WHAT HAVE WE LEARNED in ITS?

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WHAT HAVE WE LEARNED in ITS?

- Three critical dimensions
  - ✓Technology
  - ✓Systems
  - ✓Institutions
- Two primary perspectives
  - ✓Customers
  - ✓Operators

TECHNOLOGY

- The ITS-4 technologies
  - ✓ Sensing
  - ✓ Communicating
  - ✓ Computing
  - ✓ Algorithms - only functional issue
    - e.g. Adaptive Traffic Signal Control
- The issues:
  - ✓ Cost
  - ✓ Ease of use

WHAT HAVE WE LEARNED in ITS?

➢ Technology

✓ The issues are cost and ease of use.

➢ Systems

✓ The issue is integration.

➢ Institutions

✓ The major issues fall into this category.

Major Institutional Issues

- Intra-jurisdictional questions
- Regional perspectives
- Funding budgets for operations
- Institutionalized operations/ITS
- System integration
- Training and retaining qualified staff

One Clear Winner

Automated Red Light Enforcement

➢ Why?

✓ Simple, stand-alone

✓ Safety-related

✓ Relatively inexpensive

✓ Provides a revenue stream

ITS Roundtable 1
Freeway & Incident Management

➢ Core Technologies

- ✓ Transportation Management Centers
- ✓ Portable Transportation Management Centers
- ✓ Road Closure and Restriction Systems
- ✓ Automatic Incident Detection Systems
- ✓ Vehicles as Probes
- ✓ Video Display Systems
- ✓ Ramp Metering

ITS Roundtable 1
Freeway & Incident Management

➢ Core Technologies (cont.)

  ✓ Dynamic Message Signs

  ✓ Highway Advisory Radio

  ✓ Dynamic Lane Control

  ✓ Dynamic Speed Control

  ✓ Geographic Information Systems

  ✓ Graphic User Interfaces

  ✓ Local Area Networking

  ✓ Database Management Systems

ITS Roundtable 1
Freeway & Incident Management

➢ Core Issues
- ✓ Greatest challenges are institutional
  - ● No immense technical challenges to overcome
- ✓ Increasing automation, standardization and interoperability
- ✓ Shifting from responsive to predictive/ preventive action
- ✓ Diverse environments:
  - ● big urban, small/ medium urban, rural
- ✓ Need for a regional perspective

ITS Roundtable 1
Freeway & Incident Management

➢ Core Issues (cont.)

✓ Integration across systems, modes, and functions

✓ Need to institutionalize incident management

✓ Measuring performance and demonstrating benefits

✓ Long-term commitment to funding operation and maintenance

ITS Roundtable 1
Freeway & Incident Management

➢ Core Issues (cont.)

  ✓ Agency staffing challenges

  ➢ What is the proper role for privatization?

  ✓ Centralized v. decentralized control strategies

ITS Roundtable 1
Freeway & Incident Management

➤ How to sustain long-term relationships?

  ✓ Increased professionalism through training

  ✓ Top-down support, especially budgetary

  ✓ Bottom-up dialog

   • Fire, Police, EMS, Wrecking crews

  ✓ Need to integrate incident management into regional planning cycle

  ✓ Identify and nurture "champions"

  ✓ Plan coherent, traceable actions over time

ITS Roundtable 1
Freeway & Incident Management

➢ How to sustain long-term relationships? (cont.)

   ✓ Integrate new stuff into existing structures

   ✓ Structure funding for the long-term

      ➢ Fund on-going service, not one-time capital investment

   ✓ New Federal matching policy is needed

      ➢ Zero up front match with in-kind contributions to follow

   ✓ Allow mission statements to differ for different agencies

ITS Roundtable 1
Freeway & Incident Management

➢ How to sustain long-term relationships? (cont.)

  ✓ Customize National guidelines on incident management to local area

    ➢ Guidelines forthcoming from USDOT

ITS Roundtable 2
Arterial Management

➤Facilitator:

Lyle Berg, City of Bloomington, Minnesota

➤Presenter:

Mark Carter, SAIC

➤Notetaker:

Brandy Hicks, SAIC

ITS Roundtable 2
Arterial Management

➢ Adaptive Control Strategies
  ✓ Potential for substantial benefits
  ✓ However, not widely deployed
    ➢ 15 sites nationally, 4 of these FOT's
  ✓ Why?
    ➢ Concerns that algorithm is not yet mature
      ✓ e.g. treatment of over-saturation
    ➢ Prohibitive costs: Both deployment and O&M
    ➢ System complexity: Additional training required; Implementation issues

ITS Roundtable 2
Arterial Management

- ➤ ATIS for Arterials
  - ✓ Public expects wide range of information
  - ✓ Studies suggest safety and delay benefits
  - ✓ However, not yet widely deployed
    - ➤ Web sites most popular medium
    - ➤ But used by only 8% of agencies
  - ✓ Why?
    - ➤ Arterial surveillance shortcomings
    - ➤ May be addressed by new technologies - cell phones

