Motorcycle Awareness Through Data

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Objectives

• To identify data sources applicable to Motorcycle Safety Programs
• To illustrate use of the data to support problem identification and program evaluation activities
Maryland Motorcycle Safety Coalition

- Created by the Maryland Motor Vehicle Administration (MVA) and the Maryland Highway Safety Office (MHSO)
  - Mission: through essential partnerships, develop and implement a 5 year comprehensive strategic plan

- Initiatives and strategies are based on the “Maryland motorcycle crash picture”
  - Each initiative & strategy will be measured and evaluated throughout the plan period

- Plan will be shared with stakeholders and decision makers

- One agency will administer, monitor and evaluate the plan
  - Maryland Motor Vehicle Administration
Why are data needed to support programming?

- Diverse target & user groups
- Difficult to reach consensus and rally support
- Available data may not be painting an accurate picture
- Few states measure and evaluate efforts
- Little evidence regarding successful and effective countermeasures
- Most states rely on operator training and public awareness
Maryland Crash Trends:

Motorcyclists Killed

![Bar chart showing the number of motorcyclists killed from 2007 to 2011.]

- 2007: 96
- 2008: 83
- 2009: 67
- 2010: 73
- 2011: 70

5-yr Average: Over 1,500 Motorcyclists Injured Every Year

Projection for 2012: 75 (approx 7%↑)
**Target Group**

**Emphasis Area**

- Distracted Driving
- Impaired Driving
- Aggressive Driving
- Occupant Protection
- Highway Infrastructure Related
- Pedestrians

**Countermeasure Tools**

- EMS
- Public Outreach Communications Education
- Laws & Law Enforcement
- Highway Planning, Design, and Engineering

**Data**

- Communication
- Coordination
- Collaboration
- Communication
Navigating through the Presentation

- Click for more information on the subject
- Click for data (or more data) on the subject
- Click to ‘Go Home’
- Click to go to previous page
- Click to go to next page
SAFETY PROGRAMS

- Crash Reports
- Medical Examiner Reports
- Behavioral Surveys
- EMS Reports
- Citation Data
- Geographic Information System
- Training, Licensing & Vehicle Info
- Medical Records
Crash Reports

Fields of Interest

- Culpability
- Roadway type (Intersection/Non-Intersection)
- Direction of impact
- Contributing factors - Operator
- Contributing factors - Roadway
- Vehicle type (VIN)
Crash Report Data

• Motorcycle operators are reported to be at fault in approximately 54% of all motorcycle crashes

• Intersection & intersection related crashes make up 72% of motorcycle crashes

• In rear-end collisions, 47% of the time the motorcycle is hitting the motor vehicle

• Operators of cruiser and sport motorcycles seem to have more crash involvement
Crash Report Data

- Operator Contributing Factors
  - Distracted - 38.5%
  - Aggressive – 24.6%
  - Speed – 13.9%

- Roadway Contributing Factors
  - Debris, holes, highway & construction – 3%

- Top Contributing Factors in motorist at-fault crashes
  - Failure to give full time and attention (distracted)
  - Failure to yield right of way
  - Following too closely
  - Improper turn
Medical Examiner Reports

Fields of Interest

• Cause of death
• Types of injury
• Safety equipment
• Toxicology
# Medical Examiner Data

- Specific injuries
- Injury severity coding

<table>
<thead>
<tr>
<th>Injury Locations in Fatally Injured Motorcyclists When Only One Injury-Related Record Was Coded, 2000-2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Multiple Locations</td>
</tr>
<tr>
<td>Head</td>
</tr>
<tr>
<td>Neck</td>
</tr>
<tr>
<td>Thorax</td>
</tr>
<tr>
<td>Shoulder/Arms</td>
</tr>
<tr>
<td>Abdomen/Lumbar/Spine</td>
</tr>
<tr>
<td>Hip/Legs</td>
</tr>
<tr>
<td>Unspecified</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Driver & Operator Reported

- Helmet use
- Protective equipment
- Traffic awareness
- Motor vehicle driver & operator behaviors on the roadway
- Awareness of motorcycle initiatives
Behavioral Data

Have you completed a certified/state sanctioned rider safety course? (N=58)

- Yes: 58.6%
- No: 41.4%
- Completed in other State: 100% - 58.6% - 41.4% = 4.2%

Are you a licensed rider? (N=59)

