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## Research Article

### Multi-level Car Parking as a Viable Solution to Traffic Issues in Davao City

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#### ABSTRACT

The development of the economy must be strategically reflected in the transportation infrastructure. Traffic issues will arise as the economy expands, which will impede that expansion. Even if the government does its part to solve the issue, citizens still have problems. The study investigated how Davao City residents perceived current traffic-related issues and their detrimental effects. The study used a quantitative approach with a descriptive research methodology. The study selected 75 residents of Davao City who have encountered traffic issues using purposive sampling. Frequency distribution and percentages were used to assess the data that had been gathered. The results indicated that *unlawful parking of vehicles* and *high volumes of vehicles on the road* were ranked first and second on the list of existing problems; in the same way, *delay* and *time wastage* were the respondents' dominant adverse effects. Thus, the study concludes that multi-level car parking must be added as a strategic solution to the ongoing problem. Moreover, the researchers suggest a multi-level car parking plan considering all vital parts that help potential and existing entrepreneurs to start this kind of business as soon as possible.

**Keywords:** *Davao city, Multi-level car parking, Traffic issues, Viable solution*

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#### Introduction

A nation's economy depends heavily on transportation because it promotes efficient resource use and raises social welfare through suitable social, political, and economic positions. The ministers stated that to keep up with rising demand, more strategic investments in transportation and services were required at the 2013 conference held in Germany (Rail Technology Magazine, 2013). The backbone of

the country's economy, they continued, is its transportation system, which connects people and things, gives them access to jobs, and fosters trade and economic development. Another piece suggested that if the issue of transportation is adequately addressed, Africa may be a leading continent for luring international businesses and investors and turn into the preferred business location of entrepreneurs worldwide (The Times of Africa, 2017).

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Hindustan Times (2021) claimed that according to the most recent traffic index data, Indian cities were rated #2, #6, #8, and #16. (Hindustan Times, 2021). This demonstrates how this persistent issue severely impacted commuters and car owners in Indian cities. In light of this, any nation's transportation infrastructure must be enhanced alongside its economic development. Traffic congestion delays cost the nation's economy money if this does not take place.

Most cities are dealing with this traffic issue, and the worst traffic jams can be found in Mumbai, Bengaluru, and New Delhi, India, as they ranked highest in traffic congestion, as per the Tomtom Traffic Index (2021). The mentioned cities obtained more than 40% of congestion level last 2021. Also, Manila, Philippines, was ranked 6th on the list getting a 43% congestion level. As Davao and other metropolises expand and rise, it is a problem of worsening traffic congestion. Modern civilizations always produce a build-up of, expressly defined as, rush hours. People use public transit and the roads excessively every day due to their wide range of interests. Despite the best efforts of everyone involved to find a solution to the issue, the traffic congestion keeps getting worse.

As stated in the Davao City Transport Roadmap (2018), the city's transportation system has been negatively impacted by the city's continually growing population and vehicle fleet. Public transportation accounted for 80% of city travel, and the private sector accounted for 20%. This implies that the increase in vehicles and population is interconnected to the public sector, and this sector must be developed. Numerous articles have been produced to address this issue. An investigation focused on modernizing transportation. However, the main reasons the implementation of transport modernization failed were careless resource management and a lack of funding (Lagumbay et al., 2018). The increasing traffic issue in several areas of the city spurred Councilor Conrado Baluran to advocate for the approval of the "no parking spot, no new car" legislation before a similar measure pending in the Senate, according to the official website of the city

government of Davao (2019). The rule will impact not only those who live in residential neighborhoods but also businesses that lack parking for their customers' cars and their own. Moreover, these proposed solutions are not answered the primary concern of the people in Davao city. Therefore, another solution is vital to lessen the traffic congestion and serves as the central gap of the present study.

In light of this, the current study will primarily concentrate on the metropolitan area surrounding Davao City. Since numerous elements affect traffic and available solutions, the subject needs to be extensively researched from all angles. The multi-level car parking solution is used in crowded places, including commercial business districts, hospitals, markets, shopping centers, schools, government buildings, and banks. Numerous studies claim that multi-level car parking mitigates the ongoing problem (Pandey et al., 2021; Dandotia et al., 2016). Consequently, it might be possible to lessen the traffic on the highways in Davao city.

## Research Questions

The study examined the city's parking issue, which hurts the general public's local economy, income, and living standards. The inquiry focuses on Davao's commercial districts, particularly those where traffic congestion is a severe issue.

