



Identifying The Factors Affecting The Traffic Jam In Kiribathgoda Area

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Abstract

Traffic congestion in the Kiribathgoda area is an issue of growing concern, with implications for daily commutes and the broader socio-economic environment. This study is designed with the objective to meticulously identify and analyze the diverse factors that contribute to traffic jams, such as road infrastructure, traffic signals, the influence of shops and public places, driver behavior, parking issues, and public transport availability. Employing a detailed survey methodology, the research further aims to determine the impact of these factors on the duration that vehicles are stuck in traffic. Through statistical analysis of the collected data, the research quantifies the extent to which each factor contributes to traffic delays, offering a nuanced understanding of traffic congestion. The insights gained from this study are intended to inform and enhance traffic management strategies, thus aiding policymakers in their efforts to mitigate traffic jams and promote more efficient urban mobility in the Kiribathgoda region.

Introduction

The phenomenon of traffic congestion in Kiribathgoda is not only a daily inconvenience but also a complex issue with multifaceted impacts on urban life and productivity. Addressing this challenge requires a systematic approach to identify and scrutinize the contributing factors. With this in mind, our study embarks on a rigorous exploration to pinpoint and analyze the determinants of traffic jams in the area. Utilizing a robust survey methodology, which began with a pilot survey to fine-tune the question set, we collected detailed data that illuminate the influence of road infrastructure, traffic signal efficiency, the density of shops and public spaces, patterns of driver behavior, parking practices, and the state of public transportation. The core objective of this study is to not only catalogue these factors but also to assess their impact on the duration vehicles remain stagnant in traffic jams. The insights derived from this analysis are aimed at providing a foundational understanding that can guide urban planners and policymakers in formulating interventions to alleviate traffic congestion and enhance the efficiency of the transportation network in Kiribathgoda.

Objectives

- Identify and analyze the factors affecting traffic jams
- Determine the Impact of These Factors on the Duration a Vehicle is Stuck in Traffic

