

# SEAT BELT USE ON NORTH DAKOTA RURAL ROADS

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# Overview

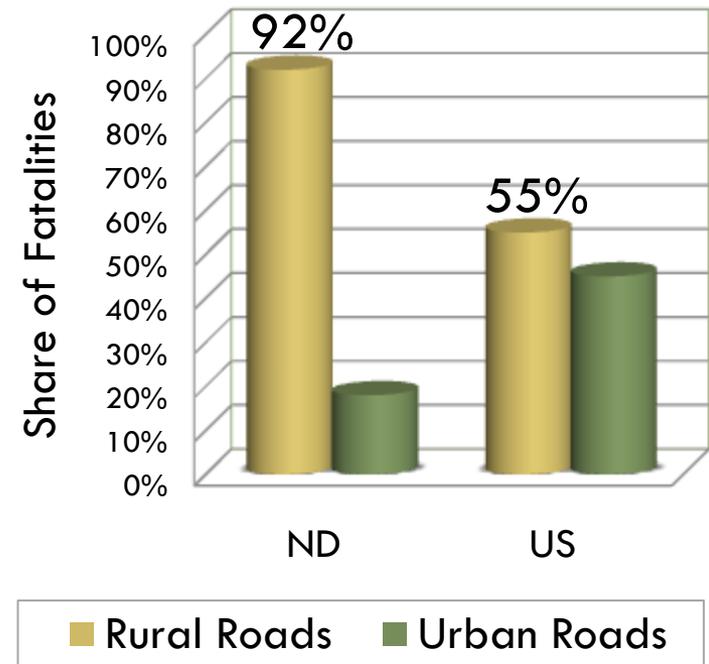
- Background - Why Seat Belts on Rural Roads?
- Other Surveys/Data Sources
- Initial Work
- Current Method
- Results
- Discussion



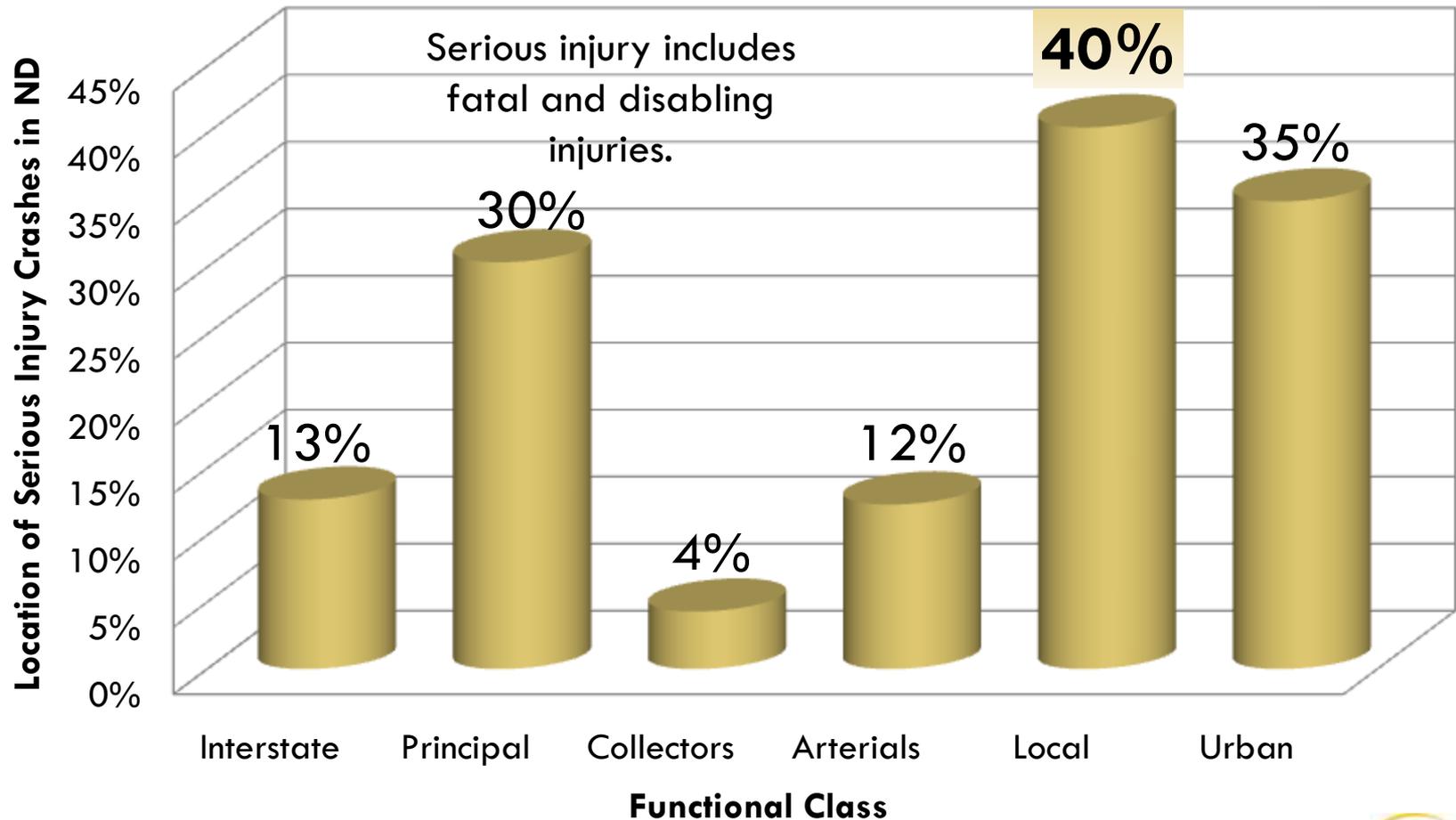
# Crash Injury Risk

- In the United States, about one-quarter of travel takes place on rural roads, but nearly half of all traffic deaths occurred on rural roads between 2003 and 2007.
- In ND, from 2002 to 2009, 88% of serious injuries (fatal and disabling injuries) resulting from motor vehicle crashes, occurred on rural roads (NDDOT).

