Selected Lane Position as Motorcyclists Approach and Traverse Intersections

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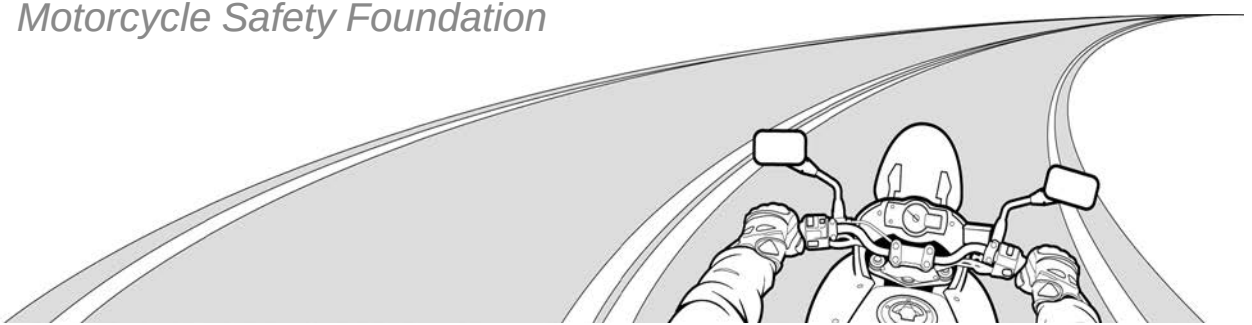


VirginiaTech Transportation Institute
MSF MOTORCYCLE SAFETY FOUNDATION®

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

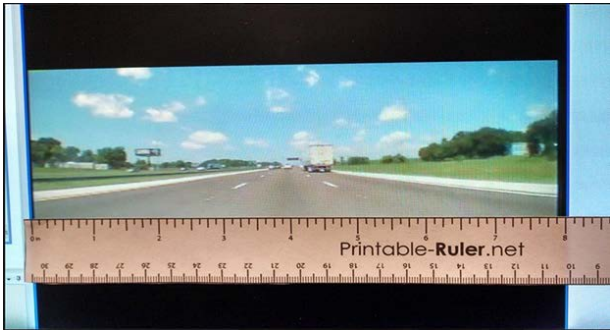
Investigation of Lane Position

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

6-SECOND POSITION	1-SECOND POSITION	N
Far left (15 total)	Far left	11
Left (23 total)	Left	11
Center (40 total)	Center	23
Right (7 total)	Center	4
Far right (13 total)	Far right	8
Null (10 total)	Null	4

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

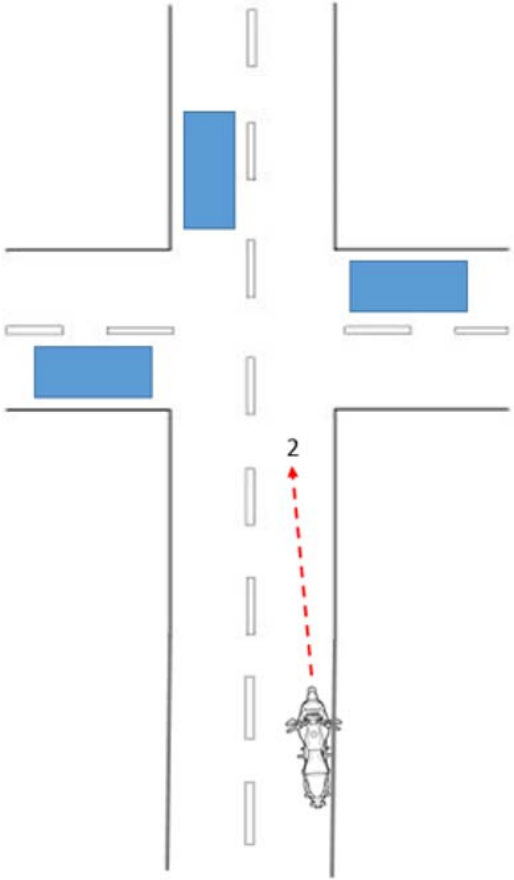
Conclusions

- ★ 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

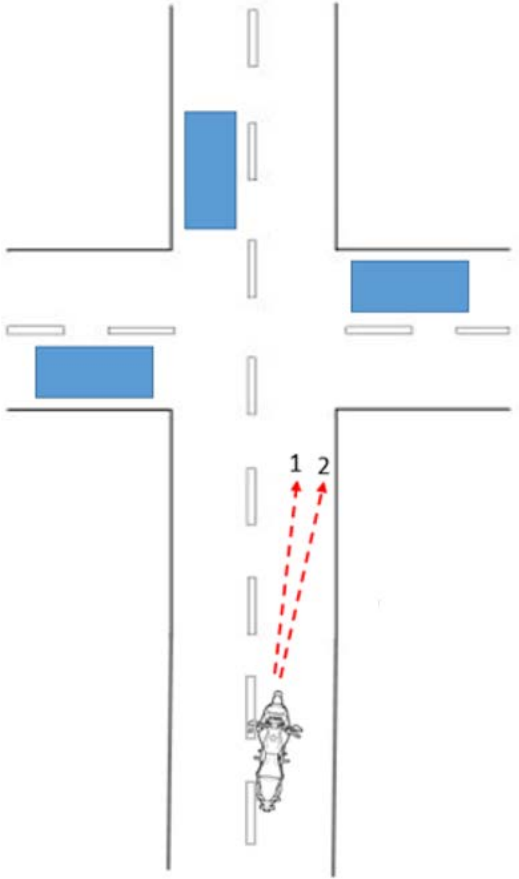
- 1 case: no lead vehicles at 1- or 6-second
- 1 case: lead vehicles in same and adjacent lane at 1- and 6-second



