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Traffic Study and Sustainable Design of Two Main Corridors in Tulkarem (As-Sikka Street and Nablus Street)

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Abstract

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Transportation sector in Palestine needs upgrading to include technology and sustainability for the purpose of people welfare. There is scarcity in projects and studies that promote sustainability and technology in design of roads. This work aims to analyze and improve traffic conditions on two critical corridors in Tulkarem city “As-Sikka Street and Nablus Street”. The roads are experiencing growing congestion, insufficient traffic control, and safety issues due to rapid urban expansion. The primary objective is to assess current traffic performance, identify existing deficiencies, and develop sustainable engineering solutions. The study employed a comprehensive methodology, including desk reviews, stakeholder interviews, field traffic volume counts, and inventory studies. Traffic simulations were conducted using Synchro Studio 11, while geometric redesign proposals were developed using Autodesk Civil 3D. The project analyzed three scenarios, current traffic conditions (2024), improvements on geometric design and traffic control devices, traffic simulation projected traffic demand with optimized circulation and outer road integration (2027). The findings include optimization of traffic plans for the corridor in the current and future situations, sustainable plan design of road, and initiatives to integrate this project into smart city. The project concludes that integrating sustainability principles—environmental, social, and economic—into traffic planning can significantly enhance urban mobility in Tulkarem. It provides actionable recommendations for local authorities and serves as a replicable model for sustainable traffic planning in other Palestinian cities.