**Crash Fatalities in 2008,  
by Road Class**



# Serious Injury Crash Location by Road Class, 2005-2009

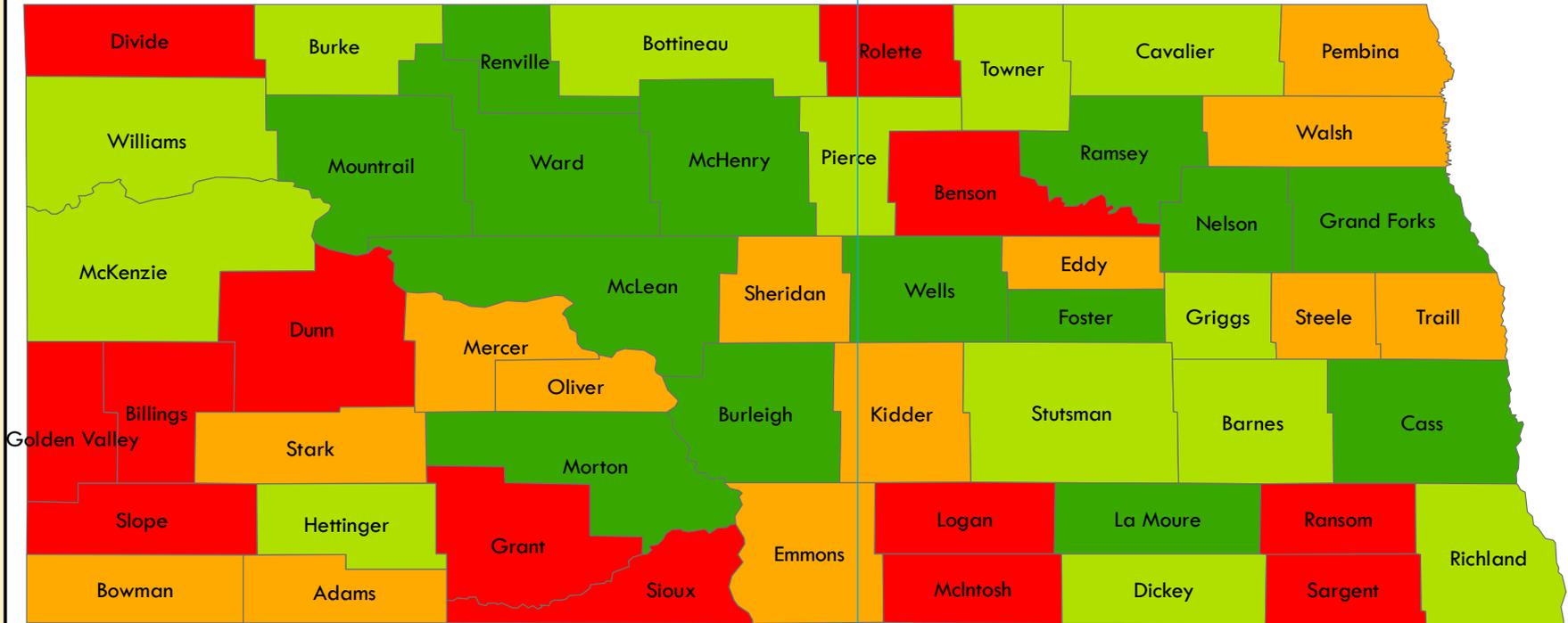




# Occupant Protection

- Crash risk and injury severity can be influenced by many factors – driver behavior, travel environment, vehicle technology, roadway characteristics, roadside features, etc.
- Seat belt reduces fatal injury risk by about half (Robertson 1976, Evans 1986, Blincoe 1994, Kabane 2000, Williams et. al 2008).
  - Existing technology - no-cost, easy to use.
  - Studies have generally been shown seat belt use rates on rural roads is lower than on urban roads (Dinh-Zarr 2001, Nichols et. al 2007, Strine et. al 2010).

# NO SEAT BELT INCIDENCE: RURAL ROAD CRASHES\*



\*Injury Crashes

Data Source: NDDOT Crash Data



**Legend**

**County sb0**

- Less than 38.4%
- 38.4% yo 43.7%
- 43.8% to 48.8%
- More than 48.8%

## ND Rural Crashes - No Seat Belt Factor 2005 to 2009



**Albers Projection**  
 Central Meridian: -96  
 1st Std Parallel: 20  
 2nd Std Parallel: 60  
 Latitude of Origin: 40



# Intervention

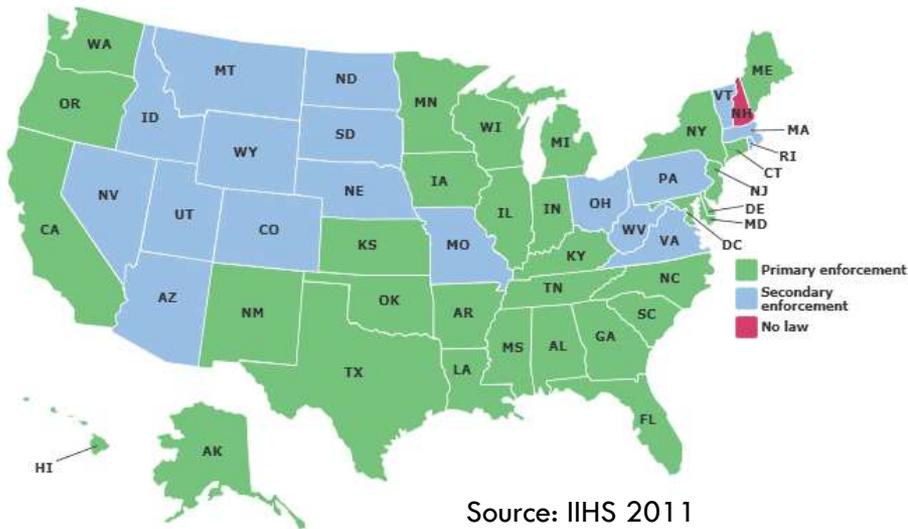
- Seat belt laws
- Primary enforcement
- Enhanced enforcement
- Incentives
- Mass media campaigns
- Education programs

Source: Harris 2005



# Enforcement

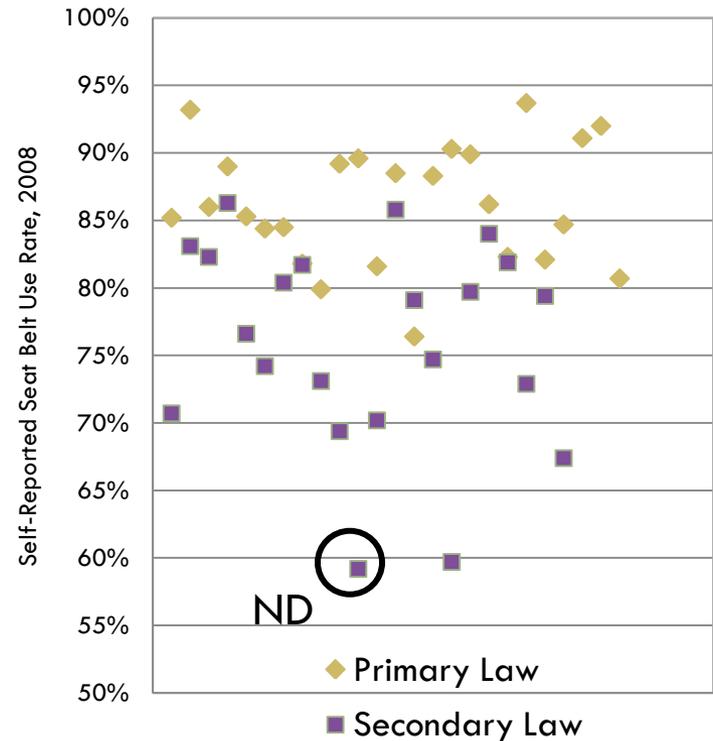
□ In 2010, Kansas became 31<sup>st</sup> state with primary law.



