2011 Bike Safety Web Survey

BPAC

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With assistance from
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Background

• **Purpose:** Assess bike accident causes by surveying a convenience sample of residents of Davidson and surrounding counties who bike.

• **Information collected:** (1) biking behavior, (2) accidents with a focus on injury accidents, (3) factors contributing to bike accidents, and (4) background information (demographics)

• **Goals:** Actionable findings that suggestion how to improve the biking infrastructure and educational targets to improve bike safety.

• **Secondary goals:** Better general understanding of biking behavior as a part of a biking needs assessment.
Methods

• **Sponsors:** BPAC and Nashville Area MPO (NMPO)
• **Web tool:** Survey Monkey.
• **Population surveyed:** (1) BPAC members; (2) Approximately 1100 respondents to a previous web survey conducted by NMPO in 2009 and 2010. Not a sample representative of either the adult resident population or of typical bike riders.
• **Invite email:** Advised recipients that the survey could be taken multiple times on the same computer by other members of the household.
• **Survey dates:** May 15 - June 9. (New surveys can still be completed.)
• **Respondent N:** 591
• **The respondents:** Sample of mostly healthy, highly educated, non-Latino white adults who live in the Middle Tennessee area and ride bikes. Approximately two thirds are from Davidson County ZIP codes.
### Web survey respondents vs. Davidson County/U.S. Estimates

<table>
<thead>
<tr>
<th>Category</th>
<th>Web survey respondents</th>
<th>Davidson County Estimates 2009</th>
<th>U.S. Estimates 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS graduates (Age 25+)</td>
<td>100%</td>
<td>85%</td>
<td>85%</td>
</tr>
<tr>
<td>College graduates (Age 25+)</td>
<td>79%</td>
<td>33%</td>
<td>28%</td>
</tr>
<tr>
<td>% Male</td>
<td>67%</td>
<td>49%</td>
<td>49%</td>
</tr>
<tr>
<td>% white</td>
<td>97%</td>
<td>65%</td>
<td>75%</td>
</tr>
<tr>
<td>% black or African American</td>
<td>1%</td>
<td>28%</td>
<td>12%</td>
</tr>
<tr>
<td>% Asian</td>
<td>2%</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>% Latino or Hispanic</td>
<td>1%</td>
<td>8%</td>
<td>15%</td>
</tr>
<tr>
<td>Cell phone only households</td>
<td>44%</td>
<td></td>
<td>25%</td>
</tr>
</tbody>
</table>

Note: 4 respondents reported less than a high school education, but due to age. Three were mid-teens and one was aged 10.
## Web survey respondents vs. Davidson County/US Estimates

<table>
<thead>
<tr>
<th>Category</th>
<th>Web survey respondents</th>
<th>Davidson County Estimates</th>
<th>U.S. Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 20-24</td>
<td>3%</td>
<td>10%</td>
<td>9%</td>
</tr>
<tr>
<td>25-34</td>
<td>23%</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>35-44</td>
<td>27%</td>
<td>19%</td>
<td>22%</td>
</tr>
<tr>
<td>45-54</td>
<td>25%</td>
<td>18%</td>
<td>19%</td>
</tr>
<tr>
<td>55-64</td>
<td>21%</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>65+</td>
<td>3%</td>
<td>14%</td>
<td>17%</td>
</tr>
<tr>
<td>BMI Normal or below normal</td>
<td>57%</td>
<td>34%</td>
<td>35%</td>
</tr>
<tr>
<td>BMI Overweight</td>
<td>33%</td>
<td>39%</td>
<td>36%</td>
</tr>
<tr>
<td>BMI Obese</td>
<td>10%</td>
<td>27%</td>
<td>28%</td>
</tr>
</tbody>
</table>

**Note:** For Davidson County and US estimates, age data is 2009 and BMI data is 2010
## Web survey respondents vs. resident population by ZIP code

(Census estimates 2010)

