



Overview of What Works To Reduce Impaired Driving

Richard P. Compton

National Highway Traffic Safety
Administration

U.S. Department of Transportation

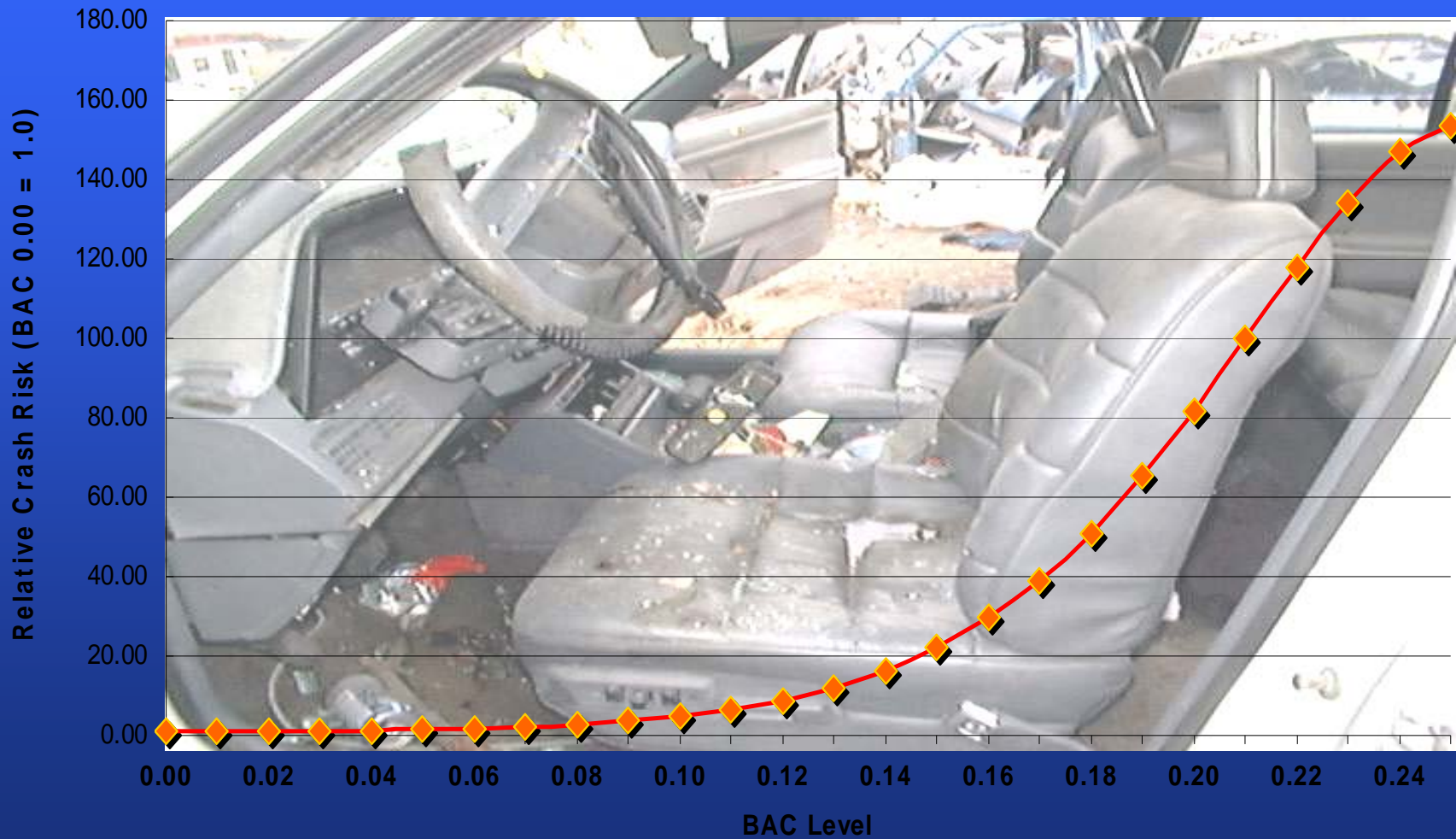
Overview of Presentation

- Relationship of BAC Level to Crash Risk
- Alcohol-Impaired Driving Fatalities in 2007
- The US Experience Combating Impaired Driving
- Conclusions

Relationship Between Alcohol Use and Crash Involvement

- **Crash risk estimated by comparing BACs of crash-involved drivers and similarly at risk non-crash-involved drivers**
- **Relative risk function determined**
 - **Likelihood of a driver at a specified BAC becoming involved in a crash compared to similar drivers under the same conditions at 0.00 BAC**
- **Borkenstein - Grand Rapids Study**
- **NHTSA Study**

