Traffic Operations Center Concepts for South Dakota

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Problem Description

- Los Angeles – “If you want to change lanes, you have to change cars.”
- New York City – “If you live in your car, you’d be home by now.”
- South Dakota – “Where you can change lanes while sleeping in your car.”
Problem Description

Define the most effective and economical means of managing traffic and emergency operations in South Dakota

- Need for a traffic operations center
- Form of the traffic operations center
Project Objectives

- Identify Functionality to Support Statewide Traffic Operations
- Assess Traffic Operations Functions and Systems
- Identify an Appropriate TOC Concept for SDDOT
- Develop a Strategic Deployment Plan
Project Approach

- Conduct a literature review
- Engage stakeholders throughout the state:
  - To identify key functions
  - To help define solutions
  - To facilitate new partnerships & strengthen existing ones
- Present alternative traffic operations center concepts and strategies
- Define final traffic operations center concept
- Develop strategic deployment plan
Key Findings

“Most traffic operations needs in South Dakota are event driven.”

Stakeholder Comment
Key Findings

- Need for a dedicated, focused organization for deploying, coordinating, operating and maintaining ITS
- Need for statewide policy, plans, procedures and standards enhancement
- Need for greater interregional coordination of traffic operations activities
- Need for greater coordination with emergency management
- Need for integrated set of tools & methods for traffic operations
- Need for dedicated funding
Traffic Operations Functions

- Freeway & Arterial Detection & Surveillance
- Arterial Traffic Signal Control
- Coordinated Incident & Emergency Management
- Traveler Information Dissemination
- Work Zone Traffic Management
- Road & Weather Condition Data Collection
- Maintenance & Construction Support
- Special Event Traffic Management
Road & Weather Condition Information

- One of most important functions

- Current Status:
  - Manual input from SDDOT field personnel to RCRS
  - Weather forecasting service
  - RWIS / ESS

- Areas for improvement:
  - RWIS / ESS maintenance and upgrade
  - Uniform procedures for reporting
  - Mobile data from maintenance vehicles
  - Partnership with State Patrol
  - Real-time RWIS data infusion into Road Condition Reports
South Dakota is a leader in MDSS

Current status:
- MDSS pooled fund study
- T1 communications to SDDOT facilities to support MDSS

Areas for improvement:
- Continued enhancement of MDSS
- Development of CDSS capabilities
- Education of staff on use & benefits
Detection and Surveillance

- Extensive statewide deployment not feasible
- Current status:
  - Mostly manual surveillance – field personnel/police
  - CCTV at select locations and ESS sites
  - No freeway detection for traffic data
- Areas for improvement:
  - Portable surveillance systems for special events
  - Partnerships with media for sharing CCTV images
Arterial Traffic Control

- Needed primarily in urban centers
- Current status:
  - Closed loop systems in Sioux Falls, Rapid City, Pierre & elsewhere
  - Emergency traffic signal pre-emption
  - Routine traffic signal optimization
- Areas for improvement:
  - Upgrade of closed loop systems to centralized control
  - Installation of detection for traffic responsive control
  - Expansion of emergency pre-emption capabilities
  - More frequent traffic signal timing updates
  - Coordination between arterial and freeway operations & systems
Coordinated Incident & Emergency Management

- South Dakota has high level of cooperation among agencies

  - Current status:
    - State Patrol & SDDOT have a close working relationship
    - RCRS enhanced to accept incident data
    - New facility for emergency management

  - Areas for improvement:
    - Formalized IM plans & procedures are needed
    - Incident Management Committee formation
    - Integration with 911 dispatch centers
    - More timely entry of incident data into RCRS
    - Stronger partnerships to leverage resources – TOC and EOC collocation
South Dakota was one of the first states to offer 511 services

Current status:
- 511 system offers weather related road conditions, work zones and events
- Strategic DMS installations

Areas for improvement:
- Process for incident identification and notification
- Enhancement of SafeTravelUSA website
- Share traveler information with adjacent states
- Uniform processes for DMS messages
Special Event Traffic Management

- Events often have statewide impact
- Current status:
  - Use of portable systems at Sturgis
  - Interagency special event planning
  - Limited use of TDM alternatives
- Areas for improvement:
  - Current mobile command center is inadequate
  - Use of 511 and other statewide media
  - Better coordination of traffic management with event organizers
Work Zone Traffic Management

- Work zones on I-90 & I-29 impact travel throughout region
- Current status:
  - DMS messages
  - Detour routing
  - Suspension of work during special events
  - Contractors provide public information
- Areas for improvement:
  - Greater use of portable ATMS devices
  - Real-time information via 511 and other media
  - Coordination with other states
Key Recommendations
1. Establish an Organizational Framework to Facilitate Traffic Operations

- Create an Office of Traffic Operations
- Establish a multidisciplinary ITS Steering Committee
  - Incident/Emergency Management Subcommittee
  - Special Event Traffic Subcommittee
  - Traffic Signal Subcommittee
- Develop organizational policies and procedures
- Develop statewide standards and practices
2. Formalize & Enhance Traffic Operations Plans & Procedures

- Develop a statewide traffic operations plan with ties to emergency management
- Clearly define operational guidelines and procedures for ITS devices
- Refine procedures for RCRS use, data entry, and content
- Establish a regular training program for traffic and incident/emergency management
- Establish a public information campaign
3. Establish Traffic Operations Presence in the Statewide EOC

- Collocate with State Radio Dispatch
- Define operational needs
  - Staffing
  - Hours / after-hours support
  - Equipment (Server, Workstations, Monitors)
- Define preliminary functions and capabilities (RCRS, DMS, CCTV, RWIS)
4. Implement Traffic Operations Centers in Pierre, Sioux Falls, and Rapid City

- Procure TOC software system
- Expand preliminary capabilities of Pierre TOC for full statewide and regional functionality
- Implement Regional TOC’s in Sioux Falls and Rapid City
5. Expand ITS Capabilities

- Establish virtual TOC capabilities for remote offices and partner facilities
- Address statewide ITS device deployment needs
- Enhance communications capabilities to remote locations
- Provide linkages to other states
- Provide additional functionality beyond core capabilities
  - 911 CAD / TOC interface
  - Asset Tracking & Management

- Systems Engineering Approach
- Statewide ITS Architecture
- ITS Standards
- Configuration Management
- Asset Management
7. Allocate Annual Funding for ITS Deployment, Operations, & Maintenance

- Mainstream ITS deployment and operations into normal project development and programming process
- Seek additional federal funding for ITS deployment and operations
- Establish annual capital & operating budgets for ITS
Traffic Operations Center Concept
Keys to Success

- **Consensus** on operational goals
- **Collaboration** among stakeholders
- **Coordination** of people and processes
- **Continuous** monitoring, measurement, and improvement
Benefits

- More accurate, timely, and comprehensive information for decision-makers and motorists
- Improved relations with the public
- Improved efficiency & effectiveness of operations
- Enhanced operational partnerships
- Greater support for funding

Greater Safety and Mobility

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