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Development of a real world driving cycle of motorised three wheelers: A case study of an Indian city

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The motorized three wheelers are one of the main modes of urban Indian roads. In this context, this paper aims to develop the driving usage pattern of intercity shared auto rickshaw using V-box. The driving uses data collected in three regions, central business districts (CBD), developed land use pattern and developing land use pattern at morning, evening peak hour and in the free flow conditions. The real-time travel attributes such as speed, time, and acceleration, dynamically related were estimated. The time-space data was obtained for thirty samples, trips for each type of study roads. The velocity of each trip for a single second was compared with the maximum probability of all the repeated velocity values. The likelihood of all the accelerations and rate of change of acceleration was found, and velocity value having a greater probability of acceleration or rate of change of acceleration was selected for the representative driving cycle. The driving pattern constructed using micro trip approach, with consideration of acceleration, cruising, deceleration and idling characteristics. The study has revealed that irrespective of road type, time periods and desired distance, duration and peak hours, a high percentage of driving time was spent in accelerating and decelerating phase. The three wheelers average running speed, and the average speed was estimated about 10 km/h and 11.30 km/h respectively in the arterial CBD. In the developed region, determined running and average speed as 21.88 km/h and 26.8 km/h respectively. The three-wheeler 95th percentile speed was calculated as 29 km/h for developing region with average running speed and average speed 29.67 km/h to 40 km/h respectively. In developing the region, acceleration and deceleration were estimated 34.42% and 37.57% respectively, and idling and cruising 5.13%, 22.88% respectively for the typical arterial road. The developed driving cycle was also compared with Indian standard driving cycle, which helped to get the usages pattern in typical Indian city.

Biography

Rakesh Kumar, a graduate in Civil Engineering, Post-graduate & Doctorate from IIT Delhi in Sustainable Engineering, has around 20 years of professional experience in the field of Transportation & Highway Engineering. He is interested in factors that lead to a more efficient, equitable and sustainable urban and regional optimal highway construction and evaluation with NDT. His expertise is in pavement investigation and various rehabilitation techniques. He works on different goal oriented research projects funded by Department of science of Technology (DST), Ministry of Science and Technology, GOI. He has published more than 50 papers in reputed journals and has been serving as an Editorial Board Member of reputed journals.

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