Pima Association of Governments

Bicycle Crash Analysis 2001 thru 2008

Overview

May 2009

Analysis Parameters

- Analysis covers all jurisdictions in Pima County
- Covers calendar years 2001 thru 2008
- Analysis of Arizona Dept. of Transportation (ADOT) data received from law enforcement agencies:
  - Arizona Dept. of Public Safety (AZDPS)
  - Marana (Marana Police)
  - Oro Valley (Oro Valley Police)
  - Pascua Yaqui Tribe (P.Y. Police)
  - Pima College (Pima College Police)
  - Pima County (Pima County Sheriff's Dept)
  - Tohono O'odham Nation (T.O. Police)
  - Tucson (TPD)
  - U of A (UAPD)

The Tucson Region

Pedalcycle (a.k.a. Bicycle)

- Non-motorized vehicle operated by pedals and propelled by human power. Includes: bicycles, tricycles, unicycles, pedal cars, etc.

Crash

- A traffic collision originating on a roadway ("trafficway") that results in property damage and/or personal injury


Annual Bicycle Crashes

Crashes and Population Growth

What is a Bicycle Crash?
Crashes By Jurisdiction

Bike Crashes By Jurisdiction

Daylight Conditions
(when crashes occur)

Daylight Conditions

Bicyclist Actions

Bicyclist Action During Crash

Remaining actions are Going Straight, Other or Unknown

Motor Vehicle Actions

Motor Vehicle Action During Crash

Remaining actions are Other or Unknown

Alcohol-Related Crashes

Alcohol Related Crashes

Violations Reported (2001 thru 2008)
all entries, including “no improper driving”
Top Violations for Motorists

% Speed too fast | % Improper turn | % Inattention | % Failed to yield | % No improper driving

Refer to slide #12 for other violations
*No evidence at time of crash/report to show violation

Top Violations for Bicyclists

% Ran stop sign | % Disregarded signal | % Inattention | % Drove against traffic | % Failed to yield | % No improper driving

Refer to slide #12 for other violations
*No evidence at time of crash/report to show violation

Wrong-Way Riding (2001 thru 2008)
225 total bicyclists reported for “driving in opposing traffic lane” (wrong-way riding); Average of 28 per year

• 16% in darkness
• 2 fatalities (<1%), 21 with serious injuries (9%), 104 with minor injuries (46%)
• 77% are male with average age of 31
• Top corridors (in order): Grant, Speedway, Broadway, Alvernon, 1st Avenue, Oracle, Pima, Stone, Campbell, Flowing Wells

Wrong-Way Riding % of Violations

Injury Definitions

Fatal: Death.
Incapacitating Injury: An injury, other than a fatal, which prevents the injured person from walking, driving, or normally continuing the activities which he/she was capable of performing prior to the motor vehicle traffic accident. Includes severe lacerations, broken or distorted limbs, unconsciousness, inability to leave accident scene without assistance.
Non-Incapacitating Injury: Any injury other than fatal and incapacitating which is evident to any observer at the scene of the accident. Includes bumps, abrasions, bruises, and minor lacerations. The person receiving these injuries is still able to leave the scene under his/her own power.
Possible Injury: Any injury reported or claimed which is not a fatal, incapacitating, or non-incapacitating evident injury. Includes such situations as nausea, hysteria, complaint of pain, and injuries not evident.
No Injury: A situation where there is no reason to believe that the person received any bodily harm from the motor vehicle traffic accident in which they were involved.

(Source: Arizona Traffic Accident Report Instruction Manual & Glossary, 2000)
Bicyclist Injuries

Bicyclist Injuries (as percentage of all Injury entries)

Remaining entries of Possible Injuries, No Injuries or Unknown bring total to 100%

<table>
<thead>
<tr>
<th>Year</th>
<th>Fatal</th>
<th>Incapacitating</th>
<th>Non-incapacitating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>2.0%</td>
<td>13.2%</td>
<td>49.1%</td>
</tr>
<tr>
<td>2002</td>
<td>1.2%</td>
<td>12.9%</td>
<td>49.6%</td>
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<tr>
<td>2003</td>
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<td>10.9%</td>
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<tr>
<td>2004</td>
<td>1.2%</td>
<td>11.8%</td>
<td>48.4%</td>
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<tr>
<td>2005</td>
<td>1.8%</td>
<td>12.6%</td>
<td>46.4%</td>
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<tr>
<td>2006</td>
<td>1.7%</td>
<td>14.8%</td>
<td>43.5%</td>
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<tr>
<td>2007</td>
<td>0.5%</td>
<td>10.3%</td>
<td>49.6%</td>
</tr>
<tr>
<td>2008</td>
<td>1.9%</td>
<td>12.9%</td>
<td>48.2%</td>
</tr>
</tbody>
</table>

Fatal Crashes
(2001 thru 2008)

39 total bicyclist fatalities; 5 per year average

- 14 (36%) in darkness
- 11 (28%) alcohol-related (4 cyclists, 7 motorists)
- 28 “going straight ahead” (2 against traffic)
- 14 confirmed cyclist violations
- 11 cyclists “no improper driving”
- 12 confirmed motorists violations
- 20 motorists “no improper driving”
- Occurred at random locations throughout Tucson region
- 35 (90%) were males with average age of 40

Incapacitating Crashes
(2001 thru 2008)

342 total bicyclists incapacitated; 43 per year average

- 71 (21%) in darkness
- 40 (12%) alcohol-related (29 cyclists, 11 motorists)
- 258 “going straight ahead” (20 against traffic)
- 127 confirmed violations
- 135 “no improper driving”
- 295 (86%) were males with average age of 35
- Occurred at random locations within Tucson region

Top Crash Roadways
(2001 thru 2008)

*Roadways vary in length, number of lanes and traffic volumes
**Other high-crash roadways include 1st Ave., Alvernon, Campbell, Craycroft, Euclid, and Golf Links
Crashes By Month
(2001 thru 2008)

Average # of Crashes By Month
(2001-2008)

Summary Findings
• Rate of crashes compared to population has declined slightly.
• Most crashes occur during daylight hours.
• Most crashes occur while bicyclists are “going straight ahead.” Wrong-way riding is also a concern.
• Alcohol is not a major factor in overall crashes, but a significant factor in fatal crashes (28%).
• Beyond alcohol, there is no distinct cause or circumstance for fatal crashes.
• Most cyclists involved in crashes are males with an average age of 35.
• More analysis is needed as to specific crash causes and locations.

Crashes By Month
(2001 thru 2008)

Average # of Crashes By Month
(2001-2008)

Next Steps
• Continue to analyze data to isolate specific crash causes and locations
• Work with regional cycling community to enhance education and enforcement efforts
• Continue to work with local jurisdictions on bicycle facility improvements and crash prevention
• Continue Annual Regional Bicycle Count

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