- Yes: 81.4%
- No: 18.6%

How often do you wear a DOT compliant helmet when you drive a motorcycle (MTF)? (N=55)

- All of the Time: 90.9%
- Most of the Time: 1.8%
- Some of the Time: 1.8%
- Rarely: 3.6%
- Never: 1.8%
Behavioral Data

Results from a survey conducted @ safety courses

Training – most students reported
- Limited riding experience prior to course
- Do not own motorcycle
- Do not complete licensing waiver process
- Do not enroll in further training
- Do not feel “on-road” qualified

Licensing – most students reported
- Limited riding experience
- Holding learner’s permit for 1-2 months before taking skills test

Vehicle – most students reported
- Purchasing a motorcycle after obtaining a license
EMS Reports

Fields of Interest
- Injury Type
- Safety Equipment
- Baseline Vitals
- Glasgow Coma Score
- Provider narrative
On arrival, found a 62 year female patient weighing 60 KG. Chief complaint of PAIN. Events surrounding incident: PT OTHER CAR CROSSED THE CENTER LINE AND HIT HER HEAD ON. PT STATES SHE REMEMBERS THE ACCIDENT.

The patient’s medical history, medications and allergies are noted below.

OBJECTIVE:
At 17:54, the patient was found SITTING IN DRIVER SEAT CAOx4 IN SOME DISTRESS. Initial assessment revealed the patient had a GCS of 15, with V/S of 140/70, P - 78, R - 16. Other significant physical exam findings: PT WAS FOUND TO HAVE AN OPEN FIB FRAC URE ON LEFT ANKLE AND CLOSED ON RIGHT. PT ALSO COMPLAINED OF PAIN IN HER RIBS ON THE RIGHT SIDE OF HER CHEST. PT DENIES NECK OR BACK PAIN.

ASSESSMENT:
The field impression of the patient was Pain. Treatment began utilizing the following protocols: General Patient Care ONLY.

PLAN:
Treatment was administered as follows:
18:00:00: Spinal Immobilization - Long Back Board was performed successfully after 1 attempt.
18:10:00: Venous Access Extremity 18 was performed successfully after 1 attempt.
18:15:00: ECG Monitor was applied. Interpretation was Normal Sinus Rhythm.
18:20:00: Fentanyl 60 MCg Intravenous (IV) Fluids per Protocol (Standing Order). The patient’s response was .
The outcome of field treatment was NO CHANGE IN PT STATUS. The patient was transported to Lights and Sirens. Medical control contact established with ON SCENE. Patient delivered to room and verbal report was given to DR.

Trauma Category
C - Vehicle tockometry data consistent high risk of injury (High Risk Auto Crash)

Prior Aid

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Glasgow Eye Opening</th>
<th>Glasgow Verbal</th>
<th>Glasgow Motor</th>
<th>Glasgow Coma Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>18:10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Past Medical History

MEDICATION ALLERGIES

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NKDA (No Known Drug Allergies)</td>
<td>NKDA (No Known Drug Allergies)</td>
</tr>
</tbody>
</table>
Fields of Interest

- Demographics
- Violation type
- Date/Time
- Registration information
- Adjudication
Citation Data

Citation type

- Speeding 48%
- Impaired 12%
- Reckless/Negligent 11%
- Suspended/Revoked 8%
- Improper license 7%
- Helmet 3%
Use of Data

- Roadway type
- Intersection relationship
- Crash density within an area
- Zip codes – residence & crash location
- Program planning
GIS Data

Maryland Motorcycle Crashes - 2009-2011 by Segmented Roadways

This map displays data only. No analysis has been performed on a site-specific basis. For enforcement purposes only.

Data derived from the State Highway Administration’s Information Database (SHA-ID), based on crash reports submitted to, and processed by, the Maryland State Highway Administration's Crash Analysis System (CAS), utilizing the Uniform Maryland Automated Accident Reporting System (UMAARS).

Disclaimer of Liability

MDOT & MHRD make no claims, promises, or guarantees about the accuracy, completeness or adequacy of the content of these maps and expressly disclaim liability for any errors or omissions in the content of these documents.

Prepared by: University of Maryland, Baltimore, National Center for Trafics and UMAARS, Rev: v1.0.2012

Data courtesy of SHA-ID_UMAARS-2011-2009-2011 (Rev 10/2012)
Training, Licensing & Vehicle Info.

