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Article

Assessing Service Imbalances as Contributing Factors to Mobility Issues in the Metropolitan District of Quito, Ecuador

Tatiana Astudillo-Ortega [1,*], Vinicio Moya-Almeida [2], Francisco Cabrera-Torres [3], Emilia Ávila-Castro [4], Marco Heredia-R [5] and Antonio Vázquez Hoehne [1]

[1] Departamento de Ingeniería Topográfica, Universidad Politécnica de Madrid, 28040 Madrid, Spain; antonio.vazquez.hoehne@upm.es
[2] Centro Internacional de Investigaciones sobre Ambiente y Territorio, Facultad de Ingeniería, Universidad de los Hemisferios, Quito 170527, Ecuador; viniciom@uhemisferios.edu.ec
[3] Escuela Técnica Superior de Ingenieros en Topografía, Geodesia y Cartografía, Universidad Politécnica de Madrid, 28040 Madrid, Spain; fd.cabrera@alumnos.upm.es
[4] Institute for Environment and Human Security, Department of Geography, University of Bonn, 53113 Bonn, Germany; s38eavil@uni-bonn.de
[5] Facultad de Ciencias Pecuarias y Biológicas, Universidad Técnica Estatal de Quevedo, Quevedo 120301, Ecuador; mherediar@uteq.edu.ec
* Correspondence: tatiana.astudillo.ortega@alumnos.upm.es; Tel.: +593-992518060

Abstract: This article analyzes the service distribution imbalance within the Metropolitan District of Quito (DMQ) and its impact on urban mobility, aiming to propose strategies for more equitable territorial planning. The data were gathered from sources such as the National Institute of Statistics and Census (INEC), the Ministry of Health, the Ministry of Education, and OpenStreetMap. These data were integrated with GIS tools to model patterns of accessibility and mobility. Through a comprehensive approach, the study assessed education, banking services, employment, and healthcare, identifying how inequitable access to these services drives increased travel demand, especially in rural and peri-urban areas. In the education field, over 500 neighborhoods faced a shortage of institutions, compelling students to commute to other neighborhoods. For financial services, only 67% of neighborhoods had adequate access, with disparities across different socioeconomic zones. Additionally, employment-related mobility posed another challenge, with 88% of workers commuting outside their residential parish. Finally, access to healthcare was also unequal across the DMQ, particularly in peripheral areas where residents must travel long distances. In this context, it can be concluded that more efficient urban planning in the Metropolitan District of Quito (DMQ) is crucial to address imbalances in the distribution of services and enhance quality of life. Proposed strategies include establishing a land reserve, decentralizing services to underserved areas, integrating smart technologies, and promoting incentives for remote work, sustainable mobility, and public transport. These actions aim to foster greater territorial equity and accessibility.

Keywords: mobility; GIS; imbalances; spatial distribution; displacement; urban planning

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1. Introduction

Mobility is a quantitative measure reflecting the frequency and scale of individual travel within a specific geographic area over a set time interval (e.g., trips per day, passengers per kilometer per day, average travel time) and can be analyzed through spatiotemporal patterns [1,2]. Globally, high mobility is a defining characteristic of modern society [3].

In Latin America, mobility challenges are compounded by road accidents, traffic congestion, environmental pollution, and security concerns. These challenges are closely linked to the increasing reliance on private transportation and the corresponding decline in public transit use [1,4].