Relative Risk Estimate



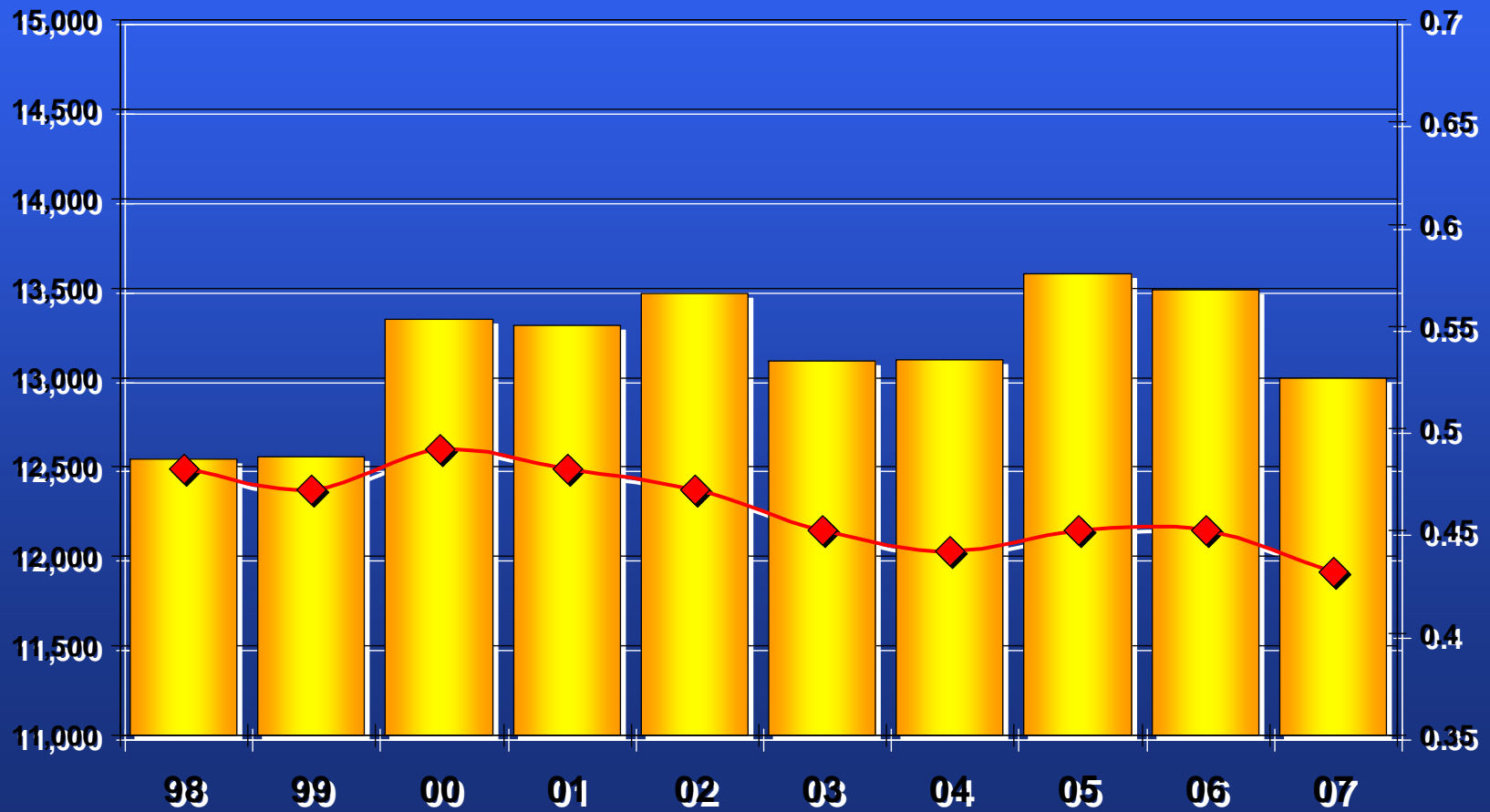
What Happened in 2007

- **In 2007**
 - **12,998 people died in alcohol-impaired driving crashes**
 - down 3.7% from 2006 (13,491)
 - **the fatality rate, per 100 million vehicle miles of travel, decreased to 0.43**
 - the lowest rate on record

What happened in 2007

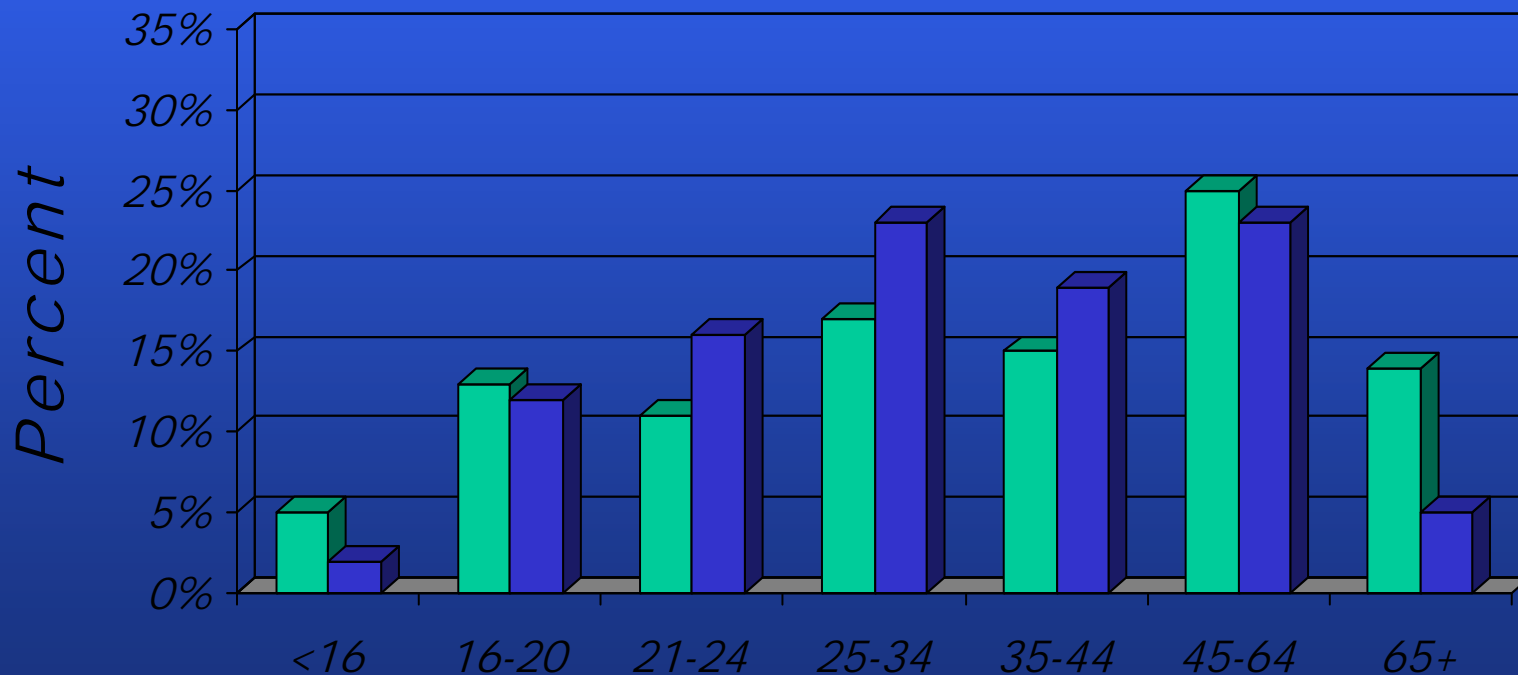
- **In 2007 compared to 2006**
 - **32 States had decreases in the number of alcohol-impaired driving fatalities**
 - **25 States and DC had increases in the number of alcohol-impaired motorcycle riders**
 - **Alcohol-impaired MC fatalities nationwide increased for the 10th year in a row (by 10% in 2007)**

