2016 Bicycle Collision Summary

City of Phoenix
STREET TRANSPORTATION DEPARTMENT

TRAFFIC SERVICES DIVISION
TRAFFIC SAFETY SECTION
DECEMBER 2017
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Introduction

The 2016 Bicycle Collision Summary provides a brief analysis of bicycle collision statistics related to demographics, accident types, and locations. The report also includes collision data from 2012 through 2016 to identify and track bicycle collision trends that have emerged during the past five years. These statistics provide a strong indication of roadway behaviors that negatively impact bicyclists’ safety and helps identify which violations should be prioritized for increased education and enforcement.

The 2016 collision summary includes a reported 515 bicycle-related collisions resulting in 468 injuries and 8 fatalities. These bicycle-related collisions accounted for nearly 2 percent of all collisions, 3 percent of all injuries, and 4 percent of all fatalities occurring on City Streets. Statistics show the number of collisions has increased (13 percent) as compared to the 2015 collisions, the 5-year trend is increasing. Consistent with previous years, male bicyclists were involved in more collisions at a male:female ratio of 3.3:1. Also, the age groups with the highest number of bicycle-related collisions were adults between the ages of 26 and 35. The majority (74 percent) of collisions occurred within 150 feet of an intersection.

The findings in this report are used to inform and influence the design of new bicycle facilities, the redesign of existing roadways, the development of education programs and enforcement campaigns for bicyclists and motorists. In an effort to identify locations and collision trends that may require special attention, this report also identifies intersections and street segments with the highest annual bicycle injury collisions.

NOTE: Some figures in the 2016 Bicycle Collision Summary differ from the 2016 Traffic Collision Summary due to the detailed analysis of crash reports.
Important Points to Know About the Bicycle Collision Summary in 2016:

• Bicycle collisions increased for the first time in 5 years.
• Nearly seven out of ten collisions occurred at or within 150 feet of an intersection.
• More than eight out of ten non-intersection-related collisions occurred on an arterial street.
• More than a third of collisions occurred while the motorist was making a right-hand turn.
• Only eight percent of bicyclists involved in a collision are not injured.

In 2016,

• Bicycle collisions in 2016 accounted for nearly 2% of all traffic collisions, 3% of all injuries, and 4% of all fatalities.
• Almost 15% of bicyclist in collisions were children below the age of 18.
• 36% of all collisions occurred in an intersection crosswalk and 20% at driveways.
• 33 school-age bicyclists (5 to 17 years old) were in crashes during school hours (Monday – Friday, 7 AM – 4 PM).
• Only 23% of all bicycle collisions occurred at night, including twilight, but 63% of all bicyclist fatalities occurred at night.
• Bicycle collisions occurred most frequently between the hours of 3 PM and 6 PM and on Tuesdays.
• September had the highest number of bicycle collisions (57).
• Only 13 bicyclists and two drivers were found to be under the influence of alcohol or drugs.
• 45% of all bicycle collisions occurred at uncontrolled locations.
• There were 90 hit and run collisions involving bicycles.
Five-Year Trend of Bicyclist-Involved Collisions, Injuries, and Fatalities

Key Note: The 10 year average is 477 collisions.
Bike lanes along East Cholla Street from 24th to 32nd Streets

Shared-use bike lane markings on East Roosevelt Street west of 7th Street
### Age and Gender of Bicyclists in Collisions

#### Key Note:
Children (below 18 years of age) account for 15% of all bicycle collision victims.

#### Bicyclists
- Male : Female = 3.3 : 1

#### Table: Age and Gender of Bicyclists in Collisions

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Unknown</th>
<th>No Injury</th>
<th>Injury</th>
<th>Fatal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upto 5</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6 - 11</td>
<td>11</td>
<td>44</td>
<td>14</td>
<td>5</td>
<td>60</td>
</tr>
<tr>
<td>12 - 17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 - 25</td>
<td>71</td>
<td>71</td>
<td>19</td>
<td>0</td>
<td>161</td>
</tr>
<tr>
<td>26 - 35</td>
<td>71</td>
<td>71</td>
<td>31</td>
<td>0</td>
<td>173</td>
</tr>
<tr>
<td>36 - 45</td>
<td>46</td>
<td>42</td>
<td>22</td>
<td>0</td>
<td>110</td>
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<tr>
<td>46 - 65</td>
<td>24</td>
<td>24</td>
<td>5</td>
<td>0</td>
<td>53</td>
</tr>
<tr>
<td>66 - Up</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>468</td>
<td>8</td>
<td>0</td>
<td>515</td>
</tr>
</tbody>
</table>

#### No Injury | Injury | Fatal | Total
- Unknown: 1 | 0 | 0 | 1
- Female: 4 | 115 | 1 | 120
- Male: 34 | 353 | 7 | 394
- Total: 39 | 468 | 8 | 515

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**2016 BICYCLE COLLISION SUMMARY**
Age and Gender of Drivers in Collisions

Note: There were 90 hit and runs.
Bicyclists in Collisions by Light Conditions

Citywide Total Collisions

Night
- 6 Fatal Collisions (23%)
- 100 Injury Collisions (21%)
- 116 Total Collisions (60%)

Day
- 2 Fatal Collisions (25%)
- 368 Injury Collisions (79%)
- 399 Total Collisions (77%)

Night
- 134 Fatal Collisions (68%)
- 2,784 Injury Collisions (29%)
- 8,962 Total Collisions (60%)

Day
- 63 Fatal Collisions (32%)
- 6,760 Injury Collisions (71%)
- 21,387 Total Collisions (71%)
Bicyclists in Collisions by Injury Severity

Key Note: There were 229 minor injuries, 75 serious injuries, and 8 fatalities.

