Intelligent Work Zones on Traffic Critical Projects

Tim Simodynes, ITS Engineer
National Rural ITS Conference / ITS Heartland
Branson, MO
August 26, 2014
“Traffic Critical Projects”

• Iowa DOT Management, Winter 2014

• Projects that can repeatedly or quickly lead to significant travel delays

• Proactive approach using ITS
2014 Proposed IWZ Locations (18 projects)
Resources

- Statewide TOC
- ATMS Software
- Communication Networks
- Existing ITS Devices
Resources:

Iowa Statewide Traffic Operations Center (TOC)

- Ames
- 24/7
Resources:

Iowa Statewide Traffic Operations Center (TOC)

- TransSuite ATMS
- Camera, Sensor and DMS Management
Resources:

Central Control of Permanent and Portable DMS

2013
Added the ability to control Portable DMS provided by Traffic Control Contractors
Resources:
Statewide DMS Network
Resources: Traffic Sensors
Resources: 300+ Cameras
Proposed Solutions

• TOC Monitoring with Traffic Sensors and Cameras
• Automated Queue Detection and Warning Systems with DMS
• Traffic Signal Preemptions
Solutions Looking for Problems
2014 Actual IWZ Locations (from 18, down to 11)
Early Decisions

• Sensor Types?
  • Wavetronix Side-fire Radar

• Communications?
  • DMS = Cell modems
  • Sensors = DOT Wireless Radios...
  • Cameras = DOT Wireless Radios
Early Decisions

• Method of Payment?
  • Deployment/Integration (per device)
  • Operation (per day)
  • Relocation (per DOT request)

• Number of Contracts?
  • Up to 3, by region
  • Selected 1 for all three regions
Early Questions

• System Monitoring Specifications?
  • Combination of DOT, IWZ Vendor and ITS Maintenance Vendor

• Duration of Contract?
  • One year with options up to 3 years
2014 Contract

• Assistance from SRF in writing contract and managing projects

• Qualifications and Cost-based selection
  • Street Smart Rentals out of Minnesota

• Integration Support from TransCore
2014 Contract

• Selection based on estimated quantities for 11 potential projects
  • Flexibility to add or remove devices and projects

• Currently 14 projects
  • Removed 2, Added 5
  • 56 Sensors, 3 Cameras, 40 DMS
2014 Actual IWZ Locations
Queue Detection System Process:

1) Slow traffic detected by portable sensors.
2) Sensors communicate to central server to process preprogrammed logic.
3) Logic from central server posts automated alert message to portable DMS and sends alert e-mail to TOC.
4) TOC verifies slow traffic via portable camera and dispatches appropriate response team, following project’s TMP/TIM.
2014 Lessons

• **MANY** steps required for success
  • Coordination with Construction
  • Deployment, Communications, Integration, System verification, Sensor calibration (speeds, volumes, classifications), Sensor monitoring, DMS monitoring
  • Queue detection systems
    • Logic development, implementation, verification, monitoring
  • Inform/educate all stakeholders:
    • TOC, District Staff (management, construction, maintenance), ITS Vendor, Prime contractor, Traffic control subcontractor, TIM staff, ITS Maintenance Contractor, ATMS programmers

• **Start Early!**

• **Have a Good Team!**
2014 Improvements

• Sensors on Cell Modems

• Sensor Data Tracking

• Automated DMS Location Tracking
  • via cell modems

• 511ia.org Integration of Cameras & DMS
Sensor Data Tracking Spreadsheet
2015 Traffic Critical Projects

• Much Earlier Start
  • Improved Communication

• Better coordination with TMP/TIM

• Broaden Toolbox with Additional technologies
  • Incorporate 3rd Party Traffic Data (INRIX)
  • Speed management / feedback
  • Trucks entering systems
Questions

Tim Simodynes, P.E.
ITS Engineer
Office of Traffic Operations

tim.simodynes@dot.iowa.gov
515.239.1606