Average Self-Reported Seat Belt Use, 2008

Primary Law States: 88.2%

Secondary Law States: 79.2%

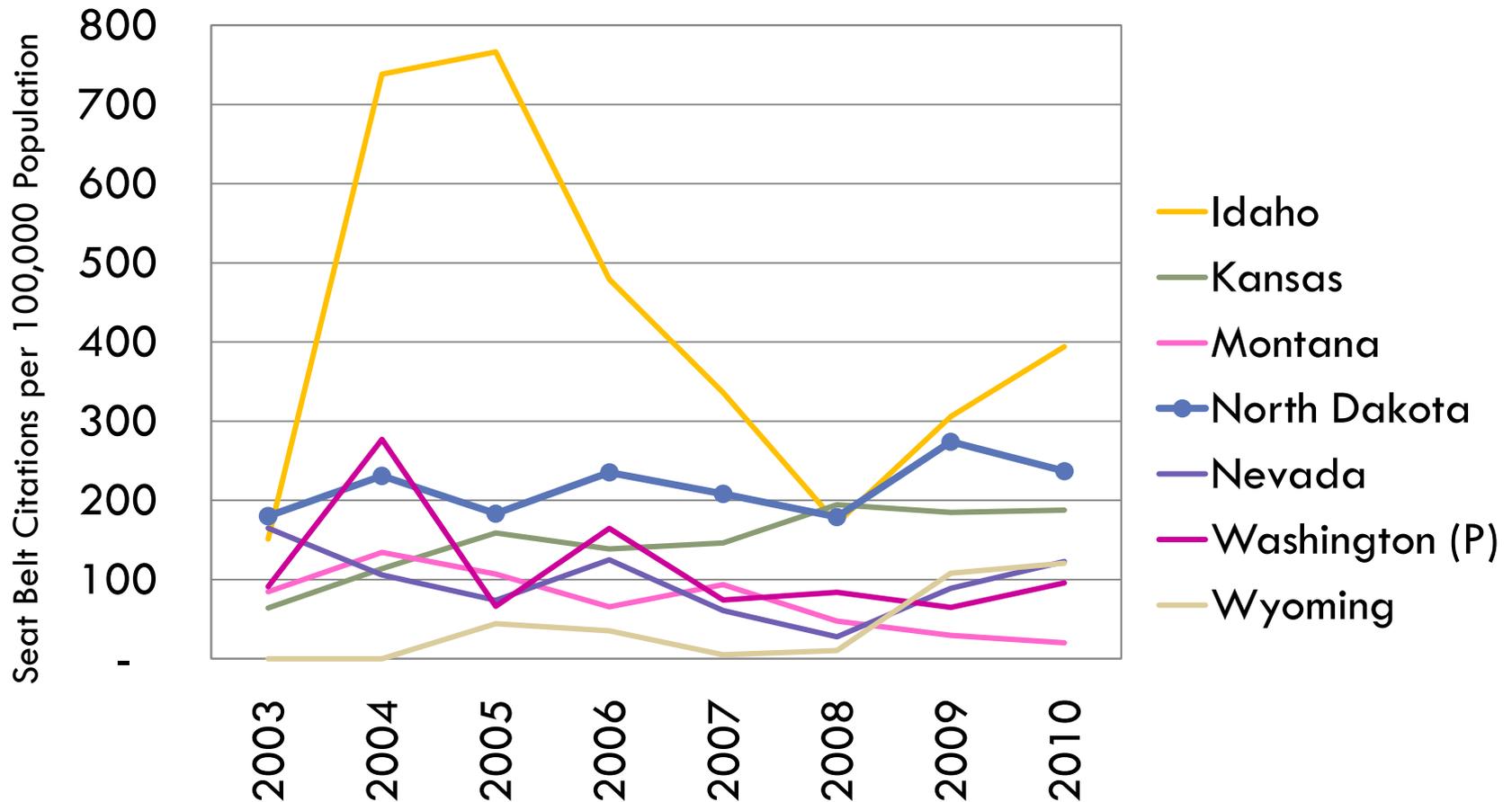


Source: CDC 2011



Enhancing mobility of people and goods in rural America.

# CIOT Activity, May Mobilization

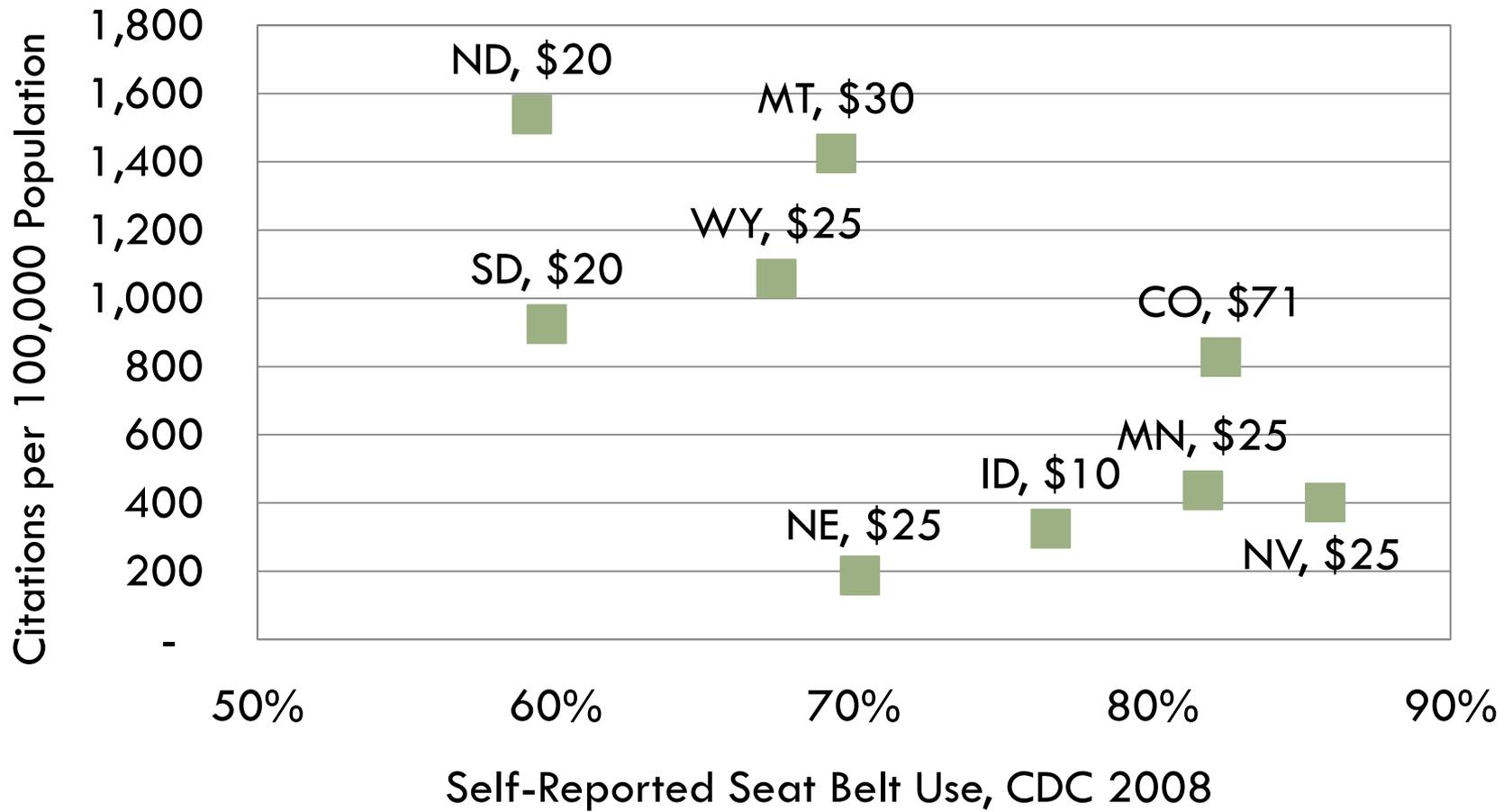


Source: NHTSA  
(P): Primary Enforcement



Enhancing mobility of people and goods in rural America.

