Smart Cards and Proof-of-Payment: A Marriage of Necessity

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Proof-of-Payment: Fundamental to LRT Success

• **Lower Capital Costs**
  – Simplified Station Design
  – No Barrier Equipment

• **Lower Operating Costs**
  – No Station Attendants
  – Less Equipment to Maintain
  – Small Staff of Fare Inspectors

• **Improved Service**
  – Faster Boarding through All Doors
Proof-of-Payment: Deployed on Several Transit Modes

- Commuter Rail
- Light Rail
- Bus Rapid Transit
- Heavy Rail
- Streetcar
Proof-of-Payment: Deployed Throughout the Country

Transit System with POP
Proof-of-Payment:
How It Works

• The Fundamentals
  – Pay the fare prior to travel
  – Fare Inspector may inspect during the ride
  – Fare evaders risk a fine

• Key Component – Printed Media
  – Fare info is printed on tickets & passes
  – Visual fare inspection is quick & efficient
Electronic Fare Payments: The New Game in Town

• The Fundamentals
  – Fare products: electronically encoded, machine-readable
  – Payment media: reusable; electronically re-encoded
  – Fare card held near a Reader communicates electronically and wirelessly:
    • Card-based: Transaction processed onsite between card & reader
    • Account-based: Transaction processed offsite by central system
Electronic Fare Payments: Evolving Technology

- Contactless Smart Cards
  (Transit Agency Issued)

- “Open Payment” Contactless Cards:
  (Credit Cards; Prepaid Debit Cards; Gov’t ID)
Electronic Fare Payments: Evolving Technology

• Smart Phones with NFC (Near Field Communication)

• Smart Phones with Bar Codes (Mobile Ticketing)
Electronic Fare Payment
Gaining in Popularity

• **Customer convenience**
  - Payment media in pocket or purse
  - Purchase new fare online or via subscription
    • Bypass TVM or pass outlet
  - Carry fare product(s) plus electronic cash (e-purse)
    • No worries re: exact change
Electronic Fare Payment
Gaining in Popularity

• Agency benefits
  – Cost reduction potential
    • Cash processing
    • Media sales & distribution
    • Maintenance costs: electronics replaces mechanical
    • Printed media theft and fraud
  – Broader fare policy options
    • Regional multi-agency partnerships
    • Loyalty frequent-rider programs
  – Service planning/marketing
    • Database of ridership patterns
Electronic Fare Payments: Gaining in Popularity; Adapting to POP

Transit System with POP
Transit System with POP and Electronic Payment
Electronic Payments & Proof-of-Payment: Making It Work

• Visual Inspection / Encoded Fare Cards

  – Handheld Reader required for fare inspection
  • Device reads/displays encoded info
  • Slower than inspecting printed media
Electronic Payments & Proof-of-Payment: Making It Work

- **Visual Inspection / Account-based System**
  - Handheld Reader requires wireless connectivity to central system to verify valid payment
  - Loss of connectivity disrupts fare inspection
Electronic Payments & Proof-of-Payment: Making It Work

• Benefits of Handheld Reader
  – Superior, more reliable inspections
  – Electronic record of inspector activity
  – Mobile reference tablet
  – Detailed electronic record of violation
Electronic Payments & Proof-of-Payment: Making It Work

• Tap-on by Pass Holders
  – Needed for:
    • Ridership data
    • Receipt of revenue?
  – Creating the Tap culture
    • Encourage or require?
  – Benefit of Tap culture
    • Counters perception of widespread fare evasion
Electronic Payments & Proof-of-Payment: Making It Work

• Processing distance-based fares from e-purse
  – Select & Tap-on: deducts fare at start of trip
  – Tap-on / Tap-off

• Charging more than the fare
• Forgetting to Tap-off
• Permitting a negative balance
Mobile Ticketing in a POP Environment: The Challenges

- **Smart Phone:** all-in-one fare payment system
  - Sales Device: purchasing fare product
  - Proof-of-payment: displaying Bar Code

- **Challenges**
  - Last-Minute Purchase
    - Waiting until fare inspector is spotted
  - Multiple Transit Rides
    - Differentiating between original and cloned text or bar codes
Electronic Payments & Proof-of-Payment
Marriage of Necessity

• Proof-of-Payment Fare Collection
  – Helps make LRT viable and efficient

• Electronic Fare Payment
  – Creating convenient new payment options
  – Improving AFC barrier & onboard systems

• Making the marriage work
  – Electronic payment continues to evolve
  – Experience will refine policies, procedures and design
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