ITS Roundtable 2
Arterial Management

- Integration of ATMS
  - From one system to another
    - Fairly widespread
  - With emergency vehicles
    - Preemption successful, but more money needed
  - With transit
    - Limited deployment - Concern over tradeoffs
  - With freeways
    - Very limited deployment - Technological and institutional issues

ITS Roundtable 3
Traveler Information Systems

➢Facilitator:

Catherine Bradshaw, University of Washington

➢Presenter:

Jane Lappin, EG&G/Volpe Center

➢Notetaker:

Cynthia Maloney, Volpe Center

ITS Roundtable 3
Traveler Information Systems

➢ ATIS consumers value:

- ✓ Quality of information
- ✓ Accessibility
- ✓ Timely information
- ✓ Usable interface
- ✓ Free

ITS Roundtable 3
Traveler Information Systems

➢ ATIS consumer demand factors:

  ✓ Regional traffic congestion

  ✓ Transportation network characteristics

  ✓ ATIS information quality

  ✓ Quality of ATIS user interface

  ✓ Trip characteristics

  ✓ Drivers' characteristics

ITS Roundtable 3
Traveler Information Systems

➢ What does the ATIS future hold?

- ✓ People's expectations of information are rising
- ✓ Willingness to pay limited to most congested areas
- ✓ Traffic information will be offered as part of a package
- ✓ Internet likely to be basis of ATIS delivery

ITS Roundtable 4
Transit Mangagement

➢Facilitator:

Ginger Gherardi, Ventura County Transportation Commission

➢Presenter:

Robert Casey, Volpe Center

➢Notetaker:

Gary Ritter, Volpe Center

ITS Roundtable 4
Transit Management

➢ Reasons why people don't ride transit:

✓ Incompatible land-use patterns

✓ Free or cheap parking

✓ Lack of knowledge on how to access and use

✓ Lack of privacy

✓ Lack of comfort

✓ Travel time is too long and unreliable

✓ Doesn't go where people want to go when people want to go there

ITS Roundtable 4
Transit Management

➢ Reasons why people don't ride transit: (cont.)

- ✓ Too many stops
- ✓ Security concerns
- ✓ Can afford to drive
- ✓ Limited service outside of peaks
- ✓ Not suited for trip chaining
- ✓ Poor image
- ✓ Not easy to carry packages
- ✓ Cleanliness

ITS Roundtable 4
Transit Management

➢ Transit ITS Technologies

- ✓ Automatic Vehicle Location
- ✓ Operations Software
- ✓ Geographic Information Systems
- ✓ Mobile Data Terminals
- ✓ Silent Alarm/Covert Microphone
- ✓ Automated Passenger Counters
- ✓ Automated Passenger Information
- ✓ Vehicle Diagnostics
- ✓ Traffic Signal Priority
- ✓ Electronic Fare Payment

ITS Roundtable 4
Transit Management

➢ What does the APTS future hold?
- ✓ Steady increased in use of ITS technology
- ✓ Funding remains a critical issues
- ✓ Training needed
- ✓ Inertia to be overcome
- ✓ Integration is important:
  - ➢ Highway<->Transit
  - ➢ Multi-provider service
  - ➢ Inter-modal transfers

ITS Roundtable 4
Transit Management

➢ What does the APTS future hold (continued)?

✓ Lack of standards barrier to deployment

✓ Continue evaluations to determine benefits

➢ The question remains:

How to use ITS to fundamentally change transit operations and services?

ITS Roundtable 5
Cross-Cutting Tech

➢ Facilitator:

James Wright, Minnesota DOT

➢ Presenter:

Michael McGurrin, Mitretek Systems

➢ Notetaker:

James Bunch, Mitretek Systems

ITS Roundtable 5
Cross-Cutting Tech

- Surveillance
  - Key enabler for ATMS and ATIS
  - Successes:
    - Cell phone for incident reports
    - Video for incident verification
  - Jury is still out:
    - Cell phone geo-location for traffic probes
  - Recommendation: Encourage deployment
    - Incentives, Promotion, Minimum requirements for NHS

ITS Roundtable 5
Cross-Cutting Tech

- Communications
  - ✓ Successes: Internet
    - Pre-trip traveler information in ATIS
    - Credentials administration in CVO
  - ✓ Emerging technologies:
    - Wireless Internet
    - Automated information exchange
  - ✓ Caveat: Majority of Americans do not have Internet access, but the growth rate is high

ITS Roundtable 5
Cross-Cutting Tech

➤ Issues

  ✓ How to deal with rapidly changing technology?

    ➤ New standards

    ➤ Rapid obsolescence

    ➤ Affects purchased and leased equipment

  ✓ What are technologies for non-urban areas?

