

Teen Driver Safety and the Junior Operator Law in Massachusetts

Research and Policy Information Session
Massachusetts State House

June 27, 2006



Presentation Overview

- About UMassSAFE
- Young Driver Safety – Data Perspective
 - US Overview
 - MA Crashes
 - MA Linked Crash/Hospital Data
 - MA Seat Belt Use
 - MA Citations
- Graduated Licensing
 - MA JOL Information
 - MA JOL Data Analysis
 - MA JOL and the National Blueprint

About UMassSafe

About UMassSafe

Support highway safety through combined approach

**Scientific data-driven
problem identification,
program design, and
evaluation**



**Traditional highway
safety practices
(engineering,
enforcement,
education & EMS)**





About UMassSafe

- Multi-disciplinary
 - Engineering
 - Policy
 - Public Health

- Draw on University resources
 - Driving Simulator
 - Transportation Lab



University of Massachusetts Amherst
COLLEGE OF ENGINEERING



University of Massachusetts
TRANSPORTATION CENTER

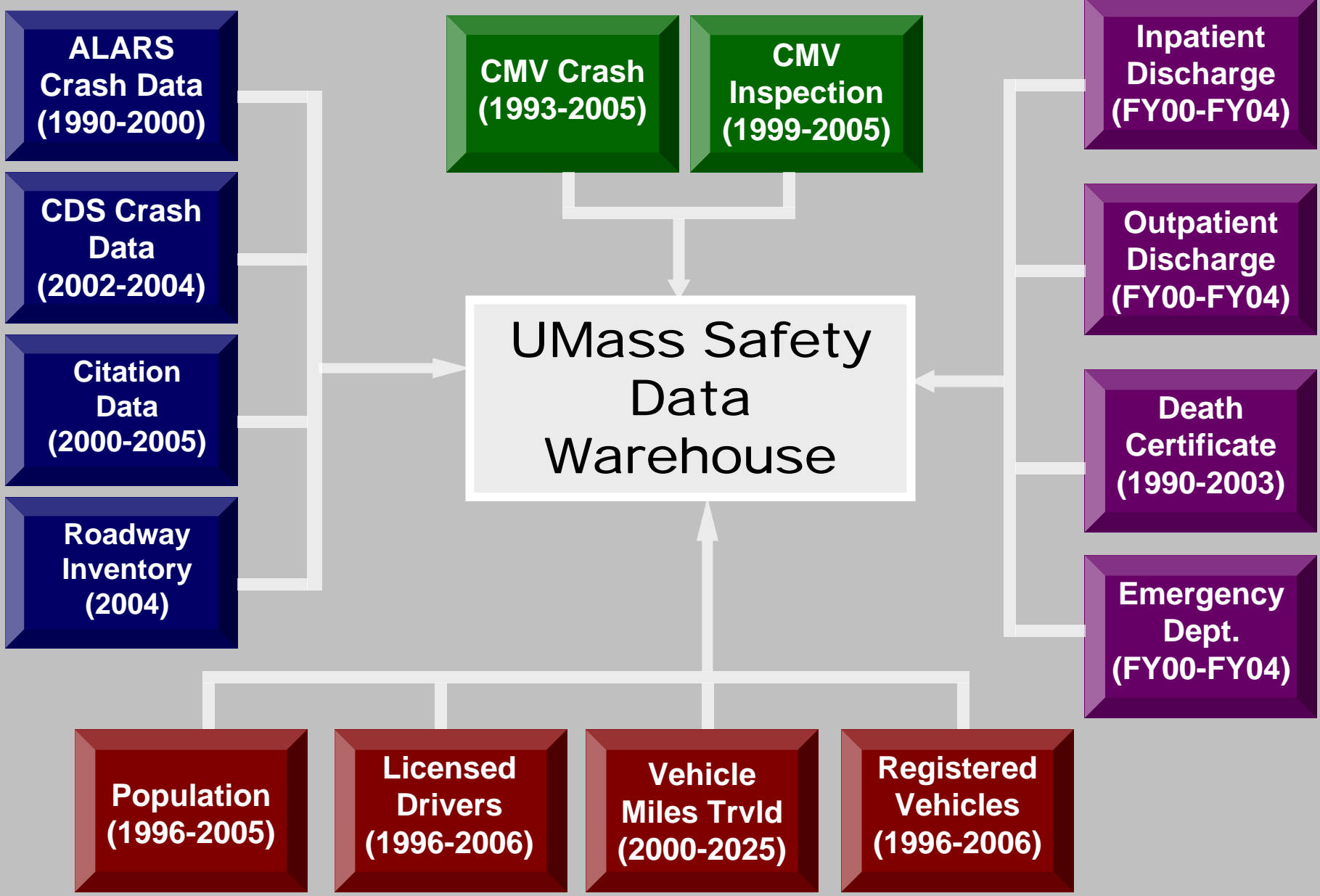


About UMassSafe

Program Areas:

- Data sharing and management
- Field data collection/analysis
- Data analysis for applied programming
- Training, education and technical assistance
- Community programming and evaluation
- Driver behavior and safety engineering research





General Highway Safety

What are the Odds?

- Struck by lightning: 1 in 240,000 (100 deaths)
- Being attacked by a shark: 1 in 11.5 million
 - 23 people were involved in shark attacks in 2000 (highest number on record)
- Being attacked by a bear: 1 in 36 million
- **Being Killed in a Car Crash (Lifetime): 1 in 77**

Leading Cause of Death from 5 to 33

70 out of 100 Children Born Today will be Injured in a Crash

Highway Safety Facts, 2004

Safety Metric	US	MA
Crashes	6.1 Million	138,632
Fatalities	42,636	476
Injuries	2.8 Million	55,500
Fatality Rate per 100 Million VMT	1.44	0.87
Crash Cost	\$230 Billion	\$6.9 Billion

Young Drivers Safety – Data Perspective

Teen Driver Crashes - US

National teen driver (16-19) crash rate 4x higher than adult drivers

Fatal crashes involving teen drivers (15-17)

Fatality→

Teen driver: 33%

Passenger in teen vehicle: 32%

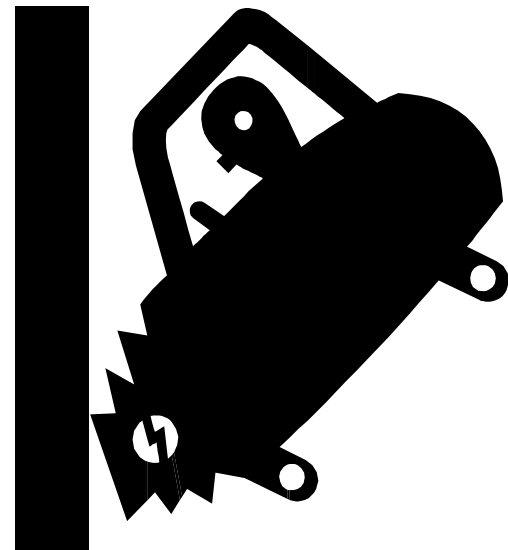
Occupants of other vehicles: 24%

Non motorists: 8%

Source: AAA Teen Crashes

Crash Data Analysis

- Crash data collected by Registry of Motor Vehicles
- Reportable motor vehicle crash:
 - Property Damage = \$1,000+
 - OR
 - Non-fatal personal injury
 - OR
 - Fatality