Alcohol-Impaired Fatalities & Rates: 1998 - 2007



Source: FARS

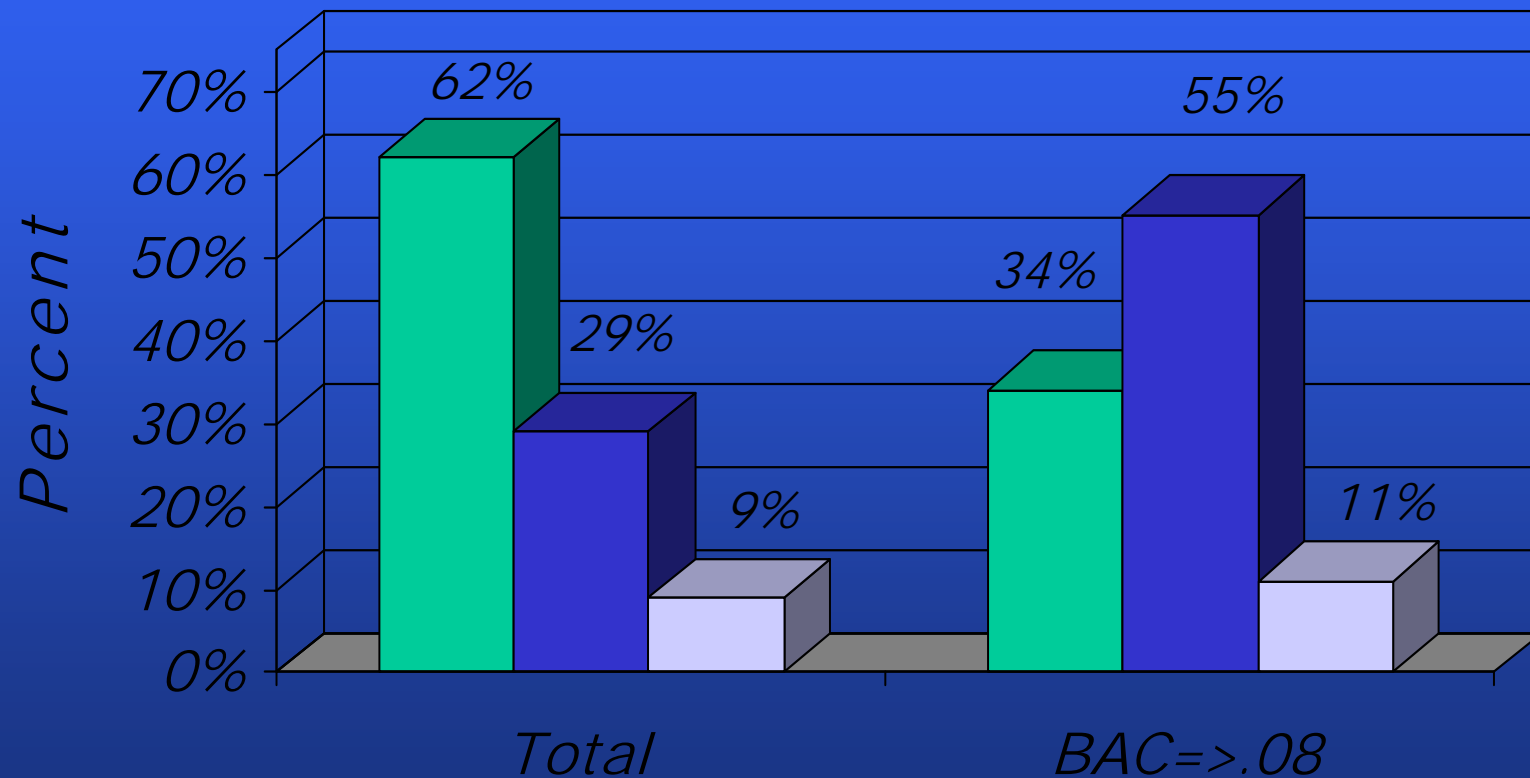
Percent by Age of Total Fatalities and Alcohol-Impaired Fatalities



■ Fatalities ■ BAC=>.08

Driver Age (Years)

