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Editorial

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Editorial

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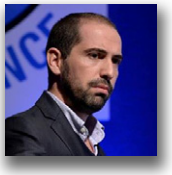

Transport-related research is nowadays multi-disciplinary, international and involves collaborations across sectors. This month's collection of papers is a clear example of how this is possible and it's a privilege for me to act on behalf of the Institution of Civil Engineers (ICE) and to present you these interesting articles that have been clustered to offer you examples on how road safety and climate change are driving innovations in our sector worldwide.

Zhang *et al*. (2022), from the University of Harbin in north-east China, open the selection by proposing a methodology to adapt the well-known performance grading (PG) system, developed by the US Strategic Highway Research Program to classify asphalt binders, to their own climate and region. The authors collected both local air and asphalt pavement temperatures to then determine a conversion formula that would effectively translate high and low PG temperatures of the American system into the corresponding regional values. As a result, the paper provides practitioners with asphalt pavement PG zones for north-east China, thus enabling them to use an internationally well-known system for classifying asphalt binder as well as correlated pavement design tools.

The second study is a fascinating read. New directives fixing methodologies and workplace exposure limits for the air concentration of nitrogen dioxide and nitrogen monoxide drove Thornes *et al*. (2022) in assessing the air quality at Birmingham New Street station in the UK. The research has clearly proven that, due to the widespread use of diesel-powered trains, this specific enclosed station registers alarming levels of air pollution. Infrastructure managers should act as soon as possible with practical interventions and robust monitoring, while in the long-term it is advised to reduce the source of pollutants.

In Iran, in the paper by Abdolrazaghi *et al*. (2022), another group of researchers in road transport looked at providing evidence of drivers' stop and go decisions at intersections during the yellow phase. The authors claim that subjective drivers' decision making in these circumstances is also dependent on more objective external factors such as: traffic, environment and geometric conditions of the intersections. By acquiring video recordings at four specific intersections and observing more than 700 samples, the authors found out this phenomenon is driven by the conditions of the traffic flows: the percentage of go decisions increases significantly with the increase of the speed of the vehicle approaching the intersection. Adverse weather conditions did not decrease drivers' aggressive behaviour, instead the presence of pedestrian crossings and more congested traffic favoured a more responsible stopping during yellow phase.

Improving road safety is the main driver of the research carried out in the fourth study. Another very important aspect deserving attention of professionals and academics is correctly estimating the time to collisions (TTC) in order to equip vehicles with in-vehicle collision-avoidance warning systems (IVCAWS). Nadimi *et al*. (2022) used both theoretical and empirical approaches to develop a model that can determine TTC dynamically based on variations in driver characteristics, environmental conditions, preceding object type and the motion characteristics of the following vehicle. The model was then calibrated and validated with data coming from driving simulations as well as from primary data collected directly from monitoring of sections of Modares highway close to Teheran, Iran. From the analysis of ten scenarios, it was found out that road safety could be improved by equipping vehicles with IVCAWS able to use the developed model to dynamically calculate TTC during car-following.

Europe is at the forefront of research to drastically reduce fatalities in road transport as well as transport-related environmental impact. The fifth paper in this issue (Ivanjko *et al*., 2022) is a clear example of how technology development and research are rapidly following these paths and providing even further improvement to already innovative approaches. In fact, the study focuses on improving variable speed limit control systems (VSLC) used in our roads to provide updated information on speed limits on the basis of traffic flows. The Croatian researchers propose the adoption of additional controllers for VSLC able to calculate speed limit values derived from traffic simulations optimised towards both improved traffic flow and reduced carbon dioxide emissions. Results clearly show that even the simplified controller significantly improves the level of service of the road section covered by the modified VLSC, hence providing a further solution for mitigating climate change.

Last but not least, the sixth paper is again on road safety and another example of how science can be at the service of practitioners. Chandra *et al*. (2022) came up with a design methodology for optimising speed bumps based on the desired speed on the crown of the bump itself. The study was conducted with an empirical approach that looked at several bump geometries and several vehicle types and speeds. The result is as simple as it gets, with prescribed minimum optimum height and entry radius values that road equipment manufacturers and road managers can consider for appropriately calming traffic through speed bumps.

I hope you do enjoy the selection of ideas in this issue as much as I did. Please remember you can access more recent papers in the Ahead Print section on the ICE Virtual Library at: www.icevirtuallibrary.com/toc/jtran/0/0.

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