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Site Selection of Public Multi-Story Parking in Izeh Using the AHP Method and SWOT Matrix

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Abstract

Background and Objective: The rapid growth of urbanization and the increasing number of vehicles in cities have led to serious issues such as traffic congestion, parking shortages, and a decline in quality of life. Izeh, due to the concentration of commercial and service centers in its central core and the limitations of urban streets, faces a severe parking shortage. This study aims to determine the optimal locations for multi-story public parking facilities in Izeh to alleviate traffic problems and optimize urban parking spaces.

Methodology: This research follows a descriptive-analytical approach, utilizing field studies, document analysis, and expert opinions for data collection. The Analytical Hierarchy Process (AHP) was employed to prioritize location criteria, while the SWOT matrix was used to assess environmental conditions. The key evaluation criteria included population density, traffic volume, accessibility, proximity to commercial centers, available land area, feasibility of construction, and land cost.

Results and findings: The results indicate that the central core of Izeh, due to its high concentration of commercial and administrative activities, has the greatest demand for multi-story parking facilities. The most influential factors in site selection were population density and traffic volume, whereas land cost and physical constraints posed major challenges. Based on the SWOT analysis, the aggressive (SO) strategy was identified as the most effective approach, leveraging available opportunities and strengths to optimize parking facility implementation. The study suggests that private sector investment should be encouraged to overcome execution challenges and enhance project efficiency. Additionally, this model can be applied to other cities facing similar urban parking challenges.

Keywords: Multi-Story parking location, AHP, SWOT, Traffic, Izeh City.

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Extended Abstract

Introduction

The rapid growth of urbanization and the increasing number of vehicles in cities have led to major challenges such as traffic congestion, parking space shortages, and reduced urban quality of life. Izeh City, due to the high concentration of commercial and service centers in its central core and the limited capacity of its streets, faces a severe shortage of parking spaces. The lack of suitable public parking facilities has exacerbated this issue, leading to an increase in illegal parking, heavy traffic congestion, and reduced accessibility. This study aims to identify optimal locations for constructing public multi-story parking facilities in Izeh to alleviate traffic problems and enhance the efficiency of urban parking spaces.

Methodology

This study employs a descriptive-analytical approach, with data collected through field studies, document reviews, and expert opinions. The Analytical Hierarchy Process (AHP) method is used to prioritize location selection criteria, while the SWOT matrix is applied to analyze environmental conditions. The evaluated criteria include population density, traffic volume, accessibility, proximity to commercial centers, available space, feasibility of construction operations, and land cost. Data analysis was conducted based on pairwise comparisons, and the weight of each criterion was determined.

Results and Findings

The central core of Izeh city is selected as the target area due to traffic problems, including through traffic and residential traffic in the city center due to the concentration of administrative, service and commercial activities and the narrow width of the main streets. Solving these problems is not possible because it is not possible to change the width of the streets due to the proximity of private commercial properties to the width of the streets. The traffic problems of the central core of Izeh city can be listed as follows:

1) The limited width of the main streets and their limited capacity and the unsatisfactory quality of traffic
2) Complete concentration of commercial, administrative and medical traffic in the central core of the city
3) High volume of through and residential traffic
4) Lack of public parking

The findings indicate that the central core of Izeh City, due to its high concentration of commercial and administrative land uses, has the greatest need for multi-story parking facilities. The AHP analysis revealed that population density and traffic volume carry the highest weight in parking site selection, whereas land cost and physical constraints were identified as major challenges. Moreover, the SWOT analysis determined that the most effective strategy for addressing the parking shortage is the aggressive (SO) strategy, which focuses on leveraging existing opportunities and capitalizing on strengths.

Conclusion

Based on the research findings, it is recommended that private sector investment be utilized to minimize implementation challenges and enhance efficiency. Additionally, parking location selection should be carried out in a manner that not only meets the high

demand for parking but also minimizes economic and operational challenges. This model can be adapted for other cities facing similar urban parking issues.

Declarations

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