

# IMPACTS OF BUS ONLY LANES ON SIGNALIZED INTERSECTION UNDER HETEROGENEOUS TRAFFIC CONDITIONS

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## Abstract

The unsolicited delays and unpredictable travel times are common in urban areas of Pakistan hence making it difficult to maintain the image of public transport. Bus priorities provided in terms of dedicated bus lanes at intersections are considered as a solution to improve the conditions for public transport. Conversely, dedicated lanes may negatively affect the performance of other vehicular classes. This study quantifies the impact of Bus Only Lanes (BOLs) on the intersection's performance as well as on the performance of individual vehicular class. The VISSIM microsimulation tool was employed to a signalized intersection located in urban area under heterogeneous traffic conditions. Sensitivity analysis followed by trial and error method was conducted to calibrate the microsimulation model. The calibrated VISSIM model was utilized to run three scenarios; scenario-1: existing conditions, scenario-2: converting existing lanes to BOLs and scenario-3: providing additional lanes as BOLs. The results indicated that for scenario-2, buses experience 14-16% lesser travel time and 10.5% reduction in delays as compared to scenario-1 due to dedicated right-of-way, while all other vehicular classes experience deteriorated conditions. Scenario-2 affected the intersection's performance and caused an increase of 5.6% in average delay, 9.0% in average maximum queue length and reduction in average speed by 9.8%. However, in scenario-3, BOLs as additional lanes improved the conditions for buses and also reduced the travel time and delays for other vehicular classes. It is established that the present findings may assist the planners and decision makers to revisit the policies for public transport services.

**Keywords:** Bus only lanes, heterogeneous traffic, signalized intersection, calibration

## Introduction

Presently, a major rise in the use of private cars over public transit is one of the leading visible problems and causing negative consequences both environmental and non-environmental (Sharma and Kumar, 2012).

Expansion of population and urban geographies has become a severe problem because of the development of society and the economy (Chen, 2015). Most of the cities in Pakistan are

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