Methodology

Selecting the Sampling Method

1

Calculate the sample size

2

Conduct the Pilot Survey and main survey

3

clean the data set and descriptive analysis

4

Cross analysis

5

Chi-squared & G-squared test

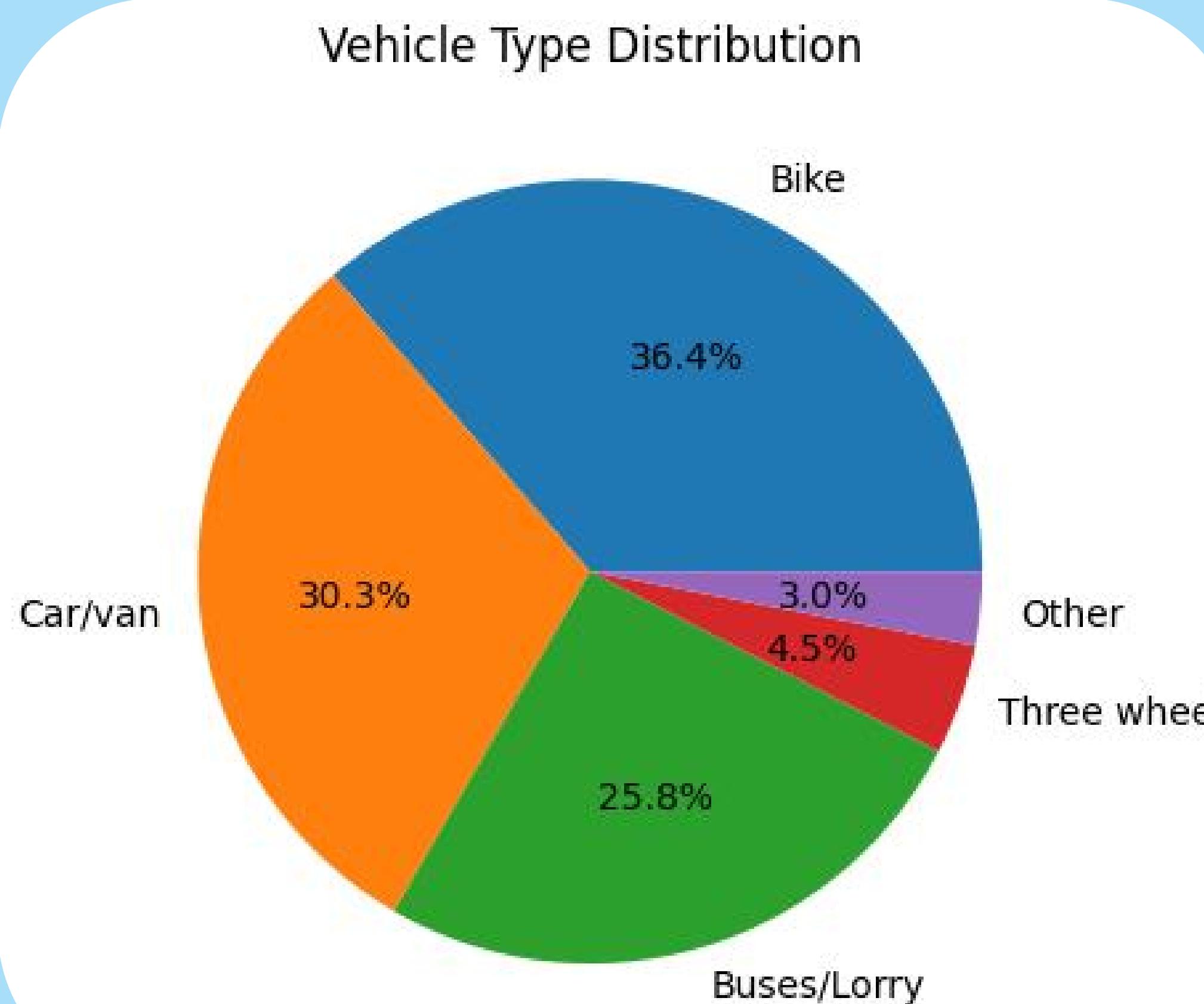
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Fit the logistics regression model