Note: This collision summary accounts for bicycle collisions with vehicles, not single bicycle collisions or two-bicycle collisions.
North 12th Street south of East Camelback Road
Before / After Buffered Bike Lanes – March 2016
Bicyclist-Involved Collisions by Time of Day and Age Group

Key Note: 1/8 fatalities occurred after 5PM.
Bicyclist-Involved Collisions by Day of Week

Key Note: Tuesday saw the highest number of collisions and Saturday for fatalities.
Bicyclist-Involved Collisions by Month

Key Note: 36% increased collisions in September from 2015.
Actions of Bicyclists and Drivers

**Bicyclists**
- Crossing road 41%
- Straight riding with traffic, 15%
- Straight riding against traffic, 25%
- Turning, 5%
- Other, 10%
- Unknown, 4%

**Drivers**
- Right turn, 37%
- Straight, 35%
- Left turn, 15%
- Other, 7%
- Unknown, 3%
- Stopped, 3%

Behavior/Violations of Bicyclists and Drivers

**Bicyclists**
- No violation, 34%
- Failed to yield, 14%
- Rode opposing traffic, 12%
- Disregarded signal/sign, 6%
- Unsafe maneuver, 4%
- Did not use crosswalk, 4%
- Faulty/missing equipment, 2%
- Other, 15%

**Drivers**
- No violation, 51%
- Failed to yield, 27%
- Unknown, 12%
- Speed too fast, 2%
- Unsafe maneuver, 2%
- Disregarded signal/sign, 3%
- Other, 3%

"Other" and "Unknown" mostly conveys bike riding wrong side on sidewalk or not walking bike through intersection crosswalk.
Who Was Cited?

Most frequent citations issued to…

**Bicyclists**
- Failure to keep to the right-hand curb
- Failure to Stop/Yield
- Failure to obey signal

**Drivers**
- Driving without proof of insurance
- Driving without proof of valid drivers license
- Failure to control speed
- Failure to yield left turn

Key Note: 34 bicyclists were issued 42 citations and 69 drivers were issued 123 citations.
Bike to School Events - April / May 2016

District 7 Community Bike and Safety Event in April 2016 at Food City Shopping Center located on SWC of 7th / Southern Avenues.

Eagle Ridge Elementary “Bike to School Day” Event in May 2016 at 12th Street / Wahalla Lane.
Impairment of Bicyclists and Drivers

Bicyclists

- No influence, 97%
- Drugs or Alcohol, 3%

Drivers

- No influence, 99.6%
- Drugs, or alcohol, 0.4%

Injury Severity of Bicyclists under the Influence

- Fatal, 5
- Serious, 5
- Minor, 2
- Possible, 1
- Under the Influence

Key Note:
There were 2 minor injuries, 5 serious injuries, and 5 fatalities involving drugs and/or alcohol and 1 Possible injury.

Male:Female 3.3 : 1
Five-Year Trend of Drug or Alcohol Use in Bicyclist-Involved Collisions

<table>
<thead>
<tr>
<th>Year</th>
<th>Intoxicated Incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>23 (18, 5)</td>
</tr>
<tr>
<td>2013</td>
<td>25 (20, 5)</td>
</tr>
<tr>
<td>2014</td>
<td>14</td>
</tr>
<tr>
<td>2015</td>
<td>15</td>
</tr>
<tr>
<td>2016</td>
<td>15</td>
</tr>
</tbody>
</table>
Bicyclist-Involved Collisions by Street Classification

**Intersection-Related**
74% of all bicycle collisions

**Non-Intersection-Related**
26% of all bicycle collisions

**Street Classification Examples**
- Freeways are I-17 (Black Canyon Freeway), I-10, Loop 202, on-ramps, access roads, etc.
- Arterial streets are typically the mile-line streets such as 7th Ave, 16th St, Camelback Rd, and Union Hills Dr as defined on the Phoenix Street Classification Map.
- Collector streets are typically the half-mile-line streets such as 39th Ave, 28th St, Roeser Rd, and Maryland Ave as defined on the Phoenix Street Classification Map.
- Local streets are typically the neighborhood streets such as 88th Ln, Dromedary Rd, Holly St, 21st St, and Glenn Dr and are not defined as arterial or collector streets.
2016 Bicycle Lane Improvements

