Minnesota's Experience with Deer Warning Systems

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Your Destination...Our Priority

Minnesota's Experience with Deer Warning Systems

- MN Deer/Vehicle Crash Statistics
- Past Detection Systems
- System Impacts
- Current/Future Systems
- System Costs

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Deer/Vehicle Crashes (DVC) in Minnesota

- MN insurance industry estimates 35,000 DVC yearly
- 3 to 11 Fatal Crashes per year
- Over 400 B and C Injury Crashes per year
- Roughly 4,000 Property Damage Crashes per year
- Average Cost of a DVC is $1,840

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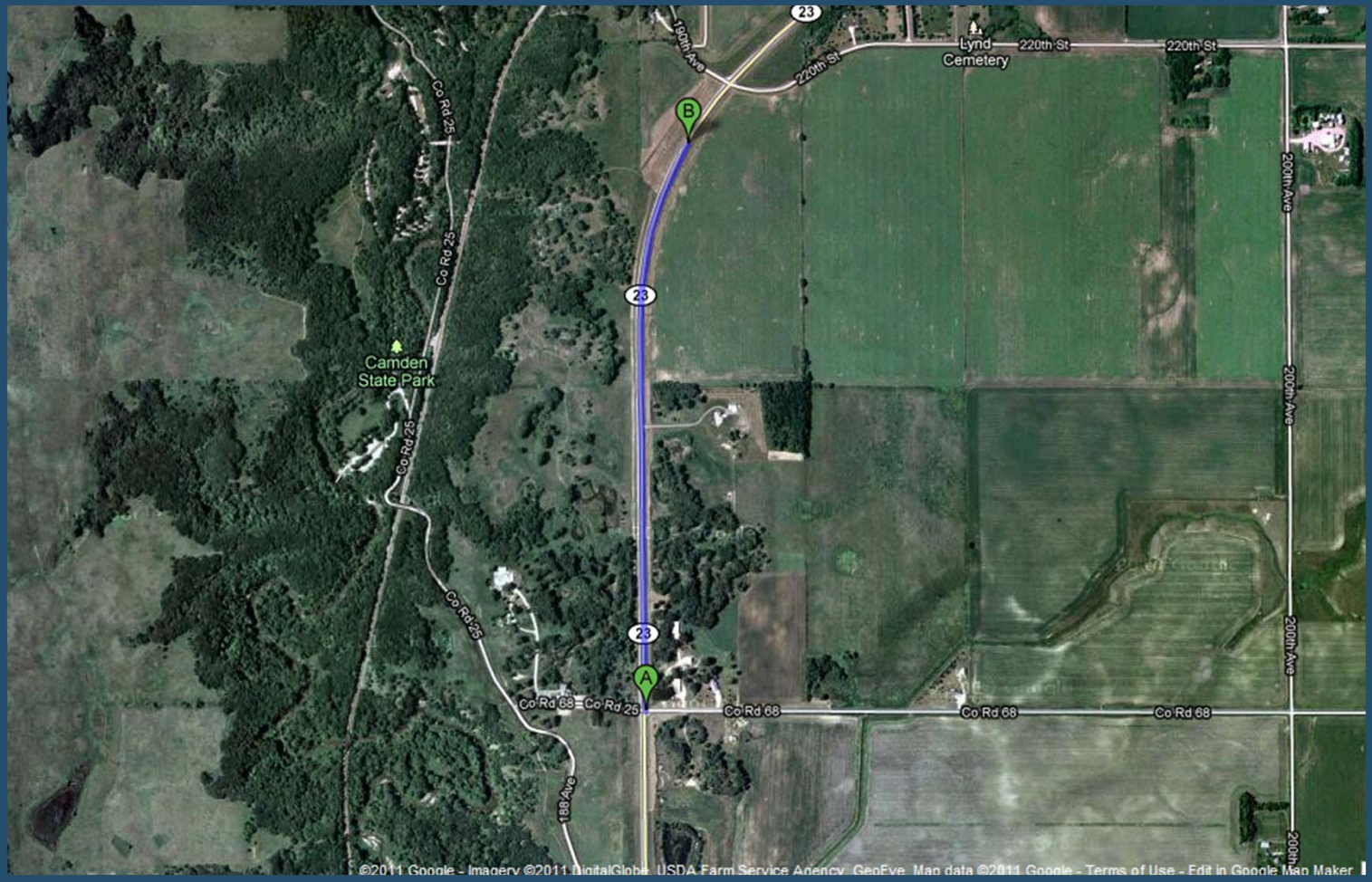
Deer Warning System on TH 23 in Marshall, MN



