Module 3

Crash Prevention & Security

Crash Prevention & Security

User Needs

- Collision Avoidance
- Roadway Geometrics
- Highway-Rail Intersection Crossings
- Vehicle Preemption
- Roadway Weather Information Systems
- Work Zone Control/Advisory System
- Security
- Data Sharing

Source: Rural ITS User Needs, 1999

Stakeholder Partners

Who are they?

Applicable Technologies

- Mayday
- Roadway Weather Information Systems
- Dynamic Warning Variable Message Signs
- Highway Advisory Radio
- Emergency Vehicle Preemption
- Animal Detection/Deterrence

Projects

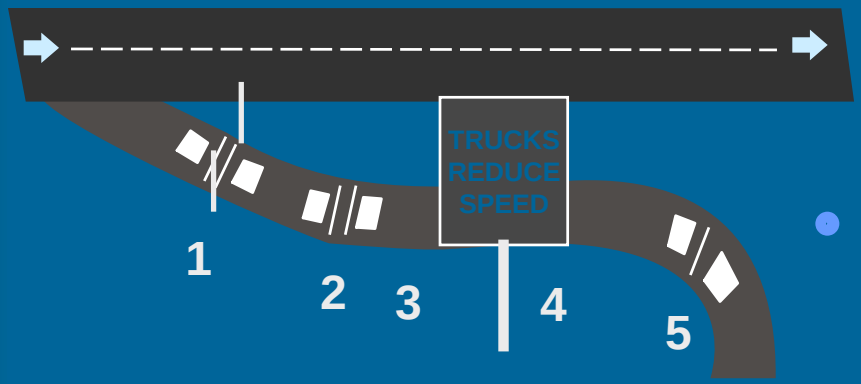
- California Dynamic Speed Warning
- Automated Truck Rollover Warning System
- Dynamic Downhill Speed Warning System
- North Dakota State University ATWIS -- #SAFE
- URGENCY
- Intersection Collision Avoidance
- Animal Vehicle Crash Mitigation Using Advanced Technologies

California Dynamic Speed Warning

- 10’ X 7’ full LED matrix
- Radar Unit
  - 18 Degrees
  - 15-120 mph and 2500 feet away
- 2 Fixed Closed Circuit Television Cameras
- Video Vehicle Detection System
- Controller and Phone Line

Source: http://www.coe.montana.edu/wti/wti.htm

Automated Truck Rollover Warning System

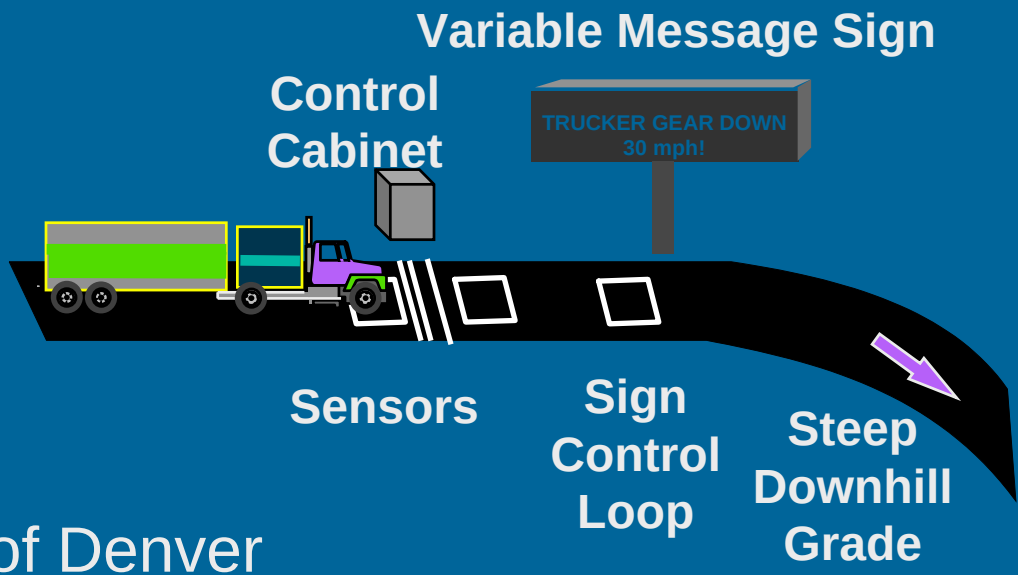


1. **Advance WIM**
2. **Tracking WIM**
3. **Calculations**
4. **Sign activation (if required)**
5. **Monitoring WIM (optional)**

- Based on real information:
  - vehicle
  - road
  - driver
- Roadside warning signs illuminate for specific trucks

Source: http://www.ird.ca/english/html/highway/system/sys_safe.htm

Dynamic Downhill Speed Warning System



- I-70 Westbound, west of Denver
  - Eisenhower tunnel leads into Straight Canyon
  - 10 miles at 7% grade
- Annual traffic count approaching 5 million
- About 20 runaways & 15 truck related crashes per year

