Reading the Signs at MnDOT

Generating Roadwork Reports Automatically from Smart Arrow Boards

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“Self-driving car companies hoping to avoid active construction sites are screwed from the get-go, because the vast majority of states don't bother with databases detailing what work is happening where.”
MnDOT’s CARS system
It’s not just self-driving cars that are puzzled sometimes.
How can we better create and share reliable knowledge about work zones...for humans and computers?
Arrow Boards

Automating lane closure reports from roadwork sites.
THE STREET SMART RENTAL
“BLACK BOX”
How does it work?

LEFT ARROW
45.522054, -93.235279
• 20 arrow boards
• Highway trucks and pull-behind attenuators
• Goal to go statewide
Creating work zone knowledge: the data flow

- **Smart AB**: A signal from the field
- **IRIS (ATMS)**: Adding operational intelligence
- **CARS (ATIS)**: Spreading the knowledge
Step 1:

SmartAB

- Finds **active** arrow boards (power on, sign up)

- Creates new “incident” for IRIS with **lat/long** and **arrow type**.

- When sign is switched off, ends the “incident”
SmartAB locates an arrow board on Hwy 36
Step 2:
IRIS

- Monitors Smart AB & imports incidents
- Maps to highway trunk
- Identifies direction of travel
- Triggers DMS Plans
- Creates TMC situational awareness
IRIS imports the Smart AB signal as unconfirmed roadwork
Step 3: CARS & 511

- Monitors IRIS and imports arrow board roadwork reports
- Creates a traffic story
- Adds delay impacts & cameras
- Makes mobile work site events
- Spreads the knowledge
A traffic story emerges in CARS and 511
Human-friendly reports, weaving in cameras and delays
Dave Tody!
CARS also creates mobile work site reports.

Event location updates automatically about every 1-2 minutes.
And communicates the delay impacts
The story gets tweeted
And shared through an API (for Google, Waze, and other systems)
From data to knowledge, for humans & computers

Arrow Board
- Lat, Long
- What arrow?
- Sign on/off

IRIS
- Highway / lane mapping
- Direction of travel
- DMS messaging
- TMC situational awareness

CARS + 511
- Human-friendly explanations
- Traffic stories
- Integrates cameras
- Measure & report delay impacts
Lessons learned (so far)

1. Be mindful of DATA TRANSLATIONS as they pass from system to system.

2. Schedule intensive TESTING with system specialists and field operators.

3. Plan for ongoing hardware MAINTENANCE checks.

4. CREATE knowledge for both HUMANS and COMPUTERS.
The project partners
Thank you!

Questions?

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