From Data to Action: Strengthening Road Safety Outcomes Through Utilizing Data-Driven Decision Making

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Background

The absence of reliable data to implement impactful road safety measures hinders the identification of high-risk areas and the prioritization of interventions. Addressing this data gap is crucial for improving road safety outcomes across the continent. Traffic crashes are a critical global issue, claiming approximately 1.2 million lives annually and leaving 20-50 million more with injuries, often resulting in long-term disabilities. They are the leading cause of death for children and young adults aged 5-29 years, posing a significant burden on families, communities, and healthcare systems. While middle- and low-income countries account for over 90% of these fatalities, they typically have only 60% of the world's vehicles, highlighting stark disparities in road safety. Contributing factors include poor infrastructure, inadequate law enforcement, unsafe vehicles, and the lack of effective road safety policies. Urgent, coordinated action is needed to address this public health crisis, as underscored by international frameworks such as the Decade of Action for Road Safety and the Sustainable Development Goals, which target reducing traffic fatalities and injuries by 50% by 2030.

Aim

Road safety should be central in the conversation of infrastructure management globally and Road Authorities are actively working to increase efforts to improve safety of their roads, but not necessarily doing this effectively due to utilisation of conventional methods for safety evaluations. Current road pavement testing technology, now makes it possible to measure all the traditional surface characteristics such as ride quality, rutting, cracking, geometry, deflection etc (at far greater resolutions and speeds than before), simultaneously with needed safety metrics, in a comprehensive traffic speed evaluation. This is achieved by obtaining continuous, synchronised friction, texture, georeferenced images and geometric measurements to provide essential data to undertake safety assessments through initiatives such as the International Road Assessment Programme (iRAP).

Method

- HOW CAN SAFETY BE ACHIEVED WITH TECHNOLOGY

Road safety is a very important aspect when it comes to the road infrastructure, an understanding of the road network is needed in the quickest possible way, and this can be achieved by an integrated solution. The iPAVe (Intelligent Pavement Assessment Vehicle) is an advanced, multi-functional road survey vehicle designed to collect and analyse comprehensive pavement and roadway data efficiently. Developed as part of modern automated road survey technology, the iPAVe integrates multiple sophisticated systems to measure road conditions, assess pavement performance, understanding the level of safety built into the road infrastructure, and support asset management and maintenance strategies.

The iPAVe combines technologies like high-resolution imaging, surface profiling, ground-penetrating radar (GPR), laser crack measurement systems, and deflection testing using a doppler laser technology. These systems work together to provide a detailed assessment of pavement structure, surface condition, ride quality, and subsurface characteristics.

- DATA FROM THE iPAVe UTILISED TO SAFETY ASSESS THE ROAD INFRASTRUCTURE

The International Road Assessment Programme (iRAP) is a globally recognized initiative aimed at improving road safety through infrastructure assessments. iRAP evaluates roads based on risk factors and assigns Star Ratings to indicate their safety levels for different road users. One of the key datasets for conducting iRAP assessments is derived from Intelligent Pavement Assessment Vehicles (iPAVe), which capture high-resolution images and comprehensive pavement condition data at regular intervals. These detailed visual records enhance the accuracy of the iRAP assessments, ensuring that the recommended safety improvements are data-driven and effectively targeted to reduce road crashes and fatalities.

Results

Outcomes from successful implementations of iRAP assessments suggests that structured and systematic data collection can lead to significant reductions in road crash fatalities. Numerous case studies from both developing and developed countries have demonstrated the effective utilization of the Intelligent Pavement Assessment Vehicle (iPAVe) in road safety assessments. By collecting high-speed road condition data, iPAVe enables comprehensive analysis using the iRAP methodology.

Conclusions

Improving road safety data collection and management in Africa requires a multi-faceted approach involving technological advancements, policy reforms, and stakeholder engagement. Global road fatalities are rising at an alarming rate, highlighting the urgent need for enhanced road safety measures. The introduction of advanced technologies like the Intelligent Pavement Assessment Vehicle (iPAVe) plays a crucial role in addressing this challenge. This approach brings us closer to achieving the UN Decade of Action for Road Safety goals by promoting safer road infrastructure and reducing lives lost on our roads.