



A Case Study on Roundabout under Congestion: Proposal to Improve Current Traffic Operation

Ghufraan Mohammed Aboud ^a, Areej Muhy Abdulwahab ^a,
Qais Sahib Banyhussan ^{a*}, Hamsa Abbas Zubaidi ^{b, c}

^a Highway and Transportation Engineering Department, Mustansiriyah University, Baghdad, Iraq.

^b Civil and Construction Engineering Department, Oregon State University, Oregon, USA.

^c Highway and Transportation Engineering Department, University of Al-Qadisiyah, Al-Diwaniyah, Iraq.

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Abstract

Roundabouts are progressively being utilized on occupied arterial streets for traffic quieting purposes. Be that as it may, on the off chance that one indirect leg is close to a conveyance center point, for instance, stopping territories of strip malls, the passage traffic volumes will be especially high in pinnacle hours. On the basis of the Al-Turkman Roundabout, which is one of the most important roundabouts in Baghdad city, linking the areas of east of Baghdad to the city center in the area of Bab Al-Moatham. This area is characterized by its high traffic volumes (congestion), especially at peak periods causing a low level of service (LOS) with increased travel time delay, costs, and CO₂ emissions. The research relied on the use of the SIDRA software to assess these variables by collecting traffic volumes in this area. The research proposed a series of planning procedures which are divided according to serial time scales. These planning procedures are to address the problem of congestion and traffic jams in the area, improve the level of service, and reduce travel time, cost and CO₂ emissions. The research concluded that the application of the planning proposals in the study area has improved the level of service from E and F to C, reduced travel time by 16%, reduced costs by 25% and reduced CO₂ emissions by 29%.

Keywords: Planning Proposals; Travel Time Delay; Cost; CO₂ Emissions; Level of Service; SIDRA Software.

1. Introduction

Traffic congestion could be a major challenge in cities of all sizes. The traffic conditions on any intersection area are characterized by slower speeds, longer trip times, and expanded queuing [1]. Level of service (LOS) and delay are the main variables to assess intersection efficiency. Level of service could be an assessment by which transportation planners verify the standard of service on a selected transportation facility or infrastructure. LOS vary from A to F; A being the higher when drivers don't seem to be influenced by other vehicles in the traffic stream, and F being the lowest. LOS for signalized intersections could be measured by average stopping delay time per vehicle [2]. Numerous planning and marketing measures tend to under-price vehicle travel and urban extension of the city, counting road and vehicle parking facilities that are not supported through user fees, uncompensated traffic congestion, accident, and pollution harms, as well as different costs of an urban extension [3, 4].

With a more efficient valuation, the car movement would cost less than it does currently, leading to less driving and sprawling, and less total costs. Public transit subsidies are usually validated, in part, as the best solution to vehicle

* Corresponding author: qaisbanyhussan@gmail.com



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