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
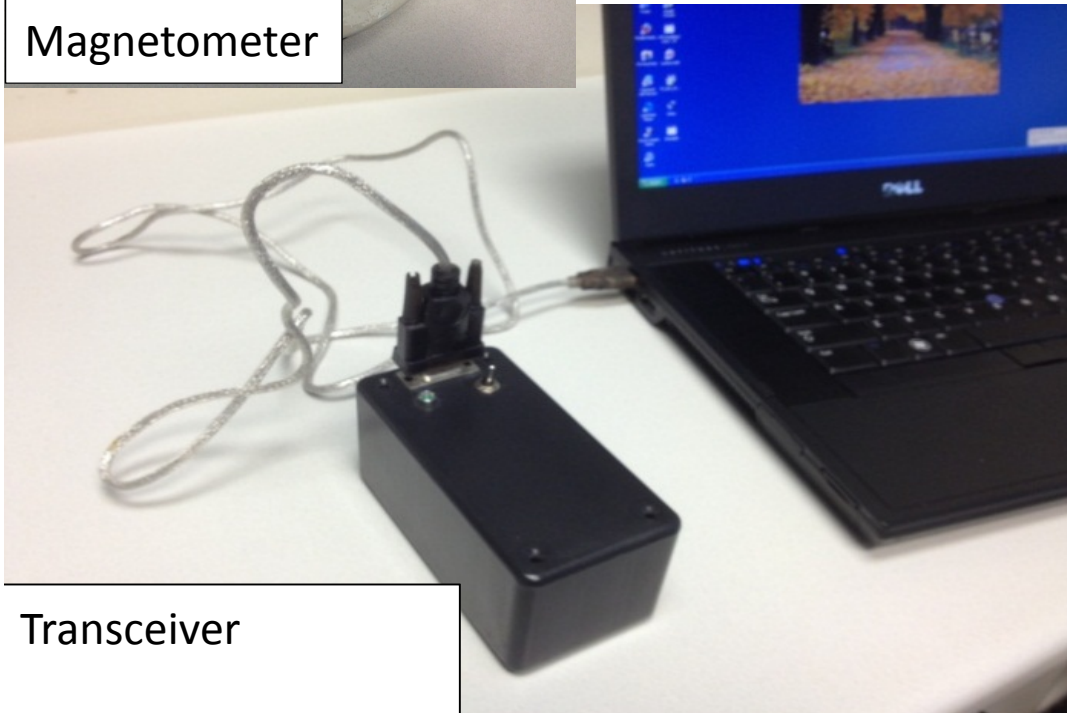- Marketing plan

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
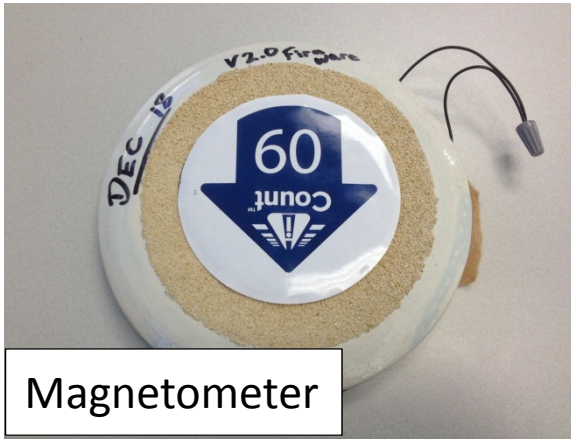
Magnetometer

