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**Compiling Historical Traffic Data to Power Breakthrough Insights**

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SS152

**December 18, 2017**

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# Abstract

As in many big cities in the world, traffic management dominates Metro Manila’s development challenge. The deterioration of transport and traffic condition has afflicted Metro Manila since the 1950s. Simply put, traffic woes in Metro Manila stem primarily from an insufficient road system, the rapid increase in car ownership, the lack of quality public transportation services, poor enforcement of traffic regulations and lack of discipline on the part of both motorists and pedestrians. These problems are again validated in the initial findings of the Metro Manila Urban Transportation Integration Study. In addition, there is a problem of overlapping of functions and duplication of services in view of the multiplicity of players involved in transport and traffic management in the metropolis. At present, more than 40 percent of all registered vehicles in the country are piling in Metro Manila. This represents 1.1 million private and “for-hire” vehicles. Of these, almost half are privately-owned cars and utility vehicles. A similar trend is also evident in areas adjoining Metro Manila (Manasan & Mercado, 1999).

# Introduction

* 1. Project Context

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. With the help of this process, we can mitigate safety and reliability risks, or improve overall performance.

The data can be used to gather mobility insights during a period that has historically experienced an increase in travel demand that impacts travel conditions throughout the metropolitan area. A reliable way of capturing data could be a great convenience in planning for the future, as well as a significant energy-saver.

* 1. Statement of the Problem

Accurate and reliable transportation data is critical for monitoring the performance of a transportation system, identifying problems, and making informed planning decisions. However, data for transportation planning is traditionally difficult to find, expensive to collect, and limited to specific locations and time periods depending on needs. The increasing road traffic congestion have had growing negative effects on business operations and on people. Therefore, this study intends to assist people in travel such as to determine likely travel times.

* 1. Purpose and Description

It is constantly helpful to further improve previous methods which were in some cases developed based on relatively poor information of traffic conditions. Therefore, the purpose of this paper is to understand travel conditions throughout the metropolitan areas when responding to needs and planning for the future which can effectively enhance mobility.

* 1. Objectives

This research aims to collect traffic conditions in urban areas. Thus, the objective is:

1. To retrieve traffic data to gain performance insights and understand patterns of behavior of traffic
   1. Scope and Limitations

This study will cover the traffic network for point “A” to point “B” location in Makati City, which will revolve around the people who resides, go to work, shop and do business. The gathered datasets will come from Uber Movement.



# Related Literature



Pan, Demiryurek and Shahbi from University of Southern California conducted a study entitled ‘Utilizing Real-World Transportation Data for Accurate Traffic Prediction’. Their data sets include traffic flows recorded under-pavement loop detectors as well as police reports on accidents and events. Their system acquired these datasets in real time from various agencies collecting several main traffic parameters such as occupancy, volume, and speed. They identified that certain characteristics of traffic data, such as temporal patterns of rush hours or the spatial impacts of accidents, which can be incorporated into a data-mining technique to make it more accurate. The observations made in the immediate past are usually a good indication of the short-term future. In that case, the historical observations (same day, time, and location) are better predictors of the future. Hence, the researchers enhanced an auto-regression algorithm by incorporating historical patterns and called it H-ARIMA. (Pan, Demiryurek& Shahbi, 2012)

Scofield and six other people conducted a study entitled ‘Predicting Expected Road Traffic Conditions based on Historical and Current Data’. The researchers have an Expected Traffic Information Provider system that obtains historical traffic data from external sources such as vehicle-based data sources, road traffic sensors et cetera., and stores the historical data in a database. They concluded that historical traffic data may be combined with recent traffic flow condition information in order to provide benefits such as the use of historical data to estimate accurate travel times and speeds. After obtaining and processing the historical traffic data, the researchers then analyze it to generate average traffic flow conditions information such as vehicle speed, volume of traffic for an indicated period of time et cetera. (Scofield, Cahn, Hersch, Stoppler, Yakich, Huang & Barker, 2016)

Nagda, Li, Howlett, Fan, Yang, Fay conducted a study entitled ‘Using Location Data to Determine Traffic and Route Information’ wherein their predictive database contains historical traffic data for a predetermined time frame (e.g., three days) and traffic pattern data under typical conditions. Their traffic pattern data are based on a daily or weekly cycle where it allows the user to look up information such as the average travel speed on a specific location two days ago. The researchers specified that the predictive database does not provide information based on current situation, but on past patterns. (Nagda, Li, Howlett, Fan, Yang, Fay, 2005)

Downs, Hersch, and Chapman conducted a study entitled ‘Representative Road Traffic Flow Information based on Historical Data’ wherein the researchers use a method for a computing system to facilitate navigation of roads by vehicles based on traffic flow information. Their method comprises of retrieving historical traffic data that reflects prior vehicle travel, the historical traffic data including numerous data samples that report speed at an indicated prior time. (B. Downs, S. Hersch, C. Chapman, 2006)

# Technical Background

* 1. Data collection

Data collectio**n** is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes.

* 1. Android Studio

Android Studio is the official Integrated Development Environment (IDE) for Android app development.

* 1. Java

Java is a general-purpose computer programming language that is concurrent, class-based, object-oriented, and specifically designed to have as few implementation dependencies as possible.

* 1. Firebase

Firebase is Google's mobile platform that helps you quickly develop high-quality apps and grow your business.

# Design and Methodology

* 1. Requirement Analysis

Researchers are using Quantitative Approach where the emphasis is on collecting and analyzing numerical data that can be easily compared and make an analysis on the data that is gathered in number.

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