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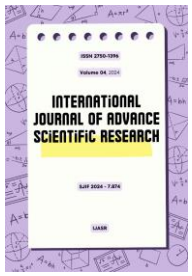

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Research Article

INNOVATIVE DESIGN OF A MULTI-STOREY MODERN CAR PARKING FACILITY

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Abstract

The article presents the concept and design of a modern multi-storey car parking facility, emphasizing its significance in addressing urban parking challenges. As cities continue to grow and space becomes increasingly limited, innovative solutions like multi-storey car parks offer efficient use of land while meeting the demands of a rising number of vehicles. This study explores key aspects of such projects, including architectural planning, structural integrity, and the integration of advanced technologies for user convenience and operational efficiency. The proposed design incorporates eco-friendly elements, such as energy-efficient lighting and ventilation systems, alongside smart parking solutions, including automated vehicle handling and real-time space availability indicators. The findings highlight how modern multi-storey car parks can enhance urban infrastructure, reduce congestion, and contribute to sustainable urban development. This research underscores the necessity of strategic planning and innovation in creating efficient and future-ready parking solutions.

Keywords

Centre, settlement, provision, automated parking systems, device, traffic jam, safety, intersection.

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INTRODUCTION

The rapid urbanization and growth of vehicle ownership have posed significant challenges for cities worldwide, particularly in terms of traffic congestion and insufficient parking spaces. Traditional parking solutions often fail to meet the demands of modern cities, resulting in inefficient land use and increased environmental concerns. In this context, multi-storey car parking facilities have emerged as an innovative and effective solution, providing high-capacity parking within a compact footprint.

This article explores the design and development of a modern multi-storey car parking facility, focusing on its role in addressing the parking challenges faced by urban areas. The integration of advanced technologies, such as automated parking systems and smart parking management, has further enhanced the functionality and convenience of such structures. Additionally, incorporating eco-friendly design elements ensures that these facilities align with the principles of sustainable urban development.

The study examines various aspects of multi-storey parking projects, including architectural design, structural considerations, and technological advancements, while also addressing the economic and environmental impacts. By highlighting the benefits and challenges associated with such projects, this research aims to contribute to the ongoing discourse on improving urban infrastructure and creating future-ready cities.

METHODS

As we all know today the number of cars is increasing day by day. The rapid increase in the number of cars necessitates the widening of highways and the design and construction of high-rise buildings to accommodate them. The problem of "car parking" is becoming a very urgent issue in our modern big cities. Even in highly developed European countries, private cars are largely unused. In this case, two storage spaces are required for each car: the first is a community garage not far from the residence, and the second is a temporary open or closed parking lot in front of the workplace or service facility.

Several key aspects are important to pay attention to when designing multi-storey car parks:

a) Space Utilization: Efficient use of available space to accommodate the maximum number of vehicles. It is necessary to take into account both parking spaces and manoeuvring areas;

b) Traffic Flow: Designing the layout to ensure smooth movement of traffic flow, especially during peak hours. Separate entry and exit points help better manage traffic;

c) Security: Install adequate lighting, security cameras and emergency call points to ensure the safety of vehicles and users;

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d) Accessibility: Make sure parking is easily accessible from the farmers market and surrounding areas. Also, take into account pedestrians entering and exiting;

e) Environmental Impact: Implement green design elements such as rainwater harvesting, green roofs and permeable pavement to minimize environmental impact;

f) Aesthetics: Include design elements that blend well with the surroundings and enhance the overall aesthetics of the area;

g) Sustainability: Consider sustainable design practices such as energy-efficient lighting, materials and construction methods;

h) Compliance: Design must ensure compliance with local building codes, regulations and accessibility standards.

Having carefully considered these aspects, we set as a task the need to design a multi-storey car shelter that not only meets the needs of cars, provides maintenance for cars, but also improves the overall urban environment.

In the centre of the city of Fergana, there is a farmer's market, which is considered a large trade centre and plays an important role in the economic and social life of the city. Due to the high traffic flow around this market, lack of parking spaces is a big problem. The problem of parking near public places and the market area of Fergana remains an urgent issue. As a result of the construction of a multi-storey modern parking lot, traffic jams will be avoided on the streets and roads near the market area, traffic participants will be able to cross the road easily, and road traffic accidents will be prevented. Along with the traffic flow is regulated.

The main purpose of designing a multi-storey car residence near the farmer's market of Fergana City is to design a car maintenance workshop on the first floor of the building and a car storage building on the upper floors.

Today, we can see that there is not enough space for the storage of many vehicles in several districts, regions and districts of Fergana. In the city of Ferganapresentthere are 5-6 public surface parking lots per day. We can see these parking lots near markets, in front of shopping complexes. Today, we can witness the irregular location of parking lots in the rest of the city of Fergana, which spoils the aesthetics and appearance of the city. When we study the analysis of temporary and permanent storage places for cars in residential areas, we can see that the roads are blocked for pedestrians and the irregular movement of vehicles in the areas of existing shopping complexes in Fergana.

Taking into account the above problems, it was studied whether there is enough space to build a multi-storey parking lot near the market area.

In our research conducted in the area of the market alone, it became known that there are 500-600 cars stored in the parking lots and their surroundings. In this area, we can observe irregularly arranged cars.

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Due to the destruction of open-type and reinforced concrete garages that do not meet the requirements of urban planning rules and sanitary standards and established by legal entities, in their place, construction of 6-8-story and small open-type parking lots following the norms and rules of modern urban planning. Planned. Following the preliminary project documents, it is determined that the planned 6-story parking lot will accommodate 600 cars, and the 8-story parking lot will accommodate 750 cars. Based on the above, Fergana city and the surroundings of the central farmer's market were studied.

In the last three years, the number of cars in the city of Fergana itself has increased by 15 per cent. As a result, car owners who do not have a garage park their vehicles in front of multi-storey buildings in unmarked places, causing traffic jams. This causes certain transport problems. In particular, the path of ambulances or fire trucks is blocked, and thefts related to unattended cars have been identified.

Conclusions

It was found that drivers were destroying other vehicles as a result of parking their vehicles in the 2nd and 3rd lanes around the city farmer's market. Based on the above studies, we considered the need for a parking lot in this area to be urgent.

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