

# **The Potential for Nighttime Enforcement and Seat Belt Law Upgrades to Impact Alcohol-Related Deaths among High Risk Occupants**

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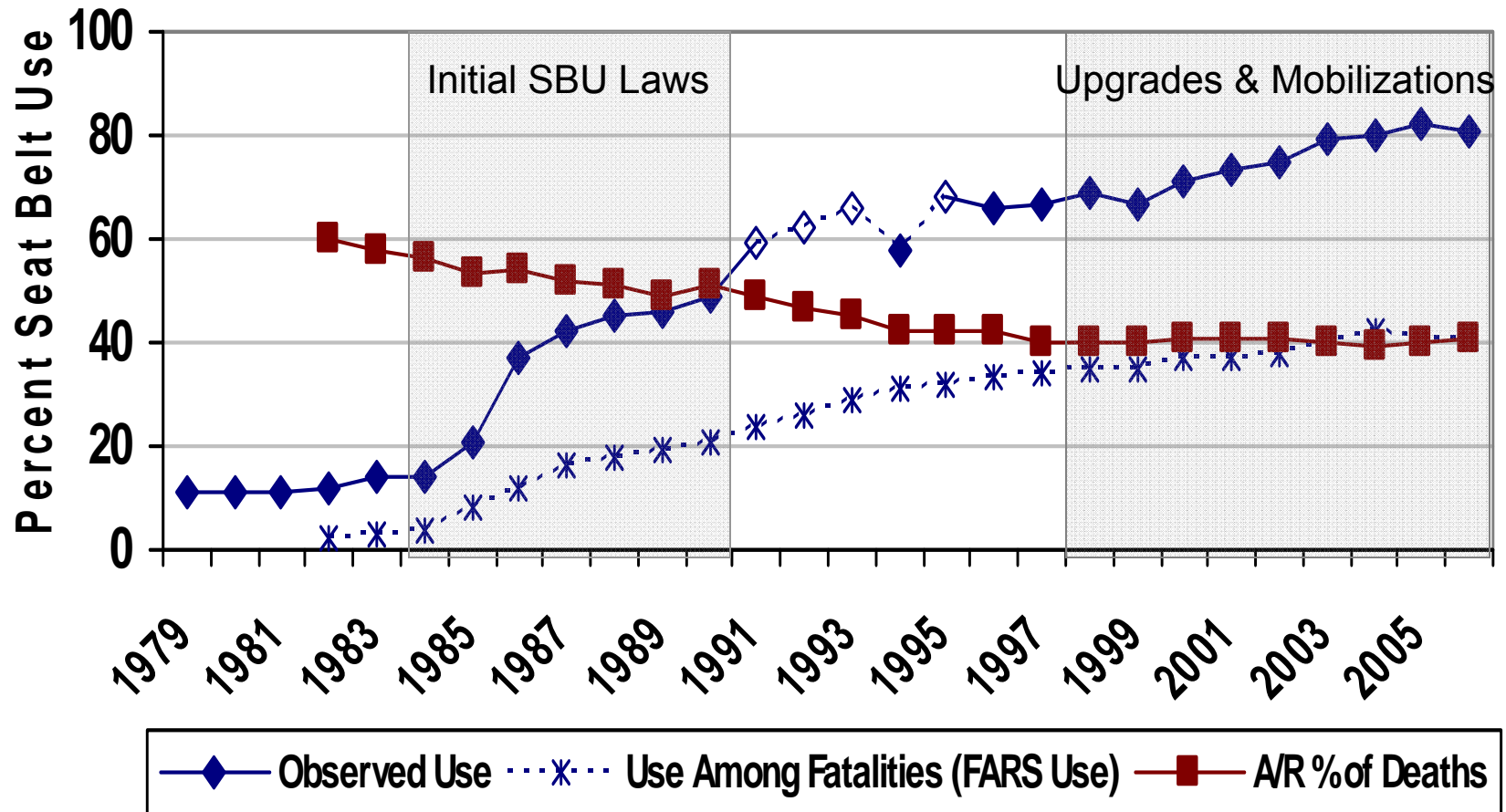
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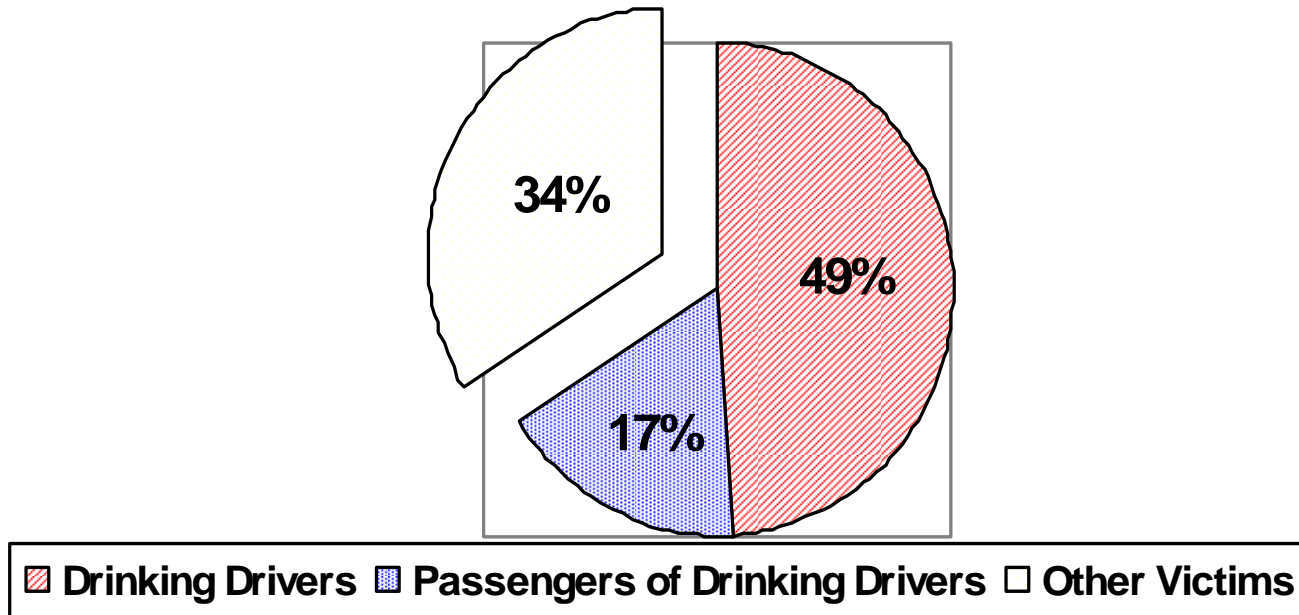
# Long-Term Trends Seat Belt Use and A/R Deaths