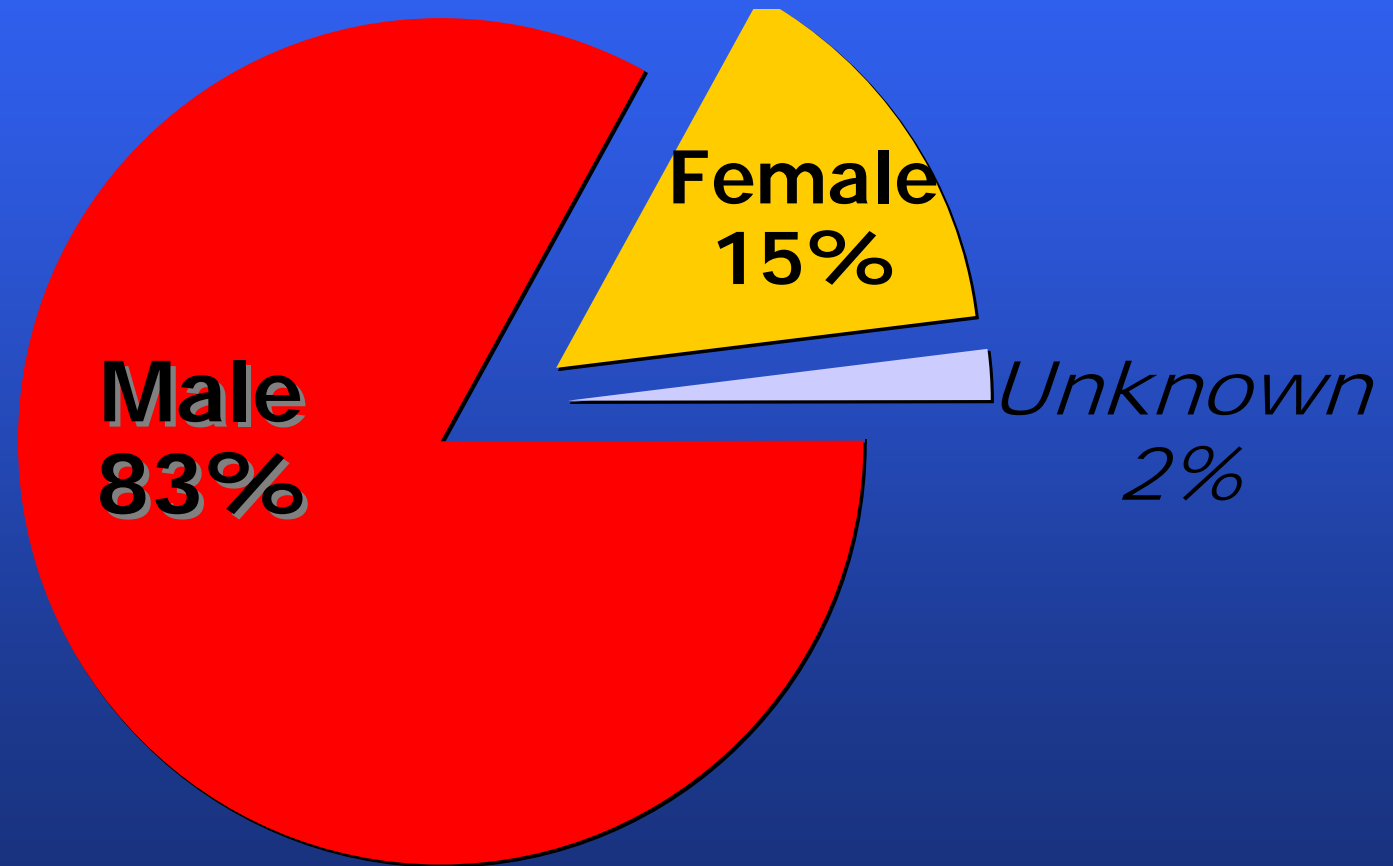
Percent Driver Restraint Use (Seat Belt & MC Helmets) for All Fatal Crashes and Alcohol-Impaired Crashes



■ Used ■ Not Used ■ Unknown

Crash Type

Percent of Drivers Involved in Alcohol-Impaired Fatal Crashes by Sex



Programs To Reduce Alcohol-Related Crashes

Major Approaches:

- Prevention
- Intervention
- Deterrence
 - Enforcement
 - Laws and Sanctions
- Rehabilitation/Treatment
- Technology

Prevention

- **Mass Media PI&E**
- **School Based Alcohol Education**
- **Environmental Approaches**

Mass Media – PI&E

- **Potential for population-wide impact**
- **Public service announcements versus paid media**
- **Contributes to impact of other programs**
- **Evidence suggests little effect as a stand alone program, but enhances other programs by raising awareness**

Alcohol Education

- Major obstacles to population-wide impact
- Normative, peer, resistance training
- Evidence of self-reported impact in classroom and on campus
- **No evidence of crash reduction impact**

Environmental Approaches

- **Examples:**
 - Pricing
 - Taxation
 - Reduction in Advertising
 - Host Liability Laws
 - Responsible Beverage Service
 - Server Training
 - Liquor Law Enforcement – Stings, Decoys, Cops in Shops
 - Reduction in “Happy Hours”
- **Strong potential for population-wide effect**

Environmental Approaches

- **Some programs have shown small reductions in crashes**
- **Consistent findings that advertising and availability can affect consumption**
- **Very little evidence of effectiveness for many environmental approaches**

Intervention

- **Designated Driver Programs**
- **Alternative Transportation Programs**
- **Personal Intervention**
- **Screening and Brief Intervention at Hospital Settings**

Designated Driver Programs

- Two types of programs:
 - Population based campaigns
 - Community based at drinking establishments
- Limited implementation
- Abstinence versus least number of drinks
- **No Evidence for reduced A/R crashes**
 - Self-reported use of designated drivers
 - Self-reported reductions in drinking and driving

Alternative Transportation Programs

- **Community based programs**
 - **Free ride home**
 - Shared vans
 - Taxi
 - Tow trucks
 - “Ask Jeeves”
- **Limited evidence for crash reduction**

Personal Intervention

- **Mass Media Campaigns**
 - “Friends Don’t Let Friends Drive Drunk”
 - Take the Keys
- **Social Marketing programs**
- **No Evidence for Crash Reductions**

Brief Screening and Intervention

- Screening for alcohol abuse
- Hospital emergency rooms
- Short set of questions
- Specific information about where to receive counseling
- Evidence for reduced drinking and self-reported drinking and driving; some evidence of crash reductions

Deterrence

- **Law Enforcement**
- **Laws**
- **Sanctions**

Deterrence Programs

- **General Deterrence Theory**
- **Examples of Successful Programs**
 - **Binghamton, NY**
 - **Experimental Evaluation of Sobriety Checkpoint Programs**
 - **Checkpoint Tennessee**

