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Design and Assessment of Traffic Management Strategies for Improved Mobility on Major Arterial Roads in Lahore City

Authors : N. Ali, S. Nakayama, H. Yamaguchi, M. Nadeem

Abstract : Traffic congestion is a matter of prime concern in developing countries. This can be primarily attributed due to poor design practices and biased allocation of resources based on political will neglecting the technical feasibilities in infrastructure design. During the last decade, Lahore has expanded at an unprecedented rate as compared to surrounding cities due to more funding and resource allocation by the previous governments. As a result of this, people from surrounding cities and areas moved to the Lahore city for better opportunities and quality of life. This migration inflow inherited the city with an increased population yielding the inefficiency of the existing infrastructure to accommodate enhanced traffic demand. This leads to traffic congestion on major arterial roads of the city. In this simulation study, a major arterial road was selected to evaluate the performance of the five intersections by changing the geometry of the intersections or signal control type. Simulations were done in two software; Highway Capacity Software (HCS) and Synchro Studio and Sim Traffic Software. Some of the traffic management strategies that were employed include actuated-signal control, semi-actuated signal control, fixed-time signal control, and roundabout. The most feasible solution for each intersection in the above-mentioned traffic management techniques was selected with the least delay time (seconds) and improved Level of Service (LOS). The results showed that Jinnah Hospital Intersection and Akbar Chowk Intersection improved 92.97% and 92.67% in delay time reduction, respectively. These results can be used by traffic planners and policy makers for decision making for the expansion of these intersections keeping in mind the traffic demand in future years.

Keywords : traffic congestion, traffic simulation, traffic management, congestion problems
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