    ➤ Surveillance, communication over long distances

  ✓ How to ensure successful deployment of standards-based products?

    ➤ Product certification testing

    ➤ "Tiger Teams" to address deployment problems

ITS Roundtable 6 Commercial Veh

➢Facilitator:

Gary Nishite, California Dept. of Motor Vehicles

➢Presenter:

John Kinateder, Battelle

➢Notetaker:

Ruth Duncan, Battelle

ITS Roundtable 6 Commercial Veh

➢ Components of CVO:

  ✓ Roadside Operations

    ➢ Safety Information Exchange

    ➢ Electronic Screening

  ✓ Electronic Credentialing

    ➢ (Back office stuff)

  ✓ Fleet Management - not discussed

ITS Roundtable 6 Commercial Veh

➢ Deployment Challenges
  ✓ Voluntary carrier participation
    ➢ Electronic screening and credentialing systems
    ➢ Mandatory use of transponders is not politically feasible
  ✓ Consistency among states?
  ✓ Weigh station bypass *versus*
    tax collection and carrier data privacy
    (Truckers like the former and are concerned about the latter.)

ITS Roundtable 7
Cross-Cutting Institutional Issues

➢ Institutional issues are the most dominant barriers to deployment.

➢ Advice: Realize that they will arise and must be addressed early.

➢ Institutional Benefits Study
  ✓ Studied 4 MMDI sites
  ✓ Identified 9 successful approaches to deploying a metropolitan ITS

ITS Roundtable 7
Cross-Cutting Institutional Issues

➢ Nine Successful Approaches:

    1. Develop a regional perspective

    2. Make ITS visible

    3. Understand the nuances of partnering

    4. Plan for long-term operations and management

    5. Develop a regional management structure

    6. Facilitate ITS within your organization

    7. Identify appropriate procurement mechanisms

    8. Address intellectual property rights issues early

    9. Develop written policies

ITS Roundtable 7
Cross-Cutting Institutional Issues

➢ Ten Most Prominent Issues (in decreasing order as voted on by session attendees)

1. Awareness and perception of ITS

2. Long-term operations and management

3. Regional deployment

4. Human resources

5. Partnering

6. Ownership and use of resources

7. Procurement   9. Privacy

8. Intellectual property   10. Liability

What Have We Learned in ITS?

➢ Operations requires a long-term perspective:

- ✓ Institutionalize it!
- ✓ Budget-staying power
  - It's less expensive than capital facilities,   but it's not free.
- ✓ Staffing
- ✓ Maintenance
- ✓ Consider life-cycle costs (and benefits)

What Have We Learned in ITS?

➢ Human resources are vital:

✓ Professional Capacity Building

✓ The New Transportation Professional

✓ Rewards for operations staff (culture)

✓ Dealing with the need for new technical and policy skills

✓ Contracting in (*versus* contracting out) may provide a solution

What Have We Learned in ITS?

➢ Positioning ITS

    ➢ (Awareness and Perception)

➢ Work toward solving problems, but not pushing ITS solutions

➢ Two most important benefits:

    ✓ Safety

    ✓ Quality of Life

What Have We Learned in ITS?

Information for Operators

v.

Information for Customers

Sharing this information is
an issue in highways and transit

What Have We Learned in ITS?

➤ Partnerships: Recognize that public and private sector have different agendas

➤ Operators

  ✓ Infrastructure: Public sector dominated, Public service orientation

  ✓ Information Providers: Private sector, Profit orientation, Customer perspective

➤ Customers: Would benefit from an integration of the two perspectives

Recurring Theme I: Integration

➢ Importance of *System* Integration
  - Arterials   - Freeways
  - Surface Streets   - Public Transit

➢ Importance of *Service* Integration
  ✓ Incident Management
  ✓ Emergency Management
  ✓ Traveler Information
  ✓ Intermodal Services

➢ Importance of *Institutional* Integration

Recurring Theme I: Integration

➤ But, what's missing?

ATMS/ATIS Integration

There is no evaluative data on the technical, institutional or societal issues relating to integrating ATMS and ATIS, whereby the ATMS, which collects and processes a variety of network status data and estimates of future demand patterns, provides travelers (via ATIS services) with dynamic route guidance. This together with ATMS-derived effective operating strategies for the network, which account for customer response to ATIS-provided advice, can lead to both optimized network performance and optimized individual routes. While integration of system and service may create the best possible regional mobility, it is a complex and, as yet uncharted, enterprise.

Recurring Theme II:
Regional Opportunity of ITS

➢ Technologically

➢ Functionally

➢ Organizationally

➢ From a strategic planning perspective

Conclusions

➤ It's the Internet Age and people's expectations are changing.

➤ They are using sophisticated IT equipment in their everyday lives.

➤ They rely on information from multiple sources in a manner beyond our imagination even five years ago.

➤ "One Size Fits All" won't cut it in the world of highway or public transportation.