardware/infrastructure consistent**
 - **Technology evolves**
 - **Migration path**
 - **Card, reader, network, servers**

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What is NFC?



Near Field Communications



Operates at the same frequency as smart cards



Secure



ISO 14443 and ISO 18092



Operating distance is ~4 cm



Can emulate a smart card



Can serve as communication between two devices



Can serve as a card reader/writer

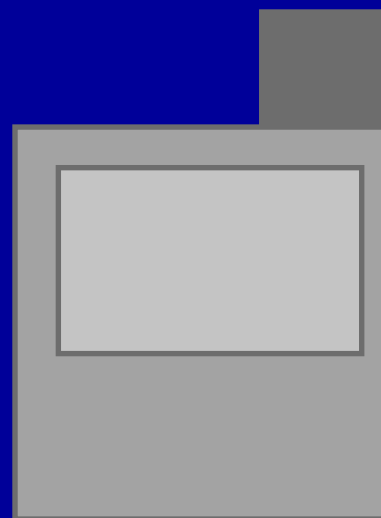
Applications of NFC

Smartcard

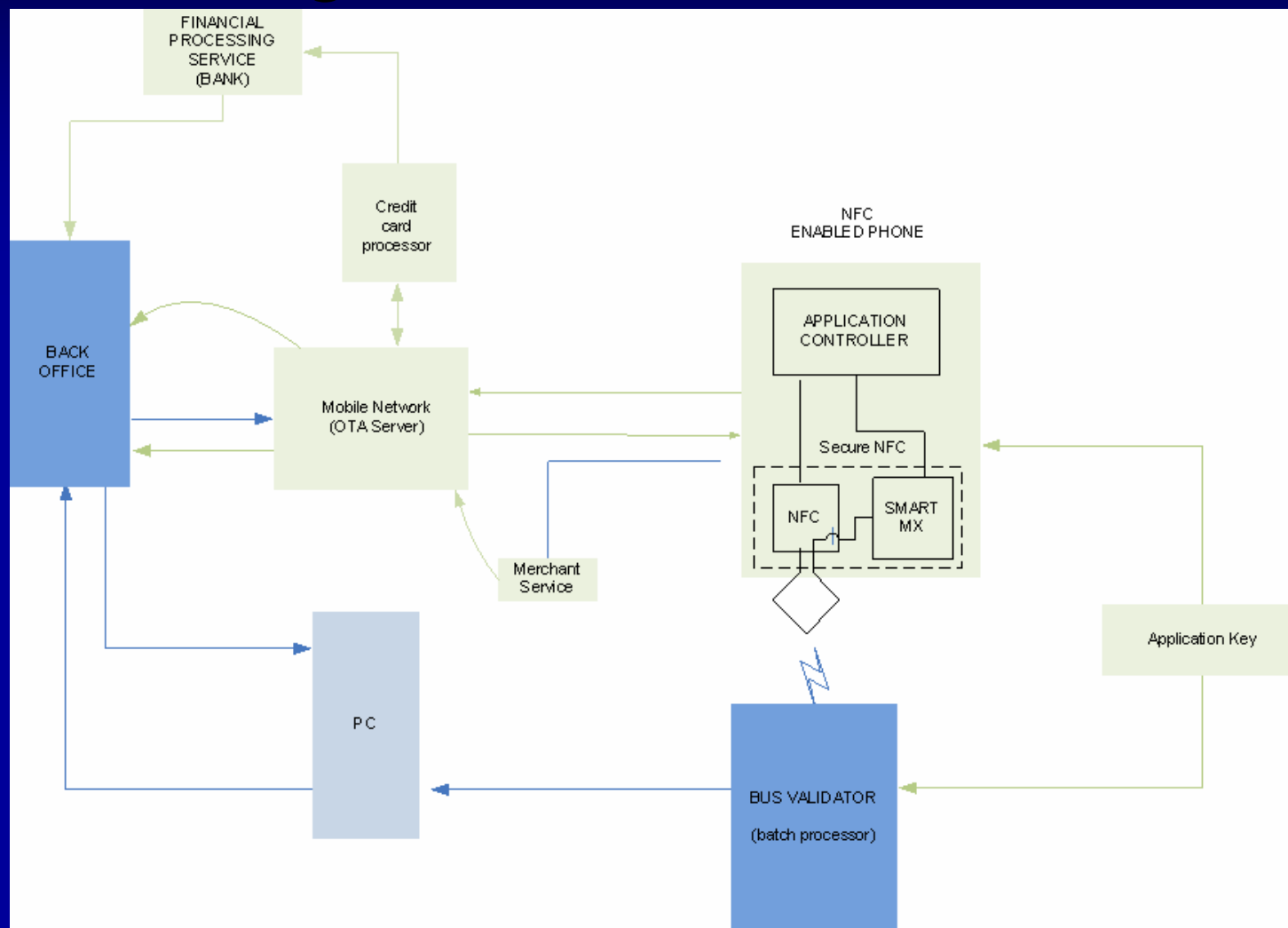
- Transportation
- Entertainment
- Customer loyalty and bonus programs
- Payment

NFC

- Share and transfer content
- Synchronize calendars
- Easy network setup and configuration
- Generating non-traditional revenue