The study addressed the following questions:

1. What existing problems cause traffic perceived by the people in Davao City?
2. What are the adverse effects perceived by the respondents concerning the traffic problem?
3. What recommendations can be developed from the findings to lessen the traffic problem and help the government solve the problem?

## Methodology

To acquire vital information about the respondents' perceptions of the present problems that contribute to traffic and their perception of the adverse effects of the traffic problem, the study used a quantitative research

approach and engaged in descriptive research. The location the researchers selected as the study's central problem areas were Davao City,

Philippines, where the present study was carried out since the main researcher is a city resident.



Figure 1: Location Map of Davao City, Philippines

From 75 people who voluntarily participated in the data collection, the sample for the current study was selected under the purposive sampling technique. These people confirmed and supported their firsthand knowledge of the city's traffic problems. In addition, the respondents' responses were

utilized to gauge how they perceived the current issues that contribute to traffic and its harmful effects. The respondents' attitudes toward current problems that affect traffic and their attitudes toward residing close to these locations were also assessed using frequency distribution and percentage.

## Result and Discussion

Table 1. Summary of Existing Problems that Cause Traffic Perceived by the Respondents in Davao City

Existing Problems	f	%
Unlawful Parking of Vehicles	28	37.33
High Volumes of Vehicles on the Road	18	24
Unruly Motorists	15	20
Ongoing Road Construction Projects	10	13.33
Booming of Real Estate Development	4	5.33
<b>Total</b>	<b>75</b>	<b>100</b>

The respondents' perceptions of the current traffic-related issues in Davao city are summarized in Table 1. Unlawful parking of vehicles received the highest frequency of 28 out of 75 responses, with a percentage of 37.33, showing that respondents thought that issue to be a substantial contributor to traffic in the city. Also ranking second to fourth in the study was

the number of vehicles on the road, disorderly drivers, and active road construction projects, indicating that respondents believed these issues to be the primary causes of traffic. Furthermore, four people responded with a response rate of 5.33 percent when asked about the real estate boom.

There are findings from several studies gathered that corroborate the present study regarding the causes of traffic problems were presented. According to Morillo and Campos (2016), unlawful parking causes automobiles to drive 50% longer. Accordingly, the researchers advocated taking two different actions, depending on the amount of illegal parking in the area, to lessen the impact that illegal parking has on the journey time of cars. The easiest way to reduce the effect on circulation travel times when there are more than 0 to 25 illegally parked vehicles per 100 meters is to concentrate them in a smaller area. From the traffic management system perspective, a study revealed that people in Davao city were aware of the rules implemented by the traffic enforcers,

with 64% awareness and 77% rules of implementation (Arcillas et al., 2019).

Additionally, the survey found that residents of Davao were content with the management and design of the city's transportation system. However, the researchers felt there was space for improvement in Educating citizens about traffic laws. Additionally, to address this issue, it was suggested in articles published by Auto Industriya and Business World that prospective car buyers show evidence that they have parking spaces for their intended vehicles (Andres, 2019; Francisco, 2019). In addition to the previously mentioned recommendations, the one from the current study will be distinct and contribute to the city's strategy for reducing the effects of traffic.

*Table 2. Summary of Adverse Effects of Traffic Problems Perceived by the Respondents in Davao City*

<b>Adverse Effects</b>	<b>f</b>	<b>%</b>
Delay	31	41.33
Time Wastage	20	26.67
Disgruntled Drivers and Passengers	14	18.67
Fuel Waste	7	9.33
Highway Range	3	4
<b>Total</b>	<b>75</b>	<b>100</b>

Table 2 shows the adverse effects of traffic problems perceived by the selected respondents in Davao city. Based on the table, delay and time wastage were positioned at the top of the survey as it obtained high-frequency distribution of 31 and 20 with a percentage of 41.33 and 26.67, respectively. The respondents identified disgruntled drivers and passengers, fuel waste, and highway range as adverse effects of traffic problems and ranked 3<sup>rd</sup> to fifth in the study.

