A New ERA in Fare Collection
Reader Solutions

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Key Presentation Takeaways

- Who is Brush?
- New Directions in Transit Smart Media Acceptance
- Applicable International Standards
- Transit "Plug & Play" Devices
- What should Our system support to remain competitive with a growing number of public transit rider alternatives?
- Remaining Competitive with more transit rider options
- State of Transit with "Plug & Play" Transit Devices
- One Transit Reader Solution
- Conclusion and Summary

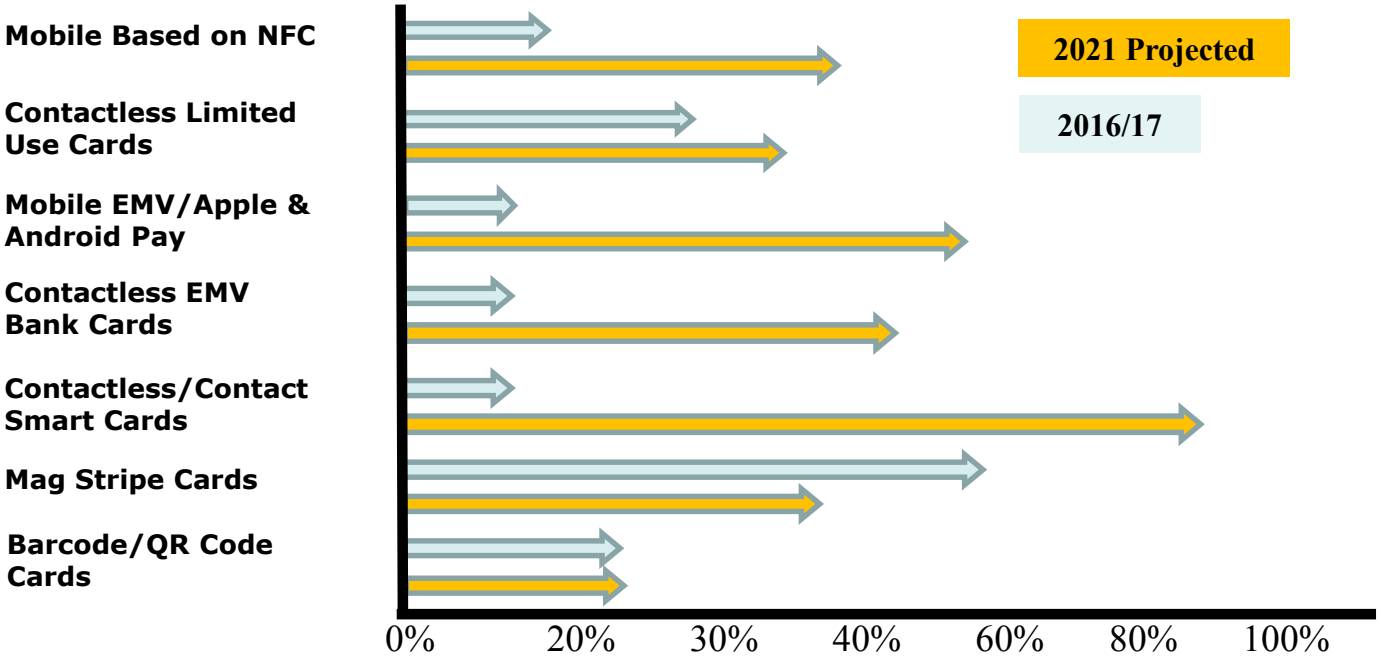
Brush Industries / Q-Card Company

- Doing Business for 100 years, Specifically Involved in Transit since the 1980's.
- Markets Include Public Transit, Card Printer, Outdoor Vending and Access Control
- International Customer Base / ISO 9001 Accredited

- ISO 17025 Accredited 3rd Party Independent Test Laboratory
- Payment, Transit and ID Markets – Doing Business in Over 40 Countries
- Certification Testing, Interoperability and Debugging
  - EMVCo - Accredited Level 1 Contactless and Mobile
  - Visa Accredited
  - American Express Accredited