# Safety Belt Use Rates (Observed and Among Fatalities) and the Alcohol-Related Percent of Total Deaths (U.S.)



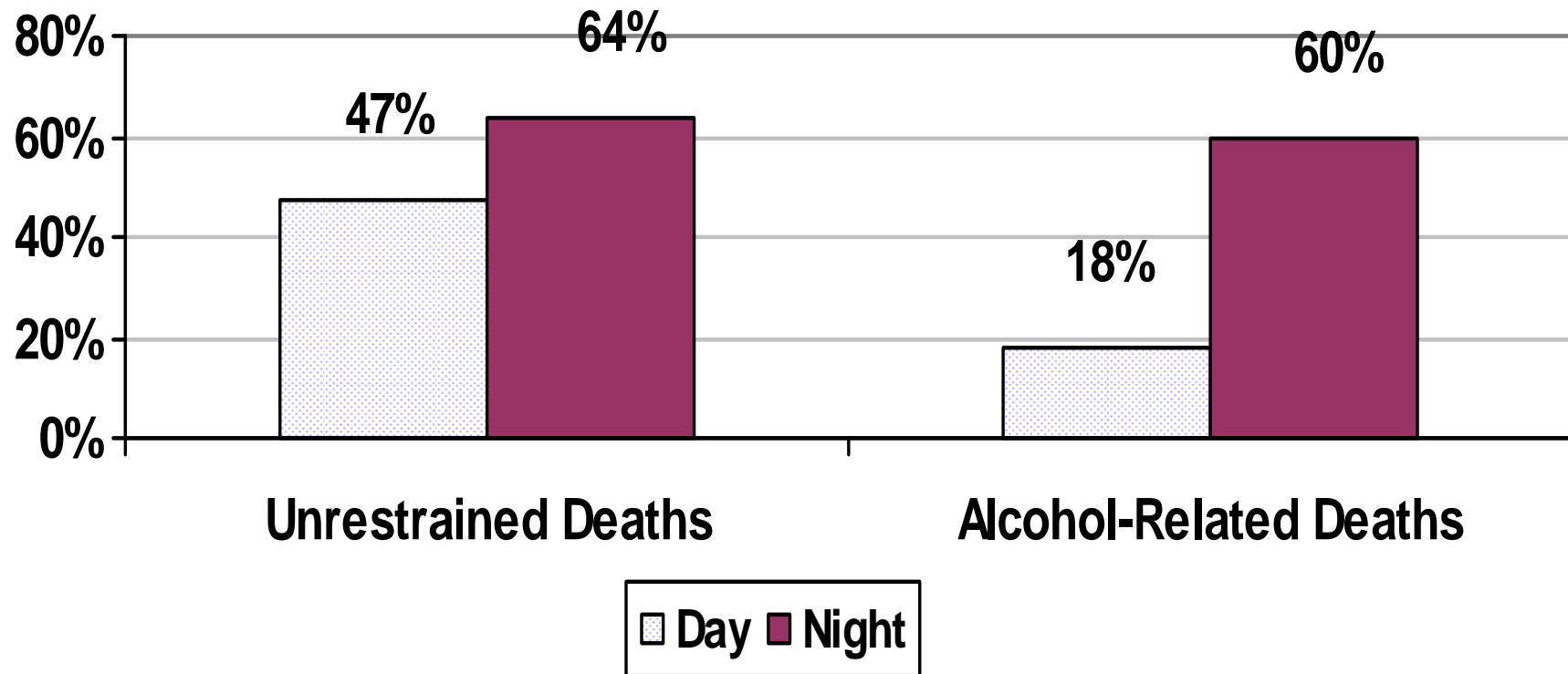
# Fatally Injured Victims of Alcohol-Related Crashes by Role in Crash (all ages)

Source: Subramanian, 2005; FARS



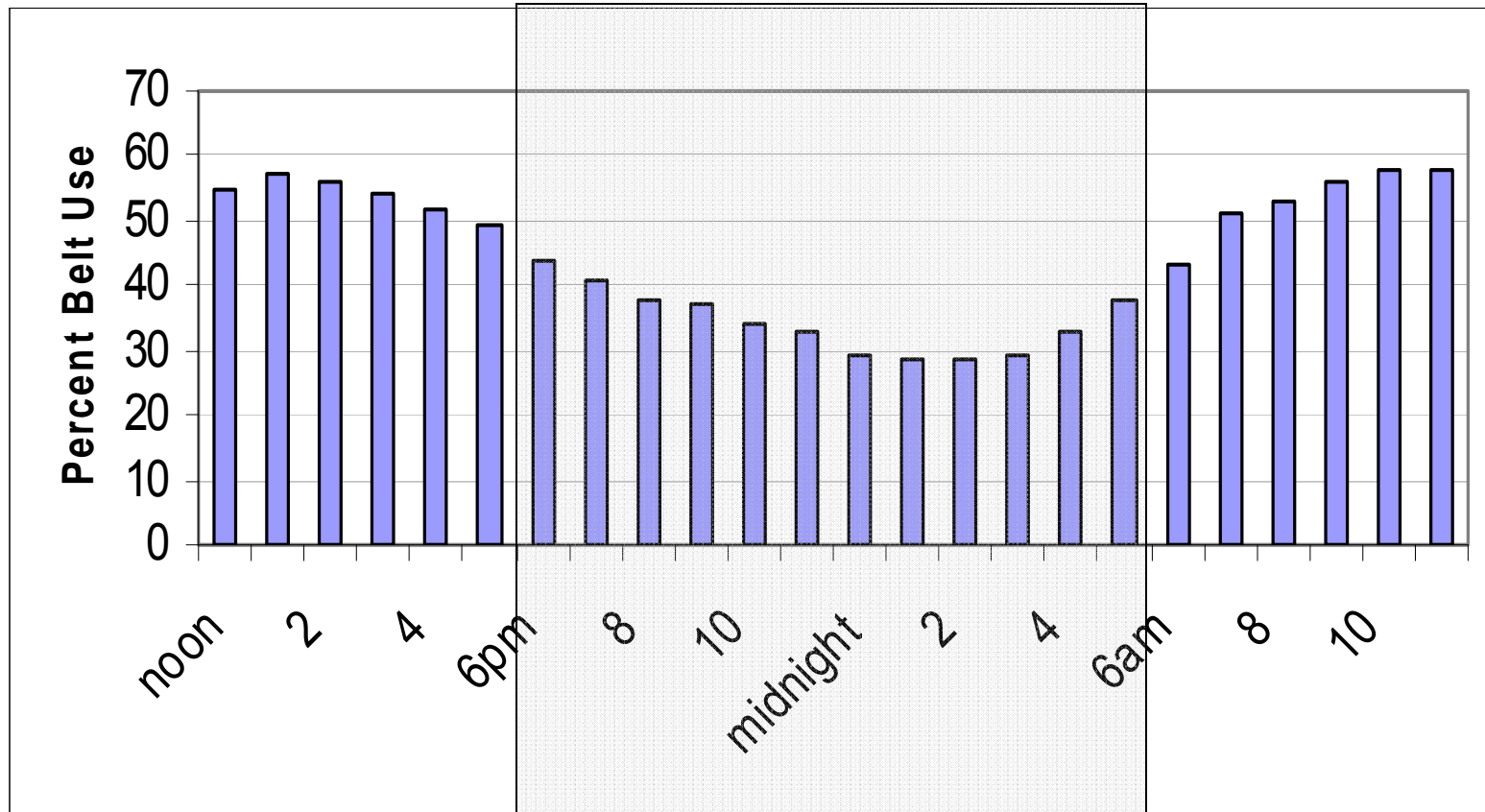
# Unrestrained and Alcohol-Related Occupant Fatalities: Daytime (6 am to 6 pm) versus Nighttime (6 pm to 6 am)

Source: Varghese and Shankar (2007); FARS, 2005 data.



