

CHAPTER I

INTRODUCTION

A. Background

There is no doubt that the quality and efficiency of roads affect the quality of life, health of the social system and continuity of the economic and business activity. Deterioration and catastrophic failure of these roads may occur because of aging, overuse, misuse and/or mismanagement. Therefore, their maintenance and preservation should have a great national interest.

Road infrastructure is affected by climatic factors and burdened by high traffic volume and repeatedly causes a decrease in road quality. As the indicator can be known from the road surface conditions, both structural and functional conditions suffer damage. Road surface conditions and other parts of the road need to be monitored to determine the condition of the road surface which suffered the damage. Poor drainage causes early pavement distresses leading structural failures. Preliminary research on the condition of the road surface is conducted visually with meaningful survey by looking and analyzing the damage based on the type and extent of the damage to use as a basis for conducting maintenance and repair activities.

Assessment is done to know and classify the types of damage to road pavement, and to analyze the density of pavement damage due to climate and effort improvements. Assessment of pavement damage density is the most important aspect in terms of determining road maintenance and repair activities. To analyze the density of the pavement damage, it is necessary to first determine the types, causes, and extent of the damage that occurred.

The importance of good road pavement construction conditions is sought able to meet the requirements of climate condition, traffic and structural requirements. For the thick pavements, deterioration and hence maintenance is largely traffic related. For the lighter rural pavement, it is much more climate related together with poor initial construction standards.

The condition of the structural requirements of road pavement construction is considered from the ability to bear and spread the load and also to resist the climatic change effects. Jl.Gajahan No.14 - Jl.Merdeka No.9 does not fulfill the condition because it is suffered from a lot of damaged, collapsed, grooves, holes, cracks, and surface deformed.

Transport infrastructure faces two major types of climate related risks: Long-term changes in the climate, particularly temperature and precipitation; and “Shock events” such as flooding and landslides which as shown above are occurring with increased frequency and intensity. To address these challenges, countries need to adapt the way they operate, maintain, upgrade, and expand the many assets that make up a road network.

In meeting the demands to improve a good maintenance system, the Department of Public Transport has developed a road maintenance system National and Provincial Roads supported by the designed equipment specifically for this activity, namely Routine Maintenance Unit (UPR). To be able to arrange a routine maintenance program and how to handle it complete field data support is required that can be obtained through a survey of road conditions. The road condition survey is done visually, is to look directly at the type and type of damage, so the results obtained from such observations may collect accurate and reliable data determined how to fix it.

B. Problem Statement

Based on the background above, the problems in this research can be written as follows:

1. What is the type of damage that occurred Jl.Gajahan No.14 - Jl.Merdeka What is the Result of the road damage density due to climatic factors that occurred on Jl.Gajahan No.14 - Jl.Merdeka?
2. What is the quality of drainage system in the segment Jl.Gajahan No.14 - Jl.Merdeka?
3. What is the Result of the road damage density due to Heavy Vehicle load that occurred on Jl.Gajahan No.14 - Jl.Merdeka ?

C. Objectives of Research

1. To analyze the road damage density on the definition road segment type, dimension and severity.
2. To analyze the quality of drainage on the definition road segment.
3. To analyze the Heavy Vehicles, load factor on the definition road segment.
4. To analyze road damage reason by comparing the previous result.

D. Product Knowledge and Output

This research is expected to analyze the relation of road damage due to climate, load and drainage quality to improve the road segments to be able to provide levels of service.

E. Benefits of Research

Knowing and classify the types of damage to road pavement, and to analyze the density of pavement damage due to climate and effort improvements. Assessment of pavement damage density is the most important aspect in terms of determining road maintenance and repair activities. To analyze the density of the pavement damage, it is necessary to first determine the types, causes, and extent of the damage that occurred.

F. Research Limitation

The limitations of this research are:

1. For alternative handling of road damage with Bina Marga method from the Directorate General of Highways.
2. This research was conducted on flexible pavement only.
3. Use analysis method with excel application only.
4. Bad weather, heavy traffic.

G. Originality of Research

As far as the author knows, this research has not been conducted before. However, similar research has been done by Darmawan (2005) about Road Damage Evaluation and Alternative Handling with Approach of Bina Marga Method (Case Study of Sragen – Gemolong Road Section Km 5 + 500 – Km 16 + 500). Another similar study has been conducted by Budiyo (2012) under the title “Analisa Kerusakan Jalan Dengan Metode PCI Dan Alternatif Penyelesaiannya (Studi Kasus Ruas Jalan Purwodadi – Solo Km 12+000 – Km 24+000)”. Another similar study has been conducted by Ihab Al-Smadi (2018) under the title “Road Damage Analysis With Pci Method And Alternative Solutions (Case Study Joint) Streets of Adi Sumarmo - Solo Km 0+000 - Km 2+000”. The similarities and differences with the previous research:

1. Similarities with Similar Research

The similarity is calculating density using PCI method.

2. Differences with Similar Research

In this study, the data is taken from Jl.Gajahan No.14 - Jl.Merdeka in April 2019 and just calculating the density of the road damage due to climatic factors, which is different from the latest concluded research of Anas Majdi (2018).