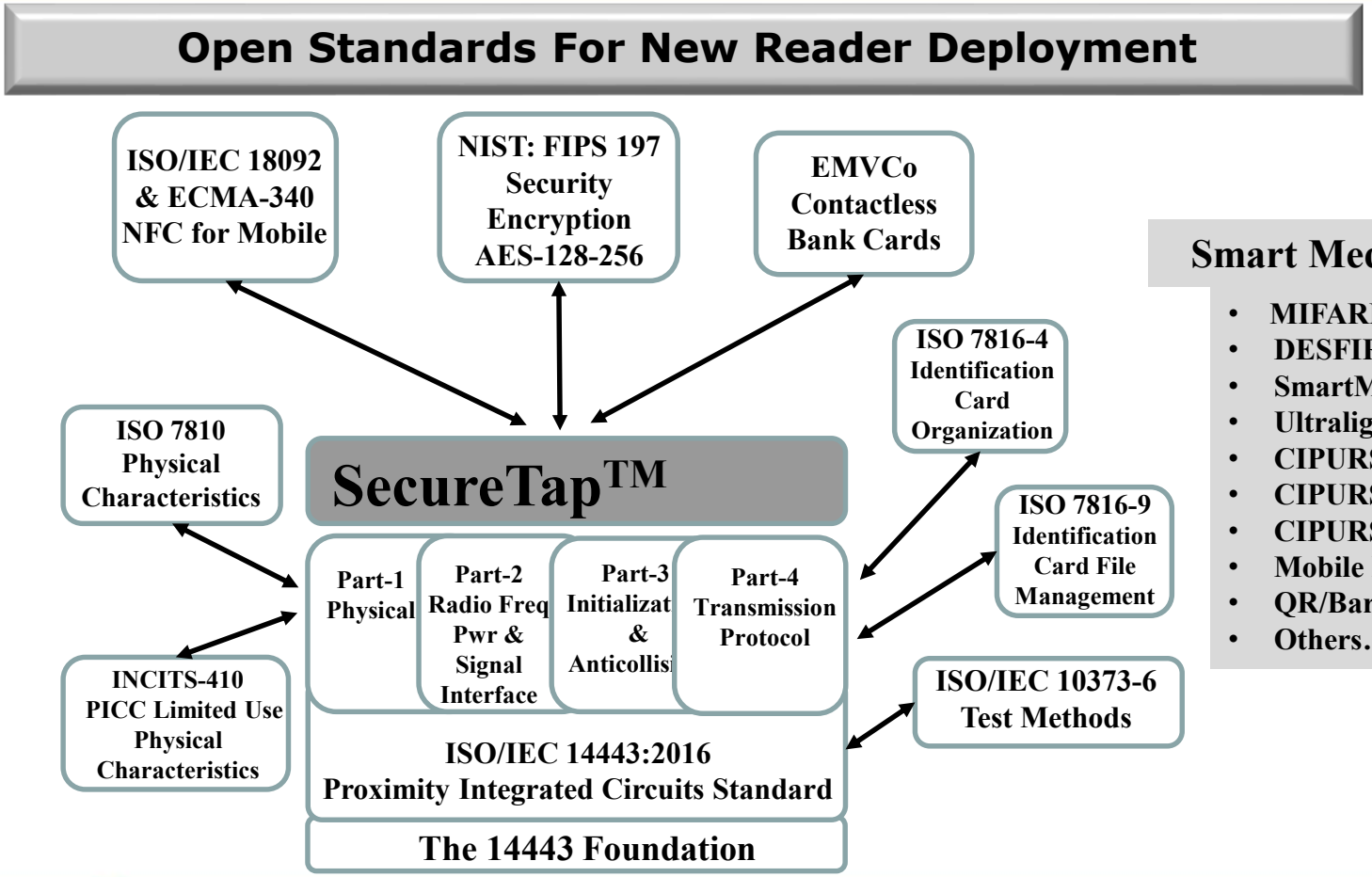
Transit & Retail Industry Payment Migration

- **<u>Technological advances</u> and <u>user acceptance patterns</u> are creating <u>directional changes</u> in the adoption of transit applied contactless smart media.**



Source: Mass Transit Magazine, Feb. 2018 Issue
Masabi Sourced polled data

State of Transit with "Plug & Play" Transit Devices



Smart Media Types

- MIFARE Plus
- DESFIRE EV1/2
- SmartMX
- Ultralight-C
- CIPURSE-L
- CIPURSE-S
- CIPURSE-T
- Mobile Devices
- QR/Bar Code
- Others…

What should “Our” Transit FC Systems Support to Remain Competitive?

