

# Narrative of City Highways and the History of Traffic Lights

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## Abstrak

Cities and traffic jams are a common phenomenon that occurs in almost all cities in various parts of the world from ancient times to the present. Various factors trigger the emergence of traffic jams, whether caused by the growth in the number of vehicles crossing roads in the city, problems with city governance, lack of driver awareness, and others. This paper discusses the history of the beginnings of traffic lights as a solution to traffic jams in cities and order on roads. This type of research is a literature review that uses data sourced from searching various related references through books, articles and other types of scientific work. The results of the research show that historically, the forerunner to the emergence of traffic lights in their manual form began in London, England in the 19th century. In its development, electric traffic lights were discovered in 1912 in the United States.

Keywords: *public space, city, highways, congestion, traffic light*

## I. INTRODUCTION

Like an old expression in Indonesian "where there is sugar, there are ants", the phenomenon of traffic jams has always been part of the facts of daily life in various cities. The solution to traffic jams has at least been the introduction of traffic lights, although in a simple form, since the 19th century in London and then updated in a more modern form using electricity in the 1920s in the United States [1]. Starting from there, traffic lights are now considered an alternative solution to overcome congestion problems and create order on urban highways. In the rapid development of cities in the world accompanied by an increase in the number of vehicles plying the roads from year to year, traffic lights are no longer the only solution to overcome traffic jams.

In reality, there are many factors that trigger traffic jams, such as: imbalance between the area of the road and the volume of vehicles passing, poor traffic management, poor urban planning such as the location of markets on the side of the road, illegal parking on the road, lack of public awareness, drivers, and others. For this reason, people who live in cities now know the times when traffic jams occur, for example in the morning, afternoon and evening. In this way,

they often adjust their activity schedules to coincide with traffic jams so that they do not encounter problems on the highway.

A research result states that the symptoms of traffic jams in developing countries, including Indonesia, are triggered by poor traffic management and failure to control motorization, especially the growth of motorbikes. It was stated that motorization growth was 10 percent per year, only followed by road infrastructure growth of less than 1 percent per year. Apart from that, it was also explained that human error is the main cause of many traffic accidents and fatalities [2].

Another research result entitled "Motorization in Asia", namely a study conducted in 14 countries in Asia regarding the motorization of passenger cars and motorbikes for 20 years, namely 1980 to 2000, mentions the growth rate of motorization. There are two groups of countries which according to him were detected to have significant differences in motorization speed, namely Sri Lanka, India, Nepal, Philippines, Pakistan, Indonesia and Thailand. This group of countries is said to have a higher motorization speed compared to other countries. Another group of countries are three metropolitan areas in Southeast Asia, namely

Jabotabek (Indonesia), Kuala Lumpur (Malaysia), and Manila (Philippines). The results of this research also state that car and motorbike ownership is independent in Jabotabek and Manila, but is negatively correlated with Kuala Lumpur. From the results of this research, it is also concluded that in general income has more influence on car ownership than motorbike ownership [3].

The problem of the growth and use of motorized vehicles in relation to factors causing traffic congestion is also interesting to relate to the results of research with case studies of China, Japan and Indonesia. The growth in motor vehicle ownership is said to be something that cannot be avoided as a result of increasing income. Apart from that, it is related to public policies regarding the allocation and use of road space, transportation subsidies, and transportation system investment [4].

Various facts that show how complex traffic problems are on city highways encourage us to want to know the history of the development of these traffic problems and the history of the emergence of traffic lights which are considered a crucial solution. There are at least two main things that are important to discuss in this paper, namely the origin of the application of traffic lights as a solution to congestion on city highways and the development of their use. This discussion becomes the basis for arguments in assessing the phenomenon of congestion as a normal part of city development or a reflection of poor transportation management and city spatial planning.

## II. RESEARCH METHOD

This research is a qualitative [5] type of literature review which uses data sourced from books, scientific articles in journals, popular scientific articles, and other types of literature. The type of research data is secondary data, where the method of collection is carried out through the stages of library study (reading, recording and managing data), source criticism (selecting relevant data, comparing related references) and data analysis in the form of content analysis as material to describe it in the discussion research result [6]. Research through literature reviews is a relevant research method amidst today's fast knowledge production process. Traditional literature reviews are considered to be often less thorough and

sometimes carried out ad hoc, and do not follow a specific methodology [7].

## IV. RESULT AND DISCUSSION

### *The Importance of Traffic Lights*

Traffic lights have an important role and are an inseparable part of urban life, especially human activities on the highway [8]. You can imagine how chaotic a city with a very dense number of vehicles would be without a regulatory system called traffic lights which would definitely result in massive traffic jams. In Indonesia, this traffic control device is also known as a traffic signal device which functions to regulate and control traffic flow. This tool is installed at road intersections and pedestrian crossings.

Due to its very important function, traffic lights are often also referred to as security and safety lights for road users. It is often said that those who always obey traffic rules tend to avoid accidents on the road, whereas those who violate the rules usually have accidents. In many cases, individuals who break through stop signs (red) traffic lights experience accidents due to collisions. Some of them only suffered injuries and some also died.

