

# A Security-Oriented INFOstructure for Emergency Management

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# Topics

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- AASHTO/NCHRP Reports
- An Approach to Building a National Emergency Management Surface Transportation Information System

# AASHTO/NCHRP Reports

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- “A Guide to Highway Vulnerability Assessment for Critical Asset Identification and Protection”
    - Assess the vulnerabilities of physical assets
    - Develop possible countermeasures
    - Estimate capital and operating costs
    - Improve security operational planning
    - Six-step process
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# AASHTO/NCHRP Reports

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- “A Guide to Updating Highway Emergency Response Plans for Terrorist Incidents”
    - Description of existing emergency management planning practices
    - Changes in emergency management and response since 9/11 (WMD)
    - Process guidance (checklist) for updating emergency response plans
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# AASHTO/NCHRP Reports

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- “National Needs Assessment for Ensuring Transportation Infrastructure Security: Preliminary Estimate”
  - Costs associated with a terrorism-related security program for the nation’s highways
  - Six-year capital and operating costs for AASHTO “Bottom Line Report”

# Some Lessons

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- Interoperable & reliable communications
  - Understanding other agency roles
  - Federal presence and crime scene factors
  - Use of Incident Command System
  - Protecting first responders
  - Need for specific traffic control regimes
  - Heightened public concerns
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# Some ITS Considerations

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- Integration of TMCs with EMCs
  - Jurisdictional and geographic scale of information sharing
  - Security of TMCs and communications
  - Gathering reliable information along evacuation routes
  - Leveraging existing incident management groups
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# Contentions

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- Transportation management issues related to homeland security are serious and here to stay
  - There is urgent need for a national system to help meet these needs
  - We must be conscious of historic political motivations
  - The path to dedicated funding for getting started on INFOstructure lies in shaping a national system to meet homeland security needs
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# Motivations

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- Interstate Highway Program – National Defense
- ITS – Defense Conversion
- INFOstructure – Homeland Security

# System Development Principles

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- Define a vision
  - Develop a concept of operations and an architecture
  - Define a clear set of requirements
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- Don't try to do too much
  - Get the right people involved
  - Fund it adequately
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# Guiding Principles of a National System That Address Security

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- Emphasis must be on gathering and sharing information across agency and jurisdictional boundaries
    - Can't define fixed regional boundaries
  - Information must be reliable, but not necessarily precise
  - The system must be deployable in the short term
  - System deployment must be significant enough to show large scale user benefits
  - The system must satisfy the needs of:
    - Emergency and transportation management system operators
    - The traveling public
  - The system should also serve day-to-day transportation management and traveler information needs
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# Integrate Multiple Sources of Information

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- Computer-Aided Dispatch (CAD) systems for emergency/incident location and status information
- Direct travel time measurement through electronic tag tracking
- Telematics systems in vehicles
- Public agency ATMS
  - Detector data
  - Video surveillance
- Train and transit schedule and status information

# Computer-Aided Dispatch

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- Links between CAD and transportation systems now being developed locally, e.g., TravInfo and CAPWIN
  - But, numerous stand-alone deployments will be slow and expensive
  - A national network could be deployed in shorter time with less total public investment
  - System should incorporate information provided by on-the-scene responders (e.g., through a hand-held wireless devices or MDTs)
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# Travel Time Measurement

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- Travel time is the most useful piece of information for diversion advisories and trip planning purposes, especially for long distance trips necessitated by emergencies
- Electronic tag tracking already deployed in several locations
  - New York Metro area
  - Houston
- Needed tag penetration percentage is small for accurate travel time estimation purposes
- Other methods being explored

# Percentage of Tags Needed – TRANSMIT Evaluation

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- For Incident Detection
  - 10% with 1.5 miles antenna spacing
- For Travel Times/Speeds
  - Lower percentage is required

# Telematics

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- Commercial carriers have proprietary systems for fleet tracking that could provide road condition, incident and travel time data
  - Systems such as GM's OnStar have similar data
  - Future cars and trucks will have built-in data collection capabilities
  - Issues associated with use of private information must be explored and data exchange standards must be developed
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# Public Agency ATMS/ATIS

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- Volume, occupancy and speed information from detectors could be made available where they have been deployed locally
    - Difficult and costly to install and maintain as part of a national system
  - Sharing of video surveillance within a region would be helpful
    - Would add to communications capacity needs and cost as part of a national system design
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# Train and Transit Schedule and Status Information

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- September 11 experience demonstrated value of train and transit systems for evacuation purposes
- Trains can be used for longer distance evacuations, or may need to be diverted
- Transit data would be useful mostly on a local (as opposed to a national) basis

# Advantages of a National Approach

- It will enable the sharing of critical information sooner and at less expense than approaches that rely on local decisions to deploy extensive amounts of new infrastructure
- Relying on systems whose operations are well supported will improve reliability
- Deployment issues largely relate to system integration, and interfaces among system components can be standardized
- Several examples of local deployments can guide national deployment

# Issues

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- What is the Concept of Operations and Architecture?
  - How can the system be made secure?
  - What institutions are responsible? Who are all of the stakeholder participants in system design, deployment and operation?
  - What are the deployment and funding strategies? Distribute or centralized? Advantages/disadvantages?
  - How quickly can a system be planned and deployed?
  - Who provides the funding for ongoing operations and maintenance?
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# Conclusions

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- Take advantage of need to address homeland security issues
  - Define, define, define
  - Don't try to do everything right away
  - Take advantage of local innovation and national progress
  - Define a vision and concept that can generate political excitement
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