- Transit Systems must continue to provide riders with easy to purchase, easy to use fare payment choices that are sustainable
- Having the option to specify and procure more than one reader brings lower system cost and more payment choices via added competition while reducing capital investment
- Non-System Integrator supplied “Buy America Compliant” transit reader products are available
- Providing secure API's that give the Transit Agency the option to plug-in alternative readers to communicate to back-office processors
- Opening up a competitive procurement environment for not only the readers but, a variety of smart fare media (cards, mobile, etc.)
- Readers that support Stored Value and or Account Based methodology and their associated fare payment applications

Offering the Transit Rider More Alternatives

- **Integrating the following within the confines of a traditional Fare Collection proprietary reader can lock the transit agency into being a captive customer for many years eliminating the transit agency's flexibility and negotiating criteria**

More Alternatives for the Rider:

- **Co-Branded Bank payment cards with benefits (EMV Compliance)**
- **Closed loop Stored Value cards issued by transit agency**
- **Closed Loop Account Based cards issued by transit agency**
- **QR/Bar Codes on mobile smart devices**
- **NFC and HCE payments via Google Pay, Samsung Pay, Apple Pay and PayPal, others…**
- **Traditional cash, coins, tokens, mag stripe and paper tickets.**

State of Transit "Plug & Play" Devices

- **The Transit FC/Revenue industry has wanted "Plug & Play" Readers for over a decade but…**
  - **Availability of transit readers designed to operate within this environment have been limited**
  - **System Integrators have been reluctant to integrate a third party reader. Stabilization of International Standards toward Smart Cards and Mobile Devices (NFC) have just recently surfaced**
  - **High Fully-functional reader cost has been an ongoing challenge for transit agencies.**

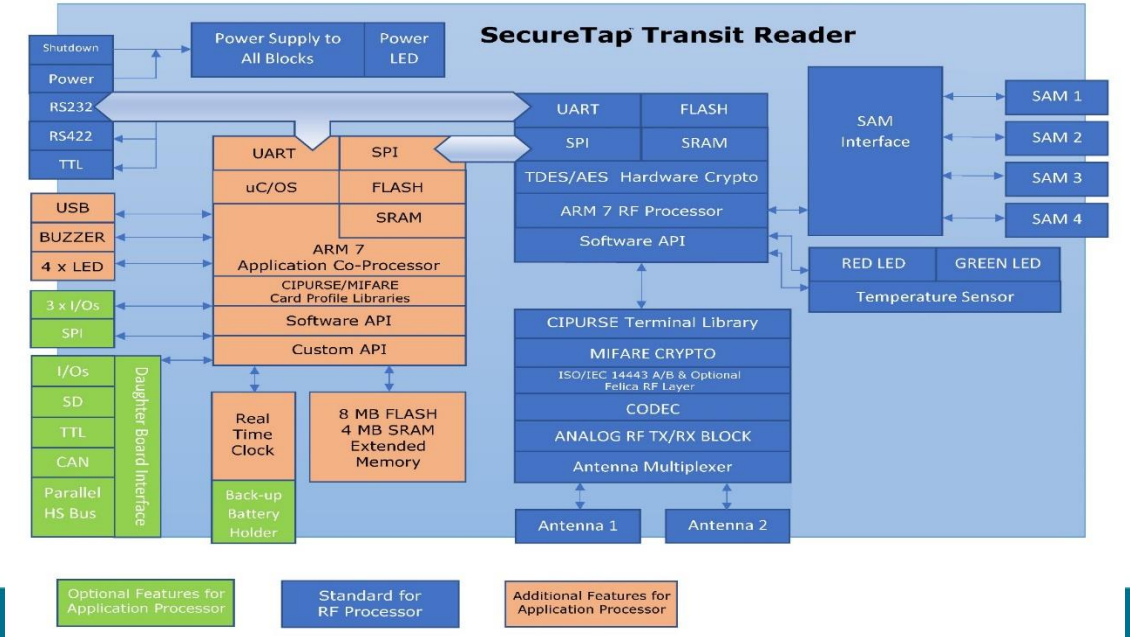
- **Expanded use of Validators and Tablets is changing the Plug & Play" landscape**
  - **Tablets coupled to a transit reader for ubiquitous payment acceptance is gaining acceptance**
  - **Validators continue to gain acceptance in replacing traditional payment acceptance devices on Bus and Commuter Rail.**