<table>
<thead>
<tr>
<th>Category</th>
<th>Web survey respondents</th>
<th>Zip code population</th>
</tr>
</thead>
<tbody>
<tr>
<td>37212 Hillsboro corridor inside I-440</td>
<td>66</td>
<td>18,547</td>
</tr>
<tr>
<td>37205 West End corridor</td>
<td>42</td>
<td>21,861</td>
</tr>
<tr>
<td>37206 East Nashville</td>
<td>36</td>
<td>27,751</td>
</tr>
<tr>
<td>37215 Hillsboro corridor outside I-440</td>
<td>36</td>
<td>22,122</td>
</tr>
<tr>
<td>37221 I-40 corridor near Old Hickory</td>
<td>34</td>
<td>34,809</td>
</tr>
<tr>
<td>37209 West Nashville above I-40</td>
<td>23</td>
<td>35,081</td>
</tr>
<tr>
<td>37027 Brentwood</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>37211 S. Nashville Btw I-65 &amp; I-24</td>
<td>17</td>
<td>64,753</td>
</tr>
<tr>
<td>37216 Gallatin Rd corridor S of Briley</td>
<td>16</td>
<td>19,132</td>
</tr>
<tr>
<td>37064 Franklin</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>
Percentage of respondents who ride bikes weekly or monthly for the listed reasons

<table>
<thead>
<tr>
<th>Reason</th>
<th>At least weekly</th>
<th>At least monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>For exercise</td>
<td>65%</td>
<td>78%</td>
</tr>
<tr>
<td>For recreation/pleasure</td>
<td>60%</td>
<td>77%</td>
</tr>
<tr>
<td>Commute to work/school</td>
<td>25%</td>
<td>46%</td>
</tr>
<tr>
<td>To visit family/friends</td>
<td>13%</td>
<td>25%</td>
</tr>
<tr>
<td>For routine shopping (groceries, drug store)</td>
<td>11%</td>
<td>23%</td>
</tr>
<tr>
<td>To entertainment venues</td>
<td>11%</td>
<td>21%</td>
</tr>
</tbody>
</table>

N=501
Bike riding venues
(Percentage of respondents riding in the following places “often” or “sometimes”)

<table>
<thead>
<tr>
<th>Venue</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential streets</td>
<td>94%</td>
</tr>
<tr>
<td>Busy city streets without bike lanes</td>
<td>74%</td>
</tr>
<tr>
<td>Parks and Greenways</td>
<td>72%</td>
</tr>
<tr>
<td>Busy city streets with bike lanes</td>
<td>69%</td>
</tr>
<tr>
<td>Rural roads</td>
<td>61%</td>
</tr>
</tbody>
</table>

N=500
Risky biking behaviors on public roads
(Percentage of respondents engaging in behavior “sometimes” or “often”)

- Rolling through stop signs: 50%
- Passing vehicles on the right: 45%
- Rolling through red lights: 18%
- Riding more than double file in groups: 17%
- Switching between riding on sidewalk and roadway: 14%
- Riding without a helmet: 13%
- After drinking alcohol: 9%
- Riding in opposite direction of traffic: 3%

N=495
Risky biking/pedestrian behaviors in parks or greenways

(Percentage of respondents engaging in/observing behavior “sometimes” or “often”)

- Greenway/path users spread out over the entire path, obstructing travel: 75%
- Other cyclists/users going more than 15 mph: 63%
- Pets on or off leashes that obstruct travel: 59%
- You going more than 15 mph: 44%
- Cyclists not slowing for pedestrians: 34%
- Cyclists engaged in reckless riding: 21%

N=495
Risky riding conditions
(% of respondents who ride bikes under the following conditions “often” or “sometimes”)

- During rush hours: 60%
- When dark: 41%
- In the rain or when roads are wet: 41%
- If there is snow or ice on the roads: 15%

N=496
Road/greenway Problems
(\% of respondents who ride bikes under the following conditions “often” or “sometimes”)

- Streets with debris present: 90\% 
- Bike lanes with debris present: 82\% 
- Drain grates facing the wrong direction for bikes: 62\% 
- Bike lanes blocked by parked cars: 58\% 
- Debris or other temporary hazard in greenway path: 37\% 
- Slick or damaged bridges in greenways: 32\%

N=496
Negligent or abusive motorized vehicle driver behaviors
(% of respondents who ride bikes under the following conditions “often” or “sometimes”)

- Vehicle driver passes within three feet of you: 81%
- Vehicle driver cuts you off (unaware of you): 65%
- Hostile vehicle driver honks or yells at you for riding on road: 56%
- Vehicle driver cuts you off (deliberate): 37%
- Occupant of parked car opens door cutting you off: 14%
- Hostile vehicle driver bumps you from behind: 3%

Note: N=496; In all, 8% responded that a hostile vehicle driver had bumped them, and 83% responded that they had been yelled or honked at (includes rarely).
Percentage of respondents who had a bike accident during the past five years

- No accident: 45%
- Accident, no injury: 20%
- Accident, minor injury: 26%
- Accident, serious injury: 9%

N=491
How serious was the injury?