### *The Origin of Traffic Lights*

History records that traffic lights, in their simple and manual form, were first discovered in London, England in the 19th century. As is known, London once emerged as the record holder for the worst city for its traffic management which caused extraordinary congestion. The capital of England holds the title of being the twenty-fifth most congested city in the world. At that time, it was recorded that there were 13 thousand vehicles operating on the city's roads.

Congestion in London in the 19th century was reviewed in a book by British historian Liza Picard entitled "Victorian London: The Tale of a City 1840-1870". This 496 page book, published by Phoenix House, is a representative picture of the author who is very interested in the realities of everyday life and the living conditions of many people. According to this alumnus of the London School of Economics and Political Science and born in Britain (1927), phenomena of urban life like this are often ignored in historical studies [9].

According to the British Broadcasting Corporation (BBC), horse-drawn carriages and pedestrians have crowded the streets of London [10]. This led British Railways manager John Peake Knight to recommend adapting the methods normally used by railways to control road traffic [11]. It was also stated that through the adaptation method traffic signals will display "stop" and "go" signs during the day and at night red and green lights will be used. In this traffic control system, a gas lamp will be installed to illuminate the sign, then a police officer will be stationed not far away to operate it.

Still from the same source, it is explained that the world's first traffic signal was installed on December 9, 1868 at the intersection of Bridge Street and Great George Street in the Westminster area, London, not far from the Houses of Parliament, Westminster Bridge [12]. It's just that a tragic incident occurred just a month after its operation, namely that a police officer in charge of controlling the signal was seriously injured due to a lamp exploding due to a gas leak. Since the incident, this tool has been considered by many groups to be dangerous, so its use was eventually removed.

#### *Development of traffic lights*

In its development, the manual version of the traffic light was then replaced by a new invention, namely the electric traffic light which was introduced by Lester Farnsworth Wire in Salt Lake City, North America [13]. The United States introduced traffic lights in 1912, which initially only had two colors, namely green (move) and red (stop). In subsequent developments, traffic lights continued to be modified until they finally found their modern form. In a book entitled "How the Automobile Change History" written by Diane Bailey, it is stated that the first modern lights were installed at the intersection between Euclid Avenue and East 10th Street, Cleveland, Ohio, United States. In this 112-page book published by Abdo Publishing, the history of automotive is explained by examining the beginning of the car as a motorized train, how it works, and its evolution to become the main form of transportation in the world due to cultural, industrial and environmental influences [14].

In subsequent developments, traffic lights not only function as a means of controlling traffic flow, but later became a legal product in the United States called the Federal Aid Road Act

[15]. This federal highway funding law was first passed on June 11, 1916, which was intended to provide legal legality so that it could function optimally for all communities on the highway [16].

Modifications to this traffic control device later occurred in its development, namely the addition of a function, namely a yellow light as a warning signal. This caution signal was introduced by Garret Morgan in 1916. Since then, traffic lights have had three colors, namely red, a stop signal, green, a moving signal, and yellow, a warning signal [17]. History records that the leader of the African-American community [18], whose full name was Garret Augustus Morgan, initially used these three-colored traffic signals in the rescue action of a tunnel construction disaster in 1916.

Another method for regulating the use of traffic flow on highway sections other than traffic lights is to provide a center line on the road to separate left and right and prohibit left turns. In a book written by Christopher Finch entitled "Highways to Heaven: The Autho Biography of America" it is explained that the dividing line painted in the middle on the first road appeared in Michigan in 1911 and the no left turn sign was first introduced in Buffalo, New York in 1916. In this book, which also explains innovations in car construction design and railway management, it also needs to be managed well. It even explains the importance of safety and that this is not a simple matter. Thus, the use of new safety devices, namely air brakes and screws, was also introduced [19].

The discovery of traffic control devices, namely traffic lights in their simple and manual form until they found their modern form in the electric light version, is indeed one solution to traffic jams on city roads. However, it turns out that the problem is not that simple and is even very complex as time goes by. Several research results explain that the trigger for traffic jams in cities in the world, including in Indonesia, is caused by many factors, including: the imbalance between increasing the number of vehicle uses and improving road infrastructure, poor transportation management, lack of awareness of road users, and others. This last factor arises partly because officers are less strict in enforcing the rules for drivers who violate traffic rules. As a result, many people dare to commit violations such as breaking through traffic lights at stop signs, going against the flow of the road, and other causes.

## V. CONCLUSION

Congestion on the highway is a common phenomenon found in almost all cities in the world and has started and continues for a long history. It has been proven that since the 19th century, London has been listed as the twenty-fifth most congested city. This condition encouraged the creation of traffic control devices starting from a very simple and manual form. In the manual version and operated by a police officer, it was later deemed dangerous and was proven in the gas explosion incident which caused the officer to suffer injuries. In its development, a modern version of traffic lights was created that uses electricity.

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