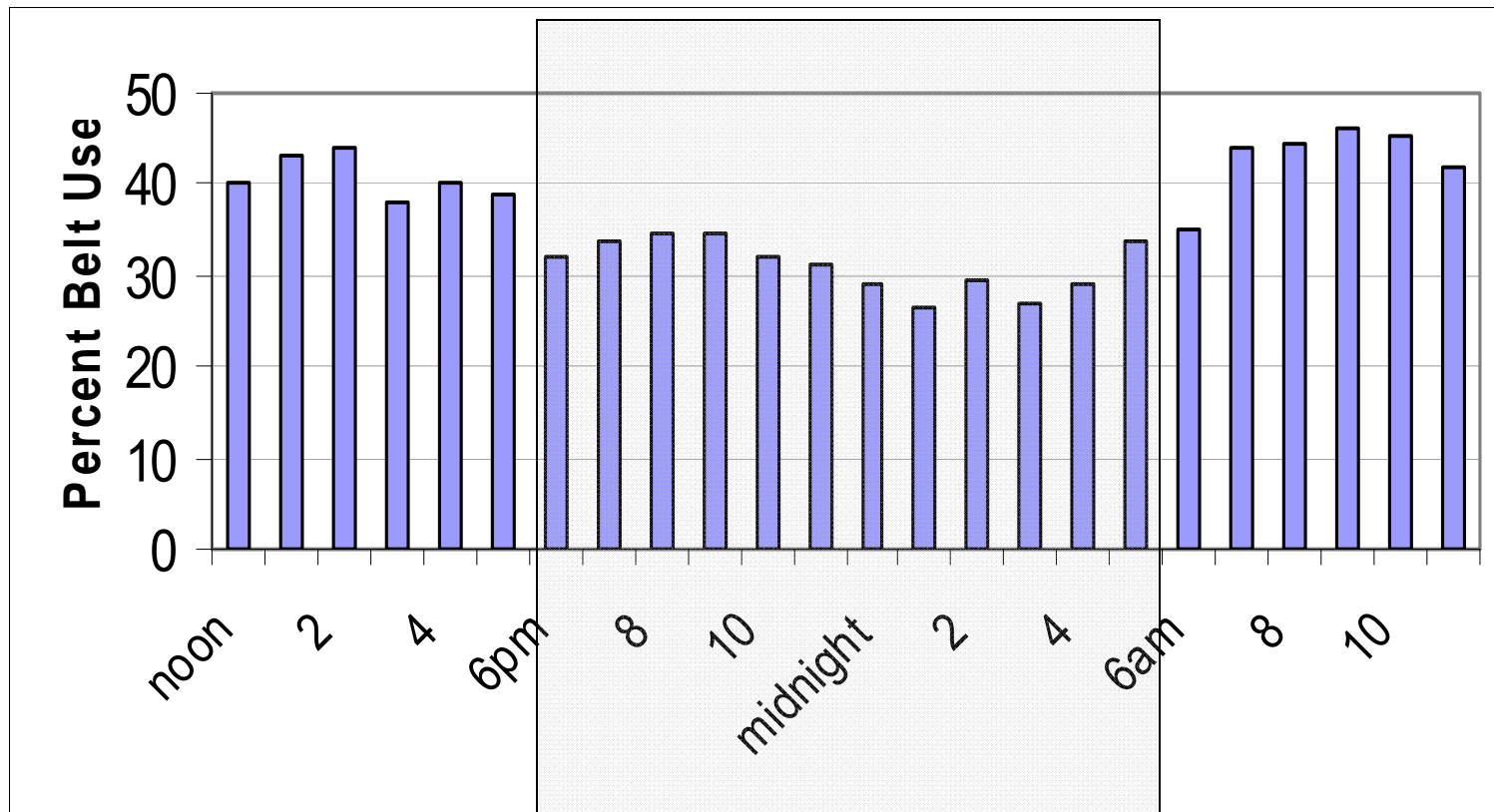
# Seat Belt Use among Fatally Injured Occupants, by Time of Day, All Ages

All Ages: Source: FARS, 2005 data



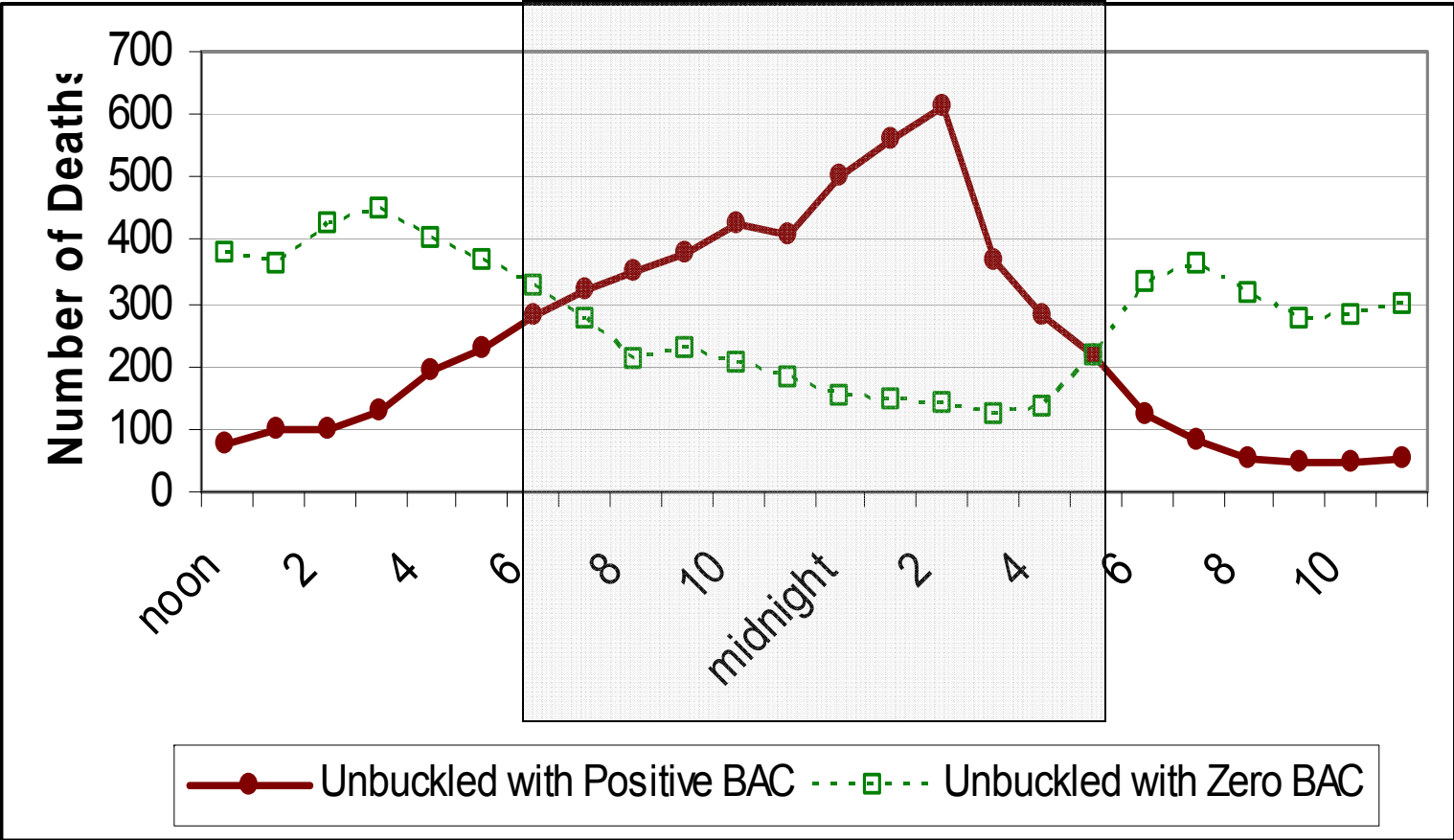
# Seat Belt Use among Fatally Injured Occupants, by Time of Day, Ages 16-24:

Source: FARS, 2006 data



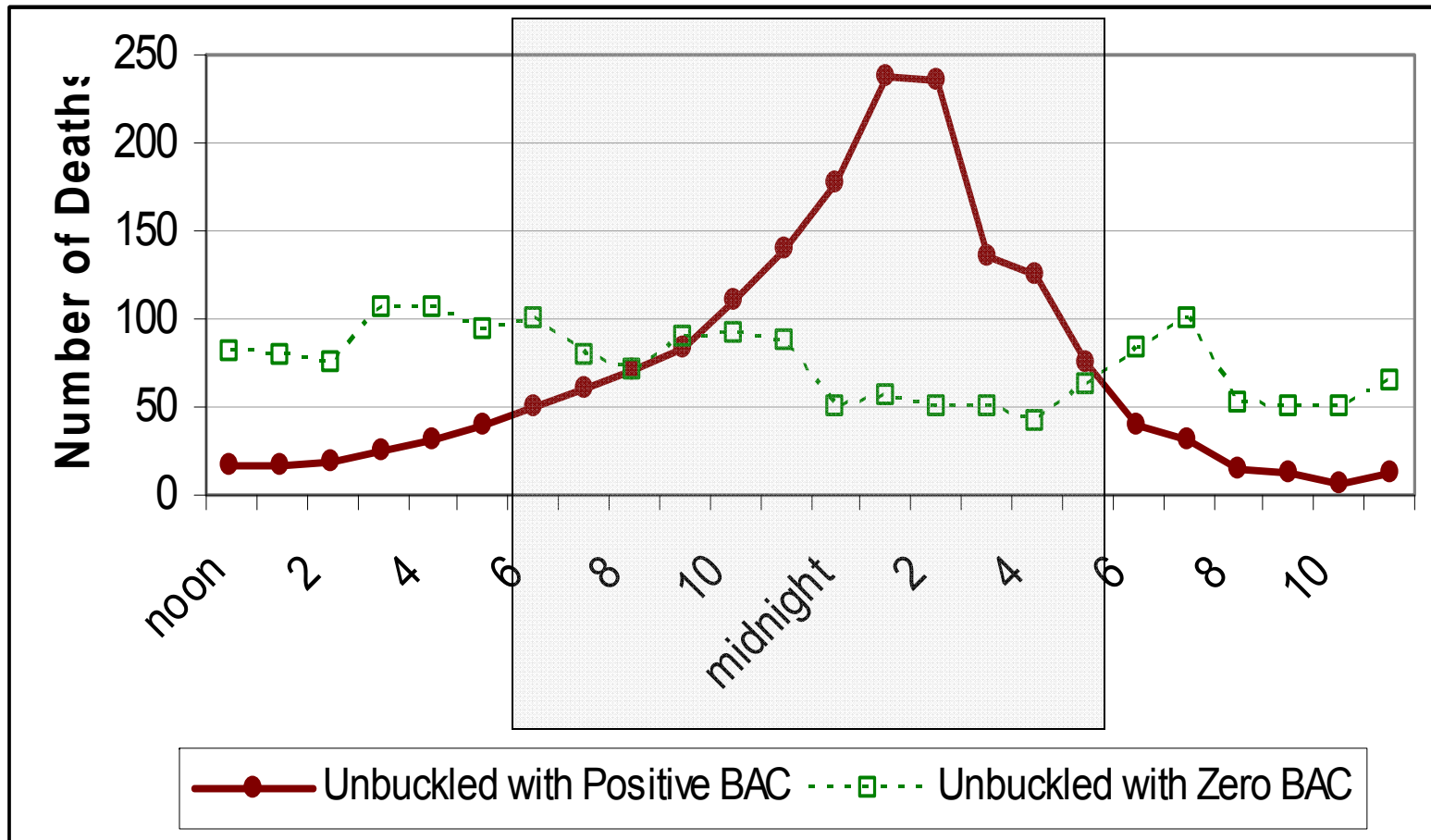
# Number of Unbuckled Fatalities, by Time of Day, and by Presence or Absence of Alcohol: All Ages

(Source: FARS)



# Number of Unbuckled Fatalities, by Time of Day, and by Presence or Absence of Alcohol Among Drivers, Ages 16-24

(Source: FARS, 2006)



# In Summary

- Most Victims are Drinking Driver's Vehicle
- Most are Unbuckled ( $\approx 70\%$ )
- Unbuckled Deaths Peak Late at Night
  - Ages 16-24 and Other Ages
- Unbuckled A/R Deaths Peak Late at Night
  - Ages 16-24 and Other Ages

# Objectives

- Increase seat belt use among:
  - Occupants involved in fatal and potentially fatal crashes
  - Occupants involved in nighttime fatal and serious injury crashes
  - Occupants involved in alcohol-related crashes (particularly those in drinking drivers' vehicles)

# Some Possible Hypotheses (based on the research literature)

Daytime seat belt enforcement does not affect nighttime usage (at least not to the extent that it affects daytime usage)

Nighttime seat belt enforcement does affect nighttime usage (possibly to a greater extent than it affects daytime usage)

Primary law upgrades do affect nighttime usage

Primary law upgrades do affect usage among drinking drivers (and their passengers).

Primary law upgrades facilitate nighttime seat belt enforcement efforts.