KABCO

Police Crash Report Injury Severity Code

K: Killed

A: Incapacitating Injury

B: Non-Incapacitating Injury

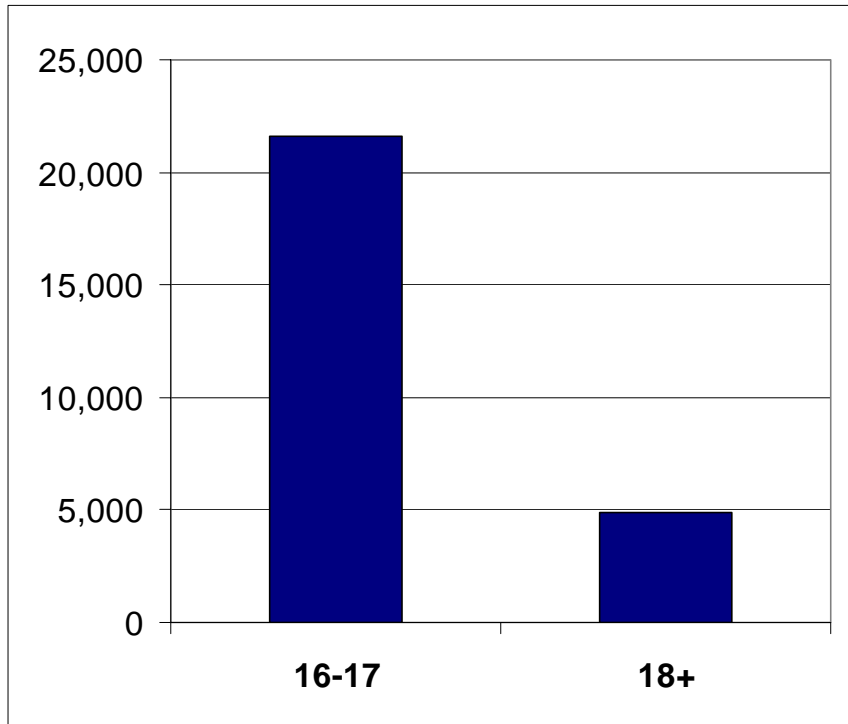
C: Possible Injury

O: No Injury

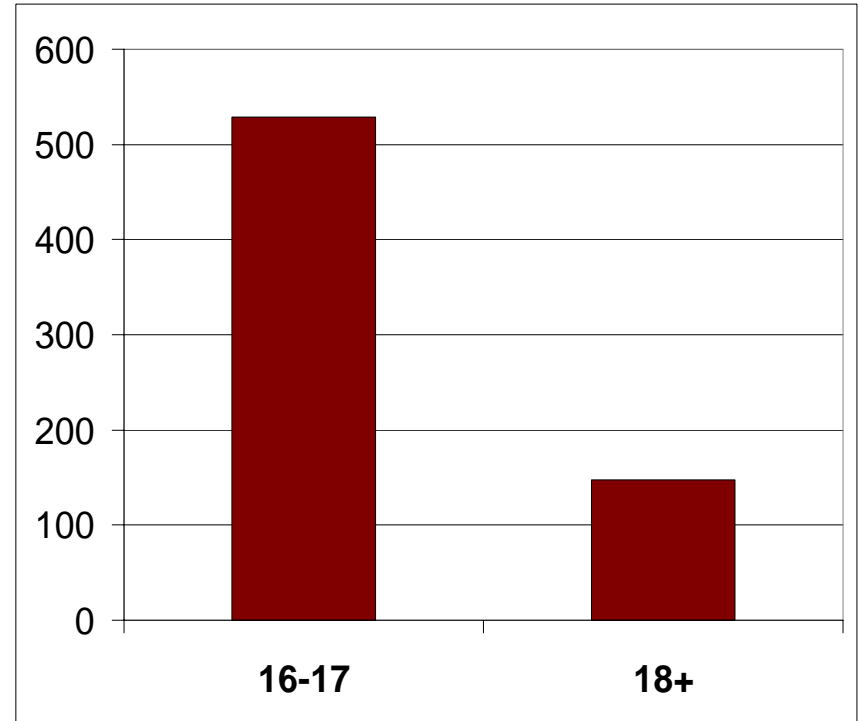
Commonwealth of Massachusetts									
Date of Crash		Time of Crash		City/Town		Motor Vehicle Crash Police Report		Number Vehicles Injured	
		24HR							
								Special Limit: <input type="checkbox"/> Local Police: <input type="checkbox"/> MFTA Police: <input type="checkbox"/> Other: <input type="checkbox"/>	
AT INTERSECTION:					LOCATION		NOT AT INTERSECTION:		
1. Route# Direction Name of Roadway/Street					Route# Direction Address # Name of Roadway/Street				
At					Mile-Marker		East Number		
2. Route# Direction Name of Intersecting Roadway/Street					Route# Direction Name of Intersecting Roadway/Street		Landmark		
Also at Intersection with									
3. Route# Direction Name of Intersecting Roadway/Street									
Please Select One of the Following: <input type="checkbox"/> Vehicle 1 # Occupants <input type="checkbox"/> Hit/Run <input type="checkbox"/> Moped									
4. Operator License # Sex Lic. Class 18 18 Lic. Restrictions 19 CDL Endorsement Address City State Zip Insurance Company					Owner Reg # Reg Type Reg State Veh Year Veh Make Veh Config 20 Address City State Zip				
5. Vehicle Travel Direction: [N][S][E][W] Responding to Emergency? Citation # (If Issued): Violation 1: Ch Sec Violation 2: Ch Sec Violation 3: Ch Sec Violation 4: Ch Sec					Vehicle Action Prior to Crash 21 Damaged Area Code: (Circle Up to Three) Event Sequence 22 22 22 22 2 Most Harmful Event 23 10 Undercarriage 5 (1) Tinted Driver Contributing Code 24 34 6 Undercarriage/Overide 25 Towed 8				
Please fill out for operator and all occupants involved. Name (Last First Middle) Address DOB/Age Sex 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 Medical Facility									
Operator					See Above				
7. Please Select One of the Following: <input type="checkbox"/> Vehicle 2 # Occupants <input type="checkbox"/> Non-Motorist A Type 14 Action 15 Location 16 Condition 17 <input type="checkbox"/> Hit/Run <input type="checkbox"/> Moped									
8. Operator License # Sex Lic. Class 18 18 Lic. Restrictions 19 CDL Endorsement Address City State Zip Insurance Company					Owner Reg # Reg Type Reg State Veh Year Veh Make Veh Config 20 Address City State Zip				
9. Vehicle Travel Direction: [N][S][E][W] Responding to Emergency? Citation # (If Issued): Violation 1: Ch Sec Violation 2: Ch Sec Violation 3: Ch Sec Violation 4: Ch Sec					Vehicle Action Prior to Crash 21 Damaged Area Code: (Circle Up to Three) Event Sequence 22 22 22 22 2 Most Harmful Event 23 10 Undercarriage 5 (1) Tinted Driver Contributing Code 24 34 6 Undercarriage/Overide 25 Towed 8				
Please fill out for operator/non-motorist and all occupants involved. Name (Last First Middle) Address DOB/Age Sex 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 Medical Facility									
Operator/Non-Motorist					See Above				

