



## ENHANCING ROAD TRAFFIC SAFETY THROUGH CAR USE RESTRICTION: THE ROLES OF SITUATIONAL FACTORS AND IMPROVED MOBILITY OPTIONS

Fatai A Yakeen<sup>1\*</sup>, Seyed Mohammadreza Ghadiri<sup>2</sup>

<sup>1</sup>School of Transport and Logistics, Lagos State University, Nigeria

<sup>2</sup>School of Aviation Management and Logistics, Swiss Institute of Management and  
Innovation

\* Lead presenter: [fatai.yakeen@lasu.edu.ng](mailto:fatai.yakeen@lasu.edu.ng)

### Background

Trips by private cars in urban areas around the world constitute about 50% of all trips and are projected to reach around 6.2 billion in 2025. A major part of the growing trend will be in the developing countries (Verma et al, 2016). The rising level of car ownership and use is motivated by socio-demographic, psychological, spatial, habit and situational factors (Wright & Curtis, 2005; Bamberg & Schmidt, 2003; Klockner & Friedrichmeier, 2011). Car use has been associated with negative impacts which include road accidents, injuries and death of pedestrians and cyclists, congestion, use of public spaces, noise, heat, emission of greenhouse gases, air pollution, lack of physical activity, stress due to driving time, lower psychological wellbeing and cognitive decline (Dons et al, 2013; Nieuwenhuijsen and Khreis, 2016; Mattision, 2016; Martin et al, 2014; Bakarina et al, 2017). Consequently, governments, researchers and transport professionals have embraced, recommended the introduction of car use restriction in order to enhance road traffic safety, mitigate the negative impacts of car use and encourage change of mode from private car to public transport and non-car modes (Tornblad, 2014). The effectiveness of car use restriction measures in reducing car travel depends on motorists' acceptability of the measures (Schade, 2003).

### Aim

This study examines the influence of situational factors and improved mobility options on motorists' acceptability of car use restriction measures. Car use restriction is a part of the transport demand management strategies aimed at improving road safety and mitigating the negative externalities arising from car use.

### Method

Data were obtained in a cross-sectional survey of 691 motorists in Lagos, Nigeria through purposive sampling technique, while the data analysis was done using Partial Least Square Structural Equation Modelling (PLS-SEM) with the aid of SmartPLS software. The situational factors investigated were Car Access, Time Pressure and Travelling together with Family and Friends, while the car use restriction measures were restriction of car access to city centres and car use restriction based on odd or even vehicle number plate. Regarding Improved Mobility Options, the following quality improvements were captured: bus priority lanes, public transport service quality, bicycle lane, subsidised fares and reduced travel time on public transport.



## Results Obtained

The results indicated that Improved Mobility Options ( $\beta = 0.437155$ ,  $t = 12.709037$ ) has the strongest direct influence on motorists' acceptability of Car use Restriction, followed by Travelling with Family & Friends ( $\beta = 0.301306$ ,  $t = 8.140114$ ), Car Access ( $\beta = -0.194982$ ,  $t = 5.682725$ ), and Time Pressure ( $\beta = 0.078148$ ,  $t = 2.042895$ ).

## Conclusion

Improving road safety and mitigating the negative impact of car use necessitates the implementation of car use reduction measures such as car use restriction. The challenges of implementation led to the study of the determinants of motorists' acceptability of car use restriction. Based on the findings, travelling with Family and Friends ( $\beta = 0.301306$ ,  $t = 8.140114$ ) has been identified to have a significant positive influence on Car use Restriction. Hence, motorists who often commute with Family and Friends are more likely to accept Car use Restriction. Also, analysis shows a significant negative relationship between Car Access ( $\beta = -0.194982$ ,  $t = 5.682725$ ) and Car use Restriction. This implies that motorists with easy access to a private car are less likely to accept Car use Restriction because they perceive the policy as unfair as it limits their ability to drive and their freedom to select a travel mode of their choice. This study demonstrates that Time Pressure ( $\beta = 0.078148$ ,  $t = 2.042895$ ) has a significant positive association with Car use Restriction. This means that motorists who perceive more time pressure are more likely to accept Car use Restriction. Lastly, this study identifies improved mobility options ( $\beta = 0.437155$ ,  $t = 12.709037$ ) as having a significant positive impact on motorists' acceptability of Car use Restriction. Hence, we can say motorists having a positive attitude towards improved mobility options are more likely to accept Car use Restriction. The findings of this study can help transport planners and policymakers to understand how to improve road safety through the introduction of car use restriction and improved mobility options.