Local Agency Traffic Data Collection

CTS Research Conference

Darin Mielke, P.E. – Carver County
Scott Petersen, P.E. – SRF Consulting Group
Two Projects with Related Goals

LRRB Research Implementation Committee

Traffic Data Collection
- Improvements
- Field Evaluation

Traffic Data Collection Processes
- Study

Is there better EQUIPMENT for collecting low volume traffic data?

Is there a better PROCESS for collecting county highway traffic data?

Local Agency Data Collection 2013-2014
Technical Advisory Panel

- Darin Mielke, Carver County
- Tim Becker, Sibley County
- Timothy Stahl, Jackson County
- Farideh Amiri, MnDOT
- Cassandra Isackson, MnDOT
- Benjamin Timerson, MnDOT
- Gene Hicks, MnDOT
- Mark Flinner, MnDOT
- Christy Prentice, MnDOT
- Carson Gorecki, MnDOT
- Malaki Ruranika, MnDOT
- Gordy Regenscheid, MnDOT
- Rick Kjonaas, MnDOT
- Walter Leu, MnDOT
- Mike Marti, SRF
- Renae Kuehl, SRF
- Erik Minge, SRF
- Scott Petersen, SRF
Two Projects with Related Goals

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Traffic Data Collection Improvements Field Evaluation

Traffic Data Collection Processes Study

Is there better **EQUIPMENT** for collecting low volume traffic data?

Is there a better **PROCESS** for collecting county highway traffic data?
Project Overview

- Tested traffic sensors in a low-volume environment
- Installed sensors at Test Site in Sibley County
- CSAH 9, north of Arlington, MN, two-lane, two-way road
Test Site
Sensors Tested

- Video
- Magnetometer
- Radar
- Raar
- Road Tubes
## Count Accuracy - Compared to ATR Baseline

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Percent Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>COUNTcam</td>
<td>2.4%</td>
</tr>
<tr>
<td>Scout</td>
<td>1.8%</td>
</tr>
<tr>
<td>Radar Recorder</td>
<td>1.0%</td>
</tr>
<tr>
<td>Wavetronix HD</td>
<td>2.4%</td>
</tr>
<tr>
<td>Houston Radar</td>
<td>4.1%</td>
</tr>
<tr>
<td>Sensys</td>
<td>1.5%</td>
</tr>
<tr>
<td>Road Tubes</td>
<td>6.8%</td>
</tr>
</tbody>
</table>
## Speed Error - Compared to ATR Baseline

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Percent Error*</th>
</tr>
</thead>
<tbody>
<tr>
<td>COUNTcam</td>
<td>N/A**</td>
</tr>
<tr>
<td>Scout</td>
<td>N/A**</td>
</tr>
<tr>
<td>Radar Recorder</td>
<td>1.2%</td>
</tr>
<tr>
<td>Wavetronix HD</td>
<td>1.2%</td>
</tr>
<tr>
<td>Houston Radar</td>
<td>3.5%</td>
</tr>
<tr>
<td>Sensys</td>
<td>5.9%</td>
</tr>
<tr>
<td>Road Tubes</td>
<td>4.2%</td>
</tr>
</tbody>
</table>
## Classification Accuracy - Compared to ATR

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Percent Matching Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>COUNTcam</td>
<td>93%</td>
</tr>
<tr>
<td>Scout</td>
<td>92%</td>
</tr>
<tr>
<td>Radar Recorder</td>
<td>92%</td>
</tr>
<tr>
<td>Wavetronix HD</td>
<td>96%</td>
</tr>
<tr>
<td>Houston Radar</td>
<td>91%*</td>
</tr>
<tr>
<td>Sensys</td>
<td>83%</td>
</tr>
<tr>
<td>Road Tubes</td>
<td>84%</td>
</tr>
<tr>
<td>Sensor</td>
<td>Volume Percent Error</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>COUNTcam</td>
<td>2.4%</td>
</tr>
<tr>
<td>Scout</td>
<td>1.8%</td>
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</table>
Evaluation Data Sheets

- Final Report contains high-level data sheets about each of the sensors
  - Description
  - Deployment
  - Cost
  - Data
• Low volume roads have different data collection requirements than high-volume roads
  - Sensors that require calibration are more difficult to calibrate on low-volume roads
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Project Overview

• Short-term traffic data collection in Minnesota
  - Most County Highway data is collected by MnDOT using road tubes
• Project compared traditional method with County and Consultant staff approaches
• Analyzed data from Sibley County and MnDOT (Le Sueur County)
# Agency Data Collection - Results

<table>
<thead>
<tr>
<th>Agency</th>
<th>Number of Sites with Acceptable Data</th>
<th>Total Hours</th>
<th>Total Hours per Accepted Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sibley County</td>
<td>151</td>
<td>250</td>
<td>1.66</td>
</tr>
<tr>
<td>MnDOT</td>
<td>270</td>
<td>204</td>
<td>0.76</td>
</tr>
<tr>
<td>Consultant</td>
<td>180</td>
<td>250</td>
<td>1.39</td>
</tr>
</tbody>
</table>

**Graph:**

- **Hours per Site**
  - **Sibley County:** 1.7
  - **MnDOT:** 0.6
  - **Consultant:** 1.4

Lower is better.
Problems Encountered

- Equipment failures
- Lack of equipment
- Procedural problems
- Lack of experience
- Difficulty in transferring data to MnDOT efficiently
• Project **improved relationships** between the counties and MnDOT TFA.

• Understanding of the nuances of traffic count procedures.
Lessons Learned

- Importance of quality, structured training
  - Second training session was necessary after Sibley County had some more experience with setting counters.
  - Best practice is to “shadow” experienced staff
Lessons Learned

• Importance of **experience** in conducting traffic counts. Sibley County rapidly became more efficient after some practice. Agencies should expect some early inefficiency.

• Necessity of **careful planning** around construction and events.
Lessons Learned

- Efficient data processing procedures of sending data to MnDOT for analysis.
- Importance of quick data analysis turnaround for conducting recounts.
Reports

- http://www.dot.state.mn.us/research/reports-2014.html
Contact

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