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)

Massachusetts Teen Driver Safety
About UMassSafe

• Multi-disciplinary
  – Engineering
  – Policy
  – Public Health

• Draw on University resources
  – Driving Simulator
  – Transportation Lab
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

<table>
<thead>
<tr>
<th>Safety Metric</th>
<th>US</th>
<th>MA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crashes</td>
<td>6.1 Million</td>
<td>138,632</td>
</tr>
<tr>
<td>Fatalities</td>
<td>42,636</td>
<td>476</td>
</tr>
<tr>
<td>Injuries</td>
<td>2.8 Million</td>
<td>55,500</td>
</tr>
<tr>
<td>Fatality Rate per 100 Million VMT</td>
<td>1.44</td>
<td>0.87</td>
</tr>
<tr>
<td>Crash Cost</td>
<td>$230 Billion</td>
<td>$6.9 Billion</td>
</tr>
</tbody>
</table>
Young Drivers Safety – Data Perspective
Teen Driver Crashes - US

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

<table>
<thead>
<tr>
<th>Fatal crashes involving teen drivers (15-17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatality</td>
</tr>
<tr>
<td>Teen driver: 33%</td>
</tr>
<tr>
<td>Passenger in teen vehicle: 32%</td>
</tr>
<tr>
<td>Occupants of other vehicles: 24%</td>
</tr>
<tr>
<td>Non motorists: 8%</td>
</tr>
</tbody>
</table>

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
Police Crash Report

K: Killed
A: Incapacitating Injury
B: Non-Incapacitating Injury
C: Possible Injury
O: No Injury
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\textsuperscript{a} driver crash involvement and license rates, 2002-2004

\begin{figure}
\centering
\includegraphics[width=\textwidth]{chart.png}
\end{figure}

\textsuperscript{a} Considered as teen novice drivers for comparison to adult drivers, not for comparison to other teen drivers
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\textsuperscript{a,b}

<table>
<thead>
<tr>
<th>Age</th>
<th>Not Restrained</th>
<th>Restrained</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-17</td>
<td>$21,000</td>
<td>$14,000</td>
</tr>
<tr>
<td>18-20</td>
<td>$17,000</td>
<td>$13,000</td>
</tr>
<tr>
<td>28-30</td>
<td>$14,000</td>
<td>$13,000</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Based on preliminary linkage analysis results, rounded to the nearest thousand

\textsuperscript{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

<table>
<thead>
<tr>
<th>Age</th>
<th>Day</th>
<th>Night</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-17</td>
<td>$14,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>18-20</td>
<td>$15,000</td>
<td>$15,000</td>
</tr>
<tr>
<td>28-30</td>
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<td>$13,000</td>
</tr>
</tbody>
</table>

Statistically significant difference

NOT statistically significant difference

Statistically significant difference

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*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

Massachusetts Teen Driver Safety
MA Seat Belt Use by Occupant Configuration, 2005a

Seat belt use rates are unweighted.
Teen Driver Observed Seat Belt Use by Passenger Configuration, 2005

Massachusetts Teen Driver Safety
Citation Data Analysis

- Citation data collected by Merit Rating Board
- Examine violations (not citations)
- Non-crash violations
16 year old\textsuperscript{a} driver violation issuance and license rates, 2002-2003

\begin{itemize}
  \item Percent of all Drivers Issued Violations that are 16 Years Old
  \item Percent of MA Licensed Drivers that are 16 Years Old
\end{itemize}

\textsuperscript{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

Massachusetts Teen Driver Safety
Rate of Non-Crash Severe Violations\textsuperscript{a} per 100,000 Licensed Drivers, 2001-2003

\textsuperscript{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**

<table>
<thead>
<tr>
<th>Learner’s Permit</th>
<th>Junior Operator License</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Minimum age of 16 years old</td>
<td>• Minimum age of 16½ years old</td>
</tr>
<tr>
<td>• Minimum holding of 6 months</td>
<td>• No driving between midnight and 5AM unless accompanied by parent or guardian</td>
</tr>
<tr>
<td>• 30 hours classroom instruction</td>
<td>• For first 6 months, no passengers under age of 18 unless supervised by a driver age 21 or older</td>
</tr>
<tr>
<td>• 6 to 8 hours behind the wheel training</td>
<td></td>
</tr>
<tr>
<td>• 4 to 6 hours as an observer to another student driver</td>
<td></td>
</tr>
<tr>
<td>• 12 hours of supervised driving experience</td>
<td></td>
</tr>
</tbody>
</table>

Massachusetts Teen Driver Safety
Rate of drivers involved in injury crashes per 100,000 licensed driver

- Before JOL Implementation (Average annual rate for 1996-1997): -14%
- During JOL Implementation (1998): -3%
- After JOL Implementation (Average annual rate for 1999-2000): +1%

Massachusetts Teen Driver Safety
Rate of drivers involved in fatal crashes per 100,000 licensed driver

Before JOL Implementation (Average annual rate for 1996 - 1997)
During JOL Implementation (1998)
After JOL Implementation (Average annual rate for 1999 - 2000)

Massachusetts Teen Driver Safety
# Number of Vehicles In Crash

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

<table>
<thead>
<tr>
<th>Age</th>
<th>Single Vehicle Crashes</th>
<th>Multiple Vehicle Crashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>16*</td>
<td>-12.2%</td>
<td>-7.6%</td>
</tr>
<tr>
<td>25-34</td>
<td>-2.9%</td>
<td>-2.2%</td>
</tr>
</tbody>
</table>

*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
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