# Annual State Patrol Seat Belt Citations, Average 2005-2009

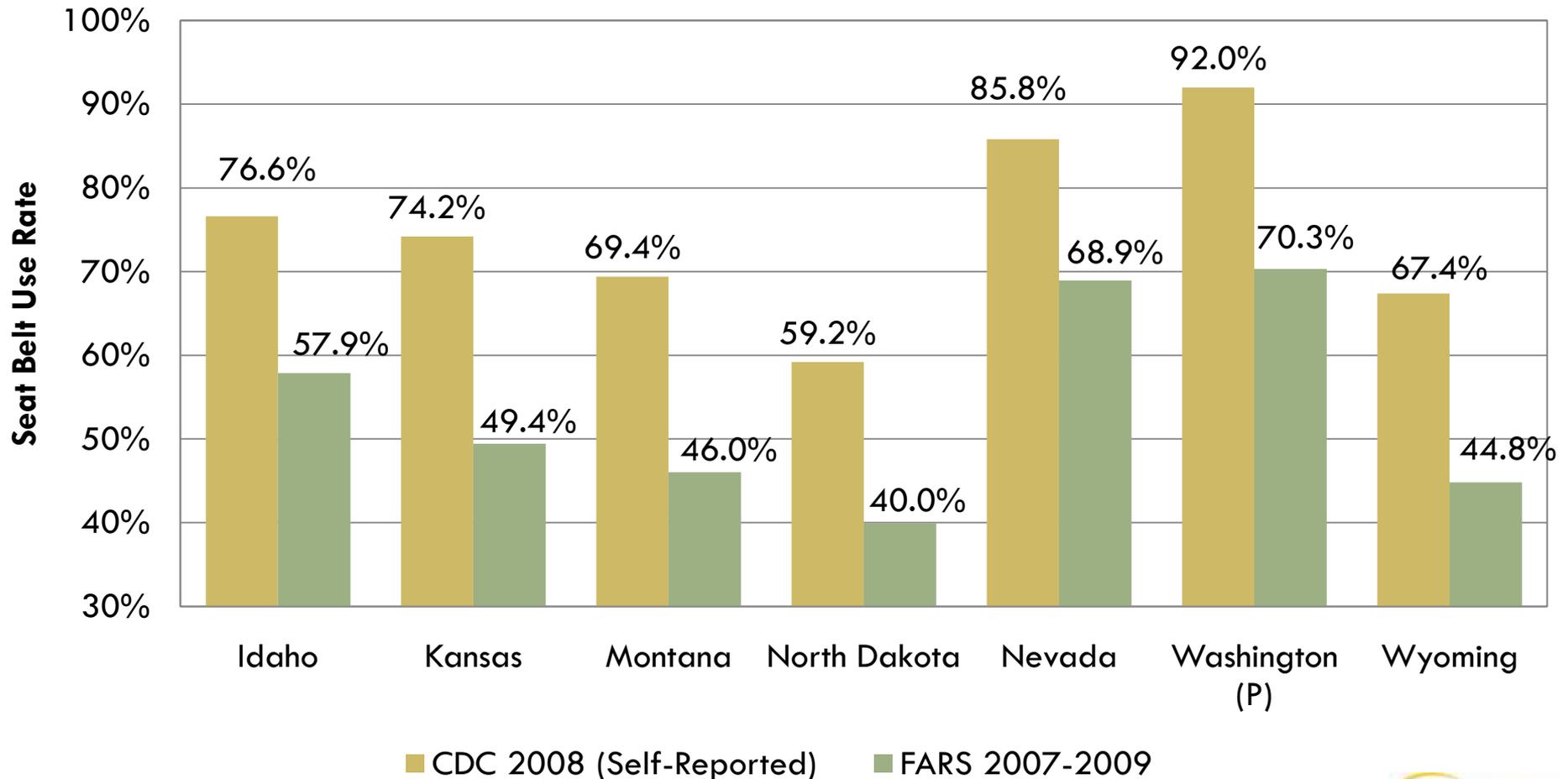


Sources: Citations from UGPTI Phone Survey of State Patrols;  
Fines from IIHS, 2010.



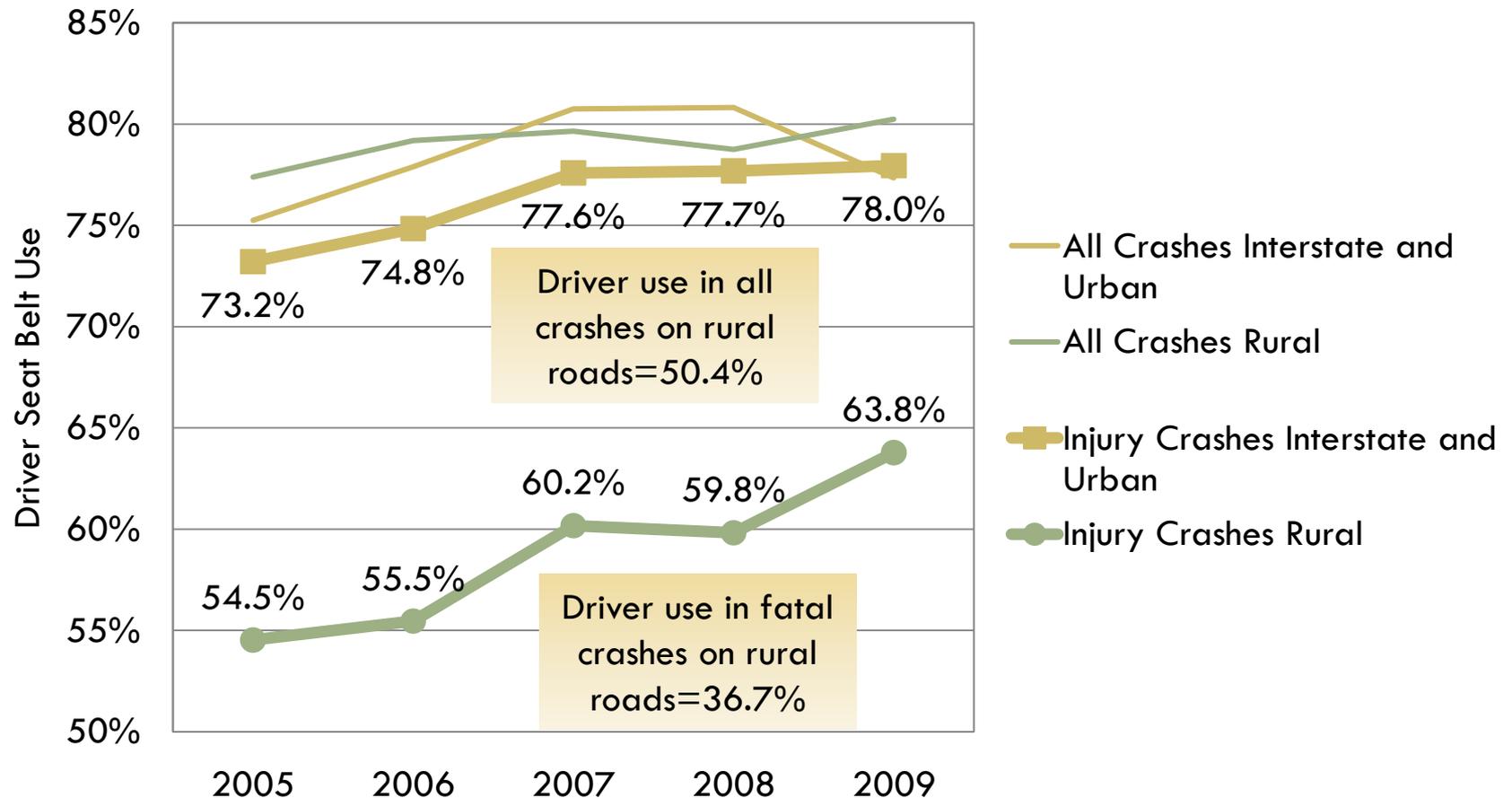
Enhancing mobility of people and goods in rural America.

# Other Seat Belt Use Measures



■ CDC 2008 (Self-Reported) ■ FARS 2007-2009

# ND Crash Report Seat Belt Use



Source: NDDOT

Note: Injury includes Fatal.