2001 Marshall Original System

Design

- Break Beam Detectors
- Rotating Beacon mounted above typical static sign
- AC Power

Problems

- High Power Consumption from Rotating Light

2007 Marshall Phase I System

Design

- Break Beam Detectors
- 8-inch flashing LED mounted above typical static sign
- 10 and 20 Watt Solar Panels
- Wireless communication

Problems

- Reliability of wireless communication batteries
- Necessary maintenance

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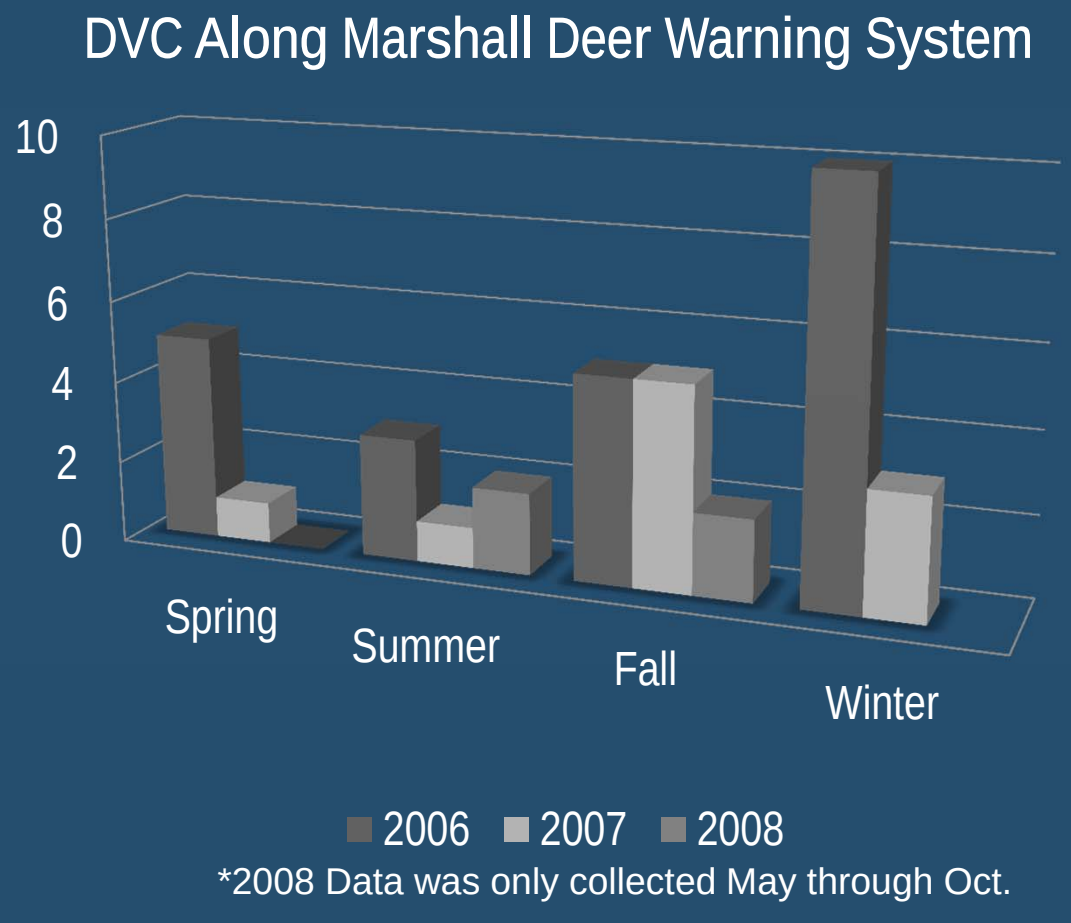
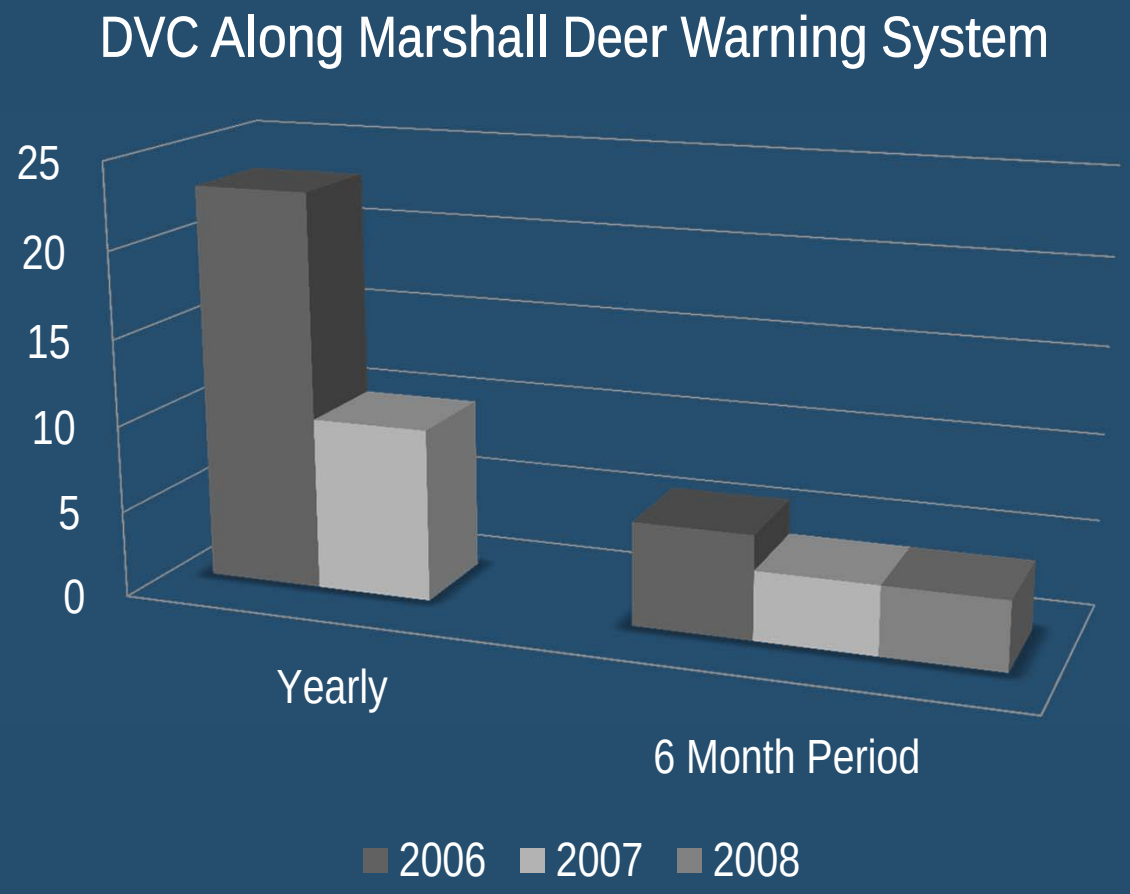
Marshall Phase I Results