iCone and Battery Box

Transceiver

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).
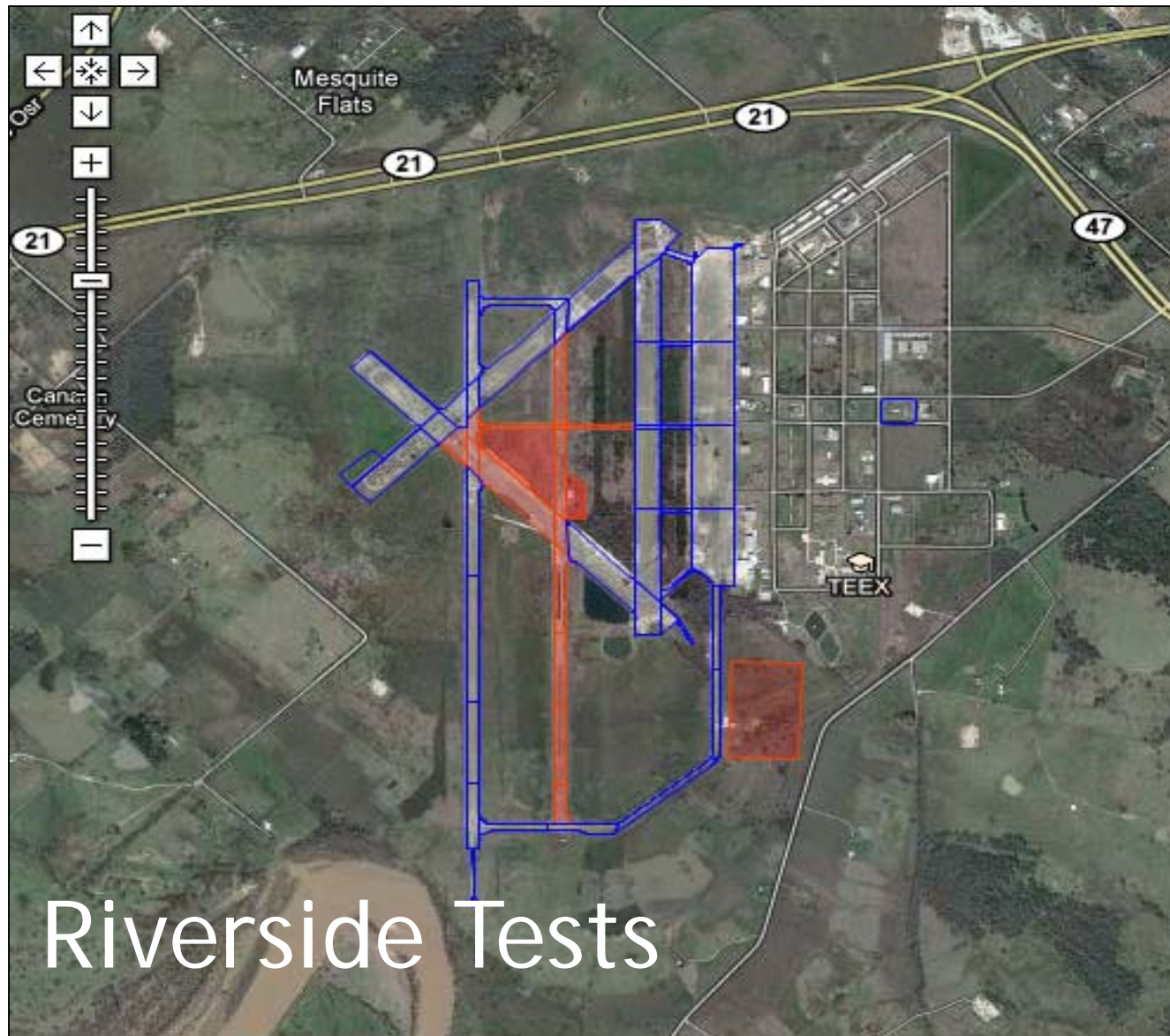
Riverside Tests

Riverside Tests

- Yamaha Silverado (year 2007).
- Kawasaki Ninja (year 2010).
- Class 8 tractor (Freightliner).
- Dodge minivan.

