Towards a Walkable City: Evaluating the Design and the Physical Conditions of Urban Sidewalks in Nablus City Using GIS*

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Abstract— **Walking is a primary means of transportation in developing countries, but poor pedestrian infrastructure poses a barrier to achieving urban sustainability. This research aims to assess the condition of sidewalks in Nablus through a field study of 1,418 randomly selected street segments analyzed using Geographic Information Systems (GIS). The analysis addressed four main aspects of sidewalks: (1) sidewalk availability; (2) sidewalk width; (3) sidewalk surface quality; and (4) obstacles that limit their use. The results showed that 46% of the segments lack sidewalks at all, and that the vast majority of existing sidewalks are no more than 2 meters wide. It also revealed that 80% of surfaces are of average quality, and that 34% of the segments suffer from both permanent and temporary obstructions. These results reveal fundamental gaps that limit pedestrian safety and accessibility. The study recommends combining high-cost physical interventions to widen and improve sidewalks with low-cost legal and regulatory measures to remove obstacles and control violations, thus contributing to enhancing walkability and achieving more sustainable cities.**

I. Introduction

Walking is a primary means of transportation in cities, especially in developing countries where a large portion of the population relies on it daily due to the limited availability and high cost of alternative transportation [1]. The literature has shown that walking is a pivotal element in promoting public health and sustainable mobility [2]. However, this high dependence is often not matched by a suitable urban environment. Many cities in developing countries suffer from weak pedestrian infrastructure, particularly absent or poor-quality sidewalks, which negatively impacts the safety and comfort of their users [3, 4, 1].

Conversely, other studies indicate that providing a suitable walking environment through connected and safe sidewalks, proximity to services, and diverse land uses directly contributes to increasing walking rates and achieving broader health, social, and economic benefits [5]. This view is supported by the results of studies conducted in developing cities such as Tehran, which showed that improving sidewalk design and integrating elements of the built environment can enhance the adoption of walking as a primary urban choice [6]. Official health reports have also emphasized that providing pedestrian-friendly infrastructure, such as safe walkways and facades, not only encourages physical activity but also contributes to improving quality of life and reducing environmental pollution resulting from reliance on vehicles [7]. Together, this evidence highlights that improving the walking environment is a key input for developing public health policies and sustainable urban planning in developing countries.

Sidewalks are one of the most essential elements in any walkability assessment, as they constitute the infrastructure that enables individuals to move safely and comfortably away from vehicle traffic. The literature indicates that most walkability indices include the condition, width, and quality of sidewalks as a key criterion in their assessment [8]. The quality of sidewalks, in terms of width, network integrity, and continuity, is directly related to pedestrians' ability to use urban space, as confirmed by studies that have addressed the development of walking indicators in urban environments [9].

Applied research in various cities, like Jalandhar City in India, has shown that poor or absent sidewalks are among the most significant obstacles to promoting walking as a sustainable mode of transportation [10]. Furthermore, national plans to promote physical activity have highlighted that sidewalks are not merely supportive infrastructure, but rather a prerequisite for increasing walking rates at the community level and promoting public health [11]. In developing urban contexts, field studies have shown that sidewalks are the most influential component in the equation of comfort and safety for pedestrians, as their absence or poor quality reduces urban sustainability and increases reliance on polluting and expensive modes of transportation [12].

Based on the above research, this study aims to contribute to the literature on developing countries in general, and Palestine in particular, by highlighting the importance of sidewalks in enhancing walkability, analyzing their condition as a fundamental step toward understanding the urban challenges facing pedestrians, and offering scientific solutions that can support sustainable urban planning.

II. Methodology

Based on previous studies on walkability and the importance of pedestrian-supportive infrastructure, a suitable methodology was designed to collect field data and analyze the condition of sidewalks in Nablus City. This methodology aims to provide an accurate scientific database on: (1) the availability of sidewalks, (2) their physical characteristics, (3) their functional condition, and (4) the barriers that limit their use. This will contribute to assessing their suitability for pedestrians and providing actionable scientific recommendations.

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Update on Presentation Status – Submission #121

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Engineering for palestine Conference Wed, Aug 20, 10:52 AM

to me, hassan

Dear Dr. Emad,

Thank you for your last message.

I would like to inform you that the Scientific Committee has recently updated the acceptance status of your submission *"Towards a Walkable City: Evaluating the Design and the Physical Conditions of Urban Sidewalks in Nablus City Using GIS" (Submission #121)* to an **Oral presentation**.

Your final manuscript, which was submitted using the official template, will be included in the conference proceedings as a full paper. We will share the oral presentation guidelines and session schedule with you soon.

We look forward to your valuable contribution at the conference in Hebron this September.

With best regards,
Dr. Jasem Tamimi
On behalf of the Scientific Committee
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