Rate of Drivers Involved in MA Crashes per 100,000 Licensed Drivers, 2002-2004

Rate of Drivers Involved in **All Crashes** in Massachusetts, 2002-2004

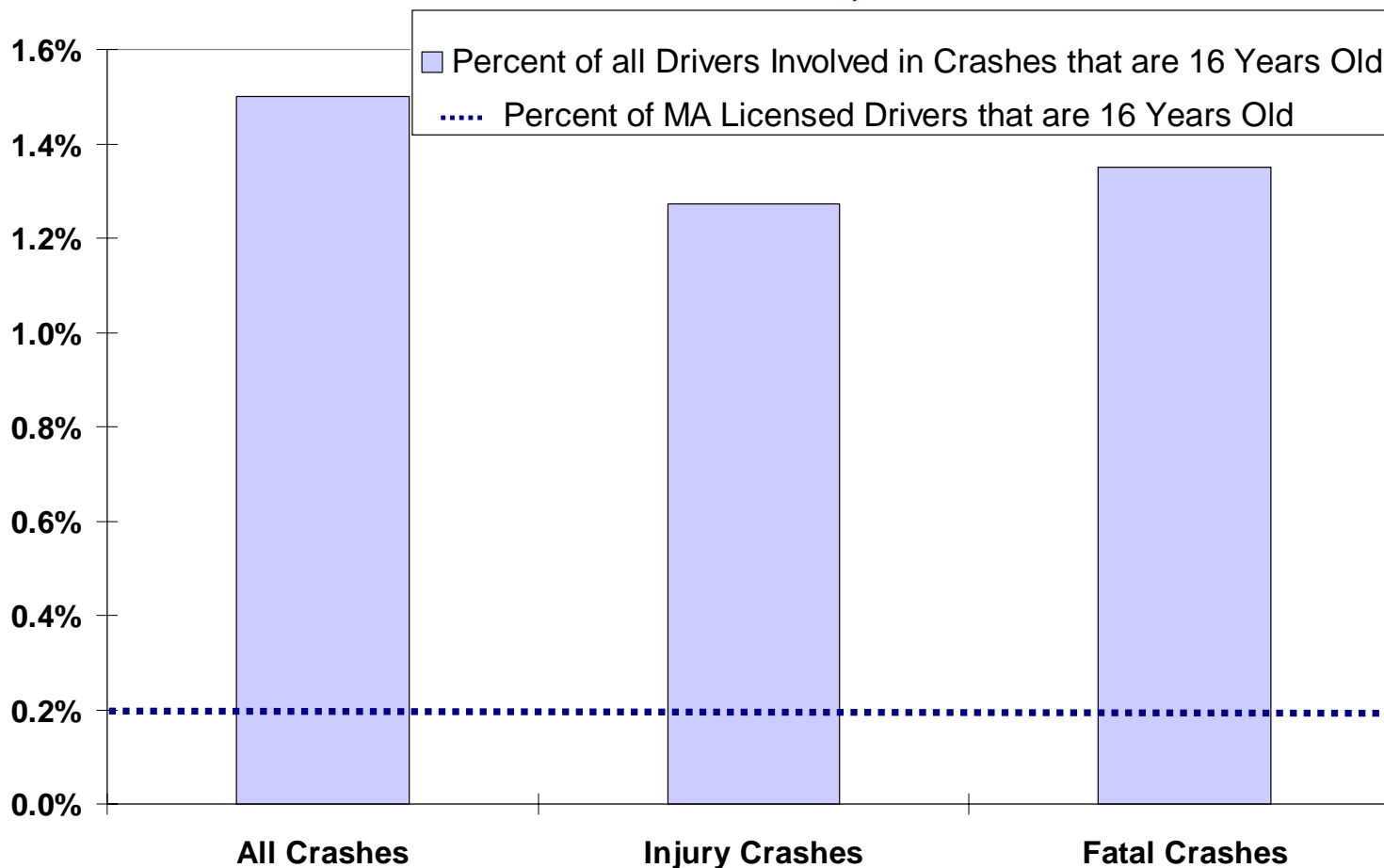


Rate of Drivers Involved in **Incapacitating Injury Crashes** in Massachusetts, 2002-2004



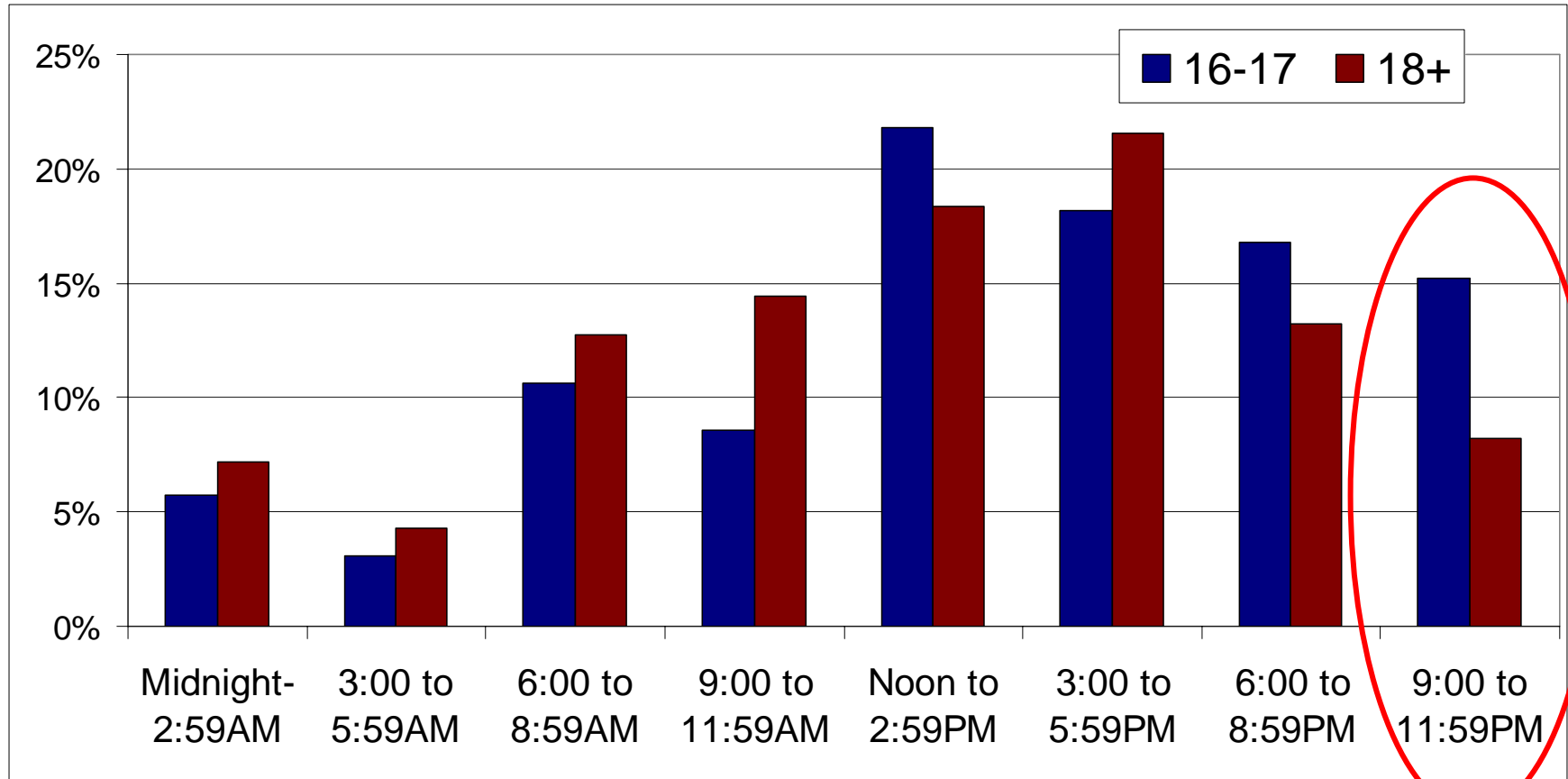
In both cases, teen driver (16-17) rate is **4 times higher** than adult drivers (18+).