# Effect of Daytime Enforcement on Nighttime Usage

Modesto, CA Demonstration

Connecticut CIOT

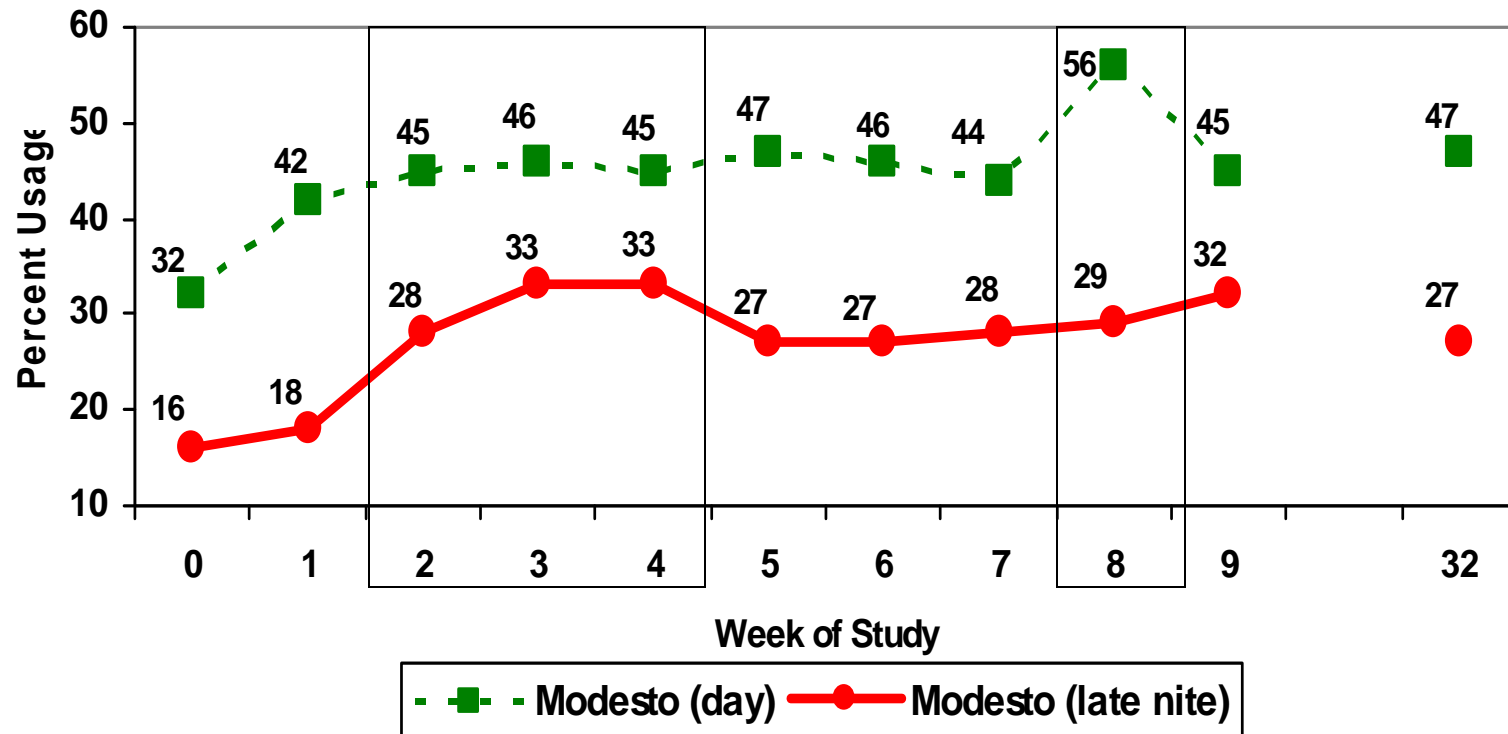
Indiana CIOT

# Modesto, CA (IIHS, 1988)

- Secondary law state
- Low baseline rate of usage
- Three weeks of enforcement and publicity
- One week of follow-up publicity (only)
- Measured change in daytime and nighttime usage (all ages)

# Daytime and Nighttime Seat Belt Use in Modesto, California (1988)

(Lund, Stuster, and Fleming, 1989)

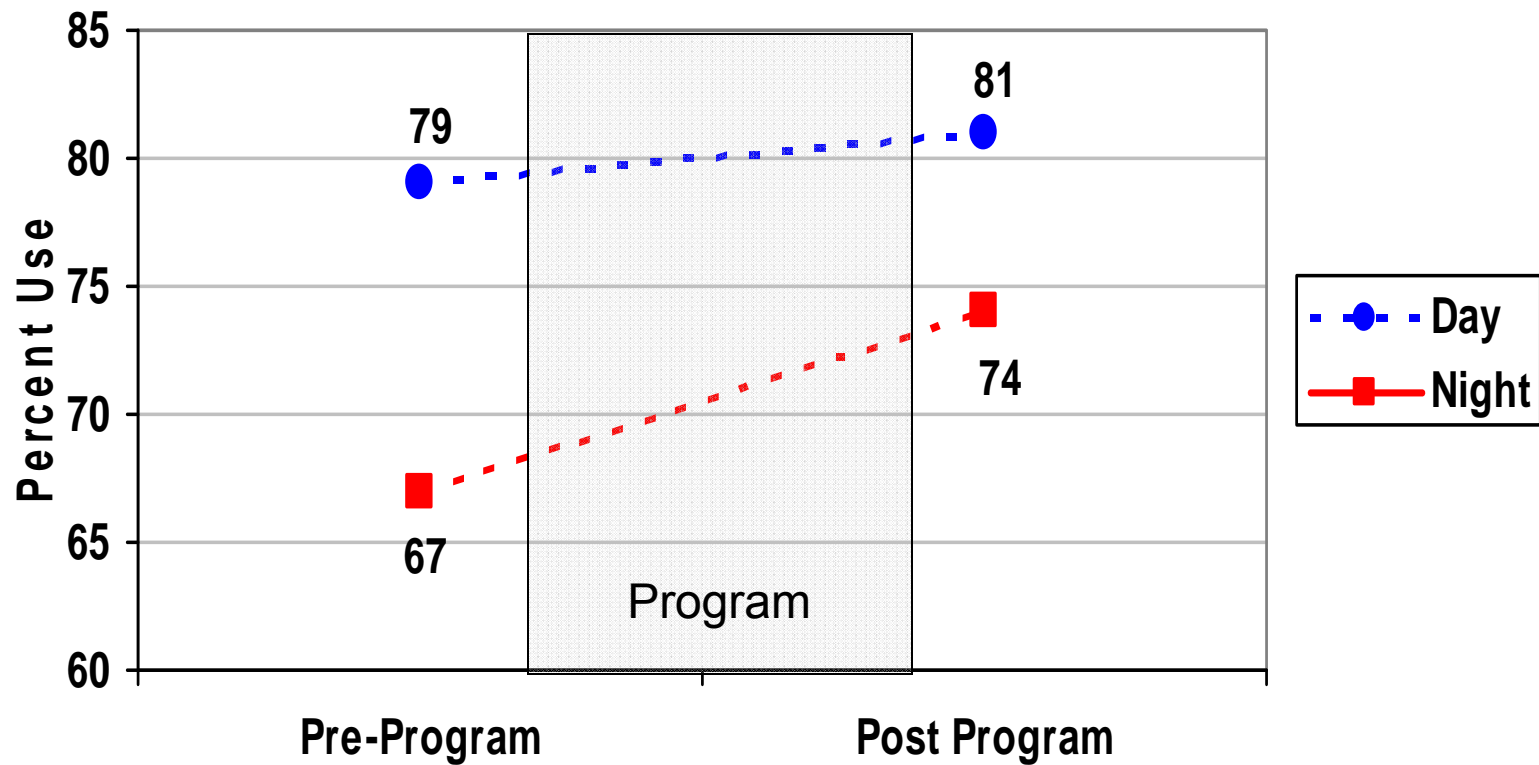


# Connecticut CIOT (NHTSA, 2004)

- Primary law state
- High rate of usage (79% day; 67% night)
- Typical CIOT mobilization
  - Three weeks of earned and paid media
  - Two weeks of intensified enforcement
- Measured daytime and nighttime usage

# Daytime and Nighttime Seat Belt Use in Connecticut Following a Daytime *Click It or Ticket* Mobilization.

(Chaudhary, Preusser, and Cosgrove, 2005)

