Exploring the Adoption of Connected Vehicles in the Global South: Policy, Infrastructure, and Socioeconomic Challenges in India and South Africa

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Abstract:

Connected vehicles (CVs) are poised to reshape mobility by integrating digital technologies to enhance transportation efficiency, safety, and sustainability. In the Global South, particularly in India and South Africa, the adoption of CVs presents unique policy, economic, and social challenges. The objective of the study is to examine the impact of CVs on road transportation systems and evaluate the policy, regulatory, and socio-economic challenges associated with their deployment in these regions. The study was conducted through a comprehensive literature review and case study analysis of India and South Africa. The findings suggest that CVs offer significant benefits, including reduced congestion, optimised logistics, and improved road safety. However, widespread adoption is hindered by issues such as inadequate smart mobility infrastructure (including road and traffic management), insufficient digital technology infrastructure and services, and the digital divide. Moreover, economic barriers, such as high implementation costs, and social concerns, including job displacement, cybersecurity risks, and public acceptance, pose significant challenges. Additionally, policy and regulatory hurdles present substantial barriers. For example, in India, the policy landscape—shaped by initiatives like the National Electric Mobility Mission Plan (NEMMP) and Intelligent Transport Systems (ITS)—provides a partial foundation for CV deployment. However, urban-rural disparities and data privacy concerns remain significant challenges. In South Africa, despite a strong automotive sector, the absence of a clear regulatory framework and policy uncertainty regarding autonomous and connected mobility present obstacles. The implications of these findings underscore the need for targeted policy reforms, improved smart mobility infrastructure, investments in digital infrastructure and services, and stronger public-private partnerships to facilitate the integration of CVs. This study contributes to the ongoing discourse on sustainable and inclusive smart transportation solutions by offering insights into infrastructure and service challenges and policy and regulatory issues in the Global South.

Keywords:

Connected Vehicles (CVs), Digital Infrastructure, Global South, Policy and Regulatory Challenges, Smart Mobility, Sustainable Transportation.