16 year old^a driver crash involvement and license rates, 2002-2004



^a Considered as teen novice drivers for comparison to adult drivers, not for comparison to other teen drivers

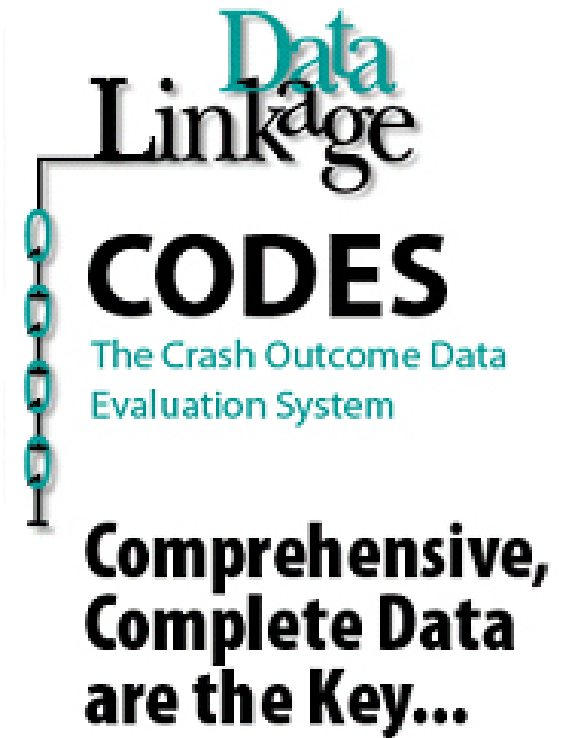
Drivers in Incapacitating Injury Crashes by Time of Day, 2002-2004



The percent of teen drivers (16-17) in crashes between 9:00 and 11:59 PM is nearly double the percentage for adult drivers (18+) during the same time.

CODES Data Analysis

- Linked crash and hospital data
- Probabilistic linkage with multiple imputation of links
- Multiple imputation of missing data
- Measure crash outcomes- injuries, length of stay, charges



Median Driver Inpatient Charges by Restraint Use^{a,b}

Age	Not Restrained	Restrained
15-17	\$21,000	\$14,000
18-20	\$17,000	\$13,000
28-30	\$14,000	\$13,000

↑
Statistically
significant
difference

↑
NOT
statistically
significant
difference

^a Based on preliminary linkage analysis results, rounded to the nearest thousand

^b Likely underreporting of charges associated with unrestrained occupants due to overreporting of restraint use in police accident reports.

Median Driver Inpatient Charges by Time of Day

Age	Day	Night
15-17	\$14,000	\$20,000
18-20	\$15,000	\$15,000
28-30	\$15,000	\$13,000

← Statistically significant difference

← NOT statistically significant difference

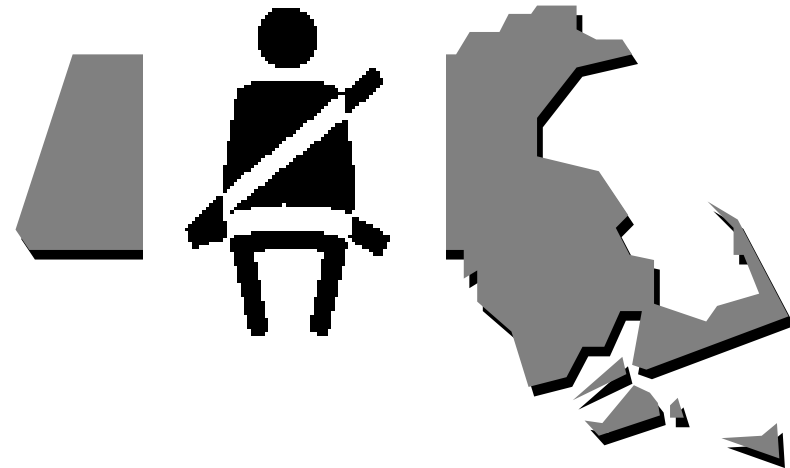
← Statistically significant difference

^a Based on preliminary linkage analysis results, rounded to the nearest thousand

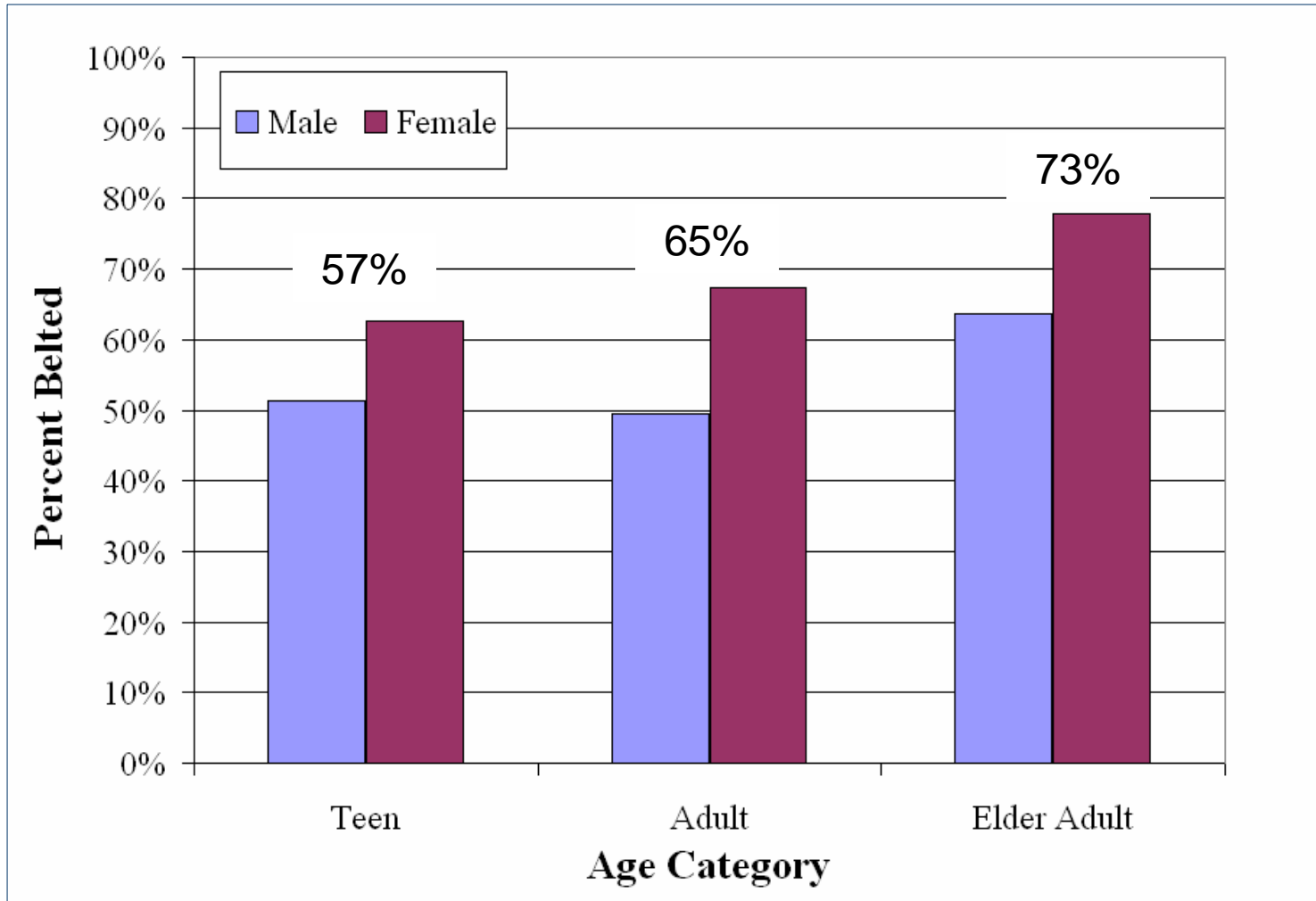
^b Nighttime defined as 9:00PM to 5:59AM