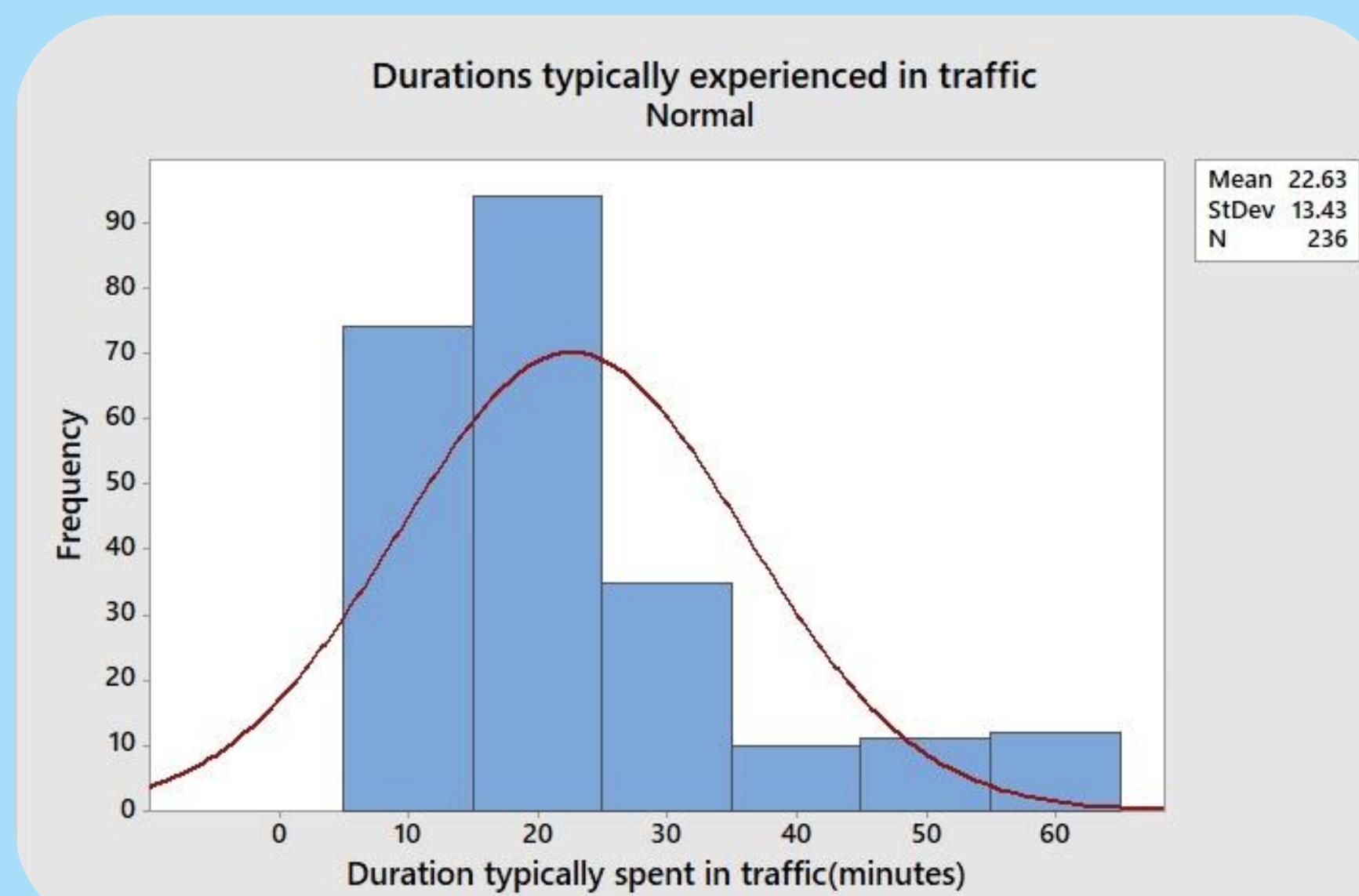
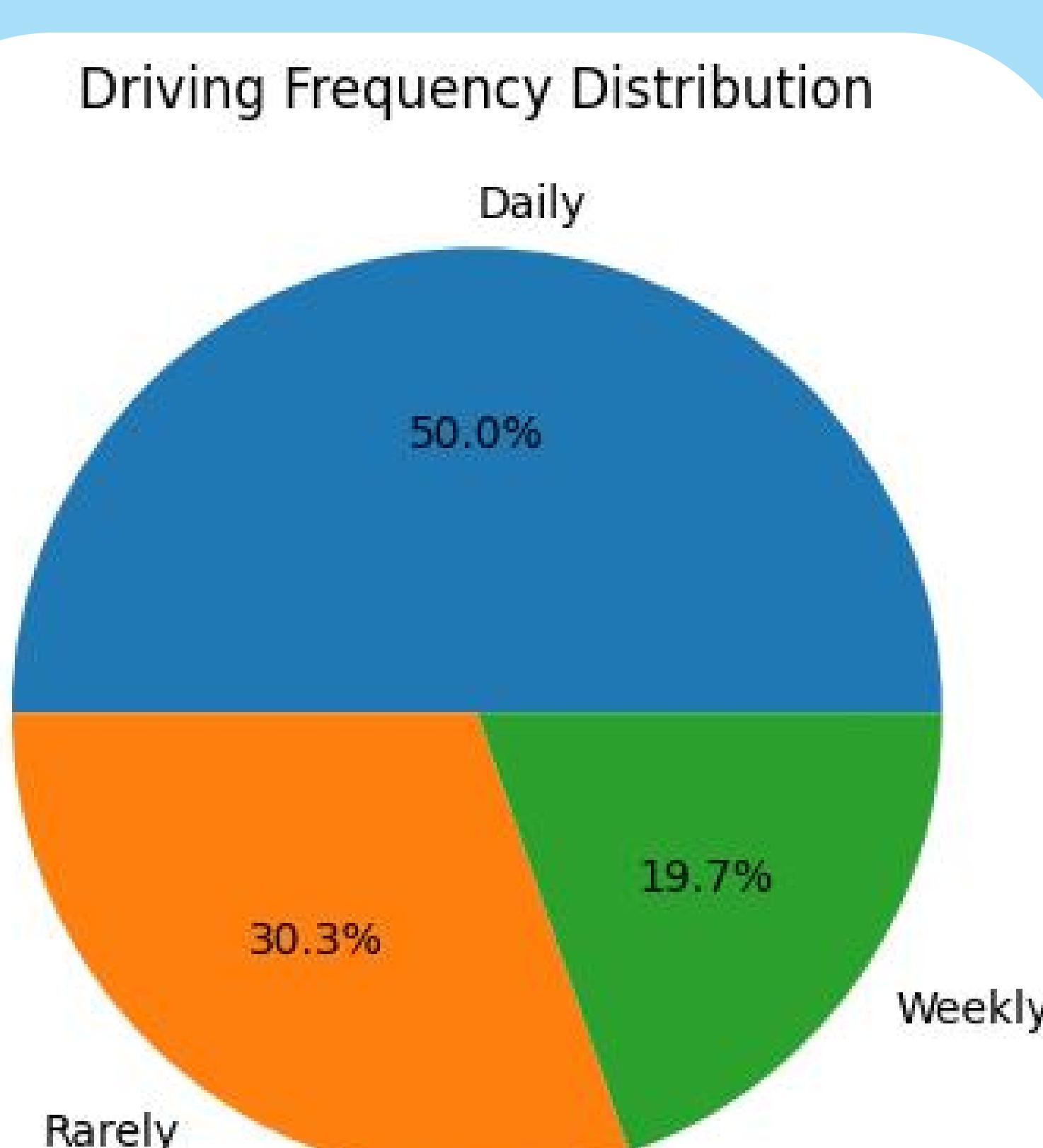
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Conclusions

