Driver Heterogeneity in Rubberneeking Behaviour at an Incident Site
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ABSTRACT
Incidents can affect the flow in non-incident direction due to rubberneeking. To this date, only homogeneous rubberneeking behaviour has been assessed. This study provides insights into inter-driver heterogeneity in rubberneeking behaviour while passing an incident site. We use empirical trajectory data obtained from a helicopter-mounted video camera. The length of study section is approximately 220 meters, starting at 125 meters upstream of the incident site.
Results show that the variations in speed in the upstream of incident location are substantially higher within passenger car drivers then within the truck drivers. The passenger cars in the median lane reduce the speed further upstream, mostly with sharp deceleration while passenger cars in the shoulder lane reduce the speed closer to the incident scene. Some drivers did not exhibit rubberneeking behaviour, passing the incident with a steady speed. The results provide a better understanding of rubberneeking behaviour and can be used to establish determinant factors to measure the rubberneeking effects.

BACKGROUND
Rubberneeking
- Describe the tendency of vehicles reduce the speed to view the scene of an incident
- Assumption: if there is an acceleration changes while approaching the incident scene, then the drivers exhibit a rubberneeking behavior, due to driver attention shift to the incident.
Heterogeneity
- Difference in individual driver behaviour over distance when passing an incident.
- Differentiate between three driver groups: passenger cars in the median lane, passenger cars in the shoulder lane and trucks drivers.
Problem statement
- average rubberneeking behaviour has been analyzed previously, however the change of driver behaviour due to rubberneeking may vary between the types of vehicles, the incident types and also between lanes.

OBJECTIVES
To identify differences in speed changes between passenger car and trucks while passing an incident site

METHODS
- empirical trajectory data on the opposite direction of incident was collected using a digital camera mounted under a helicopter
- 199 vehicle trajectories - 123 passenger cars in the median lane, 35 trucks and 41 passenger cars in the shoulder lane
- three vehicle groups: passenger car in the median lane, trucks, and passenger cars in the shoulder lane
- analyze the speed versus distance plots to determine the point where acceleration changes (rubberneeking activity)
- measure the variation in vehicle speeds
- determine the statistical difference in speed between each vehicle class and within vehicle class

RESULTS

DISCUSSION AND CONCLUSIONS
- High variation in speed profiles between individual vehicles. Within vehicle group, the variation in speed is higher in the upstream of incident location whereas between each vehicle group, the speed difference in the upstream is lower.
- Passenger cars in the median lane show a much higher variation in speed then the vehicles in shoulder lane.
- Being closer to the incident, passenger cars in the median lane are significantly affected by the incident.
- Rubberneeking behaviour is influence by vehicle types, incident visibility, and type of driver (based on occupying lane).