Observed Seat Belt Usage Rates

- Observed seat belt use rate collected for the Governor's Highway Safety Bureau
- Data collected:
 - Seating position
 - Age
 - Sex
 - Vehicle Type
 - Registration State
 - Belt Usage



MA Seat Belt Use by Sex and Age, 2005

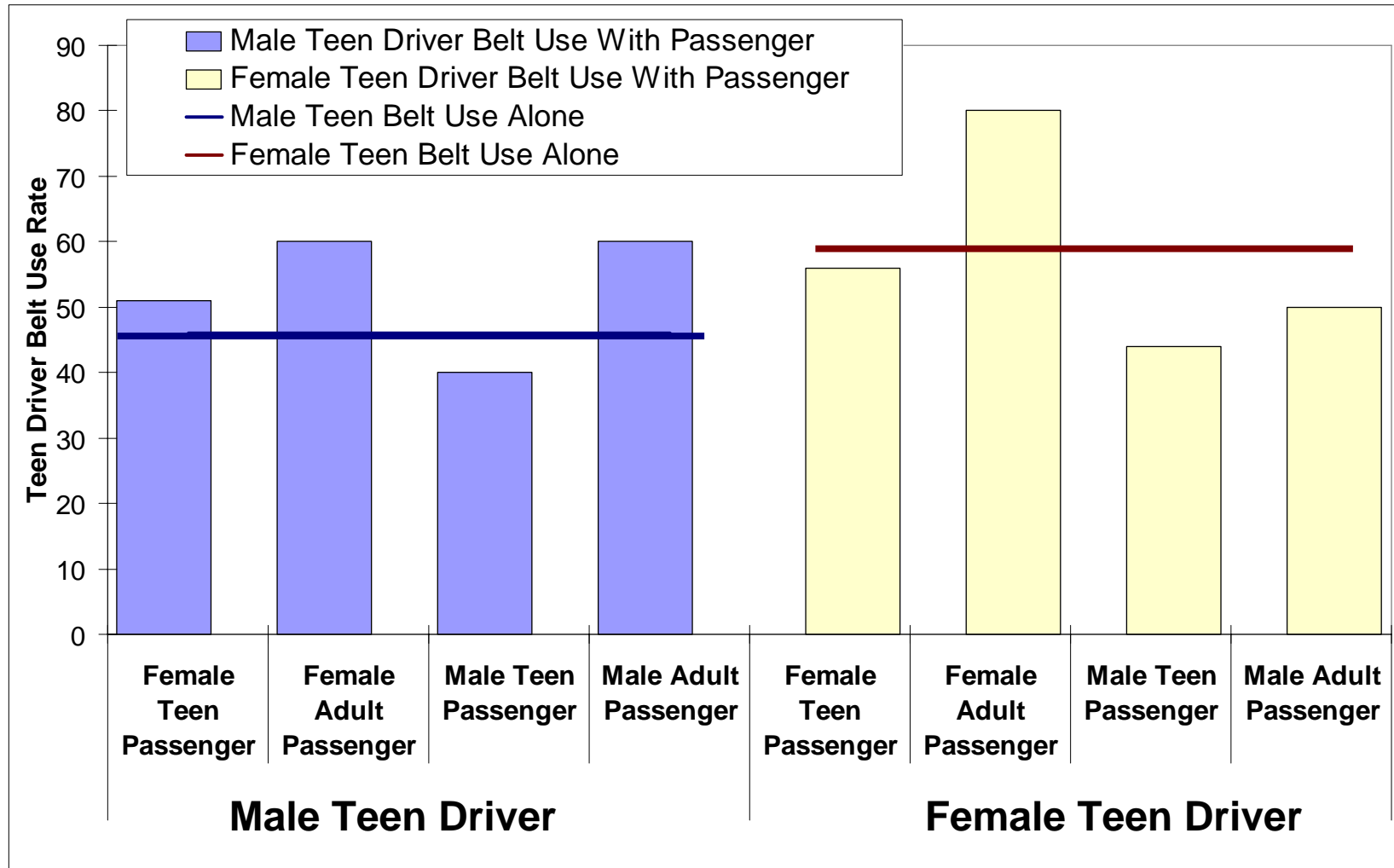


MA Seat Belt Use by Occupant Configuration, 2005^a



^a Seat belt use rates are unweighted

Teen Driver Observed Seat Belt Use by Passenger Configuration, 2005

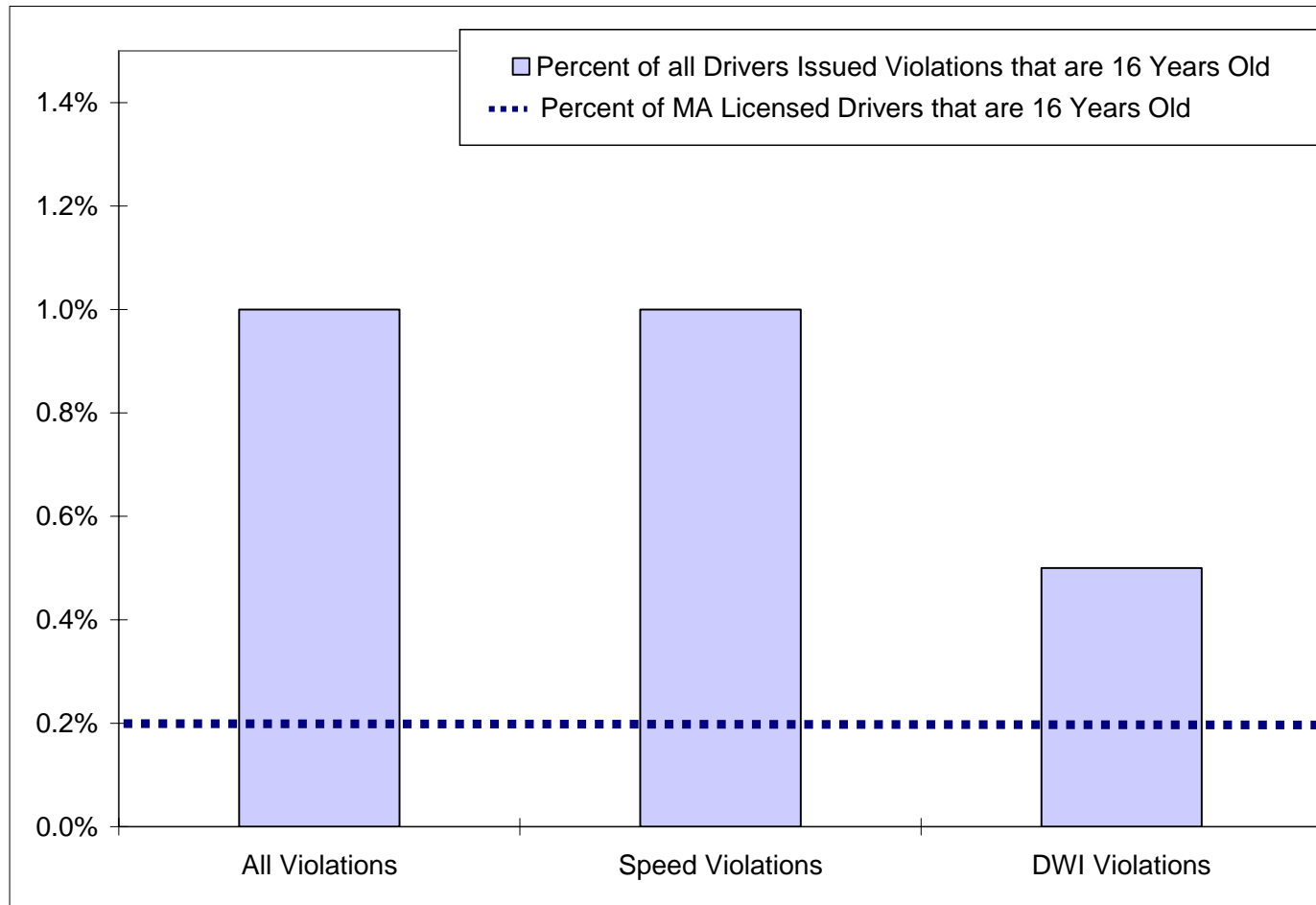


Citation Data Analysis

- Citation data collected by Merit Rating Board
- Examine violations (not citations)
- Non-crash violations