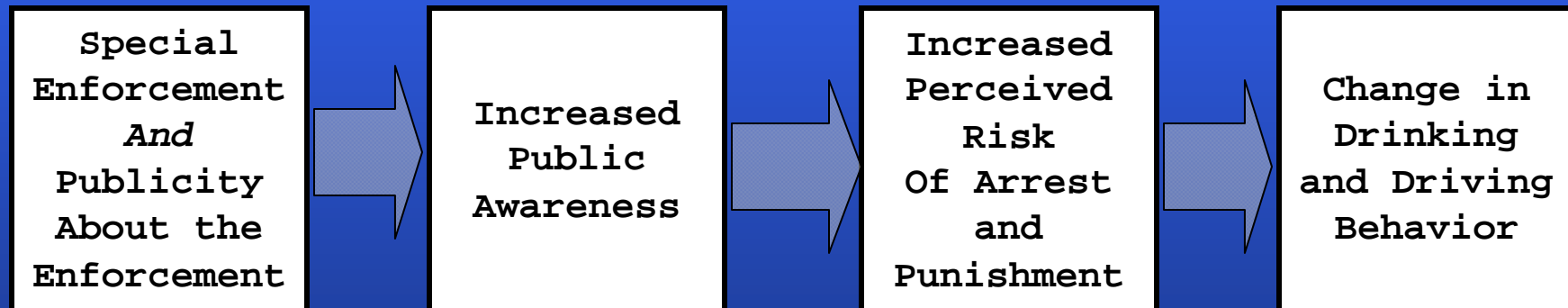
General Deterrence Theory

- **Classic Deterrence Theory**
 - Human behavior is rational
 - Deviant behavior can be deterred by the prospect of punishment if it is:
 - Certain
 - Swift
 - Severe
 - **Policing and punishment serve:**
 - Retribution and incapacitation
 - Discouraging would-be offenders from engaging in prohibited acts

Types of Deterrence

- **Specific Deterrence**
 - Prevention of repeat offenses
 - Incarceration
 - License Suspension
 - Vehicle Sanctions
 - Fines
- **General Deterrence**
 - Prevention of prohibited behavior
 - Increase perceived risk of detection, arrest, and severe punishment

General Deterrence Model Applied to Impaired Driving



Sobriety Checkpoint Program – Binghamton, NY

- **Designed to reduce alcohol-impaired driving and increase seat belt use**
- **Publicized Use of Sobriety Checkpoints and Passive Alcohol Sensors**
- **Two year program**
 - **Fall 1988 – Fall 1990**

Binghamton, NY

- **Small city (population 55,860)**
- **Distinct media market**
 - Three TV stations
 - Several radio stations
 - Daily newspaper
- **Illegal Per Se .10 BAC law**
- **Primary Seat Belt law**

Binghamton, NY - Checkpoints

- **Conducted during late night hours**
- **Thursday, Friday, and Saturday nights:**
 - 9:30 p.m. – 11:45 p.m.
 - or
 - 12:30 p.m. - 2:45 a.m.
- **Passive alcohol sensors used to screen drivers**

Binghamton, NY - Checkpoints

- **72 Checkpoints conducted in six sets:**
 - **Baseline 1988 (Oct – Nov)**
 - **Fall 1988 (Nov – Dec)**
 - **Spring 1989 (Apr – Jun)**
 - **Fall 1989 (Oct – Nov)**
 - **Spring 1990 (Apr – Jul)**
 - **Fall 1990 (Oct – Nov)**

Binghamton, NY Publicity

- **Earned media**
 - Press conferences
 - Television, radio, and newspaper coverage
- **Public service announcements**
 - Mayor, police chief, passive alcohol sensor
 - Posters
- **Paid media**
 - Local network television and cable channels

Binghamton, NY Evaluation Approach

- **Impaired driving**
 - Change in proportion of drinking drivers baseline vs 24 month program period
- **Crash rates**
 - Changes in injury producing and late-night crashes
- **Public awareness**
 - Telephone surveys before and during program

Binghamton, NY

Changes in Alcohol- Impaired Driving

- **Measured Driver BAC**
 - **Arrested drivers**
 - Evidential breath tests
 - **All other drivers**
 - Researcher requested voluntary breath test
 - Consent 93%

Binghamton, NY Crash Rates

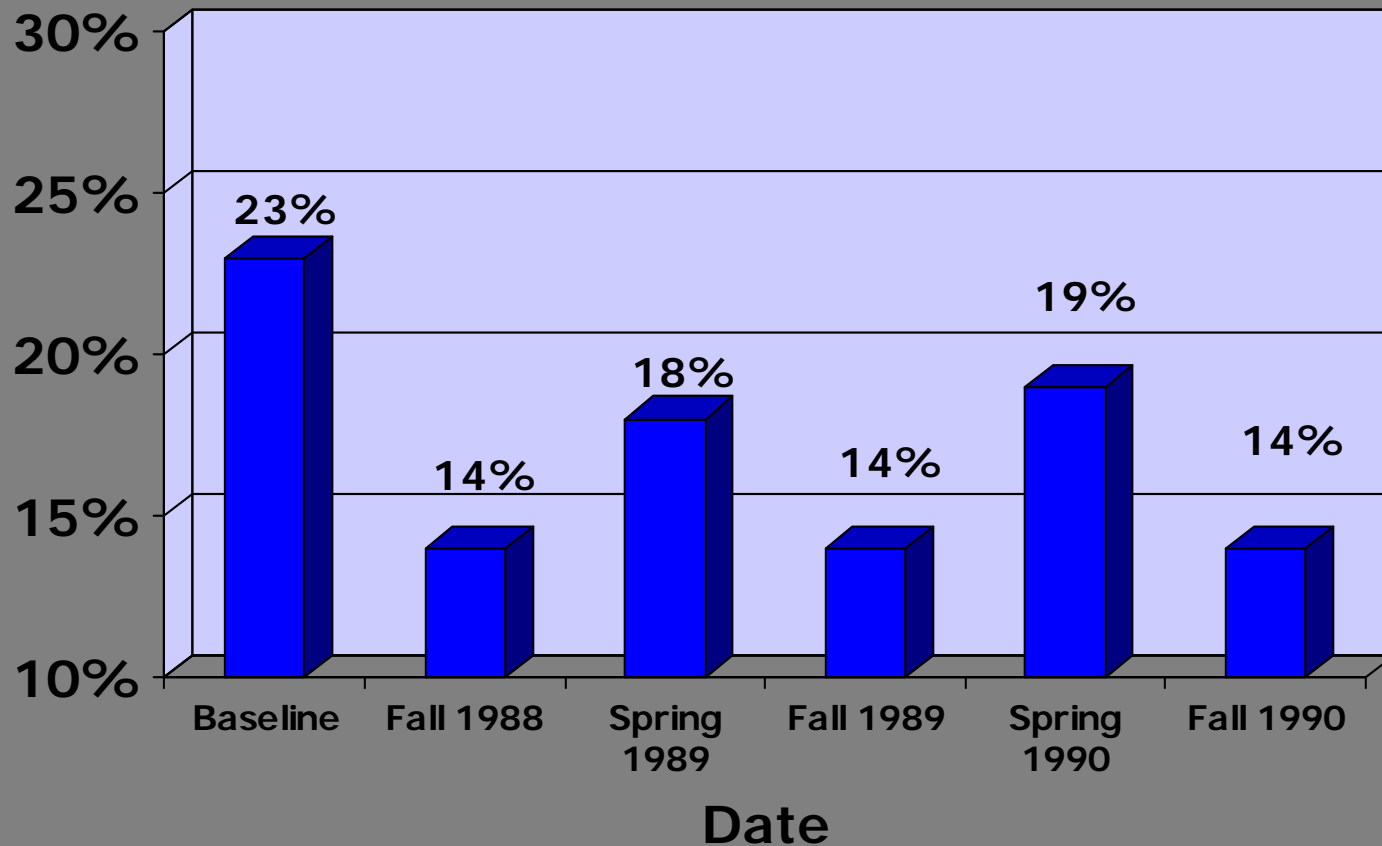
- Examined crash trends 1986 through 1990
- 2 years before compared to 2 program years
 - Monthly crashes
 - Injury crashes
 - Late night crashes