- Cholla Street from 40th to 44th Streets
- Roosevelt Street from 4th to 7th Streets
- Nevitt Bridge Path at 46th Place from Western Canal to Vineyard Road
- Indian School Road from 7th Avenue to 3rd Street
- Hearn Road from 7th to 12th Streets
- Virginia Avenue from 7th Street to Central Avenue
- Acoma Drive from 44th Street to Tatum Boulevard
- 55th Avenue from Dobbins to Baseline Roads
- Cholla Street from 24th to 32nd Streets
- 28th Street from Bell Road to Union Hills Drive
- 63rd Avenue from Durango to Sonora Streets
- 111th Avenue from Campbell Avenue to Indian School Road
- 39th Avenue from Greenway to Bell Roads for Safe Routes to School
- Durango Street from 63rd to 67th Avenues
- South Mountain Avenue from 51st Avenue to Mansa Drive
- Mansa Drive from South Mountain to 47th Avenues
- Lincoln Street from 7th to 2nd Avenues
- 48th Street from Washington to Van Buren Streets
- 39th Avenue from Missouri Avenue to Bethany Home Road
Bicyclist-Involved Roadway Collisions

**Total Roadway Related Crashes**

- **Unmarked Crosswalks**
  - 50 Collisions
  - 48 Injuries - 1 Fatality
  - 10% of all collisions

- **Travel Lanes**
  - 24 Collisions
  - 22 Injuries - 1 Fatality
  - 5% of all collisions

- **Mid-Block**
  - 41 Collisions
  - 37 Injuries - 2 Fatalities
  - 8% of all collisions

- **Driveways**
  - 55 Collisions
  - 48 Injuries – 1 Fatality
  - 11% of all collisions

- **Within Intersection**
  - 39 Collisions
  - 35 Injuries – 1 Fatality
  - 8% of all collisions

- **Intersection Crosswalks**
  - 185 Collisions
  - 166 Injuries - 1 Fatality
  - 36% of all collisions

- **Bike Lanes**
  - 22 Collisions
  - 22 Injuries - 0 Fatalities
  - 4% of all collisions

**NOTE:** There were 94 bicyclists hit on sidewalks resulting in 86 injuries, 0 fatalities, 18% of all collisions.
Bicyclist-Involved Collisions and Traffic Control

**Uncontrolled Locations**
- 246 collisions
- **48% of all collisions**
- 221 injuries – 7 fatalities

**STOP Sign Controlled Locations**
- 85 collisions
- **17% of all collisions**
- 78 injuries – 1 fatality

**Signalized Locations**
- 178 collisions
- **35% of all collisions**
- 164 injuries – 0 fatalities

**NOTE:** There was 6 bicyclists at unknown/other controls (1% of all collisions) resulting in 5 injuries, 1 fatality.
Direction of the Vehicle Impact with Bicyclist

Key Note: Bicyclists struck riding against traffic were 25% of all crashes.

89 – Intersections
64 – Sidewalk
39 – Unmarked crosswalks
25 – Mid-block
14 – Bike Lane
11 – Driveways
7 – Travel Lanes

51 – Intersections
12 – Mid-block
16 – Sidewalk
10 – Driveways
4 – Travel Lanes
2 – Unmarked crosswalks

NOTE: 7 unknown
2016 Bicycle Detection Improvements

Bicycle detection improvements were added to seventeen signalized intersections in 2016. The intersection detection systems included inductive loops, bicycle signals, video cameras, and FLIR (Forward Looking Infrared).

Example locations:

• 15th Avenue and Camelback Road
• 12th Street and Campbell Avenue
• 32nd Street at Cactus, Greenway, Thunderbird Roads, and Shea Boulevard
Bicycle Collisions by Location

- 4 Collisions
- 3 Collisions
- 1-2 Collisions

2016 BICYCLE COLLISION SUMMARY
Acknowledgements

The 2016 Phoenix Bicycle Collision Summary documents the collisions involving bicyclists in the City of Phoenix throughout the 2016 calendar year. Collision data utilized for this report was acquired through Phoenix Police records and the database maintained by the Arizona Department of Transportation (ADOT) known as Safety Data Mart (SDM). The 2016 Phoenix Bicycle Collision Summary was prepared by Ramkiran Krishnakumar (ASU Intern) with assistance from Traffic Safety Section staff Richard Russ (Principal Engineering Technician) and Jacob Martinez (Senior Engineering Technician).

The SDM database includes motor vehicle crashes involving bicyclists that occurred on public right of way where someone was injured or killed or where property damage exceeded $1,000.

Cover photograph: Phoenix Bike to Work day 2016
Photograph courtesy Joseph Perez (Bicycle Coordinator)

Presentation photographs courtesy Joseph Perez (Bicycle Coordinator), Don Cross (School Safety) and James Baker (Signal Systems)

This publication can be made available in an alternative format upon request. Contact the Street Transportation Department at 602-262-6284 if you would like any of these services. Our TTY phone number is 711.
Questions?

Please contact Street Transportation Department at 602-262-6284 or TTY 711