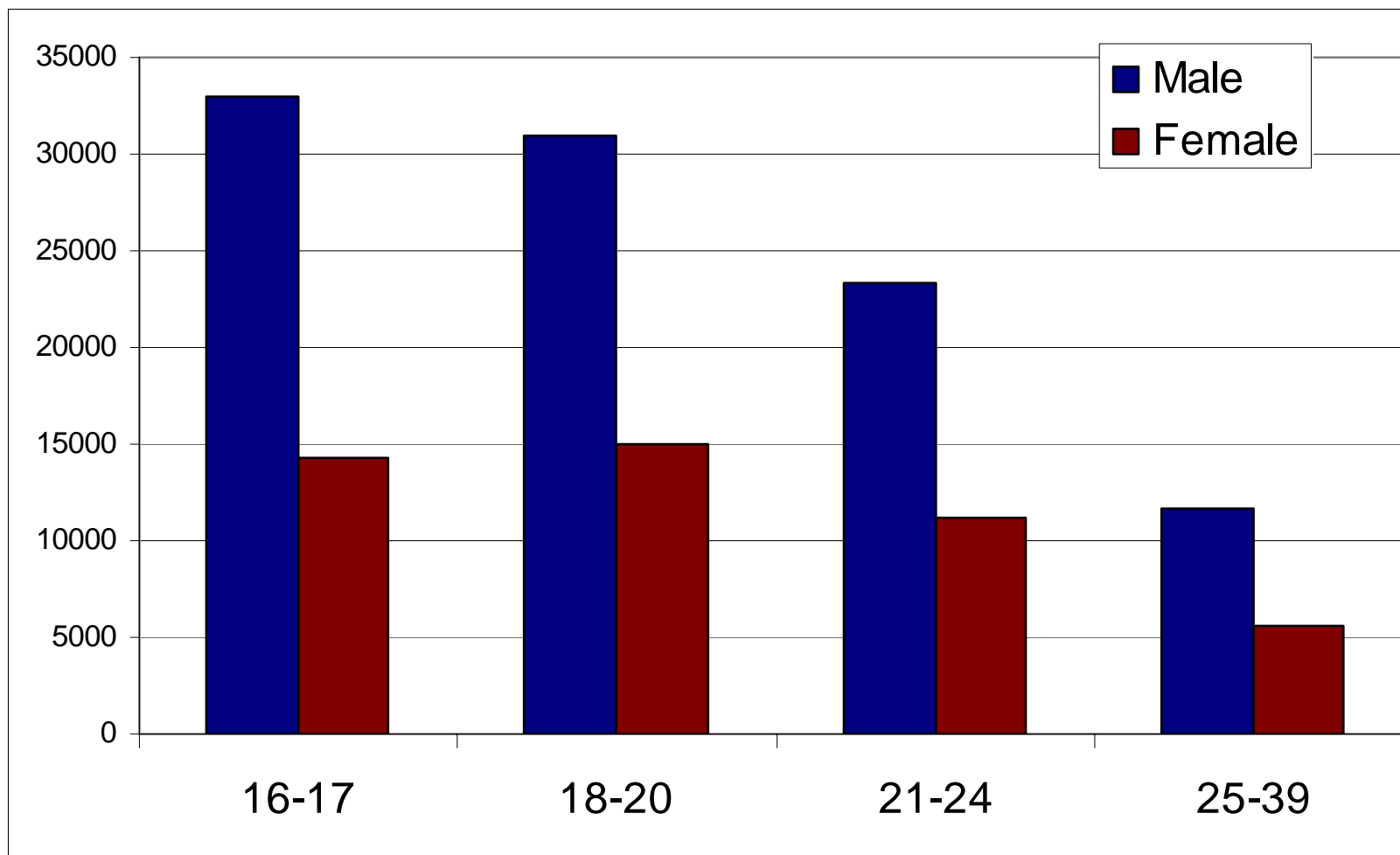


16 year old^a driver violation issuance and license rates, 2002-2003

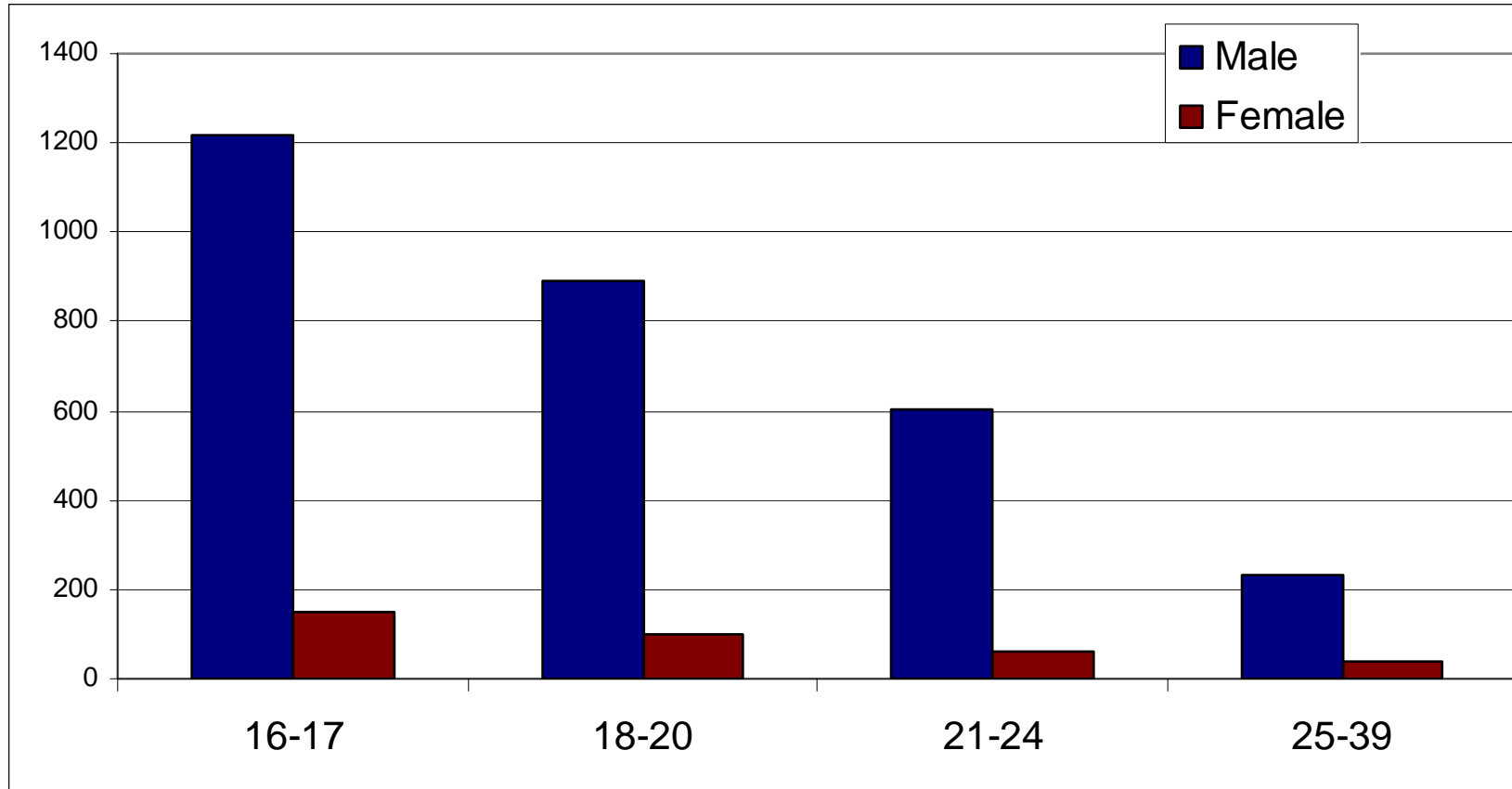


^a Considered as teen novice drivers for comparison to adult drivers, not for comparison to other teen drivers

Rate of Non-Crash Speed Violations per 100,000 Licensed Drivers, 2001-2003



Rate of Non-Crash Severe Violations^a per 100,000 Licensed Drivers, 2001-2003



