# CHAPTER 1
# INTRODUCTION

## 1.1 Background to the Study

Traffic congestion in Phnom Penh is a pressing issue that the country has been facing for years based on a recent global evaluation conducted. Due to notorious traffic jams in Phnom Penh, a study showed that at least Increased travel time, air pollution, Reduced productivity, stress and frustration, Increased fuel consumption and costs, and Increased risk of accidents. Today's advancement in technology gives people the ability to simulate environments at a rate much faster than in the real environment.

The result of the simulated environment provides results in minutes, hours, days, or even weeks ahead of what the same experiment could provide if it were to be conducted in the real world. One of the most commonly studied systems using a computer simulation is a traffic network since experimenting with traffic in a real environment is not practical.

## *1.2* Problem *Statement*

For the purpose of developing and accessing traffic management methods, traffic simulation software has grown in importance for transportation planners and engineers. However, there are a number of difficulties and restrictions related to the usage of this software, including problems with data accuracy, computational requirements, and a constrained scope. Also, there is a need to comprehend the biases and presumptions that can be applied to the simulations as well as the possibility that these biases would affect the dependability and accuracy of the outcomes. In addition to performing case studies to assess the accuracy and dependability of the software in practical applications, this project attempts to address these challenges by conducting an extensive assessment of the literature on traffic simulation software.

The primary potential issue with traffic simulation software is data collection. In Cambodia, one example of this issue is the lack of comprehensive and up-to-date data on traffic conditions in many parts of the country, particularly in rural areas. The capital city of Phnom Penh, for instance, has some traffic monitoring systems in place, but it's possible that they don't record all the information required to precisely predict traffic conditions. Also, it's possible that

there aren't any traffic monitoring systems at all in many remote locations, which makes it challenging to get information on traffic volume, speed, and other crucial factors.

### *1.3* Aim and Objectives

The main objectives that we aim, we choose a statistical model. After the data has been gathered, a statistical model must be selected to explain the relationship between the relevant variables. Regression analysis, time series analysis, and other statistical techniques might be used in this.

Understanding the processes is necessary if we want to select a statistical model. First, you must clearly comprehend the research subject or issue you're trying to address. This will direct the selection of relevant data and a statistical model. Second, gather the information that is pertinent to the issue or query you're attempting to answer. You might need to carry out tests, run surveys, or gather data from existing sources depending on the type of data you require. Third, the data may require preprocessing to eliminate outliers, impute missing values, or alter the data to better fit the statistical model you'll be using. Fourth, choose a statistical model that is appropriate for your data and research issue. Time series analysis, cluster analysis, logistic regression, and linear regression are a few popular statistical methods. Fifth, fit the statistical model using the gathered data, which entails estimating the model's parameters. Sixth, use statistics to assess the effectiveness of the statistical model. Finally, after fitting and validating the model, conclusions or predictions about the original data can be drawn from it.

### 1.4 Rationale of the Study (Updating)

The goal of traffic simulation software is to simulate how traffic might behave on a transportation network. This can be used to forecast traffic, spot bottlenecks, and assess the effects of suggested modifications to the transportation system.

A relational analysis of traffic simulation software would look at the connections between various software suites. This could involve contrasting the functions and features of various software programs, the precision of their forecasts, and the simplicity of usage.

For engineers and planners of transportation, a relational examination of traffic simulation software may offer insightful information. It could aid them in making the best software

selection for their requirements and in enhancing the precision and effectiveness of their traffic modeling initiatives.

1.2 Limitation and Scope

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1.3 Structure of Study

Traffic simulation software is a type of computer software that is used to model the behavior of traffic on a transportation network. This can be used to predict traffic flow, identify bottlenecks, and evaluate the impact of proposed changes to the transportation network.

Macroscopic and microscopic traffic simulation software are the two primary categories:

- The behavior of individual cars on the transportation network is modeled by microscopic traffic simulation software. This kind of software can be used to anticipate traffic flow at a very specific level because it is quite comprehensive. It can, however, be incredibly computationally expensive.

- The behavior of traffic as a whole is modeled using macroscopic traffic simulation software. Software of this kind is less accurate than microscopic traffic simulation software, but it also requires less processing power. To forecast traffic flow at the regional level, macroscopical traffic simulation software is frequently utilized.

Challenges in traffic simulation software time complexity of traffic systems are very complex and can be difficult to model accurately. However, accuracy of traffic simulation software can be inaccurate, especially for macroscopic traffic simulation software. (Updating)

# CHAPTER 2

# LITERATURE REVIEW

## 2.1 The Definition of Wilderness (Writing) -> Norak Panha

## REFERENCES

[1]. Self-learning adaptive traffic signal control for real-time safety optimization.

[2]. Learning to Simulate Self-Driven Particles System with Coordinated Policy Optimization

[3]. Current rood and traffic conditions.