Binghamton, NY

Results: Impaired Driving

- The percentage of drinking drivers declined 39% from Fall 1988 to Fall 1990
- Greatest effects on drivers with BAC's < .10
- No difference
 - Gender, Age, Trip Length

Binghamton, NY Percentage of Drinking Drivers (BAC > .01)



Binghamton, NY

Awareness

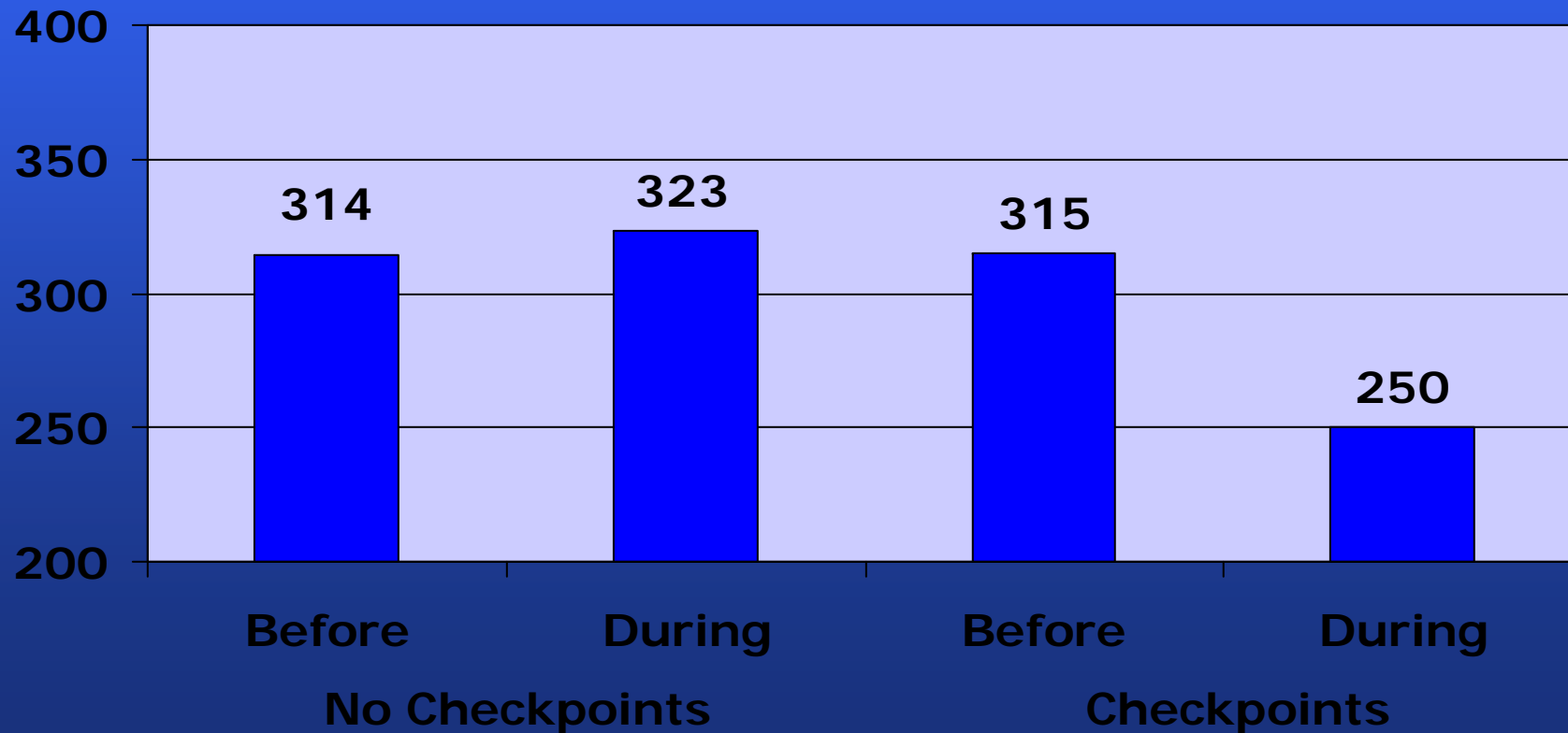
- Perceptions of changes in the enforcement of impaired driving increased
 - Baseline – 49%
 - Program 1 – 74%
 - Program 2 – 59%
- Perceptions of risk of arrest increased