In other countries like Nigeria, traffic delay problems adversely affect the cities' progress, as per Atomode (2013). According to the study, traffic delays were associated with traffic volumes translated to traffic congestion. Traffic wardens and parking problems were found to be the most significant causes of delays at the road intersections in the city. Moreover, the study suggested that road intersections should be signalized and vehicle parking be strictly prohibited from reducing traffic congestion

and delays at road intersections in the city. Du et al. (2021) revealed in their study that there had been a dramatic traffic reduction since the pandemic. The decreased traffic demand is a significant factor in reducing delays and emissions, especially in congested areas. The people in Dhaka, the capital of Bangladesh, are severely affected by traffic jams. It produces physical stress and economic loss to the commuters, as indicated in the study by Mahmud et al. (2012). According to scholars, people there can spend an average of 2.35 hours in traffic, of which 1.30 hours are due to traffic jams. Therefore, commuters are losing 1.30 hours every day, and they are also losing money. Another study presented relevant mitigation approaches for recurring and nonrecurring traffic congestion (Afrin & Yodo, 2020). The first is to increase the road capacity to cater to more vehicles. Adding the sizes of highways, providing more transit, freight rail service, additional lanes, and building new avenues will be an

excellent addition to the government body assigned to this aspect.

## Conclusion

The city's transportation infrastructure needs to expand along with it. In terms of economics, lost time equals lost money. Therefore, cities must develop strategic strategies to deal with traffic issues to make travel faster and draw in additional chances that will significantly boost the city of Davao's economy.

According to the study's findings, unlawful parking of vehicles and delays were ranked first in the tabulated data, indicating that respondents thought these issues represented the main challenge and negative impact of traffic in the city. The respondents also identified time waste and a high number of vehicles on the road as the second current issue and negative consequences contributing to traffic. These findings were not brand-new because previous research from several nations was cited in the literature. Numerous results also offered solutions for addressing or possibly reducing the adverse effects of traffic issues. The city has established measures to handle the traffic issue, but the residents there are not entirely satisfied.

The research will not discuss the government's initiatives to reduce the traffic issue. The primary researcher, who resides in Davao City and owns a business there, believed that privately owned multi-level car parking in Davao City's commercial districts is feasible in reducing traffic issues because, according to respondents, illegal parking of vehicles is the primary issue that contributes to traffic. Due to this, the city's primary point will undergo a paradigm shift, which will alleviate the problem and provide aspiring and established city entrepreneurs with commercial opportunities.

## Recommendations

To address the research questions and minimize the adverse effects of traffic issues on residents of Davao City, the researchers came up with the following recommendations:

The researchers mainly suggest a concrete multi-level car parking plan that contains five vital parts:

1. **Strategic Location-** The main emphasis of this plan section is finding the ideal and most advantageous location for the planned firm. This element will include evaluating many potential areas to determine which ones are most advantageous for the prepared firm. The placement should be close to commercial districts with few or no parking spaces available for businesses.
2. **Description of the Services Offered-** A crucial component of the plan is developing a detailed description of the prospective business's services. The size of each vehicle's parking space, the number of vehicles available, the cost of parking per hour, day, and month, and discounts for devoted customers who use the services supplied for an entire year are all included in the detailed descriptions.
3. **Market Analysis-** Potential or current entrepreneurs should thoroughly investigate the market where they are interested in bringing the planned business to life. Essential elements, including the selected market's characteristics, potential market segments, purchasing trends, and current rivals, should be included in the analysis (if there are).
4. **Financial Plan and Projections-** this section includes financial data to project future cash flows for a company. Additionally, it aids business owners interested in this industry in foreseeing the monetary requirements that will support the company's ongoing operations. The following are typically included in this section: SMART financial targets, financial projections, potential financial needs, set-up cost calculation, and cost-to-operate. The planned business should also take into account the following:
  - Three-year service revenue and expenses projections
  - Three-year statement of financial position
  - Three-year statement of changes in equity
  - Three-year statement of cash flow

This plan and its suggested components will help potential and existing entrepreneurs start this multi-level car parking as soon as possible. The study findings and literature indicated that traffic problems substantially hinder the city's progress.

The researchers embraced the suggestion by Lagumbay et al. (2018) that proper monitoring of traffic rules and regulations should be used as they have been implemented in Davao City and the suggested multi-level vehicle parking company. It will also be beneficial to alter the road networks following current and projected needs. Additionally, each vehicle must have a separate lane (PUJ, PUV, private cars, bikes, and others).

Furthermore, the researchers recommend that future studies center on projects that can lessen the traffic issues in Davao cities, such as additional road projects, road widening, and many more. Also, adding more respondents to be covered in the study might be beneficial to acquire more accurate data. Lastly, since the study utilized descriptive design, the researchers suggested employing sophisticated methods in future studies.

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