Enhancing mobility of people and goods in rural America.



# Rural Seat Belt Pilot

‘Measure it... to Understand It and to Manage It’

- Systematic measurement to supplement anecdotal information, enforcement statistics, and crash seat belt reports.
- Conducted in cooperation with the NDDOT and FHWA in 2009.
- Continued in 2010 and 2011 as a NDDOT TSO program activity.

# Study Objectives

- Establish rural seat belt survey protocol.
- Utilize partnerships with state and local associates to conduct seat belt observations.
- Provide traffic safety offices and local officials with a 'measure' they can use in understanding and managing this public health issue.
- Measure effects of new rural high visibility enforcement (HVE) activities.

# NOPUS Statewide Seat Belt Survey

## Methodology

- National Occupant Protection Use Survey (NOPUS) effort is supported by NHTSA – which approved the sample design and survey method for each state
- Survey sample design uses traffic density=annual vehicle miles traveled, so only state roads considered.
- County population stratified by population and quadrant.
  - Highest population counties and random sample of lower population counties included in the survey.
  - VMT data used for site selection within sample counties.

# Rural Road Seat Belt Survey

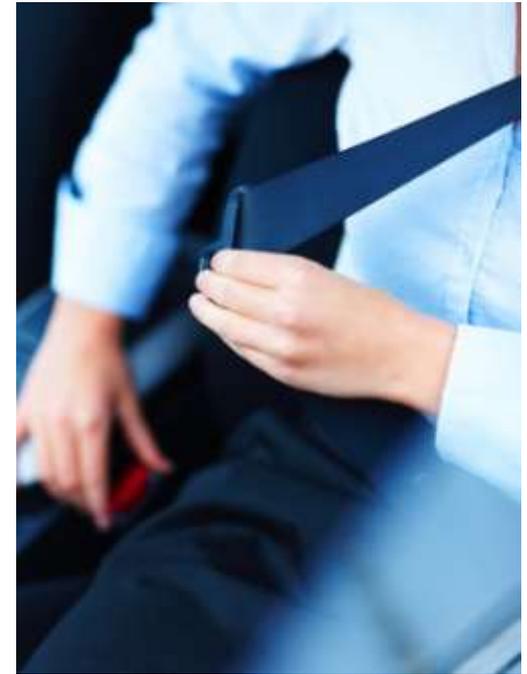
## Methodology

- Traditional observation survey method.
- Sample design included preferred and optional counties.
- Site selection:
  - 1 site in per town – maximum of 2 towns in a county.
  - Higher traffic corridors to identify 3-4 sites beyond town.
  - Minimum 30 minutes, up to one hour allowed, to meet 30 minimum observations per site.
  - Minimum of 20 miles from interstate.
- Seat belt observations collected at each site during June or July, between 7 am and 7 pm.
  - Pilot project in 2009 included additional April measurement for HVE.
- Main focus on driver seat belt use, also collected passenger belt use when possible.

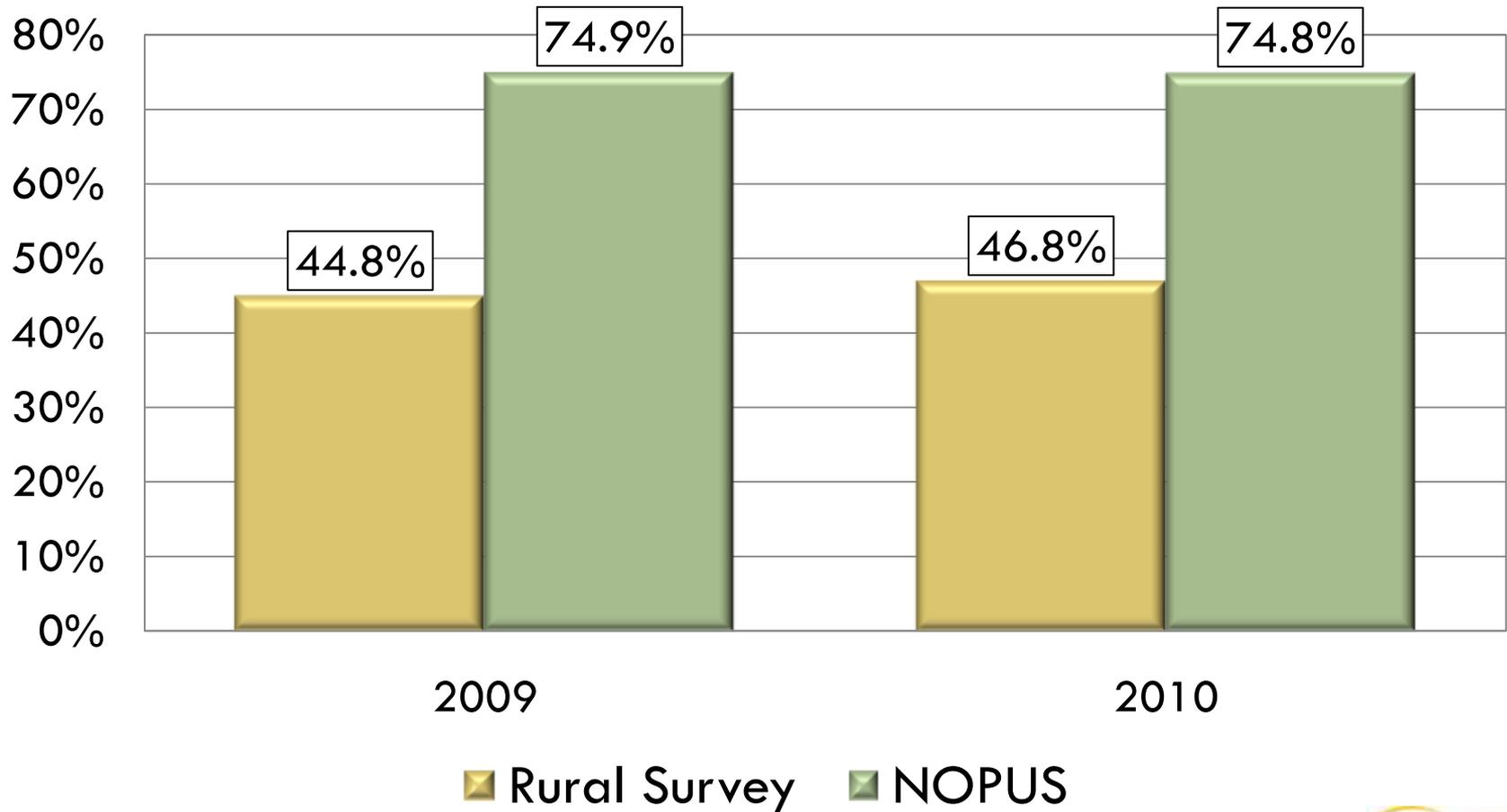


# 2010 Results: Overview

- 5,735 observations of driver seat belt use, compare to 6,919 in 2009.
- 1,330 observations of passenger seat belt use compared to 1,051 in 2009.
- Observations collected at 152 sites in 23 counties, a slight increase from 149 in 2009.



