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Traffic and Geometric Assessment and Sustainable Design of Bal'a - Tulkarem Road

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Abstract

Sustainable and smart design of roads in Palestinian cities are needed. The literature lacks the relevant studies that integrate sustainability and technology in road design and studies in Palestine. This study aims to provide sustainable geometric and pavement designs of the Bal'a-Tulkarem road. Data was collected through research, reports, websites, and many field visits to the project site to count traffic. The methodology structure is prepared to optimize the geometric layout and pavement structure to enhance functionality, safety, and durability, aligning with sustainability considerations, AASHTO, and HCM. The study includes operational analyses and redesign of the road where measures of effectiveness are obtained, such as level of service. The project analyzes traffic flow to assess the pavement structure and road capacity for the current and future year. The study integrates sustainability principles to create a safe, accessible, and inclusive street that caters to pedestrians, cyclists, motorists, and transit users of all ages and abilities. The outputs of this study are summarized in evaluating and redesigning the current geometric and pavement structure conditions of the road segment, conducting operational and design analyses of the road and its main intersections, and determining the most suitable intersection control design. The findings ensure accessibility for all road users while fostering a safe, comfortable, and inclusive environment. The outputs of this project are beneficial for stakeholders, where social, economic, and environmental dimensions of sustainability are met.