*2008 Data was only collected May through Oct.

- 57% Reduction in DVC in 2007
- 33% Reduction in DVC in the first 6 months of 2008

Marshall Phase I Results



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2011 Marshall Phase II System

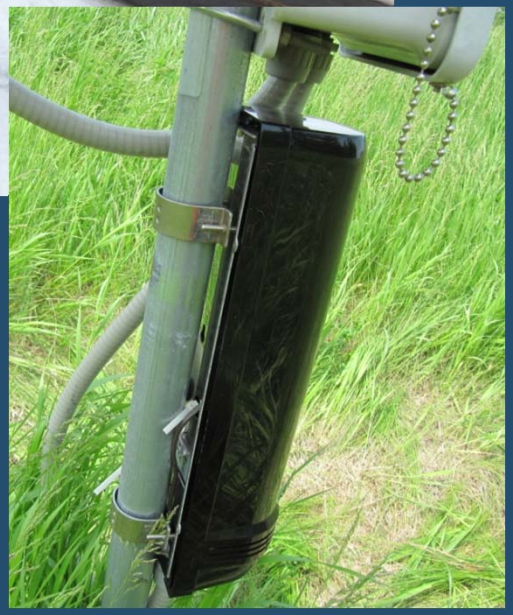
Upgrades to Phase I

- New wireless communication devices
- Detectors and solar panels realigned
- Weed barriers added to posts