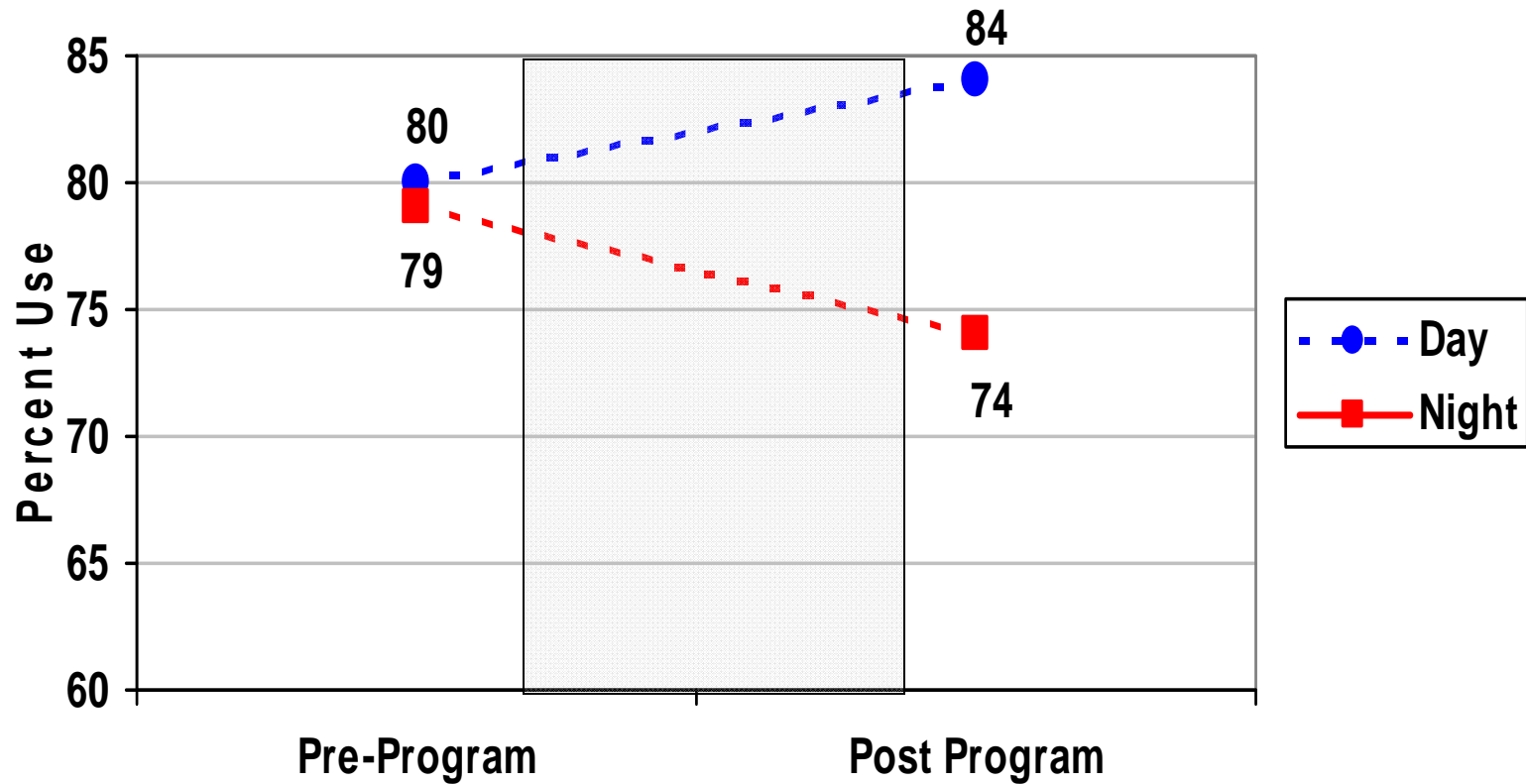


# Indiana CIOT (NHTSA, 2006)

- Primary law state
- High baseline usage (80% day; 79% night)
- Typical CIOT mobilization
  - Three weeks of earned and paid media
  - Two weeks of intensified enforcement
- Measured daytime and nighttime use

# Daytime and Nighttime Seat Belt Use in Indiana Following a Daytime *Click It or Ticket* Mobilization.

(Vivoda, Eby, St. Louis, and Kostyniuk, 2007)



# In Summary of Daytime Enforcement Efforts

- Daytime enforcement does affect daytime usage (many studies have shown this, but there is less impact today than there was in 2003).
- Daytime enforcement may or may not affect nighttime usage (few studies but FARS data suggests that nighttime usage is affected less than daytime usage)
- Little direct evidence of impact of daytime enforcement on impaired driving or alcohol-related crashes (but there are few studies)

# Effect of Nighttime Enforcement on Nighttime Usage

- New Brunswick & Nova Scotia (circa 1987)
- Binghamton, NY (1998-2000)
- Reading, PA (2004)
- Illinois CIOT (2007)

## More Recent Projects

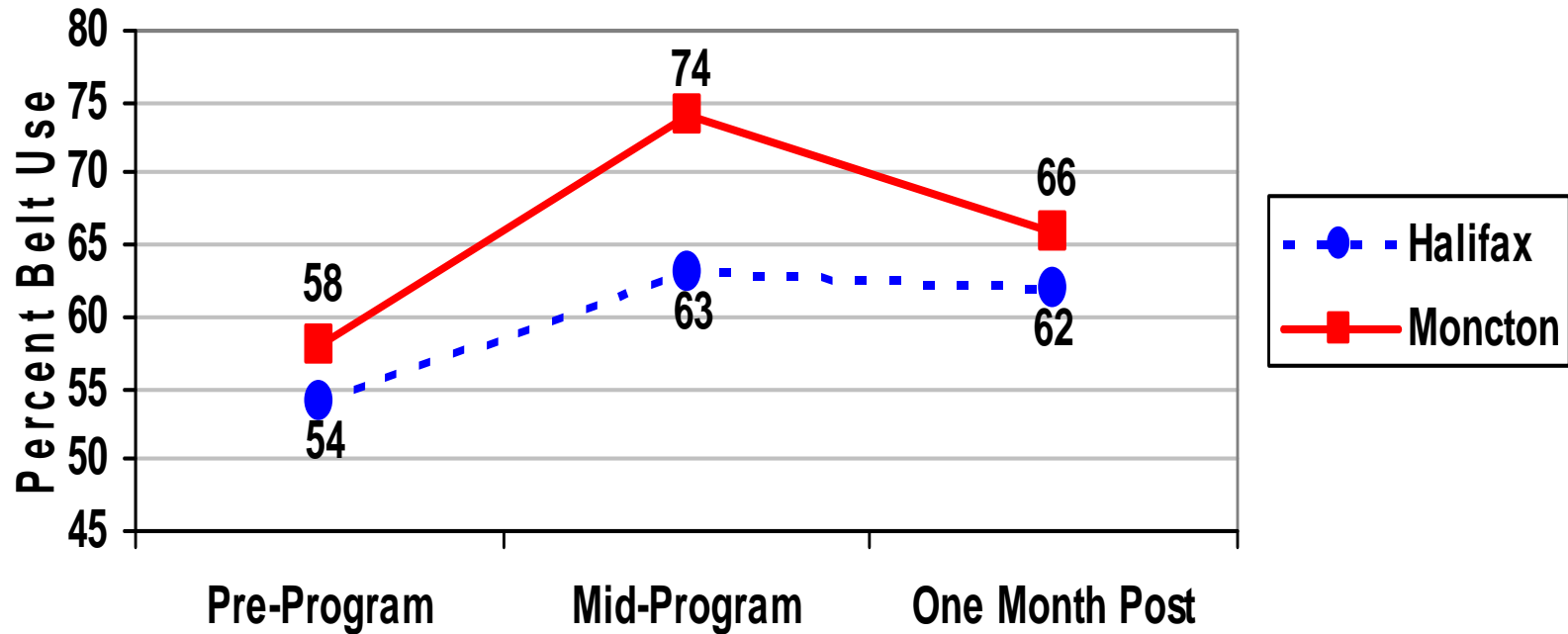
- Washington State CIOT (2006-07)
- North Carolina/West Virginia (2007-08)

# Halifax, Nova Scotia and Moncton, New Brunswick, Canada

- Primary laws
- Moderate to high baseline rates of usage
  - Halifax: 86% daytime; 58% nighttime
  - Moncton: 63% daytime; 54% nighttime
- Four weeks of enforcement and publicity (nite)
- Daytime and nighttime enforcement
  - Modest enforcement & publicity
  - Nighttime special patrols near bars & publicity
- Measured change in daytime and nighttime usage (all ages)

