Develop Stand-Alone Vehicle Detection System for Remote Areas

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Objective

Develop a turn-key system for remote traffic monitoring that requires minimum human intervention following a “drop it and forget it” approach.
Outline

• Sponsor needs
• Methodology
• Findings
• Conclusions
Project Goals

- Deliver data through a website in near real-time
- Utilize “off-the-shelf” technology
- Require minimum field configuration
- Utilize satellite communication
- Involve battery power
- Integrate components into a custom cabinet
Sponsor Needs

- Reasonably accurate
- Detection of counts and speeds
- Data collection for two weeks
- Stand-alone system
- No solar panels
- Communication anywhere
- Low cost
- Blends with environment
- Ranger proof
Methodology

- Contacts
- Field tests
- More field tests
- Add magnetometer
- Wait for manufacturer
- Deliverables
- Marketing plan
Component List

- Radar detector (for speed).
- Magnetometer (for counts).
- Cellular modem.
- Satellite modem.
- Global Positioning System (GPS).
- Transceiver to interconnect PC and magnetometer during setup.
- Battery boxes (two) and 12v batteries.
- Battery recharging system.
- Fake rock to conceal the system.
Basic Components

Magnetometer

Transceiver

iCone and Battery Box

Rock Cover
Batteries

- 290 milliamps total power draw for the iCone system
- 12v supply (not using solar panels)
- 60 amp-hr battery in the barrel lasts 2 weeks
- Needs to be crash worthy (not liquid cell)
- Battery weight 50 lb too heavy
- Solution: two batteries
Field Tests

- iCone testing included:
  - Speed detection accuracy and other characteristics.
  - Battery life of the overall system.
  - Data upload speed and effectiveness.

- iCount testing included:
  - Count accuracy.
  - Puck longevity
  - Effective range of communication with iCone.
  - Battery life (in the magnetometer).
Riverside Tests

- Yamaha Silverado (year 2007).
- Kawasaki Ninja (year 2010).
- Class 8 tractor (Freightliner).
- Dodge minivan.
S.H. 6 Tests
## Findings - Speed Tests

<table>
<thead>
<tr>
<th>No. of Runs</th>
<th>Desired Speed</th>
<th>Sensor Location</th>
<th>Sensor Angle</th>
<th>No. Vehicles</th>
<th>Average Speed</th>
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<td>30</td>
<td>Edge of Ln</td>
<td>30</td>
<td>4</td>
<td>28.25</td>
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<td>4</td>
<td>55.45</td>
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<td>60</td>
<td>21 ft away</td>
<td>30</td>
<td>4</td>
<td>54.78</td>
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</tbody>
</table>
Tests of Toyota Sedan (15 mph)
Tests of TAMU Transit Bus
Tests on S.H. 6
Conclusions

• Speed tests
• Battery tests
• Count accuracy
• Puck longevity
• Alarms
• User interface
• Future enhancements
Contact Information

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