Boston Regional ITS Architecture

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There are risks and costs to a program of action. But they are far less than the long-range risks and costs of comfortable inaction.

John F. Kennedy (1917 - 1963)
Bottom Line

- **Institutional Change**
  - Fragmented individual agencies
  - Consolidated Operations Center required

- **Use of Technology**
  - Need to leverage on the potentials, benefits and flexibilities that ITS brings to the system
Agenda

- Regional Needs
- User Centric Systems
- Flexibility
- FHWA Rules
- Conclusion
Stakeholder Identified Regional Needs

- Safety and Security
- Communications Infrastructure
- Operations and Maintenance
- Congestion Management
- Transit Demand
- Para-Transit Efficiency
- Information Sharing

Assessment: Needs analysis captures regional requirements.
Regional Needs
Safety and Security (1 of 7)

IN ITS PLAN:
- Event (Incident/Accident) management
- Information Sharing
- Transit Call Boxes

Critique of Plan:
- Focus on Security
- Reactive vs. Proactive

OUR RECOMMENDATIONS:
- Pedestrian Safety
- Consolidated Operations Center
- Port Security
- CVO Security
Regional Needs
Communications Infrastructure (2 of 7)

IN ITS PLAN:
- Communication Direct Lines
- Computer Aided Dispatch/ Actual Vehicle Location
- Massachusetts Interagency Video Information System (MIVIS)

Critique of Plan:
- Identified cost of leased lines…new fix to old problem.
- Failed to capture structure problems.

OUR RECOMMENDATIONS:
- Leverage Technology
- Consolidated Operations Center
IN ITS PLAN

- Event management
- Information Sharing
- Computer Aided Dispatching (CAD)/Automatic Vehicle Location (AVL)
- 511
- Signal Priorities

Critique of Plan:

- Focus on response to incidents
- Fails to address integration or consolidation of assets

OUR RECOMMENDATIONS:

- Consolidated Operations Center
- Cooperative Maintenance plans
The average driver was stuck in traffic or forced to drive below the posted speed limit for 51 hours in 2003, and Boston ranks 13th worst congested city in the U.S. (Texas Transportation Institute)

“Improve congestion through congestion management”

**IN ITS PLAN:**
- Event Reporting System
- Expansion of MIVIS
- 511

**OUR RECOMMENDATIONS:**
- Congestion Pricing
- Variable Parking Pricing Scheme
Regional Needs
Transit Demand (5 of 7)

- More than 20% of daily trips in Boston Metro are transit trips
- Need to improve transit service to improve transit demand

IN ITS PLAN:
- CAD
- AVL
- Transit Signal Priority

OUR RECOMMENDATIONS:
- Transit ITS initiatives satisfactory
- Coordinate with Congestion Management efforts
Paratransit service providers desire ITS solutions to improve their efficiency.

**IN ITS PLAN:**
- CAD
- AVL
- 511

**ON TRACK FOR EFFICIENT OPERATIONS:**
- Better coordination with fixed-route transit
- Combined paratransit trips
Regional Needs
Information Sharing (7 of 7)

- Need for information sharing amongst the numerous Boston agencies including traffic data, information on incident or other events, and video feeds

**IN ITS PLAN:**
- Event Reporting System
- Expansion of MIVIS
- Transportation Data Archiving System

**SOLID COMMUNICATIONS SETUP WILL BE CRUTIAL**
- Common operations center
- Wireless Local Area Network (LAN)
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User-Centric Systems

Measure Metrics

- Multi-Modality
- Flexible travelers
- Emergency services
- Other services

<table>
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<tr>
<th>MBTA Integrated Regional Fare Cards</th>
<th>511</th>
<th>VMS</th>
<th>Emergency Management Network, Interagency Communications Network, Event reporting and Video Integration Systems</th>
<th>Cashless &amp; Convenient</th>
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Agenda

- Regional Needs
- User Centric Systems
- Flexibility
- FHWA Rules
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Flexibility

- Ability to change future configuration
- Uncertainty Management => Adds value
- Types
  - Fiscal, Institutional, Technical, **Operational**
- ITS provides for Operational flexibility
ITS provides operational flexibility:

Problem: (example)
- Congestion in Boston

Traditional Solution:
- $14 billion Big Dig Infrastructure

ITS Solution: (example)
- Congestion Pricing

How Flexibility Provided:
- More cost-effective ways to mitigate problem
- Option of change/abandon exercised easily in future

By Managing *existing* Infrastructure at lower costs
ITS provides operational flexibility:

**Problem: (example)**
- Limited leveraging of ITS capabilities: *only* sharing of fragmented info feeds
  - Different organizations have individual equipment
- System upgrades expensive and difficult

**Recommendation for better ITS:**
- common data gathering
  - Integrated data sourcing infrastructure => Cost effective O&M

**How Flexibility Provided:**
- Provides way to manage uncertainties as an integrated team
- Less risk aversion and flexibility to take on projects
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FHWA Final Rule

- Boston met Final Rule – but not enough on operations/standards
  - Set of standardized components
    - Each region chooses according to need
    - Why not do this with institutional structures/O&M?
  - Technical, institutional integration strategies
    - No mention of Operations and Management
    - No definitions for design standards
  - FTA Final Rule and Transportation Planning Policy separate
  - Upgrading existing systems discouraged
    - Why not provide for O&M/institutional upgrade?
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Consolidated Operations Center

- Multiple agencies work together
- Share information directly.

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Conclusion

- Consolidated Operations Center
- Updated use of technology
  - Pedestrian/Bike Safety
  - CVO/Port Safety and Security
  - Pricing
    - Congestion and Parking
  - Wireless LAN
QUESTIONS???

Whenever you have an efficient government, you have a dictatorship.

Harry S Truman (1884 - 1972), Lecture at Columbia University, 28 Apr. 1959