^a Severe violations are: Vehicle to commit felony, serious violation, negligent operation, operating recklessly, vehicular homicide, and driving to endanger.

Graduated Licensing

MA JOL Policy

Implemented in 1998

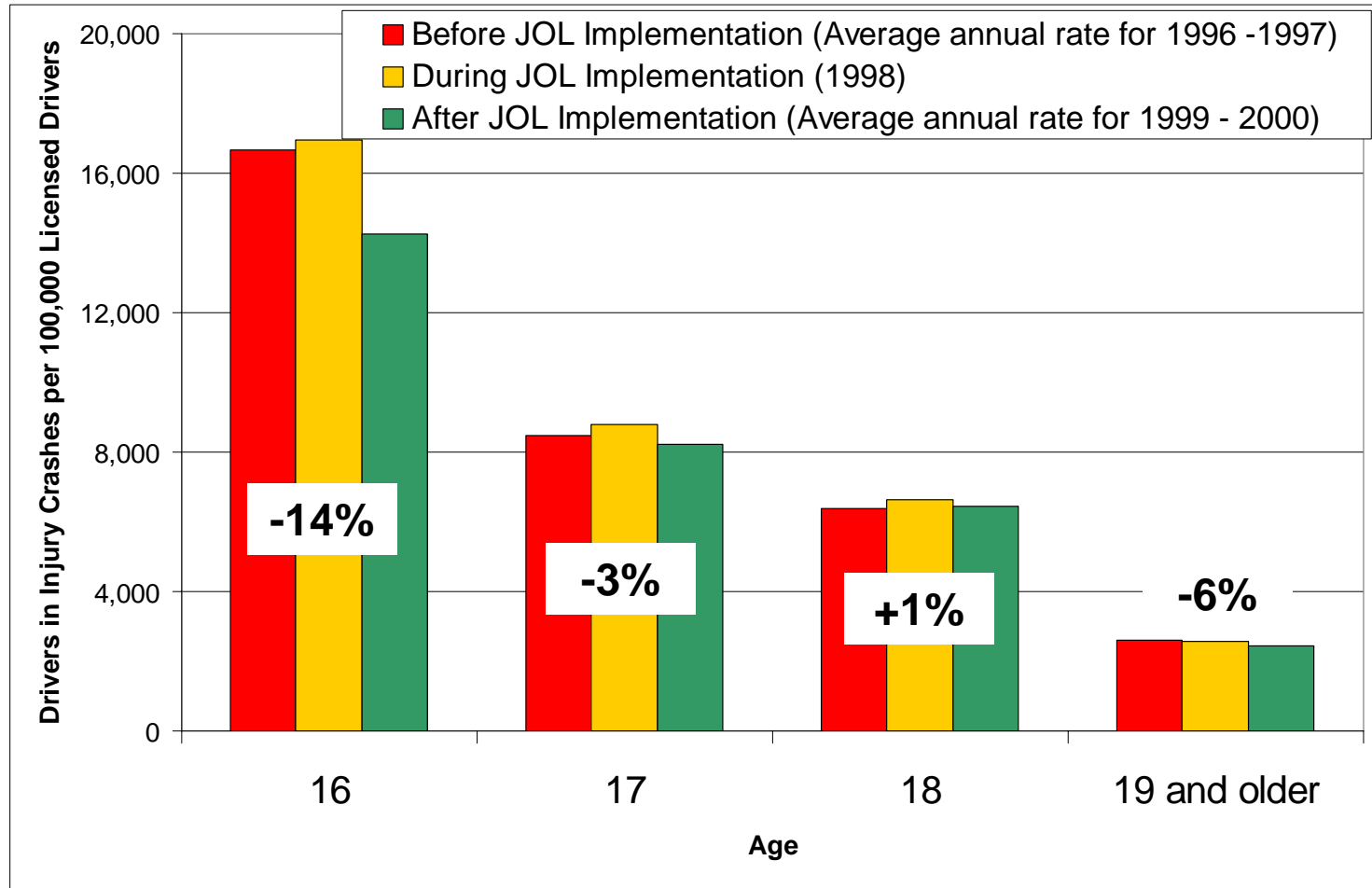
Learner's Permit

- Minimum age of 16 years old
- Minimum holding of 6 months
- 30 hours classroom instruction
- 6 to 8 hours behind the wheel training
- 4 to 6 hours as an observer to another student driver
- 12 hours of supervised driving experience