Source: http://www.ird.ca/english/html/highway/system/sys_safe.htm

University of North Dakota ATWIS -- #SAFE

- Forecasts weather for six hours into the future
- Forecasts weather for 60 miles in direction traveling
- 94.3% believe that they will benefit from #SAFE in the future

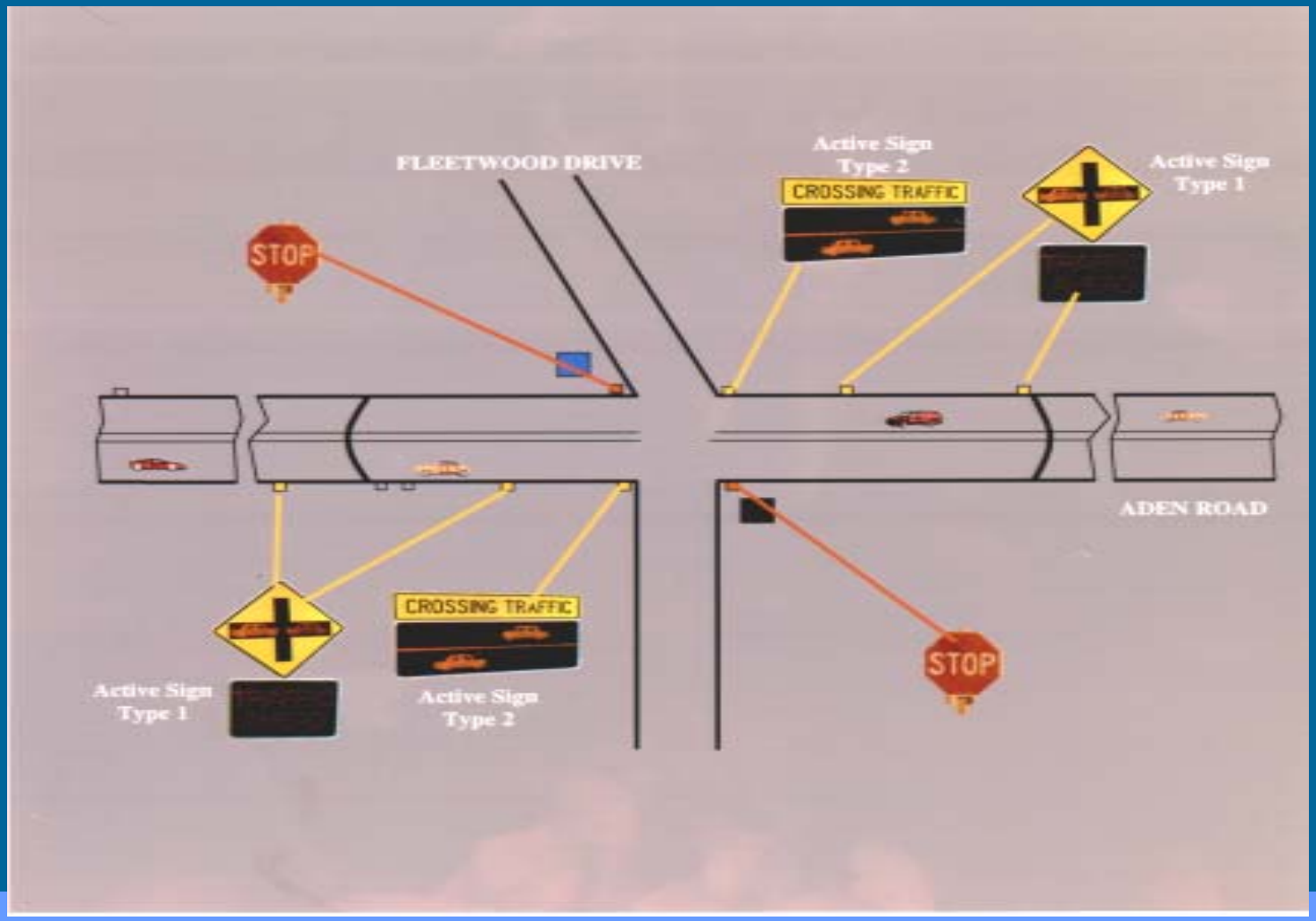
Source: Mark Owens, Regional Weather Information Center

URGENCY

- Sensor shows
  - Location
  - Final Resting Position
  - Change in Velocity
  - Car Model
- Identifies the 250,000 crash vehicles with serious injuries from 27 million vehicles crashes each year.
- Crash sensor measurements are translated into a rating of urgency from 0 to 100%

Source: http://www.nhtsa.dot.gov/cars/problems/studies/acns/champion.htm

Intersection Collision Avoidance



Animal Vehicle Crash Mitigation Using Advanced Technologies

- System will
  - detect animal presence
  - alert driver through dynamic signing
- Demonstrate 2-4 sites
- 12 state pooled fund study
- 3 year project starting FY99-00

Source: http://www.coe.montana.edu/wti/wti.htm