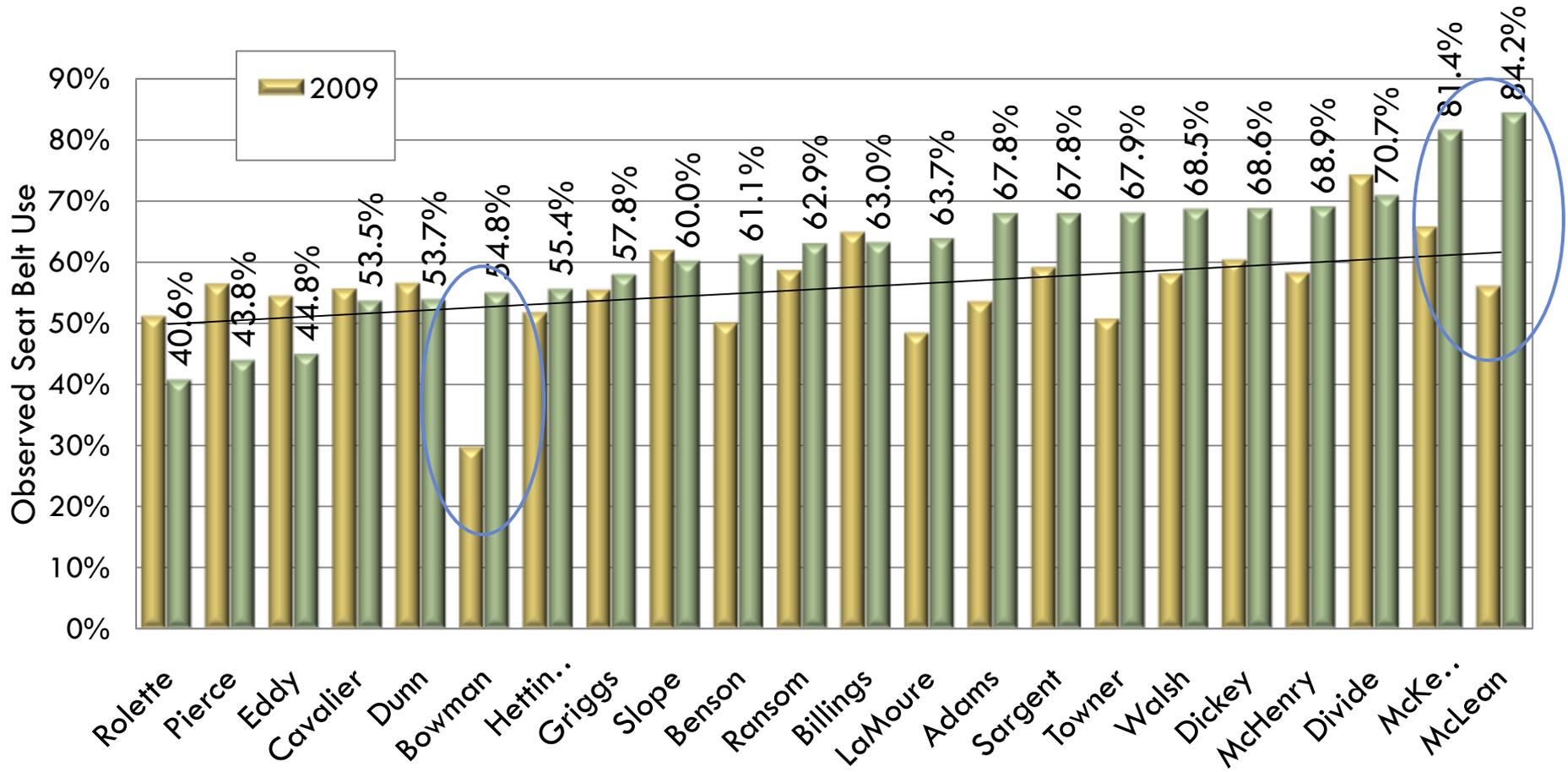
# 'Overall' Seat Belt Use Rates



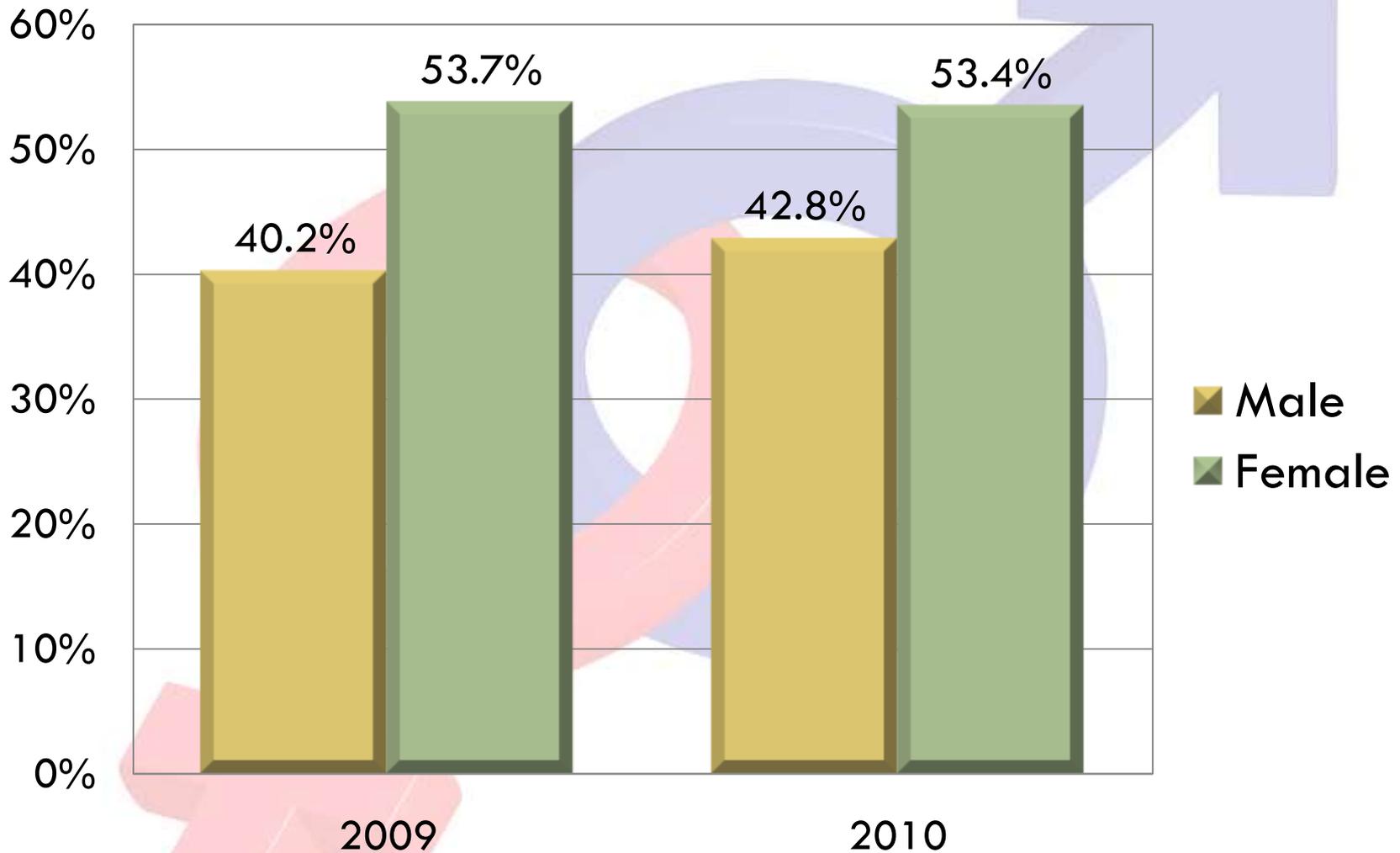
# Seat Belt Use, by Road Type



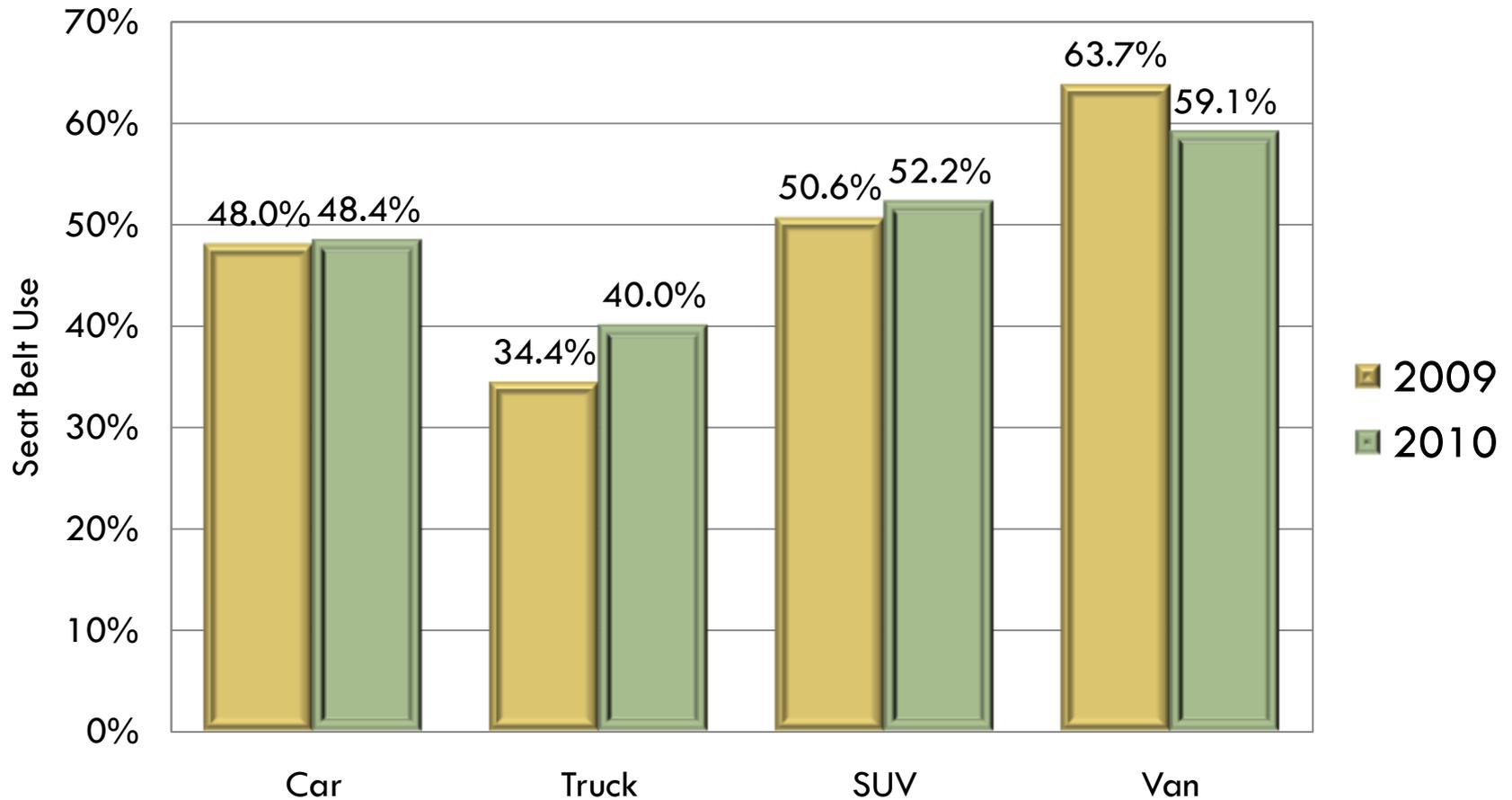
# Highway Use Rates, By County



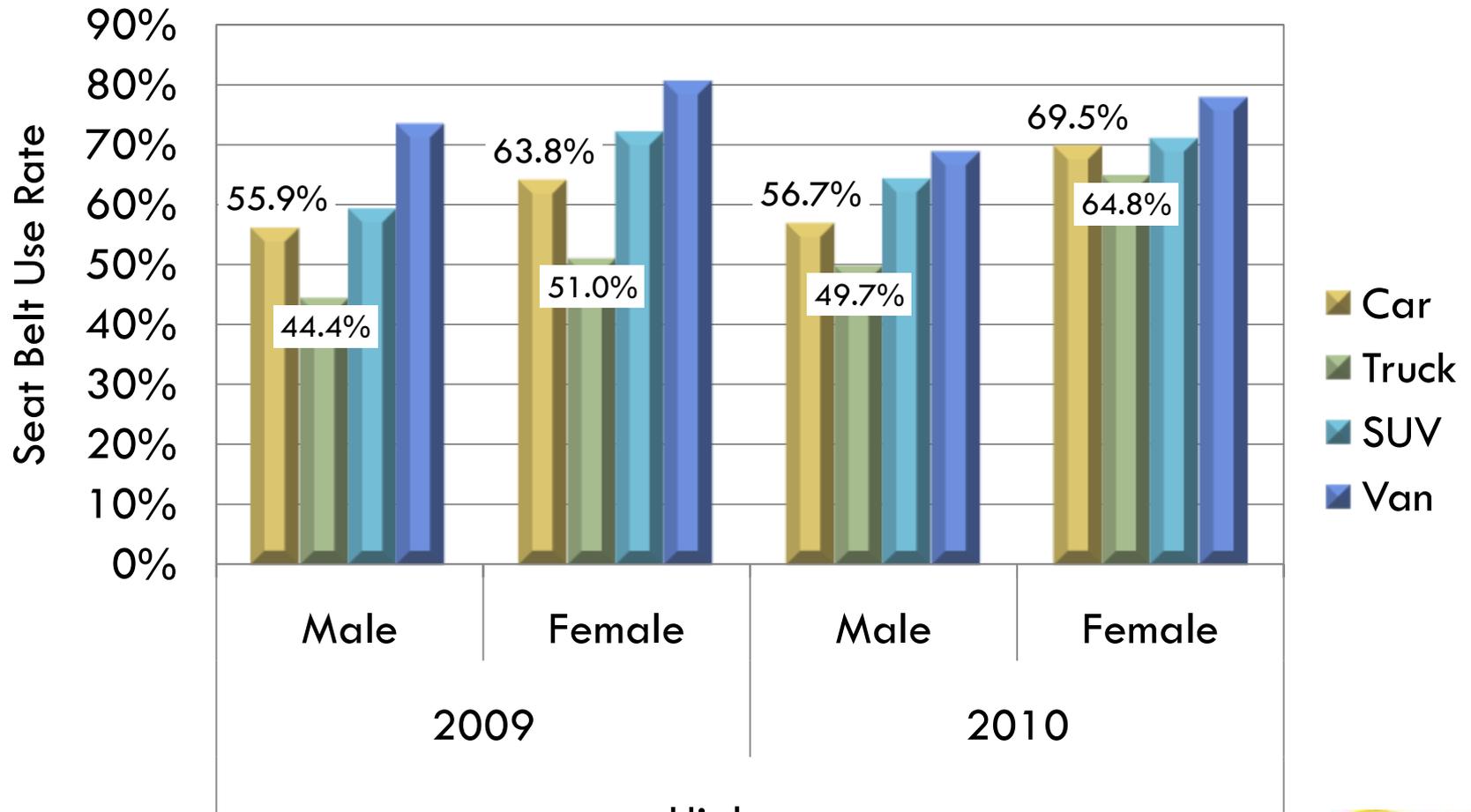