State of Transit "Plug & Play" Devices Continued…

- **Physical and Functional Attributes of a "Plug & Play" Reader for Transit**
  - **The Reader must be designed to allow for easy mechanical and functional integration within existing: Faregates, TVMs, Validators and Fareboxes, POS, etc.**
  - **The Reader must support dual antenna capability with the option of both a rectangular and/or circular antenna physical geometry**
- **What about the PC/SC standard?**
  - **Advantage of hosted PC/SC; Applications do not have to acknowledge the details corresponding to the smart card reader when communicating with the smart card or host. (*Providing for the ability to adopt new payments solutions with minimal system integrators core HW/SW modifications*)**
  - **Agency application(s) can function with any reader that complies with the PC/SC standard, this environment is based on Microsoft's Window platforms supporting a smart card resource manager with LINUX.**

A Fully-functional “Plug & Play” Systems Reader Architecture Should Have:

- A true dual processor architecture for application flexibility and fast agency FC processing
- Large FLASH and SRAM memory capacity for localized data store (Autoload, etc.)
- Flexible I/O and Comms: USB, RS232, JTAG, TTL, etc.
- Open Standards compliant (14443, 18092, EMV, etc.)
- Cost effective multiple reader implementation



A Transit Reader Solution for Today The SecureTap™ Reader

Brush INDUSTRIES™

WWW.BRUSHINDUSTRIES.COM

SecureTap™ Contactless Reader for Transit

optional external antenna

The SecureTap™ Contactless Reader Module brings contactless reading, processing and secure communications technologies together in a single, flexible product platform for public transportation closed-loop applications.

The Brush SecureTap™ reader module is designed for integration into fare boxes, validators and transit gates. Its robust construction is suitable for high traffic applications in public areas and the intuitive design simplifies installation and retrofitting applications.

If your application includes multiple technologies for fare gate, fare box or fare validation, Brush can customize the SecureTap reader to include media such as magnetic stripe, QR and barcodes, and even Bluetooth Low Energy for future applications.

- **Transit Proven**
- **Transit Ready**
- **Transit Designed**

The Feature Set

- Off-the-shelf, non-proprietary ISO/IEC 14443:2016, 15693, and 18092 mobile compliant reader
- Designed for contactless public transit Closed Loop and optional Open Payments cards, and mobile applications
- Supporting 4 high-speed SAM sockets (ID000 format)
- Small footprint with rectangular or circular transit antenna
- Supports NFC RF protocol
- Integrated support for MIFARE-Classic, DESFIRE EV1/2, Ultralight, MIFARE 2/4K Plus, CIPURSE L, S & T - profiles
- Fully customizable firmware with large SRAM and FLASH Memory
- Remote downloadable firmware upgrades
- Remote Autoload support
- Available in three cost effective configurations
- Buy America compliant (Manufactured in the USA)
- ESD protected serial interfaces
- Fraud attack resistant
- Designed for power efficiency

Conclusion and Summary

- **The FC Transit Industry is actively involved in new payment technologies and changing User preferences**
- **System integration is never a simple matter; the initial task of adding alternative multi-sources devices such as a reader requires a reader that is designed to reduce integration complexities**
- **Having a Non-System Integrator supplied reader offers the transit agency with added functional flexibility and the opportunity of substantial cost savings**
- **Until recently, Transit Agencies have not had much opportunity to adopt a non-system integrator owned reader solution**
- **A Transit Reader must be designed for Transit Applications**
  - **Open Standards Compliant**
  - **Supporting multiple IC/card types to yield competitive procurement savings**
  - **Application User friendly**

Thank You!

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The Action Before The Transaction™

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