NFC System Architecture





International NFC Transportation Pilots

- **O2 Wallet w/Trans for London, Transys, Barclaycard; Visa Europe, Nokia & AEG**
 - This launch is UK's first large scale pilot of NFC (Near Field Communications) technology on mobile phones
 - Allows mobile phones to pay for purchases, access events or even be used as Oyster cards for travel around London, simply by touching the phone to a reader
- **Project TreiZEN Mobile NFC Ticketing w/OTA ticket top-up**
 - This was a mobile NFC ticketing trial that allowed you to reload and pay for your transport ticket with your mobile phone
 - All the transactions were available Over-The-Air without a need to visit a ticket counter or vending machine

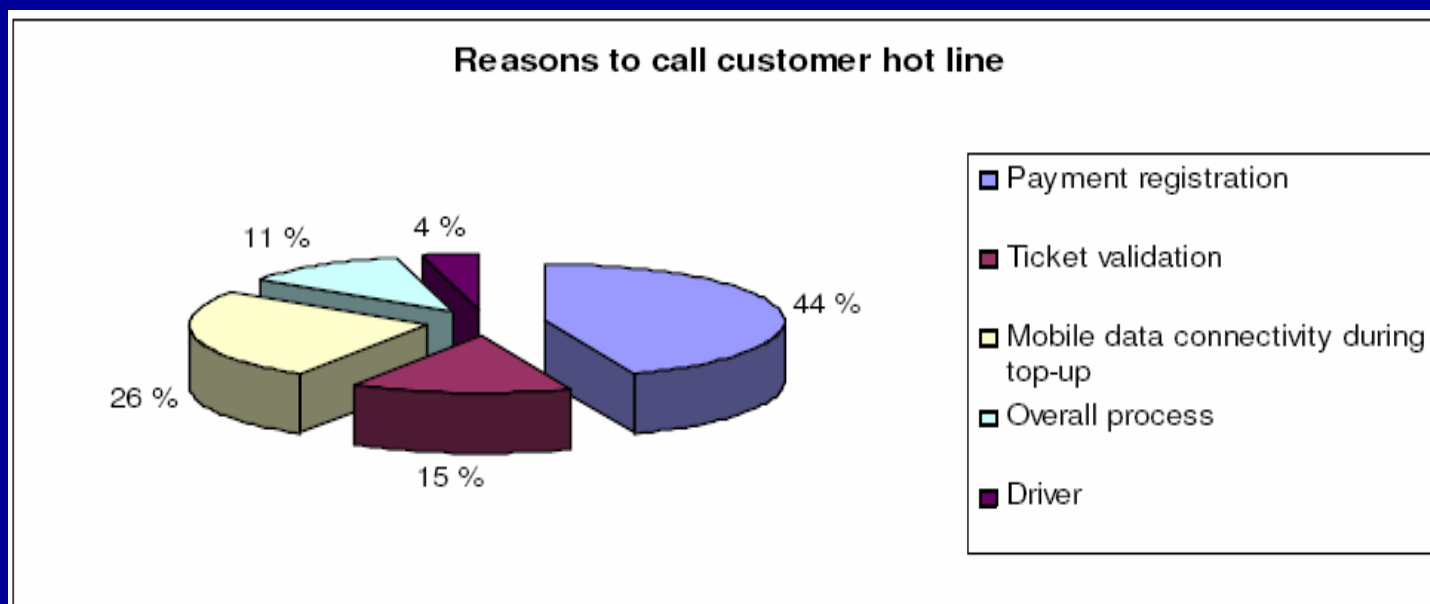
TreiZEN Trial Findings

■ Positive

- Commuters like to use their phones for ticketing
- No consumer education needed for validation
- User interface on mobile

■ Negative

- Mobile phone settings for data connectivity
 - » Consumers not sure if they have a data plan
- Payment registration too long
- Physical receipts required for employer reimbursement



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Why Promulgate Standards?

- Aid open competition for fare collection systems
- Achieve an open, consensus-driven specification
 - Due to the robust membership of UTFS, the entire industry can use it with confidence
- Help contactless technologies gain acceptance
 - In addition to the standard development activities, outreach and research have gone hand-in-hand



How the CFMS Standard Fits

- The Standard provides a common language for regional contactless fare systems
- Provides a common format for data elements and messages
- UTFS will use an open approach to update/modification of the Standard
- CFMS Standard is a key tool for procuring a contactless payment system
- As the Standard matures, technological advances and new approaches can be brought into the fold



UTFS Activities

- Supplementing the CFMS Standard
 - Test Methods Specification development
 - Limited Use Specification development
 - Sub-system Interface development
- Tracking international standards development and technology innovation
- Regional training- *your feedback will drive content*



Interoperable Fare Management Systems (IFMS)

- International Organization for Standardization Technical Committee for Public Transport
 - Chung Chung Tam U.S. Delegate and Industry Expert
 - Public Transport Interoperable Fare Management Systems (IFMS)



Training and Outreach

- Training and outreach an important element for UTFS
- Developing regional training for roll out beginning in 2008
- Turn our research activities into informational products
- Actively recruiting new members (*no need to be an expert, we all learn through collaborative work*)



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Your Questions