Vehicle & Titling
- Driver license number
- Vehicle ownership
- VIN
- Type of motorcycle
- Odometer reading (when re-titled)

Licensing
- Driver license number
- Previous experience/training
- Skills and knowledge testing
- Date issued
# Training Data

<table>
<thead>
<tr>
<th>2011 Training Numbers - License Waiver</th>
<th>Received Waiver Certificate</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Enrolled</td>
</tr>
<tr>
<td>Basic Rider Course</td>
<td>7,928</td>
</tr>
<tr>
<td>Alternate Basic Rider Course</td>
<td>769</td>
</tr>
<tr>
<td>Totals</td>
<td>8,697</td>
</tr>
<tr>
<td>Percentage of those Enrolled</td>
<td>91%</td>
</tr>
</tbody>
</table>
Licensing Data

- 2,037 motorcycle operators were involved in crashes
  - 24% were out-of-state operators
- 1,544 were reported to have a MD license
- 1,513 linked to MVA licensure files
  - 896 (59%) had an M endorsement on record
- Only 339 (22%) had an M in the class field on the crash report
Vehicle Data

• 11 character (de-identified) VIN numbers from Motor Vehicle Administration (MVA) registration file provided to Insurance Institute for Highway Safety (IIHS)

• IIHS returned motorcycle ‘class name’ information for each VIN number
  • Cruiser (35%)
  • Sport (9%)
  • Sport Touring (1%)
  • Super Sport (34%)
  • Touring (14%)
  • Other (chopper, dual purpose, off road, scooter, sidecar, standard, unclad sport)
Motorcycle Training Data
(project with Cambridge Systematics)

• Primary research questions
  – Do crash characteristics (collision type, contributing factors, etc) and injury outcomes (injury severity, type, frequency) differ between motorcycle riders that were trained in Maryland as compared to those not trained in Maryland?
  – Is there a difference in rider behavior (contributing factors such as speed, impairment, aggressive or distracted driving) between trained and untrained riders? Are those factors associated with injury occurrence and outcome?
  – What types of citations are issued to trained and untrained riders while they are operating a motorcycle? While they are operating a passenger vehicle?
Cambridge Systematics Project

• Data integration
  – motorcycle training data (provided by the Maryland Motor Vehicle Administration)
  – police crash reports (provided by the Maryland State Police)
  – emergency department and hospital inpatient records (provided by the Health Services Cost Review Commission)
  – traffic citation data (provided by the Maryland District Court)
Fields of Interest
- Demographics
- Injury type & severity
- Safety equipment
- Disposition
- Charges
# Medical Records Data

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Number</th>
<th>Charge ($ in 1,000s)</th>
<th>Percent (%)</th>
<th>Hospital Charges (Percentile)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25th</td>
</tr>
<tr>
<td>Driver</td>
<td>3,132</td>
<td>60,945</td>
<td>45.7</td>
<td>3,923</td>
</tr>
<tr>
<td>Passenger</td>
<td>1,125</td>
<td>19,363</td>
<td>14.5</td>
<td>4,075</td>
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<tr>
<td>Motorcyclist</td>
<td>835</td>
<td>27,455</td>
<td>20.6</td>
<td>4,835</td>
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<tr>
<td>Pedal Cyclist</td>
<td>105</td>
<td>2,225</td>
<td>1.7</td>
<td>4,062</td>
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<tr>
<td>Pedestrian</td>
<td>736</td>
<td>18,171</td>
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<tr>
<td>Unspecified</td>
<td>247</td>
<td>5,110</td>
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<td>4,281</td>
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<tr>
<td>Total</td>
<td>6,180</td>
<td>133,269</td>
<td>100.0</td>
<td>4,104</td>
</tr>
</tbody>
</table>
What the data tell you-

• Training status, scores, course type
• Crash frequency, severity, type & location
• License status, rider/operator gender & age and driving history
• Motorcycle vehicle type
• Roadway characteristics
• Citations, convictions & dismissals
• Injury type, severity and cost
• EXPOSURE
• Maryland MVA
• ABATE of Maryland
• Maryland State Police
• MD Motorcycle Dealers
• Maryland EMS
• State Highway Administration
• Maryland Highway Safety Office
• Prince George’s County Police
• NHTSA Region 3
• and other partners......