Mapping Bicycle & Pedestrian Crashes in St. Paul (and greater Minnesota)
Initially a project for the District Council Collaborative (DCC) in part with the Center of Urban and Regional Affairs (CURA)

The District Council Collaborative is a non-profit community organization whose primary purpose is to provide community input in planning and policy development for the University Avenue Central Corridor between Minneapolis and St. Paul.

- Goals: provide awareness to community members about pedestrian and bicyclist safety and to support a Towards Zero Death Plan for the city of St. Paul.
- Evaluate crash patterns along the central corridor specifically evaluating Snelling Ave, Lexington Ave, & Rice St.

Later adopted in part with Minnesota Department of Transportation (MnDOT) which was presented at the State Fair in 2015 as part of the Eco Experience’s Kick Gas.

- Extended to include all of Minnesota
Why study bicycle and pedestrian crashes?

- Bicyclists and Pedestrians are some of traffic’s most vulnerable users, so when collisions occur with motor vehicles pedestrians and bicyclists take on the brunt of the impacts.
- Furthermore roads are designed primarily for motor vehicles use and rarely take into account alternative users of the network.
- Analyzing and learning where and why crashes are occurring can help define solutions to address factors that create risky situations for users.
DATA SOURCE

- MnDOT Office of Traffic, Safety & Technology
- Crash Data for St. Paul from 2010-2015
  - Date and time of crash
  - Severity of the crash
  - Factors involved in the crash
  - Number of fatalities, serious injuries or ‘other’
  - Road Design, Diagram, Speed Limit, Intersection

- Limits
  - Data comes from Police Reports, and is only as complete as the original reports are
  - Data does not include bike to bike crashes or bike to pedestrian crashes, it only includes crashes that involve a motor vehicle
ANALYSIS

- Basic Spatial visualization of crashes (where)
- Severity Index (how bad)
  - Disabling Injuries - A
  - Evident Injuries - B
  - Possible Injuries - C
  - Fatal Injuries - K
  - No Injuries - N
- Factors (what)
  - Whether there was the usage of alcohol
  - Whether either party was distracted
  - Whether the driver was going above the speed limit
  - Whether there was a failure to yield
- Traffic volume (why)
- Time of Day (when)
## Crash Data for St. Paul from 2010-2015

<table>
<thead>
<tr>
<th>Category</th>
<th>Alcohol</th>
<th>Speed</th>
<th>Distraction</th>
<th>No Yield</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injuries Disabling</td>
<td>19</td>
<td>2</td>
<td>16</td>
<td>36</td>
<td>25</td>
<td>98</td>
</tr>
<tr>
<td>Injuries Evident</td>
<td>34</td>
<td>6</td>
<td>62</td>
<td>142</td>
<td>91</td>
<td>335</td>
</tr>
<tr>
<td>Injuries Possible</td>
<td>44</td>
<td>11</td>
<td>134</td>
<td>321</td>
<td>252</td>
<td>762</td>
</tr>
<tr>
<td>Injuries Fatal</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>No Injury</td>
<td>3</td>
<td>4</td>
<td>17</td>
<td>22</td>
<td>44</td>
<td>90</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>101</td>
<td>25</td>
<td>233</td>
<td>525</td>
<td>420</td>
<td>1301</td>
</tr>
</tbody>
</table>
BICYCLE & PEDESTRIAN CRASHES BY SEVERITY
## BICYCLE & PEDESTRIAN CRASHES BY SEVERITY

<table>
<thead>
<tr>
<th>Crash Severity Index</th>
<th>Bicyclist</th>
<th>Pedestrian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury Disabling</td>
<td>29</td>
<td>16</td>
</tr>
<tr>
<td>Injury Evident</td>
<td>111</td>
<td>51</td>
</tr>
<tr>
<td>Injury Possible</td>
<td>314</td>
<td>224</td>
</tr>
<tr>
<td>Fatal</td>
<td>39</td>
<td>69</td>
</tr>
<tr>
<td>No Injury</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Crash Severity Index

- **Injury Disabling**: 29 (Bicyclist) vs. 16 (Pedestrian)
- **Injury Evident**: 111 (Bicyclist) vs. 51 (Pedestrian)
- **Injury Possible**: 314 (Bicyclist) vs. 224 (Pedestrian)
- **Fatal**: 39 (Bicyclist) vs. 69 (Pedestrian)
- **No Injury**: 0 (Bicyclist) vs. 0 (Pedestrian)
BICYCLE & PEDESTRIAN CRASHES BY FACTORS
BICYCLE & PEDESTRIAN CRASHES BY FACTORS

Crash Factors

<table>
<thead>
<tr>
<th>Number of Crashes</th>
<th>Bicyclist</th>
<th>Pedestrian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>22</td>
<td>79</td>
</tr>
<tr>
<td>Speed</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>Distraction</td>
<td>90</td>
<td>143</td>
</tr>
<tr>
<td>No Yield</td>
<td>163</td>
<td>313</td>
</tr>
<tr>
<td>Other</td>
<td>212</td>
<td>257</td>
</tr>
</tbody>
</table>
BICYCLE & PEDESTRIAN CRASHES BY TRAFFIC VOLUME
BICYCLE & PEDESTRIAN CRASHES BY TIME OF DAY
HEAT MAP OF CRASH DATA

https://barne703.carto.com/viz/189ee061-0b9d-4276-8d92-fff7fea9328d/public_map
BICYCLE & PEDESTRIAN CRASHES IN MINNESOTA APPLICATION

http://maps.umn.edu/cura/mndot
FUTURE DEVELOPMENTS

- Update with 2015 crash data
- Display Color Pallets for different types of crash severity/factors
- Turn on and off different layers to provide context
  - Specifically traffic volume
QUESTIONS?