The objective of this study is to deal with the effects of driver waiting time, conflicting traffic flow and speed on U-turn critical gaps at median openings without left-turn lanes. Video graphic data of nine conventional mid-block median openings on four and six lane urban roads were assembled. All these sites belong to the three cities of Bhubaneshwar, Rourkela and Ranchi situated in the eastern province of India. A new concept of “Merging Behavior” for U-turns is introduced for the first time to estimate critical gaps at these sites. Driver waiting times were calculated after processing the raw video data in the AVIDEMUX software. Conflicting traffic speed and flow were obtained in a similar manner. Flow was converted to standard passenger car units per hour (PCU/hr.) from vehicles per hour according to Indian traffic norms. The traffic composition was split into four motorized vehicular classes for simplicity. Empirical relationships between critical gaps and all the other factors were formulated after performing regression analysis in Statistical Package for Social Sciences (SPSS). Waiting time-critical gap relation followed power regression variation for all three modes except three wheelers (3W) which in turn followed a positive exponential variation. Also, longer waiting times affect U-turn critical gaps irrespective of the gap sizes. Critical gaps are also affected by conflicting traffic flow even during off-peak periods. At last, Vissim simulation outputs from the extracted field data are illustrated in order to signify the problems frequently encountered by U-turn drivers under mixed traffic situations (Ref: Bhuyan PK, Datta S. Effect of Waiting Time, Flow and Speed on U-turn Critical gaps at Median Openings under Mixed Traffic. Indian Journal of Engineering, 2015, 12(28), 1-15), (Image: www.sgi.sk.ca/images).
Effect of Waiting Time, Flow and Speed on U-turn Critical gaps at Median Openings under Mixed Traffic

Bhuyan PK, Datta S

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