Binghamton, NY Crash Trends

- **Two years before program compared to program years**
- **Months with no checkpoints compared to months with checkpoints**
 - **No Checkpoints**
 - Injury crashes up 7%
 - Late night crashes up 3%
 - **With Checkpoints**
 - Injury crashes down 16%
 - Late night crashes down 21%

Binghamton, NY

Number of Late-Night Crashes



Binghamton, NY Crash Trends

- **Trend analysis (using all crashes as a comparison series) showed a statistically significant decrease in:**
 - **Injury crashes (24%)**
 - **Late-night crashes (23%)**

Experimental Evaluation of Sobriety Checkpoint Programs

- Study conducted to evaluate the effectiveness of sobriety checkpoints and “roving patrols” in reducing alcohol-related crashes
- Conducted in six communities in CA
- 9 month program (August 1992 – April 1993)

CA Sobriety Checkpoint Program Enforcement Programs

■ Sobriety Checkpoints:

- **Staffing levels**

- Low (3 – 5 officers)
- High (6 –12 officers)

- **Mobility**

- One location (4 hours, 10:30 – 2:30)
- Three locations (1 hour at each, 10:30 – 2:30)

CA Sobriety Checkpoint Program Checkpoint Program Variations

- **Four communities conducted 18 sobriety checkpoints (Modesto, Santa Rosa, Ventura, Visalia):**
 - **Twice a month for 9 months**
 - High staffing – Low mobility
 - High staffing – High mobility
 - Low Staffing – Low mobility
 - Low Staffing – High mobility

CA Sobriety Checkpoint Program

Roving Patrols and Control

- **One community conducted “Roving DWI Patrols” (Ontario)**
 - Special DWI squad on Thursday, Friday, Saturday nights
 - Level of effort equal to conducting high staffing level sobriety checkpoints
 - Patrolled areas with high DWI crashes or arrests
- **Control community (Santa Barbara)**
 - No special DWI enforcement effort or publicity

CA Sobriety Checkpoint Program Publicity

- **Traffic safety program support committees formed in each community**
- **Publicity efforts included:**
 - **Press conferences**
 - **Media events**
 - **Posters, Brochures, and billboards**
 - **Public Speakers**
 - **TV and radio public service announcements**

CA Sobriety Checkpoint Program Evaluation

- **Attitudes and awareness measured by DMV surveys conducted monthly (starting two months before program and continuing during program)**
- **Results:**
 - **Public awareness elevated in all 5 test communities**
 - Checkpoint program communities average 80%
 - Roving patrol community doubled to 30%
 - **Public awareness unchanged in control community**

CA Sobriety Checkpoint Program Program Impact on Crashes

- Examined changes in alcohol-related fatal and injury crashes (BAC > .01%)
- Compared the four checkpoint programs and the “roving patrol” program, to the control community and the rest of the State
- Interrupted time series analysis conducted

CA Sobriety Checkpoint Program Results: Crashes

- Statewide decline in alcohol-related crashes during this time period
- The four checkpoint communities experienced an additional **28% decline**
- The “roving patrol” community experienced an additional **5% decline**
- The control community experienced **no change** in the decline in crashes

CA Sobriety Checkpoint Program Checkpoint Differences

- **No significant differences were found in effectiveness between the four sobriety checkpoint programs**

Checkpoint Tennessee

- **Statewide year-long program of highly publicized sobriety checkpoints**
 - April 1994 – March 1995
- **Checkpoints conducted every weekend**
 - Four sets of three checkpoints across the state
 - On five weekends checkpoints were conducted in each of the 95 counties

Checkpoint Tennessee

Checkpoint Program

- **Coordinated by Tennessee Highway Patrol with support from local law enforcement agencies**
 - **Used special vans, lights, signs, video taping, on-site evidential breath testing, passive alcohol sensors and SFST's to detect impaired drivers**
 - **Non-blitz checkpoints were smaller scale**

Checkpoint Tennessee

Checkpoints Conducted

- 882 checkpoints conducted during project period
- 10 – 15 checkpoints a year conducted on average during five previous years
- Selected statistics:
 - 144,299 drivers checked
 - 773 arrested for DUI or DWI
 - 201 arrested for drug violations
 - 84 for youth offender violations
 - 35 felony arrests
 - 1,517 cited for seat belt or child restraint

Checkpoint Tennessee

Publicity

- Special cooperation obtained from a TV station in each major market in the state to publicize the program
- Earned media coverage:
 - Hard news coverage from other outlets
 - Statewide billboard campaign
 - Press releases covering checkpoints and results
- TV, radio and print media coverage was extensive during the 12 month operational phase of the program

Checkpoint Tennessee Awareness Measured

- Three waves of DMV surveys conducted to measure awareness and attitudes
 - **March 1994 – baseline**
 - Summer 1994 – 4 months
 - Spring 1995 – project completion
- Analysis showed awareness increased

Checkpoint Tennessee

Impact

- Impaired driving fatal crashes analyzed:
 - Interrupted time series analysis of crashes involving a driver with a BAC of .10% or higher 1988 – 1996
 - Five surrounding States (KY, GA, AL, MS, LO) used as comparison
- **20.4%** reduction in fatal crashes for the year in Tennessee
 - 9 crashes per month
- Impaired driving fatal crashes increased in the comparison States

Summary

- **High visibility enforcement conducted weekly can raise perceived risk of detection and arrest**
- **Result in reductions in impaired driving and alcohol-related crashes of 5% - 20%**

Characteristics of Successful Programs

- **Frequent (weekly) enhanced impaired driving enforcement (sobriety checkpoints or saturation patrols)**
 - **Intensive**
 - **Sustained**
 - **Highly publicized**
 - **Visible**

Laws

- **Administrative License Revocation (ALR)**
- **Minimum Drinking Age (MDA)**
- **Zero Tolerance for Youth**
- **Lower BAC Limits for Offenders**
- **Tiered Sanctions – High BAC**
- **Open Containers**

Administrative License Revocation (ALR or ALS)

