

U.S. ETC System Interoperability

Transportation Innovations, Inc.

9/2/2009



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U.S. ETC System Interoperability

- Definition
- Benefits
- Genesis of U.S. interoperability
- Existing schemes
- Future

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Interoperability Definition

- Seamless access to multiple systems; one OBU, one account, one contract
- Technical
- Contractual
- Procedural

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Technical Interoperability

- RFID standards
 - Frequency
 - Protocols
 - Message sets
- Competitive multiple supplier environment
 - Tags
 - Readers

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Contractual Interoperability

Business Rules

- Not all business rules must be standardized
 - The more similar the more seamless the experience
- Tag issuance and CSC practices
- Rules on image tolling
- Agency transaction clearance process
- Violation processing standards

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Contractual Interoperability

- Exchange relationship
 - Cost agreement (credit card fees, processing fees)
- Pricing (do you want to be a tag distributor?)
 - Tags
 - Fees
 - Violations

Procedural Interoperability

- Data transfer record specifications
- Security standards
- Privacy procedures
- System interface for transaction processing
 - Transactions with invalid transponders
 - Valid accounts, no transponder
 - filters for charging errors

Benefits of Interoperability

- Economic
 - Freight (\$1.00/minute for tractor trailer)
 - Passenger
 - Missed business meeting
- Customer convenience
 - One transponder, one account one contact
- Reduced accidents
 - Recent report by NHTSA

Genesis of U.S. Interoperability

- ETC on individual systems
 - OOCEA and FL Turnpike
- Statewide Interoperability – FL, TX, NY
- Regional Interoperability – IAG, Title 21
- National Interoperability? VII?
- Each stage was born of necessity rather than a result of planning
- Need for international interoperability?

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US Interoperability IAG

- 22 agencies, 9 states, a concessionaire
- Over 2500 lanes of equipment & 16 MM tags
- Average of 30% of revenue from another agency
- File exchanges each evening
- Another state will join next year
- Mark IV tags and readers (proprietary)
- Eight clearinghouses

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US Interoperability IAG

- 4 NY agencies & New Hampshire
- NJ agencies, Delaware & Burlington County
- Massachusetts agencies, Maine and West Virginia
- Several states have their own clearinghouse
 - Maryland
 - Virginia
 - Illinois
 - Pennsylvania
 - Indiana

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US Interoperability Schemes

- CA Title 21
 - Standard in the statute of law
 - Open standard multiple manufacturers
 - 3 MM tags, 300 lanes of equipment
- Existing agencies within CA have become interoperable
 - MTC in San Francisco
 - Southern California
 - SR 91, SR 125, OCTA, TCA

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US Interoperability

- Out of necessity
- National technical standard does not exist
- Contractual interoperability
 - Between each pair of agencies
- Procedural
 - Limited by the ETC systems capabilities

Future of U.S. Interoperability

- VII and Ubiquity
 - Tags manufactured on all vehicles
 - Dual readers on all toll roads
 - Each customer must be able to opt out
- Electronic Vehicle Registration
 - Tags required on vehicles by government
 - Ubiquity of readers not required
 - Each customer must be able to opt out

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Summary

- An evolved process based on necessity and proximity
- Tremendous benefits
- Uncertain future for ubiquity

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