



Winneba
12-15 August 2025

Safety risks created by the non-compliance behaviour to traffic signals by motorcycle riders in Kampala

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Introduction

- Motorcycles have emerged as a prominent mode of transportation in the East African region.
- Most function as transportation service providers.
- Most start to operate without prior training.
- Despite repeated awareness campaigns, they have been resistant to modifying their risky riding practices.
- Non-compliance with traffic signals is among these risky behaviours.

Purpose of Study

- Evaluate the traffic conflicts generated due to motorcycle riders' non-compliant behaviour, utilising Traffic Conflicts Techniques.
- Guide the development of necessary policy and infrastructure interventions to address this non-compliant behaviour and its potential safety consequences.

Methodology

- A sample of 10 signalised intersections that were representative of the geographical distribution of the 35 that the city had then.
- Video footage was collected from 10 signalised intersections across the city, generating 41 hours of intersection traffic data when traffic signals were the sole means of traffic control.
- For 5 intersections, 6 hours of footage were collected. 2 hours in the morning and evening peak periods and 2 hours in the afternoon non-peak period.
- For 4 intersections, 2 hours in the afternoon non-peak period. For 1 intersection in an NMT zone, 3 hours in the afternoon non-peak period.

Methodology

- The traffic conflicts that were generated were analysed using the Time to Collision, Traffic Conflicts Technique.
- The maximum of the two speeds for the motorised vehicles that were in conflict was when categorising the conflicts into serious, moderate and slight conflicts.
- In addition, both motorised vehicles had to be moving at least at a speed above 1km/hr and not stationary.

Methodology

Time to collision (TTC) (s)	Maximum speed (km/hr) of any of the two vehicles For Car-motorcycle conflicts	Maximum speed (km/hr) of any of the two motorcycles For motorcycle-to-motorcycle conflicts	Conflict categorisation
0 – 1.5	>30	>40	Serious
0 - 1.5	15-30	20-40	Moderate
0 – 1.5	1 - 15	1-20	Slight
1.5 – 2.5	>50	>50	Serious
1.5 – 2.5	30-50	35-50	Moderate
1.5-2.5	15-30	20-35	Slight

Results

- **61188 motor vehicles and 160474 motorcycles** were captured in the 41 hours across the 10 intersections.
- **Motorcycle riders exhibited a much lower compliance rate with traffic signals of only 34.2%** for through-traffic and right-turning traffic.
- **87.7% compliance rate was observed among car drivers.**
- At the one intersection for yielding to NMT road users, the compliance was much lower at 0% for motorcycle riders and 33% for motor vehicle drivers.

Results – Traffic Conflicts

- Among motorised vehicles (in 38 hours) as many as 3620 serious conflicts, 30610 moderate conflicts and 29840 slight conflicts resulted.
- The proportion of motorised vehicles, ranging from 13% (1 in 8) to 50% (1 in 2), encountered traffic conflicts while navigating intersections at any given hour, resulting from the motorcycle riders' non-compliance to the traffic signals.
- At the single intersection that connected with a non-motorised transport route, every non-compliant motorcycle rider was on average in conflict with at least two pedestrians.

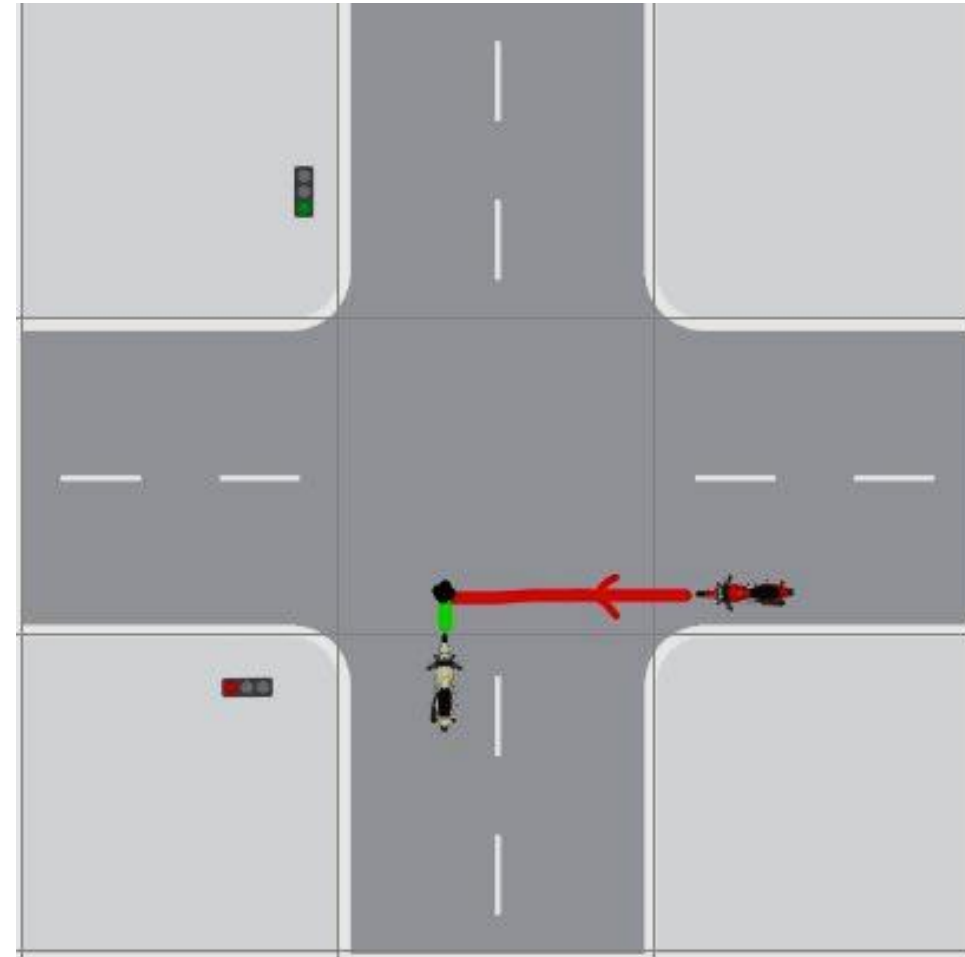
Unique Evasive Action

- An evasive action of lifting of legs to scare another oncoming motorcycle was also observed.



