



Smart Information for a Sustainable World

Floyd Diaz Telvent

Card Brands

VISA

MasterCard
paypass™



**AMERICAN
EXPRESS**

DISCOVER®
NETWORK
zip

Public Transit

Advantages

- ***Outsourced Card Management***
- **↓ *Equipment***
- **↓ *Costs***
- ***Reduce the use of cash***
- ***Open System***

Disadvantages

- ***Complex Back Office***
 - ***Transfers***
 - ***Discounts and loyalty programs***
- ***Concession fares must register***
- ***Cellular Network for authorization***
- ***Enforcement***
- ***No prepayment***
- ***Fees***

Open Payment Realities

- Limited system wide experience (CTA and SEPTA have awarded)
- Private card for the unbanked and providing the public a choice
- No firm figures on bank charges
 - ▶ Employ techniques to minimize charges
- Work force changes
 - ▶ existing positions for outdated business process eliminated or redirected
- New Business Processes Requirements/Obsolete Processes Phase-Out
- Transition – New technology, new fare structure, new payment
 - ▶ Cut-over plan, marketing, Agency/public buy-in
- Authorizing a transaction – account vs. non-account (speed of transaction) – who takes the risk?
- Security of data – end-to-end (PCI DSS)

Open Payment Realities con't

- Reload of account – automate, extensive, convenient,
 - NFC technology – emerging and must be considered in design
 - NFC phones can allow transit app as well as credit card app
- Revenue sharing opportunities
- Complex fare management/multi agency/multi application
- Convenient for multi-agency commercial rules
- Multi-application (parking, tolls, municipal card, etc.)
- Reduced Maintenance Costs
- Technology is ideal for SaaS

Special Fares-Open Payment

- Concession fares (student, senior, ...)
 - ▶ Must be registered as an account
 - ▶ Indication on card an option
 - ▶ Non-account users cannot enjoy any concessionary fares
- Special event or one-off fares managed by clearing house
- Frequent user discount – managed by clearing house
- “Autoload” discount managed by clearing house
 - ▶ Goal – high % autoload to reduce overall operational costs
- Hand-held device for inspector

Realtime Validation on Vehicles

- High speed connectivity to buses and stations
- Rail – generally access to HS data lines
- Bus – dependent on cellular and/or equivalent infrastructure
- Separate for account holders vs. non-account holders

■ Account Holders

- ▶ Authorization at Clearing House

■ Non-Account Holders

- ▶ Additional step - payment gateway
- ▶ No guarantees as to round trip time

Validation on Vehicles con't

■ Anatomy of a transaction:

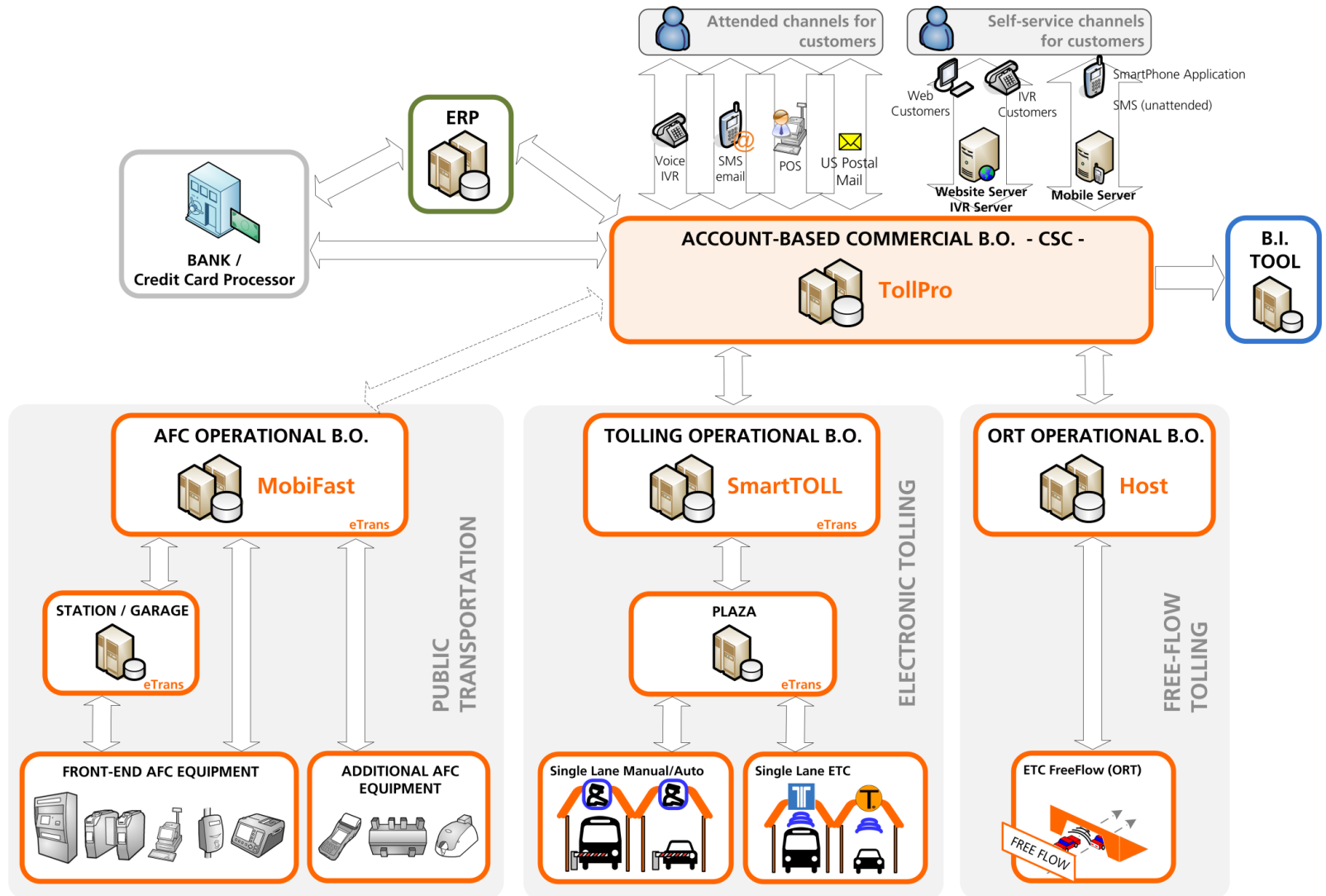
- ▶ Read the card – 100 ms
- ▶ Field Device to communication Server – 20 ms
- ▶ Communication server to Agency Network – 20 ms
- ▶ Agency Network to Clearing House – 20 ms
- ▶ Clearing House to process transaction – 5 ms
- ▶ Clearing House to Agency Network – 20 ms
- ▶ Agency Network to Communication Server – 20 ms
- ▶ Communication Server to Field Device – 20 ms

■ Total time – 225 ms ideal conditions

■ Assumptions

- ▶ 100 Mbit/s network maximum theoretical download peak bandwidth for a 4G network
- ▶ 50% of 100Mbit/s network is dedicated for realtime messaging – 5000 validation transactions
- ▶ No re-tries, latencies, payment gateway or customer errors

Payment Solutions Diagram



Thank-you Questions?

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Transaction flow

