Selected Lane Position as Motorcyclists Approach and Traverse Intersections

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Problem

• One issue of concern in motorcycle safety is recognition of the motorcycle by other road users
• Statistics (including the latest MSF research) indicate that intersections pose increased risk of motorcycle-involved accidents
• Motorcyclist lane position is one way to increase visibility
Relevant Training

Training such as the MSF Basic RiderCourse recommend lane positioning based on the situation

- Leftmost portion is default
- Rightmost if line of oncoming cars
- At intersections, depends on whether limited visibility
Investigation of Lane Position

The Motorcycle Safety Foundation (MSF) 100 Motorcyclists Naturalistic Study

– Data mined to find intersections
– Intersections restricted to signalized four-way perpendicular junctions which the participant rode straight through without stopping
– Used 115 intersections, 47 riders (1-5 each)
Data Reduction

• Measurement locations from forward video
  – 6 seconds before stop bar (approach)
  – 1 second before stop bar (traversal)

• On-screen standardized measurement of both left and right lane lines to edge of video frame

• Recorded presence and location of surrounding vehicles

• Results based on measurements: location categorizations (Far Left; Left; Center; Right; Far Right) and percentage change between 6-sec and 1-sec position
Verification of Measurements

• Video review verified percentage change calculations
• Change of ≥ 20% of the lane width deemed “significant” (roughly 2.4 ft.)
• 20% change noticeable to video reductionist, and most likely intentional by rider, rather than drifting
## Most Common Pattern for Each Starting Point

<table>
<thead>
<tr>
<th>6-SECOND POSITION</th>
<th>1-SECOND POSITION</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Far left (15 total)</td>
<td>Far left</td>
<td>11</td>
</tr>
<tr>
<td>Left (23 total)</td>
<td>Left</td>
<td>11</td>
</tr>
<tr>
<td>Center (40 total)</td>
<td>Center</td>
<td>23</td>
</tr>
<tr>
<td>Right (7 total)</td>
<td>Center</td>
<td>4</td>
</tr>
<tr>
<td>Far right (13 total)</td>
<td>Far right</td>
<td>8</td>
</tr>
<tr>
<td>Null (10 total)</td>
<td>Null</td>
<td>4</td>
</tr>
</tbody>
</table>

- Null = no measurement
- Cases of lane splitting and changing lanes not included
Conclusions

⭐ Most common cases
  – Pattern: holding one’s lane position
  – Starting points: left or center

• Less common cases
  – Starting in right portion (training level was lower than group avg.)
  – 8 cases of “significant” (> 20% of lane) position change
  – Look more closely to see if there’s a pattern
Significant Change: Cases 1,2

2 cases

• 1 case: no lead vehicles at 1- or 6-second
• 1 case: lead vehicles in same and adjacent lane at 1- and 6-second
Significant Change: Cases 3-5

3 cases
- All cases: various instances of lead vehicles throughout approach and traversal
Significant Change: Case 6

1 case

- At both 1- and 6-seconds, no lead vehicles
Significant Change: Case 7

1 case

- 1 case: no lead vehicles at 6-seconds; lead vehicle in adjacent lane at 1-second
Significant Change: Case 8

1 case

- At both 1- and 6-seconds, no lead vehicles
Significant Change Cases: Conclusions

- No common demographics
- Generally high training levels
- In 6 of 8 cases: rider changed left → right
- In 2 of 8 cases: rider changed right → center
Significant Change Cases: Conclusions

• No common rule
  – Correcting position following off-road glance
  – Anticipating turn at next minor intersection
  – Deciding against a passing maneuver
  – Reaction to adjacent vehicle movement

• Movements and positioning appeared to be reactionary, not pre-planned
Overall Conclusions

When riders approach and ride straight through 4-way perpendicular intersections:

• They most commonly hold the same position regardless of surrounding roadway/traffic situation or rider training
  – Tend to remain centered or to the left (default conspicuous position?)

• They less frequently begin in right
  – When begin in right, tend to move toward center
  – These riders are generally less trained

• Only a small portion move a significant amount
  – Move is usually reactionary
  – These riders are generally more trained