8



Results



Average Traffic Time

Peak Hours 23 min

OOF Peak Hours 11 min



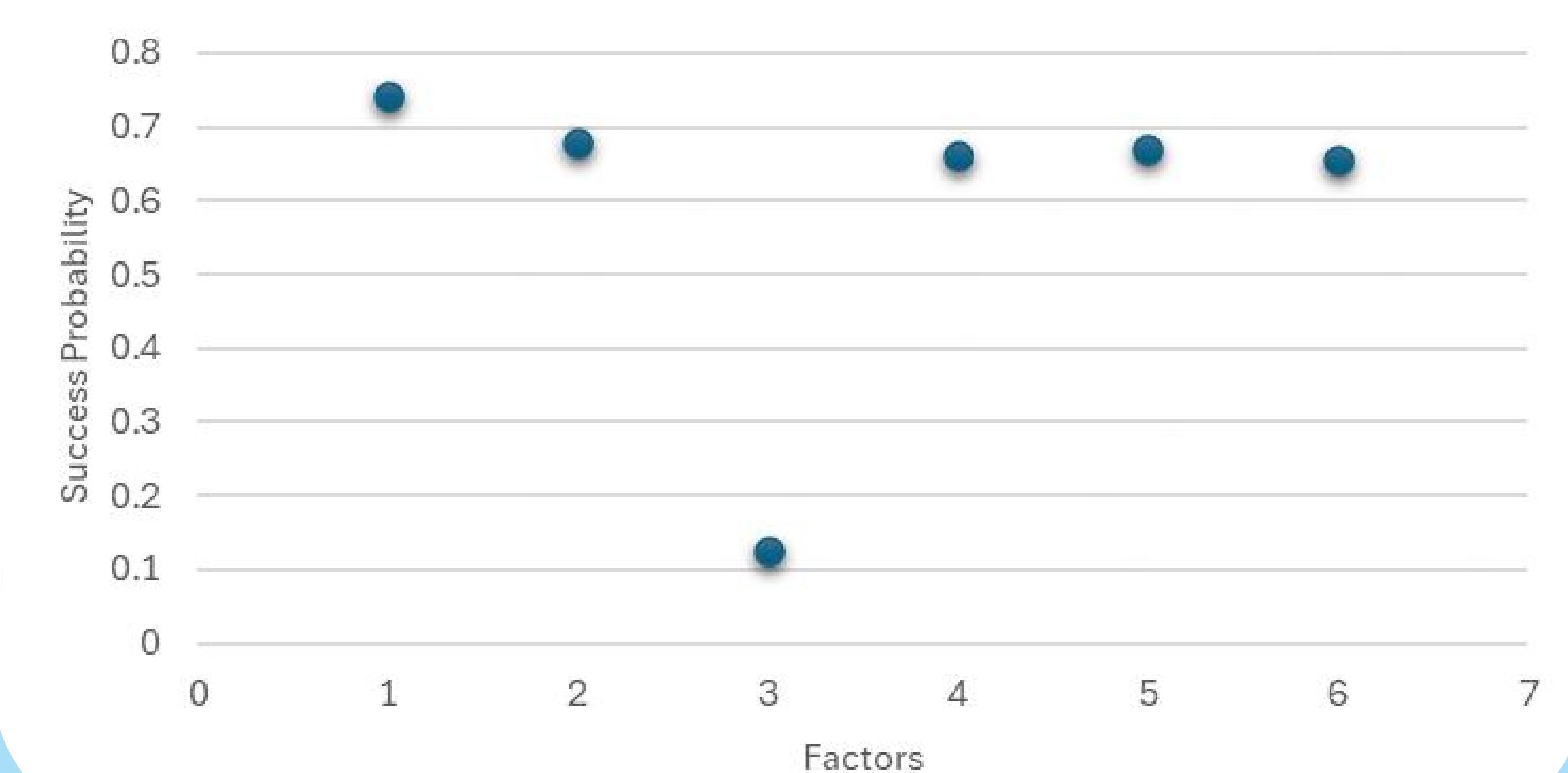
Most Associated factors for traffic jams (using χ^2 & G2 Tests)