# Nighttime Safety Belt Use Among Bar Patrons in Halifax and Moncton, Nova Scotia.

Source: Malenfant and Van Houten, 1988



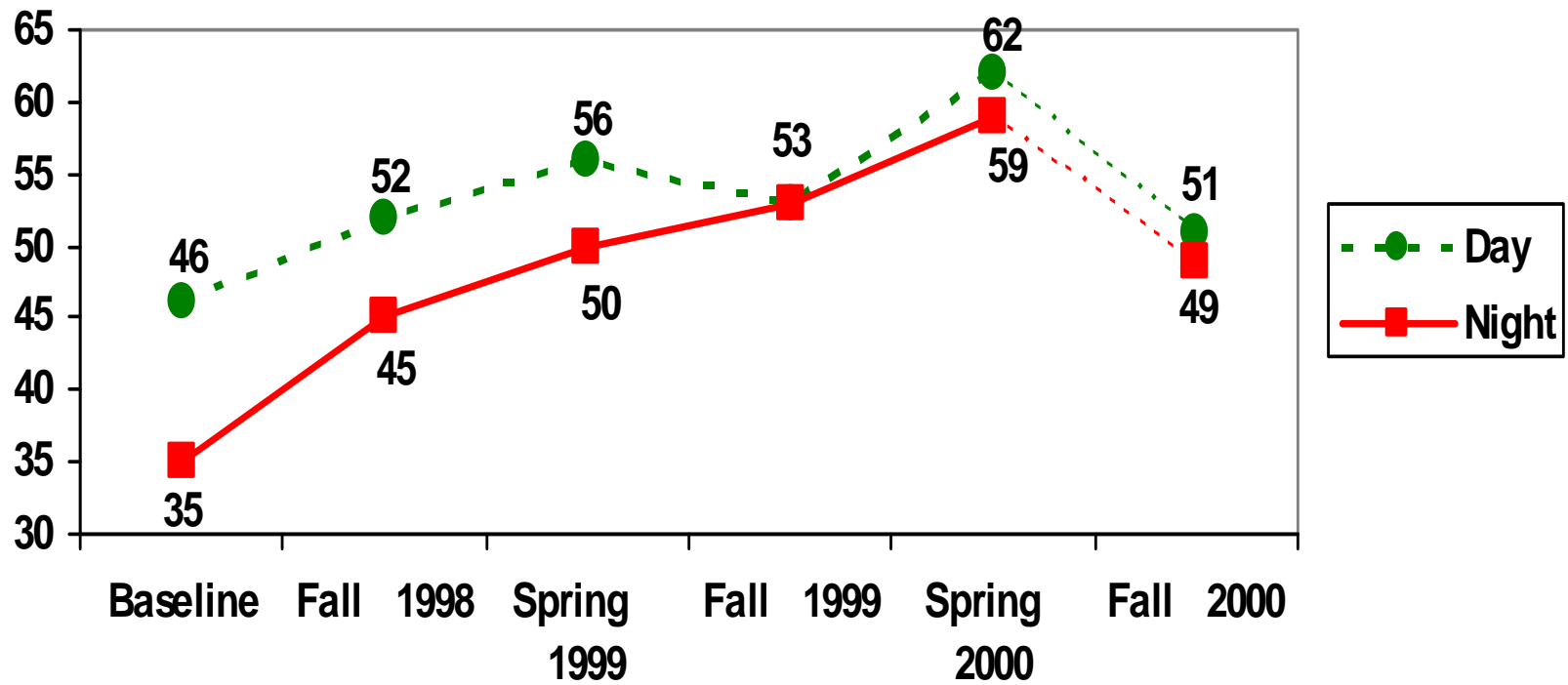
# Binghamton, NY (1988-1990)

## Combined Impaired Driving/Seat Belt Effort

- Primary law
- Low baseline rates of usage
  - 46% daytime; 35% nighttime
- Two-year program of
  - Impaired driving and seat belts
- Daytime and nighttime enforcement
  - 54 nighttime checkpoints for impaired driving (300 arrests; 5,000 seat belt warnings)
  - 8 daytime checkpoints for seat belts (864 tickets issued)
- Substantial publicity (paid, earned, & PSAs)
- Reduced number of drinking drivers; fewer late-night and injury-producing crashes; increased seat belt use.

# Daytime and Nighttime Safety Belt Use in Binghamton, NY

Source: Wells, Preusser, and Williams, 1992

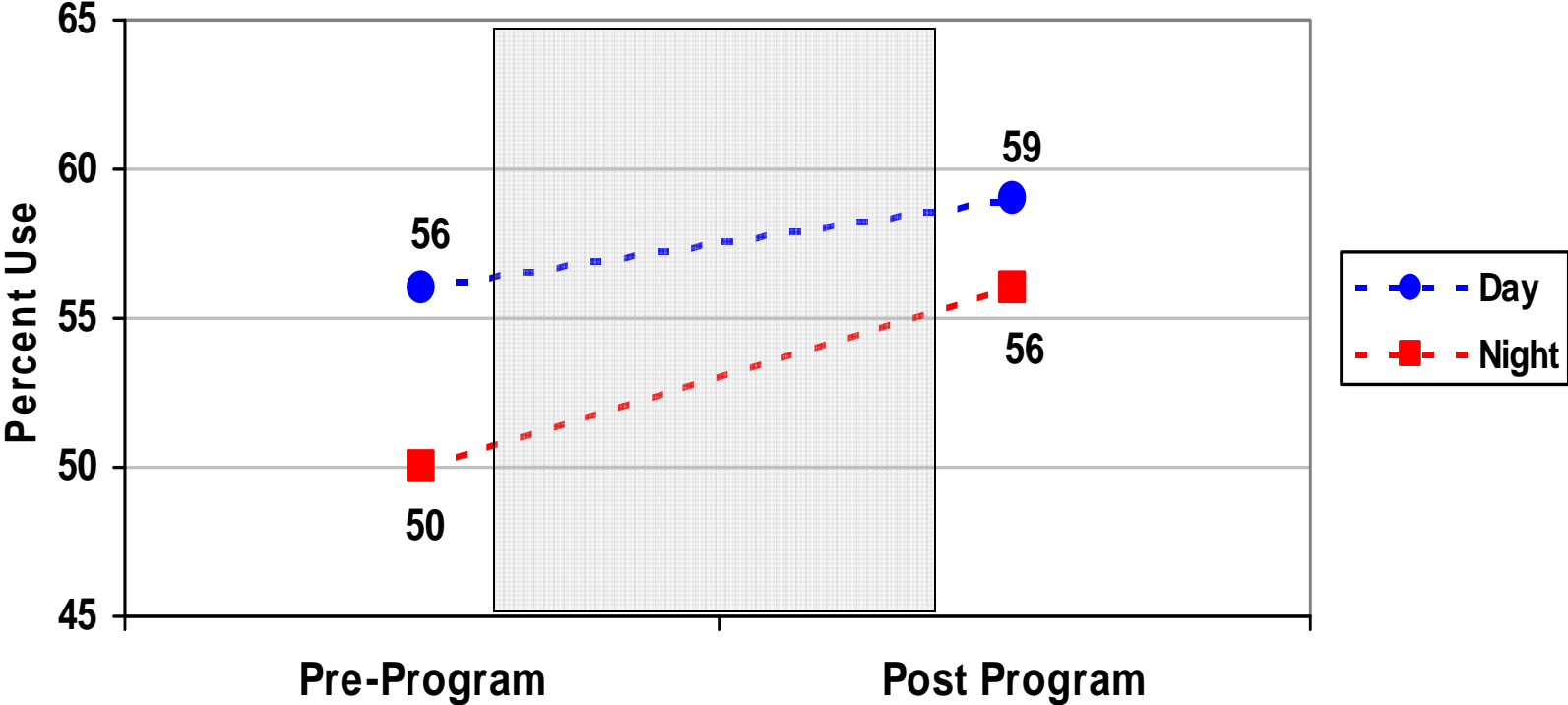


# Reading, PA (2004)

- Secondary law state
- Low baseline rate of usage
  - 56% daytime; 50% nighttime
- Enforcement with night vision equipment
- Earned media only (much media interest)
- 225 warnings and 42 tickets issued
- Measured change in daytime and nighttime usage (all ages)