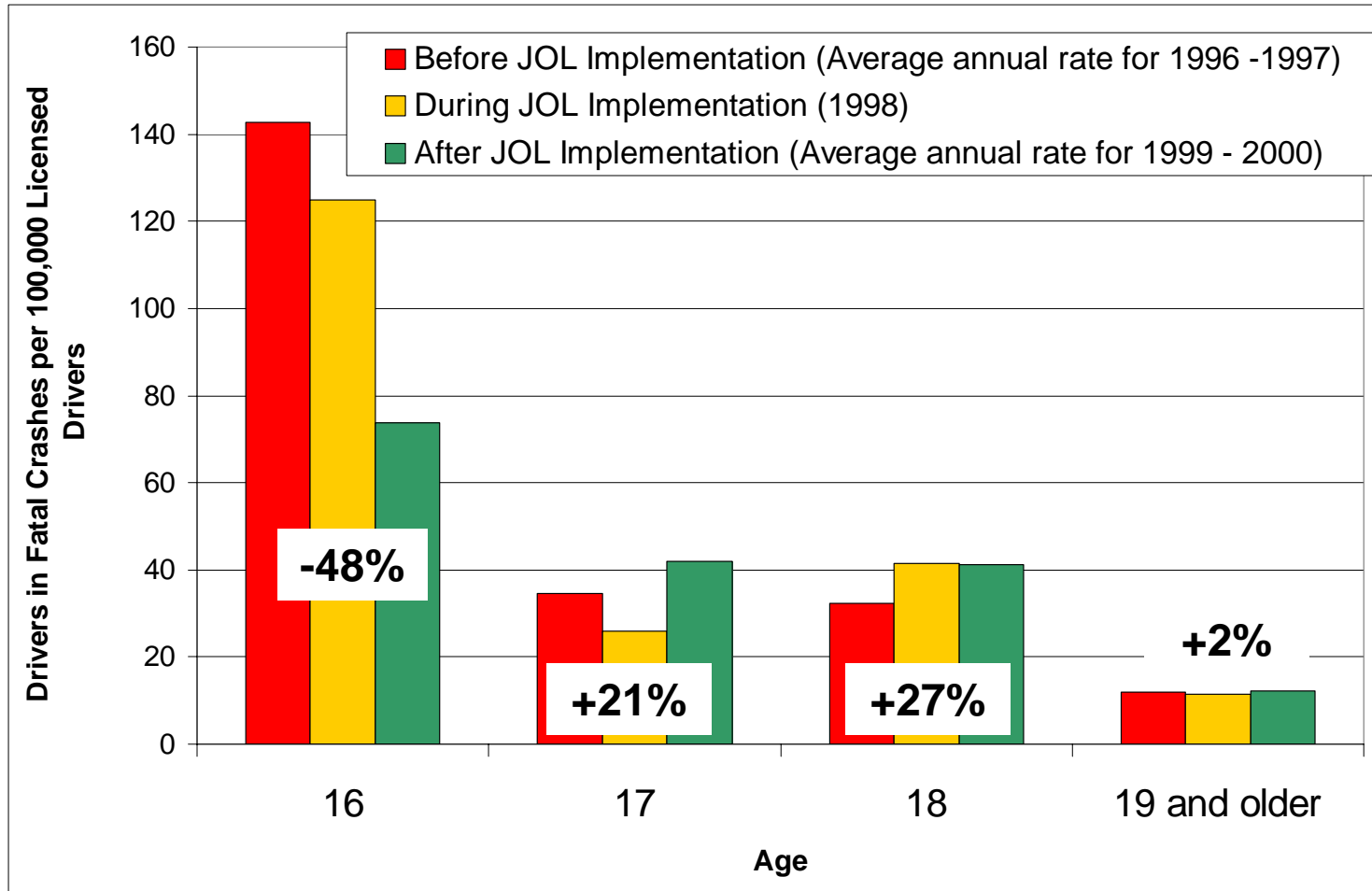
Junior Operator License

- Minimum age of 16½ years old
- No driving between midnight and 5AM unless accompanied by parent or guardian
- For first 6 months, no passengers under age of 18 unless supervised by a driver age 21 or older

Rate of drivers involved in injury crashes per 100,000 licensed driver



Rate of drivers involved in fatal crashes per 100,000 licensed driver



Number of Vehicles In Crash

Change in Crash Rate per 100,000 Licensed Drivers –
Before and After 1998 Implementation of MA JOL

Age	Single Vehicle Crashes	Multiple Vehicle Crashes
16*	-12.2%	-7.6%
25-34	-2.9%	-2.2%

*considered as teen novice drivers for comparison to adult drivers, not for comparison to other teen drivers

Before: Average crash rate/100,000 licensed drivers 1996-1997
After: Average crash rate/100,000 licensed drivers 1999-2000

MA JOL and National Blueprint

Graduated Licensing: A Blueprint for North America

Insurance Institute for Highway Safety, Washington, DC

Traffic Injury Research Foundation, Ontario, Canada

**Require 30 to 50 hours of certified driving,
some of which should be allocated to
nighttime driving.**

*Massachusetts may consider increasing
the number of hours of supervised
driving experience required before
proceeding to the next phase of licensure
from 12 hours to at least 30 hours with some
of those hours being nighttime driving.*

Restrict unsupervised night driving by newly licensed drivers...optimal starting times are 9 or 10 PM. Exempt appropriate activities from the night driving restriction.

Massachusetts may consider expanding the restricted nighttime driving period which currently begins at midnight to begin at 9 or 10 PM.

Limit teenage passengers to none or just one during some or all of the intermediate phase, absent adult supervision.

*Massachusetts might continue the current **passenger limitation** which prohibits any passengers under the age of 18 for the first six months of unsupervised driving time unless there is adult supervision and might consider **expanding that to include the entire duration of Junior Operator's Licensure.***

**Consider an exit test to ensure competence
prior to full-privilege licensure.**

*Massachusetts may consider requiring
young drivers to pass a road test at age
18 prior to acquiring a full license.*

Driver education...should be integrated to complement graduated licensing. However, there is no justification for time discounts.

*Massachusetts may continue to require the driver education component specified in the learner's permit stage for drivers in their first six months of licensure; however, **further evaluation of the effectiveness of driver education** and the role it plays in graduated licensing would be beneficial.*

Include penalty provisions that delay graduation for drivers with poor driving records.

*Massachusetts should continue to penalize new teen drivers who have poor driving records during the learner's permit or Junior Operator's phases but should consider **expanding the penalties beyond the current violations.***

Questions?

For more information:

www.ecs.umass.edu/umasssafe