# Driver Gender



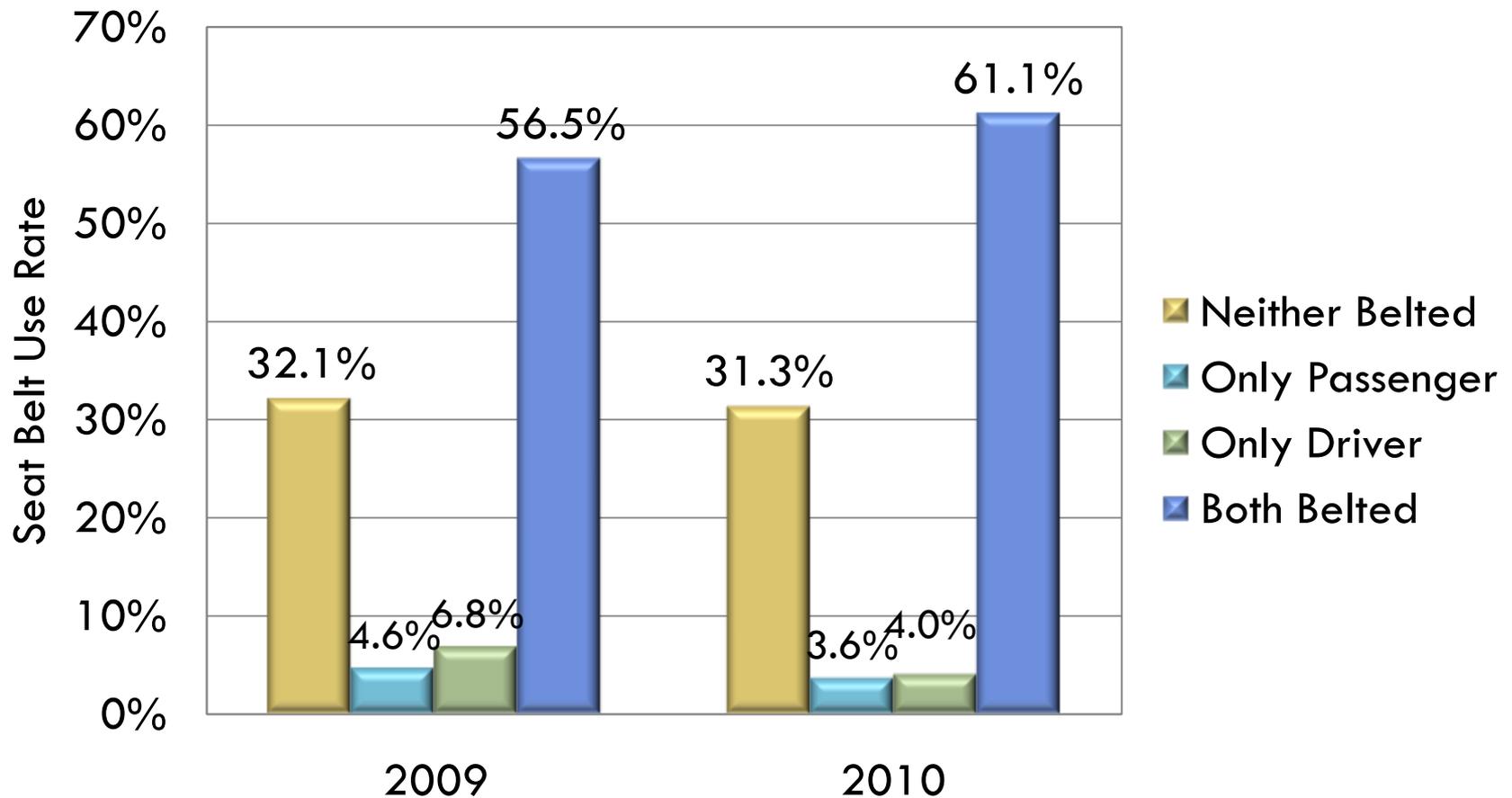
# Seat Belt Use, By Vehicle Type



# Seat Belt Use by Vehicle Type and Gender, on Highways



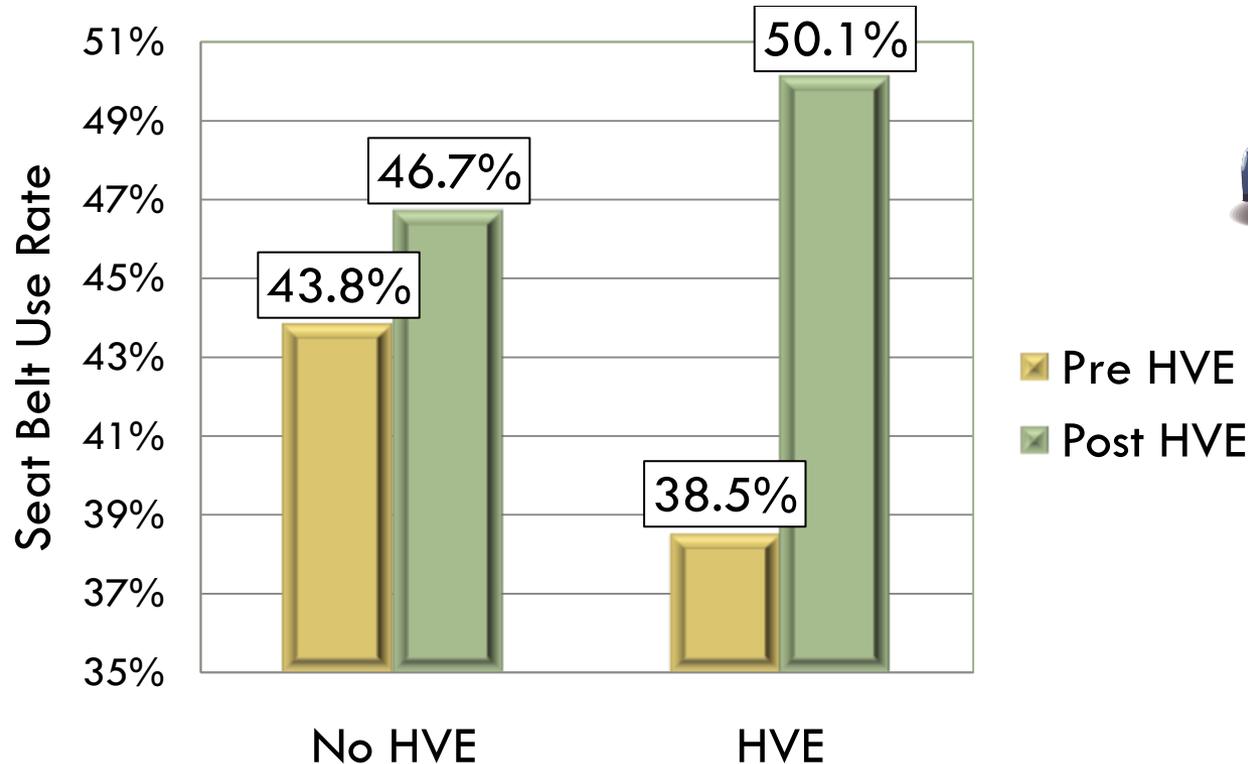
# Driver/Passenger Use Correlation



Pearson's Corr.=0.835,  $p < .0001$ ,  $n = 1,330$  (2009)

# High Visibility Enforcement (2009)

- Significant increase in seat belt use was found measuring intervention effects of HVE in rural counties.



- Pre HVE
- Post HVE

# Discussion

[www.ugpti.org/rtssc](http://www.ugpti.org/rtssc)

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