- Vehicle crash damage repaired

Deer Warning System on CSAH 121 in Dayton, MN

2011 Dayton System



Utilizes Marshall Design with Further Upgrades

- U-Channel Posts for Detectors
- One Passive Infrared (PIR) Device will be used to demonstrate new technology
- Inductive Loops will detect vehicles accessing the Elm Creek Park entrance
- Remote Terminal Unit and Programmable Logic Controller

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Dayton System Costs

- Costs:
  - Equipment $76,000
  - Installation and Testing $20,000
  - Estimated Total $96,000
- Equipment Costs include:
  - 2 signs nodes
  - 14 detectors nodes
  - 1 Remote Terminal Unit/ Programmable Logic Controller
  - 2 loop detectors
  - 1 PIR

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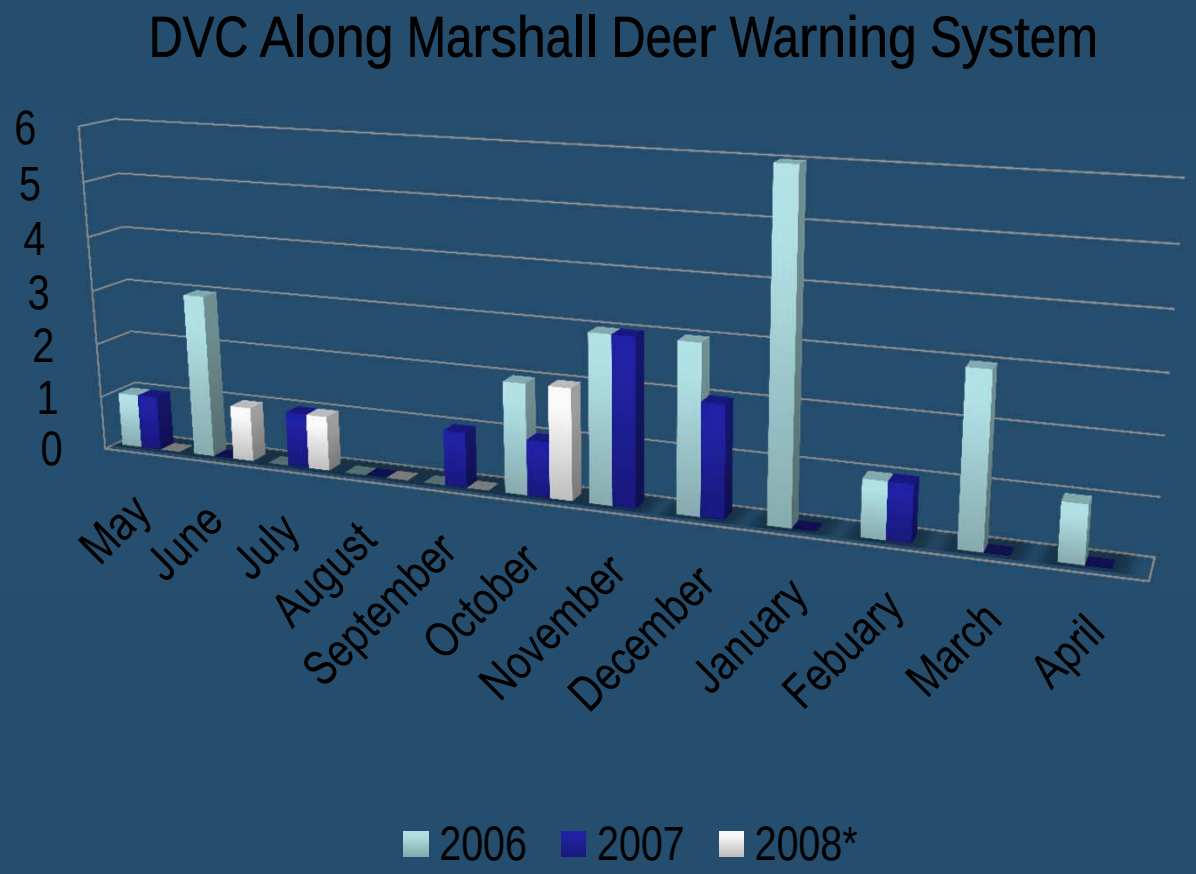
Marshall Phase I Results



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