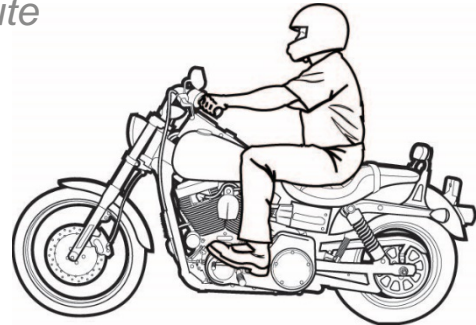


Motorcyclists' Self-Reported Riding Mileage Versus Actual Riding Mileage in the Following Year

Vicki Williams, Shane McLaughlin, and Robert McCall
Virginia Tech Transportation Institute

Tim Buche

Motorcycle Safety Foundation



Topic of Interest

- Motorcycle safety continues to be a national focus
- The latest statistics from NHTSA indicate:
 - Motorcyclist injury rate is on the rise
 - Fatality rate per 100,000 registered vehicles for motorcyclists in 2014 was 4 times that of automobiles (rate per miles travelled was 18 times that of automobiles)

Topic of Interest

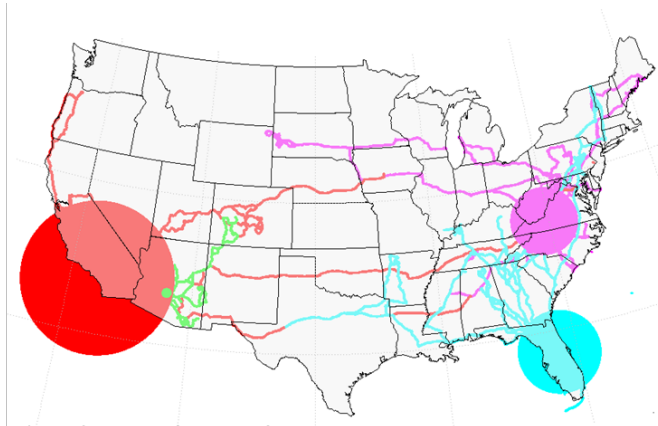
- One factor to consider is the rider's capability of evaluating their own riding experience
- Another factor is whether reported mileage is a good estimate of continued patterns (can we assume that riding patterns will generally hold for the following year?)

Supporting Data

The Motorcycle Safety Foundation (MSF) 100 Motorcyclists Naturalistic Study

- Sponsored by MSF, who assisted with day-to-day operations
- Pre-participation surveys (including estimated mileage) for 100 riders
- Recorded mileage during study participation (collected over 366,000 miles)
- First large naturalistic motorcycle study to provide this rider self-reported mileage along with corresponding actual mileage

MSF 100 Motorcyclists Naturalistic Study



- California (Irvine)
 - Year-round riding
 - Mixed traffic densities
 - Geographic overlap with past studies
- Arizona (Phoenix)
 - Year-round riding
 - Mixed traffic densities
 - High concentration of sport bikes
- Virginia (Blacksburg)
 - Fall and Winter
 - Two-lane with hills and curves
 - Geographic overlap with automotive studies
- Florida (Orlando)
 - Conditional helmet law
 - Mandatory training
 - Flat and straight roads

MSF 100 Motorcyclists Naturalistic Study



- GPS
- Machine vision lane tracker
- Accelerometers (3 axes)
- Gyro (3 axes)
- Forward radar
- Turn Signals
- Brake lever inputs
- Continuous collection
- 8-12 mo capacity
- Cellular communication from bikes back to VTTI
- Five color cameras
 - forward
 - rear
 - left
 - right
 - rider

MSF 100 Motorcyclists Naturalistic Study



Female	22
Male	78

Cruiser	41
Sport	21
Touring	38

Obtaining self-reported mileage

Applicable survey questions:

Approximately how many miles have you ridden a MOTORCYCLE on public roads in the past 12 months?

(Please include the amount you have ridden IN TOTAL ON ALL MOTORCYCLES)

_____ Miles **INTEGER** *(whole integer, round to the nearest whole number)*

Approximately how many miles have you ridden a MOTORCYCLE on public roads in the past 3 months?

(Please include the amount you have ridden IN TOTAL ON ALL MOTORCYCLES)

_____ Miles **INTEGER** *(whole integer, round to the nearest whole number)*

On average, how many miles *per year* do you ride a street motorcycle? **INTEGER** miles
(round to nearest whole number, make sure to convert to yearly number if necessary)

Obtaining self-reported mileage

- So we have:
 1. Miles ridden last year
 2. Miles ridden last 3 months
 3. Average miles per year

Obtaining self-reported mileage

- How we used this information:
 1. Miles ridden last year → *Used as previous year estimated mileage*
 2. Miles ridden last 3 months
 3. Average miles per year