- Allows for the revocation or suspension of the driver's license if the driver is over the legal BAC limit or refuses to take a BAC test
- The arresting officer typically takes the license and the driver receives a temporary license
- Designed to provide swift and certain punishment for DWI, rather than the lengthy and uncertain outcome of a criminal trial
- Currently 41 States and DC have some form of ALR or ALS
- **Many studies have shown that ALR or ALS reduce crashes**

Minimum Drinking Age (MDA)

- The minimum legal drinking age (MDA) has been 21 in all States since 1987
 - State laws vary regarding vendors, adults and youth provisions
- **There is strong evidence that MDA-21 reduces drinking, driving after drinking, and impaired driving crashes**

Zero Tolerance for Youth

- Zero tolerance laws set a maximum BAC for drivers under 21 at .02 or less
- All States have some version of a zero tolerance law since 1998
- **Some evidence that zero tolerance laws are associated with decreased alcohol-involved crashes for youth**

Lower BAC Limits for Offenders

- **Some States have laws establishing lower BAC limits for convicted impaired drivers (one or more convictions)**
- **Two studies, in Maine, found evidence the law reduced the proportion of repeat offenders in fatal crashes**

Tiered Sanctions – High BAC

- **Most States increase the penalties for repeat offenders and some increase the penalties for drivers with high BACs, typically .15 or .16 and higher**
- **Only one study has evaluated high-BAC sanctions (MN) and it found an increase in the average severity of the sanctions imposed after the law went into effect**

Open Containers

- Open container laws prohibit carrying open alcoholic beverages (or consuming) in the passenger compartment of a vehicle
 - Certain exemptions apply (taxis, buses, mobile homes)
- In 1998 federal law required States to enact open container laws or faces a transfer penalty
- As of January 2006 39 States and DC had open container laws that complied with federal requirements
- One study of open container laws in four States found a decline in the proportion of alcohol-involved fatal crashes after the law was adopted.

Sanctions

- **License Suspension/Revocation**
- **Jail**
 - Home Detention
- **Fines**
- **Community Service**
- **Education**
 - DWI School
- **Vehicle Sanctions**
 - Impoundment
 - Forfeiture
 - Vehicle Plate Impoundment
- **Alcohol Ignition Interlocks**

License Suspension/Revocation

- All States allow for post-conviction license actions
- Most States have some form of administrative license action for over the limit or test refusal
- **Strong evidence for reduced crashes**

Jail

- All States allow some offenders to be sentenced to jail
- Laws requiring mandatory jail often allow alternatives (community service)
- Little evidence jail sentences are effective

Community Service

- **Many States allow community service as part of the impaired driver's sentence**
- **Most programs are not tailored for impaired driving offenders**
- **No evidence for reduced crashes**

Fines

- **Most States impose fines on impaired driving offenders**
 - Significant other costs are also likely (alcohol treatment, legal fees, insurance costs, etc.)
- **Fines at current levels have not been shown to reduce alcohol-impaired driving**

Alcohol Education

- **Many States allow or require offenders to attend alcohol education classes (DWI School)**
 - **Short-term, non-treatment**
- **No evidence of reduced impaired-driving or crashes**

Vehicle Sanctions

- **Immobilization**
 - Impoundment
 - Boot or Club
- **Forfeiture**
- **Vehicle Plate Impoundment**
- **Special Plates**

Immobilization

- **Laws in 17 States allow vehicle immobilization**
- **Few States have active programs**
- **Little evidence for beneficial effects (reduced recidivism or crashes)**

Forfeiture

- **30 States have provisions allowing for vehicle forfeiture**
- **Few programs**
 - NYC 1st offender program
 - Oregon and California for DWS
- **Little information available on use or effectiveness**

Plate Impoundment

- **Some use in 20 States**
- **Administrative, not court ordered**
- **Other States allow impoundment of vehicle registration**

- **One study (MN) showed evidence of reduced recidivism**

Special License Plates

- A few States allow for special license plates (e.g., HA, IA, MN, OH)
- Oregon and Washington tried stickers applied to the plates
- **No evaluation of effectiveness has been done**

Rehabilitation and Treatment

Post Conviction:

- **Screening for Alcohol Abuse**
 - **Before Sentencing**
- **Alcohol Treatment**
- **Intense Supervision and Probation**

Screening for Alcohol Abuse

- Many DWI offenders have alcohol abuse problems; a DWI arrest provides an opportunity to identify offenders and refer them to appropriate treatment
- Most States require some form of assessment for some DWI offenders
- Many screening or assessment tools miss some offenders likely to recidivate

Alcohol Treatment

- Alcohol treatment approaches vary considerably
 - For example, the duration can vary from short-term to long-term, it can be out-patient or in-patient
- **Reviews of treatment effectiveness have shown an overall reduction in recidivism and alcohol-involved crashes of 7-9 percent**
 - Treatment appears to more effective when combined with other sanctions and when offenders are monitored closely

Intense Supervision and Probation

- **Various methods have been used to control and monitor convicted offenders:**
 - Intensive supervision
 - Home confinement with electronic monitoring
 - Dedicated detention facilities
 - Oversight by judges
- **All four methods have been evaluated in individual settings and found evidence for substantial reductions in recidivism (30% - 50%)**

Ignition Interlocks

- Alcohol ignition interlocks prevent a car from starting until the driver provides a breath sample with a BAC below a pre-set threshold
- These devices contain features to prevent or reveal tampering and circumvention, and drinking after starting the vehicle
- **Strong evidence that ignition interlocks reduce recidivism while on the vehicle; after removal the effect disappears**

Vehicle Technology

- **Advanced Vehicle Technology to Reduce Impaired Driving**
 - **Government - Industry Initiative**
 - **Design vehicle to Prevent Impaired Driving**
 - Interlock based on BAC
 - Performance monitoring

Conclusions

- ***Evidence Based Practice Requires Good Quality Data***
 - ***Surveillance Systems Critical***
- ***Evidence on Effectiveness of Countermeasure Programs Suggests Maximum Short-term Impact from High-Visibility Enforcement***
 - ***Increased impaired driving enforcement***
 - ***Sobriety Checkpoints/Saturation Patrols***
 - ***Sustained***
 - ***Enforcement Oriented Publicity***