Results - Collisions

- A dozen collisions were also observed during the entire hours of video recording.
- With half involving a motorcycle was crossing the intersection as through-traffic or right-turning during the earlier portion of the green light for that approach, close to the stop line.
- At such moments, the rider would collide with another motorcycle rider from the adjacent right-hand approach who was also traveling through the intersection in its red-light period.
- Most occurred between pairs of motorcycles and the majority ended without injury. They thus represent collisions that rarely end up in the police government crash data.



Crash Video 1



Crash Video 2

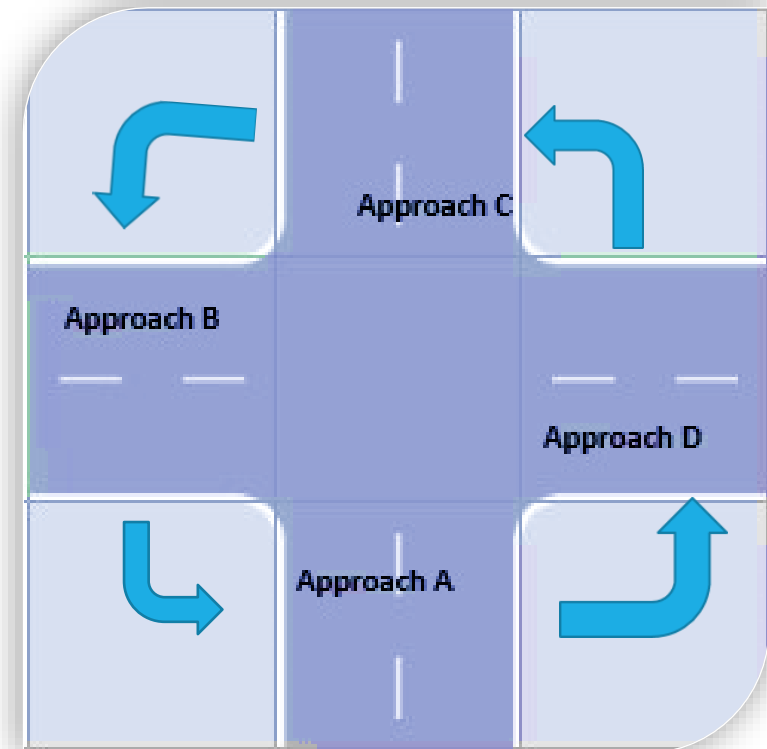
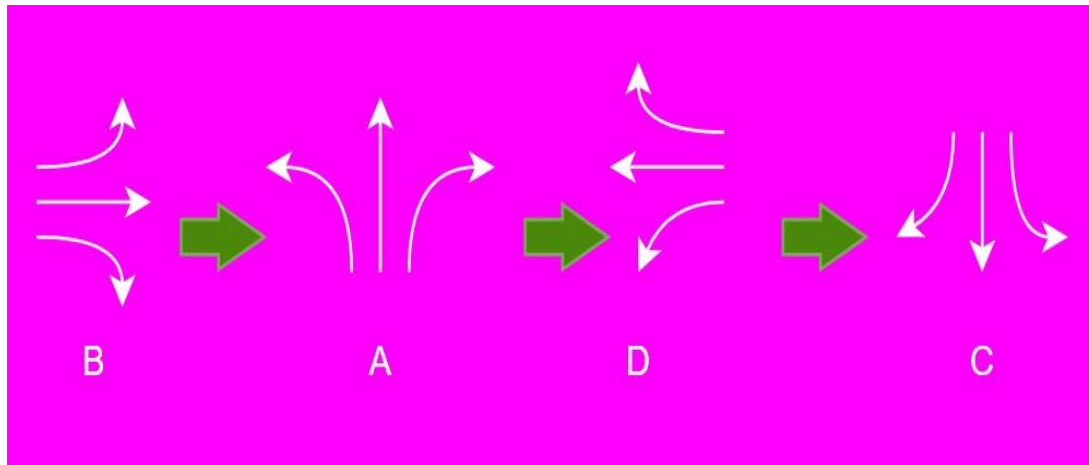


Crash Video 3



Better Signal Phase Design

- For traffic signals whose phases are designed by giving each traffic approach a separate green timing.
- The flow of the various phases should follow an anticlockwise flow to eliminate the common crash scenario that was observed.
- Approach B to A to D to C back to B.



Conclusion

- The non-compliant behaviour of the motorcycle riders results in the generation of many traffic conflicts, for which evasive actions have to be performed to avoid collisions from occurring. However, not all evasive actions are successful, as some collisions were observed during the study.
- Many of the observed collisions occurred when a motorcycle was navigating the junction as through-traffic during the first quarter of the green light period, within a few meters of the stop-line and among the leading vehicles initiating passage through the intersection when it collided with motorcycle from the approach on the right-hand side that was navigating as through-traffic during its red-light period.
- This shows that even some compliant motorcycle riders and their passengers became victims in these collisions, shortly after waiting for their green light.
- Urgent interventions, such as increased enforcement, are needed to improve compliance and protect also the law-abiding motorcycle riders and their passengers.

Thank you!



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