- Road infrastructure and layout - RIF
- Traffic Signal timings - TST
- Shops & public places - SPP
- Public transportation availability - PTA
- Driving behaviour - DB
- Parking issues on streets - PI

P(TRAFFIC=YES|RANKED FACTOR)

Feature	RIF	TST	SPP	PTA	DB	PI
Yes	0.7408	0.6773	0.1244	0.6617	0.671	0.6556
No	0.2592	0.3227	0.8756	0.3383	0.329	0.3444

Success probability of affecting factors



Discussion

Here we conduct the analysis using our survey responses. the survey conclude that the most affected factors on traffic jams in Kiribathgoda area and how they affected accordingly.

Using categorical data analysis we search the association between all factors we got and finally we end up with these factors by implementing the Chi square and G squared test. Then we fit a logistic regression model for each factors with binary responses of "yes" & "No". Then the R.I.F get the highest probability of being success. The odds of these factors are higher than other factors. Here we calculated the success probability for each factor and if they are greater than 0.5 we get it will mostly affected for traffic jams. The hypothesis for these association is 5% significance. Hence there is a 5% significance for each variable. With this research it is possible to getting actions to reduce the traffic jams in Kiribathgoda area with starting from our most affecting factor. It is the best way to continue the process.

Conclusion

With our results we can introduce most affecting factors for the traffic jams of Kiribathgoda area which is multifaceted problem that require comprehensive solution. By analysing data we found that the road infrastructure doing a huge effect on the traffic jams. Because the planning for a good road infrastructure will reduce the traffic jams. Then according to our findings the responsible people should get actions for the factors of traffic signal timings, Driving behaviour of drivers, Public transportation availability, parking facilities on the town, and then managing shops and public places accordingly. the research study on factors affecting traffic jams can provide valuable insights for policymakers, urban planners, transportation engineers, and other stakeholders involved in managing and improving transportation systems. Then finally getting continue with research on problems associated with road infrastructure and management is the most recent step to continue the process of reducing traffic jams in Kiribathgoda area.

Limitations

This is a project of 3 months. The time limitation is mostly affected for the result. And the sampling method can be somewhat bias because we use Convenience sampling. And these results are fully based on the responses of survey. Assuming a linear relationship between the predictors and the log odds we model the regression model. A threshold (often 0.5) is used to decide which class an instance belongs to. If the output of the logistic function is above the threshold.