S.H. 6 Tests
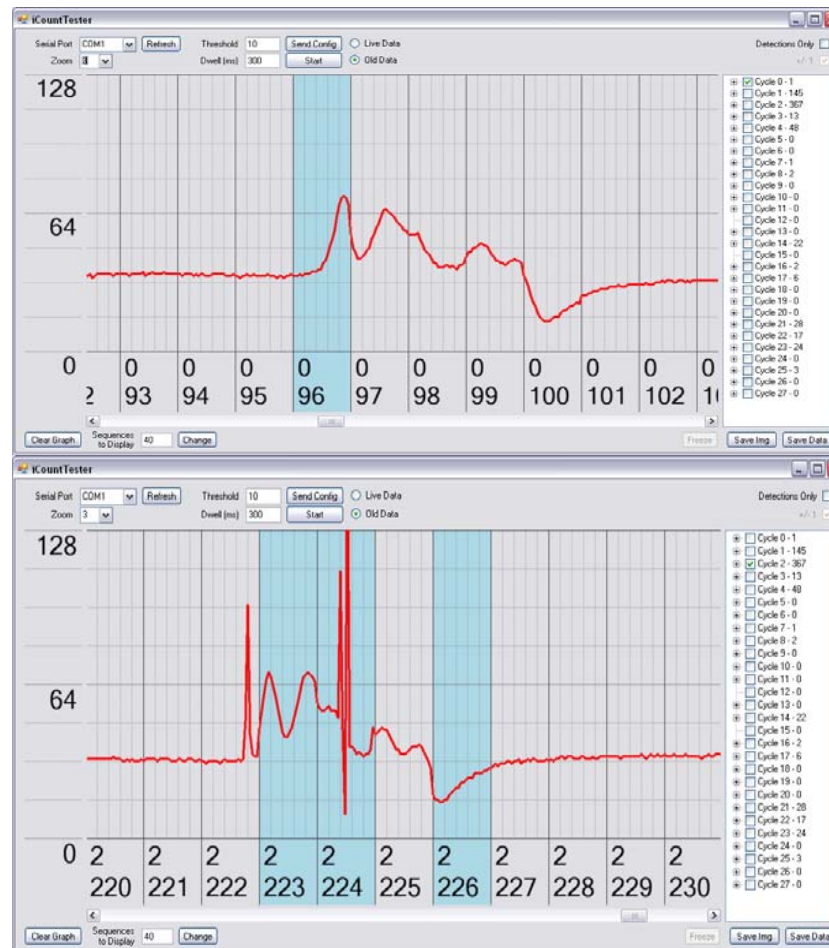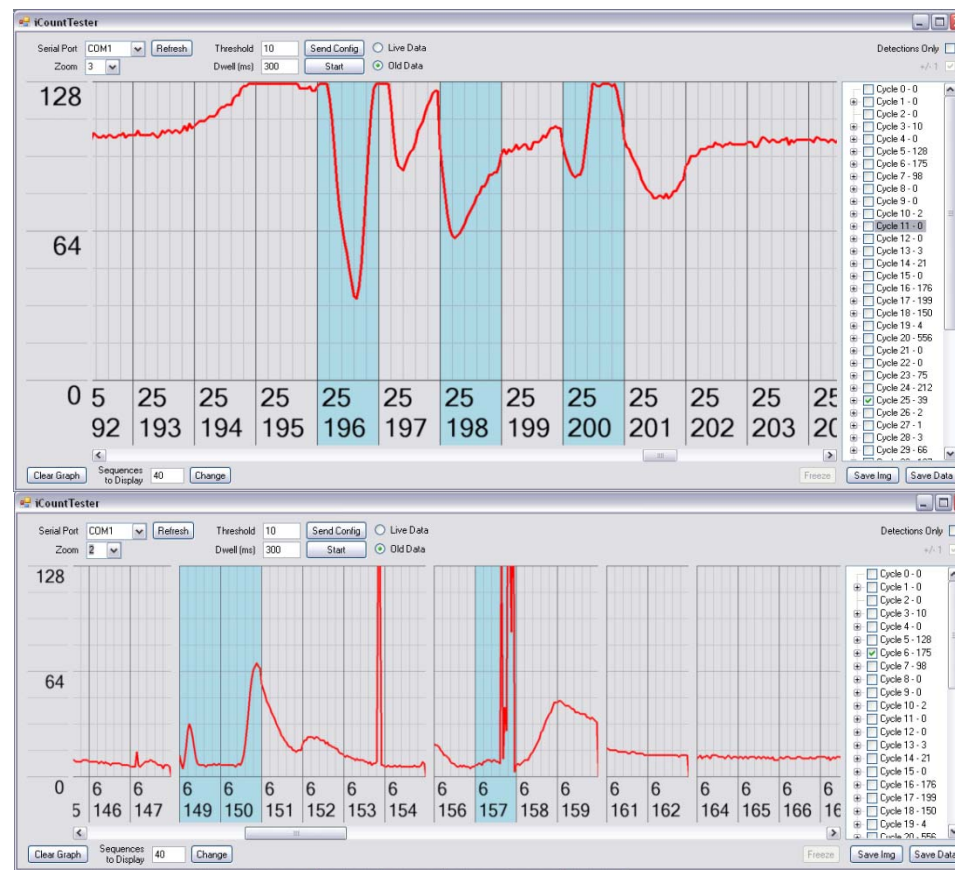
Findings – Speed Tests