N=175 (injury accidents)
# Bicycle accident factors or contexts, by injury severity

<table>
<thead>
<tr>
<th>Injury severity</th>
<th>Minor (N=129)</th>
<th>Serious (N=43)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falling off bike due to own actions</td>
<td>45%</td>
<td>33%</td>
</tr>
<tr>
<td>Potholes, road debris, slick roads</td>
<td>44%</td>
<td>16%</td>
</tr>
<tr>
<td>Collision with other cyclists</td>
<td>19%</td>
<td>9%</td>
</tr>
<tr>
<td>At roadway intersection/entry</td>
<td>17%</td>
<td>33%</td>
</tr>
<tr>
<td>Collision with moving motor vehicle</td>
<td>15%</td>
<td>19%</td>
</tr>
<tr>
<td>Collision with an animal</td>
<td>12%</td>
<td>21%</td>
</tr>
<tr>
<td>Bike mechanical problems</td>
<td>12%</td>
<td>14%</td>
</tr>
<tr>
<td>Collision with a fixed object</td>
<td>9%</td>
<td>14%</td>
</tr>
</tbody>
</table>

N=173 (injury accidents); Note that more than one response can be selected.
Road conditions that were an accident factor

- Streets/bike lanes/gravel: 29%
- Slick streets (rain, snow): 19%
- Drain grates wrong direction: 5%
- Rumble strips: 5%
- Road markings: 5%
- Rail road tracks: 3%

N=175 (injury accidents)
Environmental conditions that were an accident factor

- Rainy conditions: 19%
- Icy or snowy conditions: 5%
- Darkness (bike has lights and reflectors): 7%
- Darkness (bike has no lights or reflectors): 1%

N=175 (injury accidents)
Motorized vehicle driver behaviors that were an accident factor

- Vehicle driver cut you off by turning or swerved in your path: 73%
- Hostile vehicle driver honked or yelled at you: 38%
- Vehicle driver passed within three feet of you: 16%
- Vehicle driver bumped you from behind: 14%
- Occupant of parked car opened door: 11%

N=37 (bike riders in accidents mentioning vehicle driver behaviors as factors)
Risky biking behaviors that were an accident factor

- Riding without a helmet: 2%
- Switching between riding on sidewalk and roadway: 2%
- Passing vehicles on the right: 1%
- Riding more than double file in groups: 1%
- Rolling through stop signs: 0%
- Rolling through red lights: 0%
- Riding in opposite direction of traffic: 0%

N=175 (injury accidents);
Who was at fault in causing the accident?

- ** Own fault: 45% **
- ** Other person's fault: 24% **
- ** Both at fault: 15% **
- ** Riding conditions: 43% **
- ** Not sure: 4% **

N=175 (injury accidents);
In accidents involving a motorized vehicle (n=37), no respondent said it was only his/her fault. Instead, the other driver was said to be jointly at fault in 28% of the cases and solely at fault in 44% of the cases.
Accident narratives

1. Among the 175 injury producing accidents, 114 respondents gave a narrative description of their accident.
2. Among 25 respondents mentioning road debris, there were mentions of curb cuts that upended, slipping on loose gravel on a turn, hitting a brick in the road, encountering broken pavement on roads and sidewalks, potholes that flipped, as well as rough road patches that led to falls.
3. Five respondents mentioned that their feet became stuck in pedal clips, causing an accident.
4. The risky riding behaviors include trying to adjust the fender while riding, riding too fast on slippery roads, cell phone usage while riding, and carrying groceries by hand while trying to steer the bike.
5. The dog stories include attacking dogs, loose dogs, as well as dogs on leashes. One individual ran into a deer.
6. Mechanical problems included brake failure, blown tires, and broken pedals.

7. Running into other cyclist typically involved group rides in which cyclists bikes touched or cyclist in front slowed unexpectedly.

8. Pedestrian accidents included a skateboarder out of control, a fall to avoid a pedestrian group, and a pedestrian screaming for help causing a crash due to the bike rider’s distraction by the scream for help.

9. Grate accidents include not only slits going the wrong way, but protruding grates.

10. Two individuals reported being “doored.”

11. Many of the motor vehicle accidents involved distracted or inattentive drivers turning into the biker after passing him or her. A few bikers were hit from behind, and several bikers were hit by vehicle drivers running stop signs. One biker reported a head-on with a slow moving truck.