

# Beyond Benefits and Costs: Understanding Outcomes of ITS Deployments in Public Transit

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dg.0 2002 Conference  
ICTs in Urban Transportation  
May 21, 2002

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# Genesis of Research

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- Several FOT evaluations
- Common explanations for outcomes
- Critical importance of institutional and organizational issues
- Is there a theme here?

# Purpose of Research

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- Understand outcomes of public transit FOTs
- Emphasis on multi-agency FOTs
- Focus on institutions
- Lessons learned for future ITS implementation

# Why ITS in Public Transit?

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- Background
  - Public transit's declining market share
  - Efforts to increase attractiveness of public transit for choice riders
- Improve efficiency, productivity
  - APCs, AVL, electronic fare media, automated dispatching
  - Service integration

# Challenges

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- Industry structure
  - Dependence on large subsidies →
  - Political considerations in service decisions
  - Strong labor unions
- Spatial monopolies
  - Geographical segmentation of transit service
  - Growing reliance on local subsidies →
  - Benefits to local residents; no incentive for service integration
- Small transit systems
  - Limited technical capacity

# Case Study Approach

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- Revisit six public transit FOTs
- Mix of single agency, multi-agency FOTs
- Published reports, ex-post site visits, interviews with key participants

# Case Studies

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- WMATA SmarTrip
- CTA SmartCard
- San Francisco Bay Area TransLink
- Ventura County Smart Card
- Santa Clara County Automated Dispatching
- San Gabriel Valley Smart Shuttle

# WMATA SmarTrip

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When	1999 – 2000
What	Contactless fare card
Why	Fare integrations for bus, rail, parking lots
Who	WMATA + vendors

# CTA SmartCard

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When	2000 – 2001
What	Contactless fare card
Why	Fare integration for bus and rail
Who	RTA, CTA, PACE + vendors

# SF Bay Area TransLink

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When	1993 – 1994
What	Automated fare card
Why	Fare integration for bus and rail
Who	MTC, BART, BART Express, CCCTA + consultants, vendors

# Ventura County Smart Card

When	1995 – 1997
What	Contactless fare cards, AVL, APCs
Why	Countywide integration of public transit services
Who	VCTC, SCAT, Ojai, Camarillo, Fillmore, Moorpark, Simi Valley, Thousand Oaks, contract service operators + technology integrator

# Santa Clara County Automated Dispatching

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When	1994 - 1996
What	Automated dispatching, trip scheduling, AVL
Why	Increase capacity for ADA paratransit
Who	Santa Clara VTA, contract service provider + vendor

# San Gabriel Valley Smart Shuttle

When	1998 – 2000
What	Automated dispatching, AVL, inter-agency communications system
Why	Demonstrate interoperability between transit and paratransit
Who	SCAG, Foothill Transit, Monrovia, Arcadia, Duarte, contract service providers, technology integrator + vendors



# Outcomes

FOT	All elements deployed?	All elements function?	objectives achieved?
WMATA	NO	NO	YES
CTA	YES	YES	YES
TransLink	YES	NO	MIXED
Ventura	YES	NO	NO
Santa Clara	YES	YES	YES
SGV	YES	NO	NO



# Integration Spectrum

	TECHNOLOGY INTEGRATION →							SERVICE INTEGRATION
	Front-end interface	Back-end interface	Applications compatibility	Formal data standard and exchange agreement	Formal security management agreement	Cost and revenue sharing agreement	Formal operations agreement	Shared governance
San Gabriel Valley		√						
Chicago	√	√	√	√	√	√	√	√
Ventura	√	√	√?					
SF Bay Area	√	√	√	√		√	√	

# Explaining FOT Outcomes 1

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- Technical complexity
  - Mature technology, standard application
  - Interagency communications, data exchange
- Multiple partners and service integration
  - Interagency agreements re operating policies
  - Different polices = more technical complexity
  - Project management and control
  - Lack of common objectives among participants
  - Regional goals vs operator goals

# Explaining FOT Outcomes 2

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- Technical capacity
  - Computer literacy of equipment users
  - Maintenance of equipment
  - Limited training budgets
  - Communications between technology integrators, vendors and system users
    - Intimidation of technical jargon
    - Underestimation of technical complexity

# Explaining FOT Outcomes 3

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- Institutional capacity
  - Technology does not solve institutional problems
    - Integrated technology  $\neq$  integrated service
  - Pre-existing agreements, interagency relationships
  - Clear project goals
  - Effective project management
    - Flexibility, response to problems
    - Realistic expectations

# Lessons Learned for ITS Implementation 1

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- Basic feasibility check
  - Will ITS solve the problem?
  - Is it the best solution?
- Clear goals and objectives
  - -Technology solution consistent with objectives
  - -Agreed upon by all parties
- Formal institutional arrangements
  - Pre-existing relationships
  - Written agreements
  - Appropriate allocation of responsibility and risk

# Lessons Learned for ITS Implementation 2

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- Incremental technology implementation
  - Minimizes burden on participants
  - Avoids potential costly mistakes
  - Allows learning
- Technical capacity
  - Don't assume technical literacy
  - Invest in training and support

# Lessons Learned for ITS Implementation 3

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- Benefits to all participants
  - Single agency tests
    - Benefits and costs accrue to agency
    - Built-in checks
  - Cooperative action requires justification – a problem that can be solved to the benefit of all parties