No. of Runs	Desired Speed	Sensor Location	Sensor Angle	No. Vehicles	Average Speed
20	30	Edge of Ln	30	4	28.25
13	30	Edge of Ln	0	4	28.46
14	50	Edge of Ln	0	4	46.13
20	60	13 ft away	0	4	55.45
10	60	21 ft away	30	4	54.78

Tests of Toyota Sedan (15 mph)

Tests of TAMU Transit Bus

Tests on S.H. 6
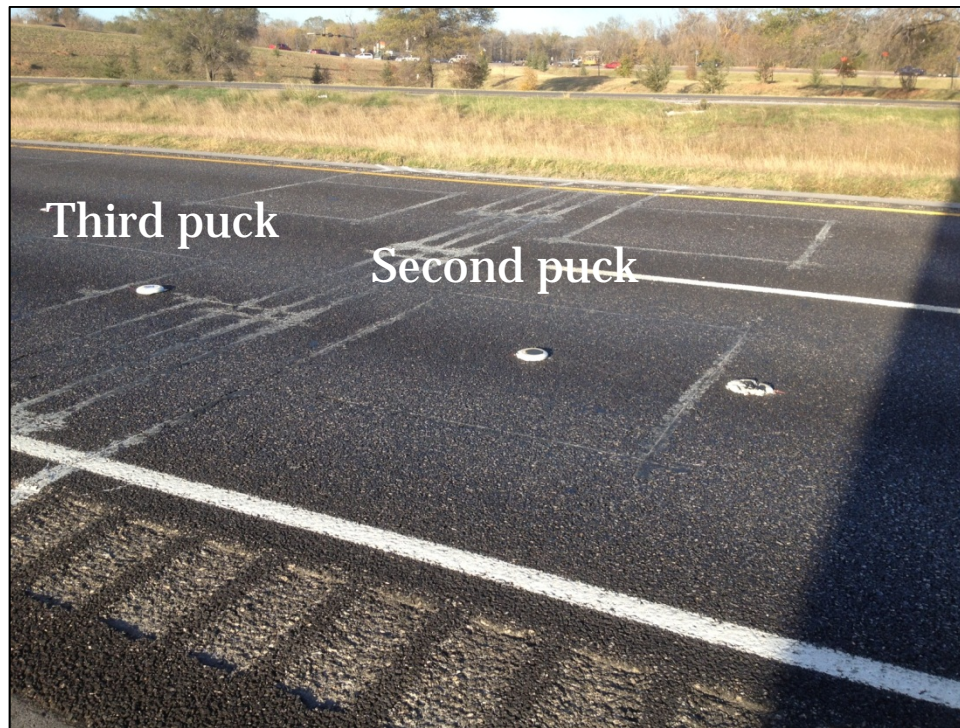
Conclusions

- Speed tests
- Battery tests
- Count accuracy
- Puck longevity
- Alarms
- User interface
- Future enhancements

Contact Information

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