

Multi- Leg Intersection Analysis and Optimization using VISSIM

Prutha Sudhir Deshmukh¹ and Apeksha Choudhary²

Student, Civil Engg. Department, R. H. Raisoni University, Amravati, India ¹

Faculty, Civil Engg. Department, R. H. Raisoni University, Amravati, India ²

Abstract: PTV VISSIM is a microscopic traffic simulation tool, use to analyse urban traffic congestion at multi-leg intersections and optimize traffic flow. Panchavati Square at Amravati is one of the complex multi-leg intersection. The research involves traffic data collection, including vehicle volumes, turning movements, signal timings at peak hours. The study evaluates the existing intersection performance by assessing key parameters such as average vehicle delay, vehicle travel time, queue lengths, queue counters, level of service (LOS), and emissions. Various optimization strategies are tested, including signal timing adjustments, lane reconfigurations, and adaptive traffic control systems. Simulation results indicate that optimized signal phasing and geometric improvements significantly reduce delays and improve intersection efficiency. The findings highlight the effectiveness of VISSIM-based simulation in enhancing intersection performance, reducing congestion, and improving urban mobility. The study provides recommendations for implementing optimized traffic control strategies to ensure safer, more efficient, and environmentally sustainable urban transportation.

Keywords: Multi-leg intersection, signal optimization, traffic simulation, urban mobility, VISSIM