Significant Change: Cases 3-5

3 cases

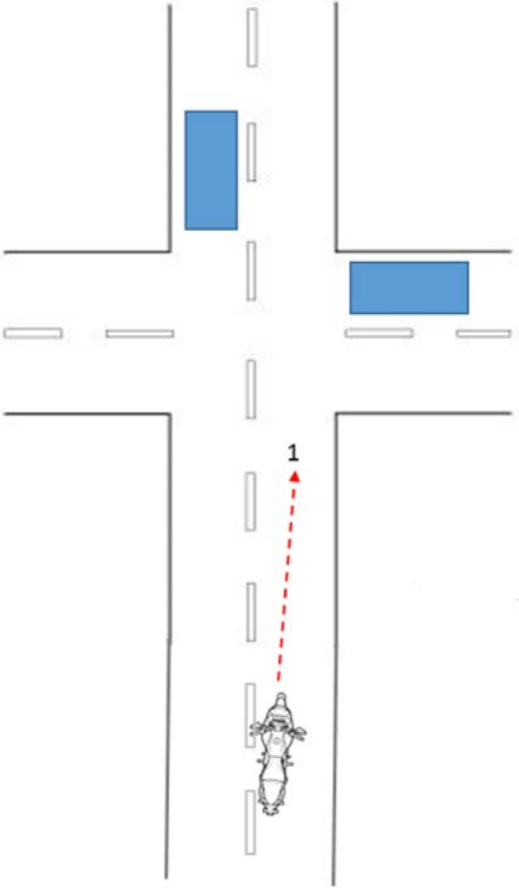
- All cases: various instances of lead vehicles throughout approach and traversal



Significant Change: Case 6

1 case

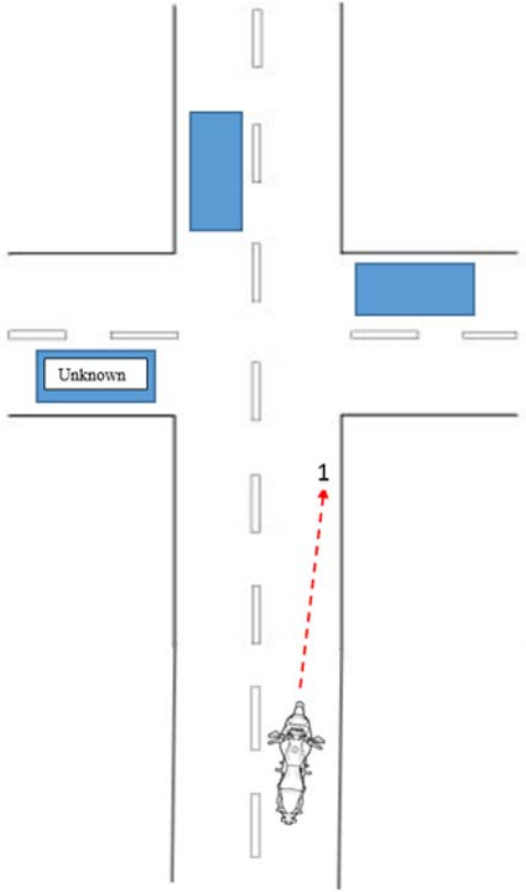
- At both 1- and 6-seconds, no lead vehicles



Significant Change: Case 7

1 case

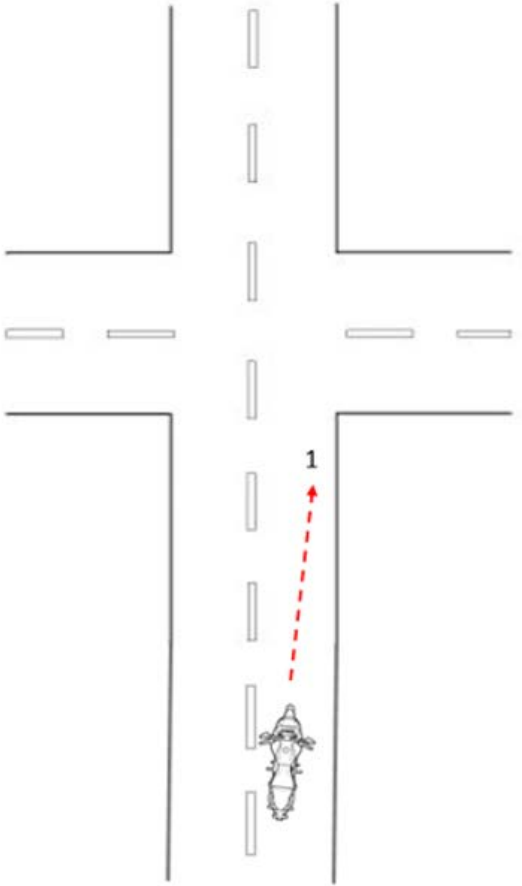
- 1 case: no lead vehicles at 6-seconds; lead vehicle in adjacent lane at 1-second



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