Obtaining self-reported mileage

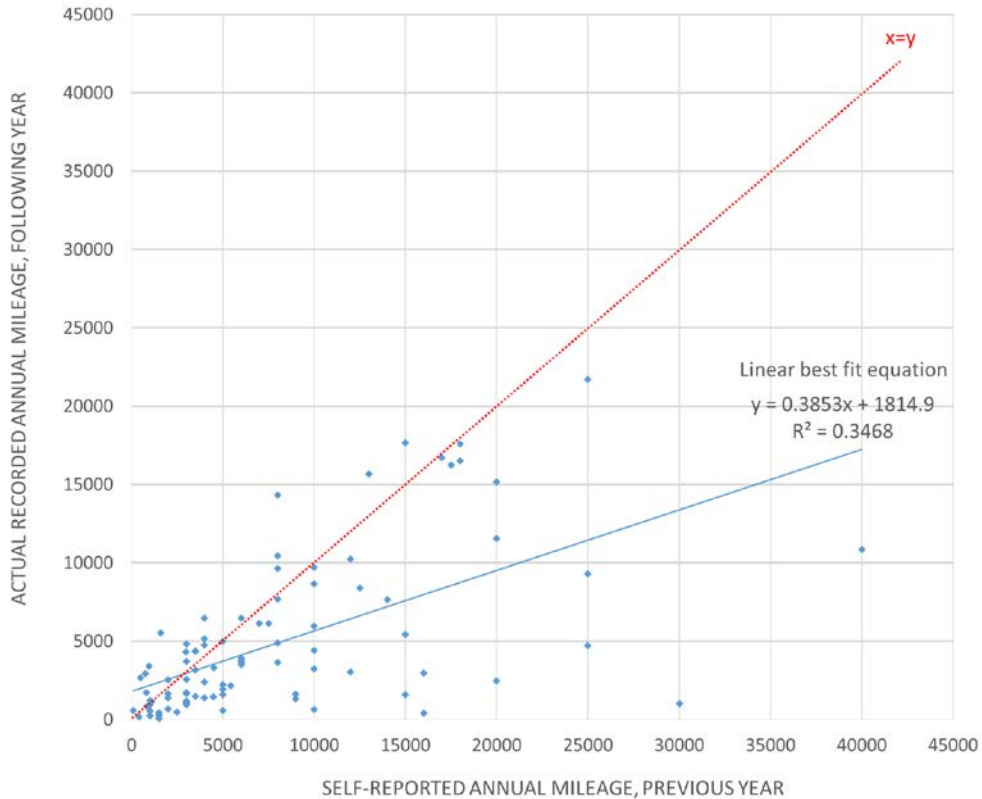
- How we used this information:

1. Miles ridden last year → *Used as previous year estimated mileage*
2. Miles ridden last 3 months → *Used to check 12 month estimate*
3. Average miles per year → *Used to check rider implication of whether previous year is average*

The Data

- Of 100 riders, evaluated data from 91 who had been riding for at least one year before study enrollment
- Self-reported mileage for the previous year: 100 to 40,000 miles (avg. 7,868)
- Actual collected mileage during the study year (annualized from study participation): 65 to 21,696 miles (avg. 4,847)

SELF-REPORTED VS. RECORDED ANNUAL MILEAGE (91 RIDERS)



- 66 riders (73%) rode less than reported for previous year
- 25 riders (27%) rode more than reported for previous year

Self-Reported vs. Collected Mileage: What the Numbers Tell us

- There are individual differences between reported mileage for the previous year and what that rider ends up riding—it's not a direct, predictable relationship
- Some riders are consistent in reported vs. collected—most aren't
- The majority rode fewer miles in year two than they reported riding in year one

Self-Reported vs. Collected Mileage: What the Numbers Tell us

- Collected mileage was, on average, 89% of the previous year reported mileage
- Range: collected was 3/100ths to 5.88 times the previous mileage
- Chi-square test indicated that significantly more riders reported higher mileage than the collected mileage ($p < .05$)

Does the Pattern of Reporting More Than Collected Hold for All Ages?

Age Group	Rode less than reported			About the same	Rode more than reported			
	0 to 0.2x	0.3x to 0.5x	0.6x to 0.8x	0.9x to 1.1x	1.2x to 1.4x	1.5x to 1.7x	1.8x to 2.0x	More than 2x
21-30	3	4	2	3	3	0	0	2
31-40	2	6	4	1	0	0	0	0
41-50	6	2	1	6	3	0	0	2
51-60	2	7	5	3	2	1	1	2
61-70	1	4	3	3	3	1	0	0
71-80	0	1	0	1	1	0	0	0
	14	24	15	17	12	2	1	6

Sum = 14

Sum = 6

YES, for every age group:
of riders who “rode less than reported” always
≥ # riders who “rode more than reported”

Does the Pattern of Reporting More Than Collected Hold for All Bike Types?

YES.

Proportion of Reported Miles Represented by Actual Collected Miles								
Motorcycle Type	Rode less than reported			About the same	Rode more than reported			
	0 to 0.2x	0.3x to 0.5x	0.6x to 0.8x	0.9x to 1.1x	1.2x to 1.4x	1.5x to 1.7x	1.8x to 2.0x	More than 2x
Cruiser	6	10	6	5	5	0	0	5
Sport	3	6	4	2	2	0	0	1
Touring	5	8	5	10	5	2	1	0
	14	24	15	17	12	2	1	6

Note: 6 riders recorded > 2x reported mileage:
All Novice or Newly Returning, low previous mileage

Riders' Report of Previous Mileage vs. Average Mileage

Q: What does the comparison of *self-reported* last year mileage vs. *self-reported* annual average mileage indicate?

A: (Last year) – (average) Often the same, but when different, fairly split between being higher and lower.
Implication: riders either stick with the same estimate, or recognize the difference in mileage pattern changes.

- Average: 495 miles difference (range: -7,000 to 20,000)
- Positive difference: 28 riders
- Negative difference: 22 riders
- No difference: 41 riders
- T-test: no significant difference between positive and negative differences ($p=0.2265$)

Conclusions

- Riding mileage in year 2 was found to be less than the reported mileage for year 1
- In general, riders either tend to overestimate riding mileage or just don't ride the same amount from year to year
- Differences could be due to:
 - actual decreases in mileage
 - weather variation
 - rider reporting how much they wish they could ride
 - rider wanting to appear more accomplished
- Exception: novice riders either underestimate or simply ride more as they become more advanced

Conclusions

- Riders may not have an accurate picture of their own experience on the road, and thus may overestimate their riding proficiency
- In general, reported or previous mileage should not be relied upon to catalog actual or future mileage