

# **The Mathematics of Safe Vehicular Overtaking of Cyclists.**

**With references to the Ontario Highway Traffic Act.**

# Acknowledgement.

**Sergeant Hughes, Original Member of the Toronto Police Service Bicycle Unit.**

- The basis for this presentation stemmed from a conversation I had with Sergeant Hughes in 2016, when the 1metre passing law had recently been incorporated into the Ontario Highway Traffic Act.
- I had asked him about motor vehicle drivers being able to calculate the metre distance, while remaining in their driving lane. He explained that there should be no calculation on the vehicle drivers part. If there is a hint of doubt about maintaining the safe one metre distance, while remaining in the drive lane, the obligation is for the over taking vehicle to safely change lanes.

# References.

## Ontario Highway Traffic Act

- O.H.T.A. References - A bicycle is defined as a “vehicle”.
- Bicycles Overtaken
- O.H.T.A. Section 148(6) Every person on a bicycle or motor assisted bicycle who is overtaken by a vehicle or equestrian traveling at a greater speed shall turn out to the right and allow the vehicle or equestrian to pass and the vehicle or equestrian over taking shall turn out to the left so far as necessary to avoid collision. R.S.O. 1990,c.H.8 148(6)
- O.H.T.A. Section 148 (6.1) Every person in charge of a motor vehicle on a highway who is overtaking a person travelling on a bicycle shall, as nearly as may be practicable, leave a distance of not less than one metre between the bicycle and the motor vehicle and shall maintain that distance until safely past the bicycle. 2015, c.14, s. 42
- O.H.T.A. Section 148(6.2) The one metre distance required by subsection (6.1) refers to the distance between the extreme right side of the motor vehicle and the extreme left side of the bicycle, including all projections and attachments. 2015,14, s. 42

# Passing Bicycle.

## Cycling Skills Ontario's Guide To Safe Cycling

- Ref. - <https://files.ontario.ca/mto-young-cycling-skills-en-2021-09-16.pdf>
- “When going straight ahead, use the right-hand through lane. Stay as close as practicable, about one metre, from the right curb of the roadway to avoid curbside hazards. Remember to be predictable and ride in a straight line.”
- “When your safety warrants it, it is legal for a cyclist to take the whole lane by riding in the centre of the lane. Never compromise your safety for the convenience of a motorist behind you.”

# The Mathematics.

## Road Lane Width.

- The curb lane on a four lane arterial road is usually between 3.0 to 3.5 metres wide.
- Storm sewer grates extend a minimum of .4 metres into the curb lane.
- Real world examples in Brampton. Glendale Blvd. north of Gold Crest Road, curb lane is 3.16 metres. Balmoral Drive east of Eastbourne Drive, curb lane is 3.18 metres.

# The mathematics.

## Vehicle Width, Including Bicycles

- 2023 Ford F150, with stock mirrors. - 2.43 metres.
- 2023 Toyota RAV4, with mirrors. - 2.16 metres.
- 2023 Honda Civic with mirrors. - 2.08 metres.
- Modern mountain bike. - .76 metres (.38 metres, half width).
- Hybrid bike. - .60 metres (.30 metres half width).
- Racing bike. - .46 metres (.23 metres half width).

# The Mathematics Applied.

## Scenarios, with different vehicles and bicycles.

- Ford F150 (2.43 m) + distance from curb apron (1.0 m) + mountain bike half handlebar width (.38 m) = 3.81 metres.
- Toyota RAV4 (2.16 m) + distance from curb apron (1.0 m) + hybrid bike half handlebar width (.30 m) = 3.46 metres.
- Honda Civic (2.08 m) + distance from curb apron (1.0 m) + racing bike half handlebar width (.23 m) = 3.31 metres.

# Conclusions.

## Motor vehicle staying in the curb lane and passing safely.

- It is theoretically possible for a 2023 Toyota RAV4 and a 2023 Honda Civic, to pass a cyclist safely, within the parameters of the Ontario Highway Traffic Act, if the curb lane is close to 3.50 meters wide.
- A Ford F150, the most popular vehicle currently being sold in Canada, can not legally pass a cyclist in a curb lane of 3.50 metres width, without changing lanes.
- As cited by real world measurements, on Glendale Boulevard and Balmoral Drive, none of the three example vehicles could legally pass a cyclist, without changing lanes.