# Daytime and Nighttime Seat Belt Use in Reading, PA following A Nighttime Enforcement Campaign.

Source: Chaudhary, Alonge, and Preusser, 2005

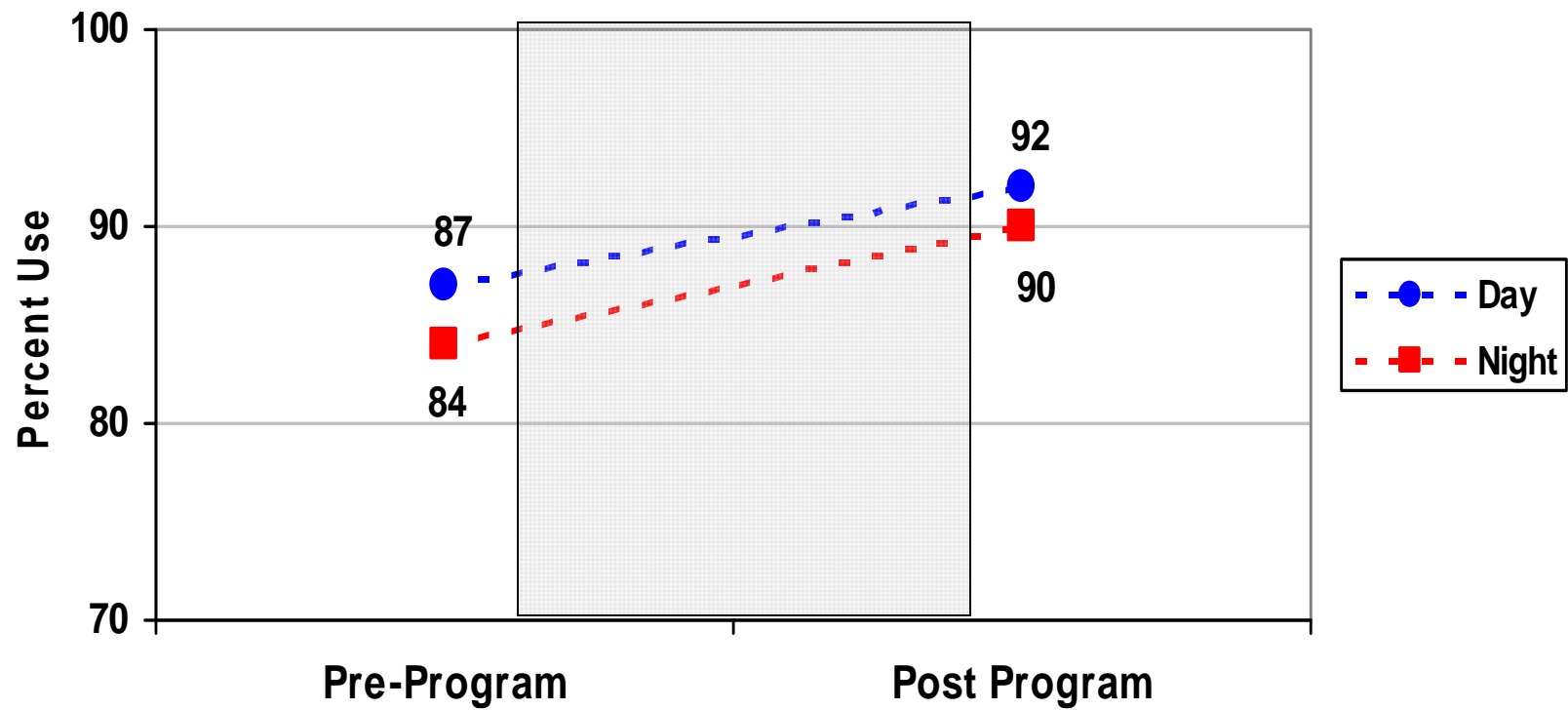


# Illinois CIOT(2007)

- Primary law state
- High baseline rate of usage
  - 87% daytime; 84% nighttime
- Typical CIOT Schedule
- Nighttime enforcement and media
- Measured change in daytime and nighttime usage (all ages)

# Daytime and Nighttime Seat Belt Use in Illinois following a CIOT Mobilization with Night Enforcement.

Source: Nassirpour, 2007



# In Summary of Nighttime Enforcement Efforts

- Nighttime usage is affected (few studies)
- Daytime usage may or may not be affected (few studies)
- Some evidence with regard to impact on impaired driving and alcohol-related crashes (combined effort in Binghamton)

# Effect of Primary Law Upgrades on Nighttime Usage and A/R Measures

- California (1993)
- Michigan (2000)
- Washington (2002)
  
- Voas et al. (2007)
- Masten (2007)

# California Upgrade (1993)

- Moderately high baseline rates of usage (70%)
- 13-point increase in daytime use (Bentacourt)
- 23-point increase in nighttime use (Lange & Voas)
- 39-point increase in nighttime use among drivers with  $BAC \geq 0.10$  (obs.) (Lange & Voas)
- Increase in usage among alcohol-related crash victims (Voas et al.)
- Reduction in alcohol-related deaths (Voas et al.)

# Michigan Upgrade (2000)

- Moderately high baseline rates of usage (70%)
- 13-point increase in daytime observed use
- increase among higher risk groups greater than among lower risk groups (males, youth, pickups)
  - Eby et al. (2002)
- Increase in usage among alcohol-related crash victims
- Reduction in alcohol-related deaths
  - Voas et al., (2007)
- Much additional enforcement associated with this law change.

# Washington State (2002)

- Very high baseline rate of usage (83%)
- 12-point increase in daytime observed use
- Reductions in fatalities
  - Salzberg and Moffat (2004)
- Increase in usage among alcohol-related crash victims
- Reduction in alcohol-related deaths
  - Voas et al., (2007)
- Much additional enforcement associated with this law change (along with increase in fines).

# Five-State Case Study

(Voas et al., 2007)

- California (1993) + 13 points observed
  - Maryland (1997) + 13 points observed
  - Michigan (2000) + 13 points observed
  - Washington (2002) + 12 points observed
  - Illinois (2003) + 8 points observed
- 
- All but Maryland had increases in usage among front-seat occupants in A/R fatal crashes
  - California, Michigan, and Washington had decreases in alcohol-related deaths

# Study of Nighttime Usage in Six States

(Masten, 2007)

- Oklahoma (1997) +12 points observed
  - Maryland (1997) +13 points observed
  - Indiana (1998) + 7 points observed
  - Alabama (1999) +23 points observed
  - Michigan (2000) +13 points observed
  - New Jersey (2000) +17 points observed
- 
- All but Maryland had increases in daytime and nighttime usage among occupants killed in fatal crashes
  - In Michigan and New Jersey, nighttime increases were greater than daytime increases

# In Summary

- Seat belt use is low at night and among alcohol-involved occupants (all ages)
- Nighttime seat belt enforcement appears to affect nighttime usage (to a greater extent than daytime enforcement affects nighttime usage).
- Primary law upgrades are most effective in increasing usage among crash victims (alcohol-related and non-alcohol-related).
- Combined nighttime enforcement of seat belt and impaired driving laws has potential for reducing both problems.