ABSTRACT

The complicated legacy design of traffic circles results in operational and safety deficiencies. This type of intersection design is commonly used at major roadways in Cochabamba, Bolivia. Traffic circles are intended to accommodate various types of vehicles and turning movements, and to store queues along the circulatory roadway, but the actual operational performance is poor. Traffic data was collected over the summer of 2012. Video was recorded of traffic movements from main approaches and speeds at 200 meters upstream from the intersection to determine approach speeds. A video display along with the use of pre-defined keyboard keys is used to optimize the data processing. The results of this research were found to be statistically significant and were similar to previous studies. Initially, increase in red light running rates were found to relate to higher approaching speeds and higher traffic volumes. The implementation of count-down panels in the traffic signal control did reduce red light running, but on a short-time basis only. A geometric conversion from a traffic circle to a four-legged conventional intersection was found to be a poor countermeasure for safety and operational performance. Regarding the model for estimating red light running rates, the most significant variables included in the model were Y (yellow running rate), A (small vehicle traffic flow), and G (single unit truck traffic flow).