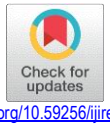
International Journal of Innovative Research in Engineering
Volume 4, Issue 3(May-June 2023), PP: 227-229.
www.theijire.com ***ISSN No: 2582-8746***

Development of Pavement Condition Index for Local Street of Pune

S.S.Kori[1], Supriya Patil[2], Jui Borse[3], Priyanka Suryawanshi[4], Manisha Borhade[5]
[1] *Professor, Civil Department, JSPM's Imperial College of Engineering and Research, Maharashtra, India.*
[2,3,4,5] *Civil Department, JSPM's Imperial College of Engineering and Research, Maharashtra, India.*

How to cite this paper:
S.S.Kori[1], Supriya Patil[2], Jui Borse[3], Priyanka Suryawanshi[4], Manisha Borhade[5]. "Development of Pavement Condition Index for LocalStreet of Pune", IJIRE-V4I03-227-229.



https://www.doi.org/10.59256/ijire.2023040379

Abstract: *The project titled "Development of Pavement Condition Index for LocalStreets of Pune" aims to assess the condition of local streets in Pune and developa comprehensive and reliable index to measure pavement condition. The study involves field surveys to collect data on pavement distress and distress severity, followed by data analysis and the development of a new pavement condition index (PCI) specific to the local streets in Pune. The proposed index is expected to provide a standardized and objective approach for evaluating pavement conditions and prioritizing maintenance and repair activities. The study is expected to contribute to the development of more efficient and effective pavementmanagement strategies for local streets in Pune, ultimately leading to improved road safety, reduced maintenance costs, and increased user satisfaction.*

Key Word: *Pavment Condition index (PCI).*

I.INTRODUCTION

The condition of roads and streets is a critical factor affecting transportation efficiency, safety, and user satisfaction. In urban areas, local streets form a significant portion of the road network and serve as essential links between residential areas, commercial centers, and public facilities. The pavement condition of these streets can deteriorate over time due to traffic loads, weather conditions, and inadequate maintenance. To ensure the smooth and safe operation of the road network, it is essential to evaluate the condition of local streets periodically and prioritize maintenance and repair activities based on objective and reliable indicators. The present study focuses on the development of a pavement condition index (PCI) for local streets in Pune, a rapidly developing city in India. The proposed index aims to provide a comprehensive and standardized approach to assessing the pavement condition of local streets in Pune and prioritizing maintenance and repair activities accordingly. The study involves field surveys to collect data on pavement distress and distress severity, followed by data analysis and the development of a new PCI specific to the local streets in Pune. The proposed index is expected to contribute to the development of more efficient and effective pavement management strategies for local streets in Pune. The study is significant as it can provide decision-makers with objective and reliabledata for prioritizing maintenance and repair activities, ultimately leading to improved road safety, reduced maintenance costs, and increased user satisfaction.

II.METHODS

A. VISUAL EVALUATION Visual evaluation is a simple method Distresses (Alligator cracking, Longitudinal and transversecracking, Bleeding, Pothole, Patching, Ravelling, Rutting) are visually noted and recorded.

B. FUNCTIONAL EVALUATION Based on Riding quality (road roughness), Pavement distresses and Skid resistance. Surfacedistresses are actually measured in smaller representative stretches.

Pavement Condition Rating (PCR) The IRC: 82-2015 gives guidelines for Practice of Maintenance of Bituminous Road. For a Highway, the IRC guidelines asks to collect measurement of following pavement distresses through observations; cracking, ravelling, potholes, shoving, patching, settlement and rut depth. based on the measured distresses the standard condition is as below table 5.1

(i) It provides a measure the present condition of pavement.

(ii) Provides an objective and rational basis for determining maintenance and repair needs.

(iii) Used to establish the rate of pavement deterioration for early identification of rehabilitation needs.

After assigning rating to each parameter, an appropriate weightage is given to rating value of each parameter for

calculation ofWeighted Rating Value for each parameter.

The Final Rating Value is calculated by taking the average of the Weighted Rating Values of all parameters viz. cracking, ravelling,potholes, shoving, patching, settlement and rut depth.

Table 5.1: Pavement Distress Rating

Defect(type)	Range of Distress		
Cracking (%)	>10	5 to 10	<5
Ravelling (%)	>10	1 to 10	<1
Pothole (%)	>1	0.1 to 1	<0.1
Shoving (%)	>1	0.1 to 1	<0.1
Patching (%)	>10	1 to 10	<1
Settlement & Depression (%)	>5	1 to 5	<1
Rut depth in mm	>10	5 to 10	<5
Rating	**1**	**1.1 – 2.0**	**2.1 – 3.0**
Condition	**Poor**	**Fair**	**Good**

Table 5.2:Pavement Distress Weightage

Defect(type)	Range of Distress		
Cracking (%)	>10	5 to 10	<5
Ravelling (%)	>10	1 to 10	<1
Pothole (%)	>1	0.1 to 1	<0.1
Shoving (%)	>1	0.1 to 1	<0.1
Patching (%)	>10	1 to 10	<1
Settlement & Depression (%)	>5	1 to 5	<1
Rut depth in mm	>10	5 to 10	<5
Rating	**1**	**1.1 – 2.0**	**2.1 – 3.0**
Condition	**Poor**	**Fair**	**Good**

III.OVERVIEW

The project titled "Development of Pavement Condition Index for Local Streets of Pune" aims to develop a comprehensive and reliable index to measure pavement condition for local streets in Pune, India. The project involves field surveys to collect data on pavement distress and distress severity, followed by data analysis and the development of a new pavement condition index (PCI) specific to local streets in Pune. The proposed index is expected to provide a standardized and objective approach for evaluating pavement conditions and prioritizing maintenance and repair activities.

The project is significant as it can contribute to the development of more efficient and effective pavement management strategies forlocal streets in Pune, ultimately leading to improved road safety, reduced maintenance costs, and increased user satisfaction. The new PCI can provide decision- 3 | P a g e makers with objective and reliable data for prioritizing maintenance and repair activities, which can help in developing a cost-effective and sustainable maintenance strategy for local streets in Pune.

The project will involve a multidisciplinary team comprising of civil engineers, data analysts, and field surveyors. The team will conduct field surveys to collect data on pavement distresses and use statistical methods and data analysis tools to develop the new PCI. The project's outcomes will include a detailed report on the pavement condition of local streets in Pune, a new PCI specific to local streets in Pune, and recommendations for prioritizing maintenance and repair activities based on the PCI.

Overall, the project is expected to make a significant contribution to the development of sustainable and efficient pavement management strategies for local streets in Pune, ultimately improving road safety and user satisfaction.

IV.PROPOSED SYSTEM

The proposed system for the "Development of Pavement Condition Index for Local Streets of Pune" project involves the following steps:

Field Surveys: The project team will conduct field surveys to collect data on pavement distress and distress severity for local streetsin Pune. The surveys will be conducted using advanced technology such as lasers, GPS, and cameras to collect accurate and detaileddata on pavement distresses such as cracking, potholes, and rutting.

Data Analysis: The collected data will be analyzed using statistical methods and data analysis tools to identify patterns and trends in pavement distresses. The team will develop a new pavement condition index (PCI) specific to local streets in Pune based on the analysis.

Validation: The proposed PCI will be validated using additional field surveys and data collected from different parts of Pune. The validation will ensure that the new PCI is reliable, accurate, and consistent in assessing pavement conditions for local streets in Pune.

Implementation: The proposed PCI will be implemented to assess pavement conditions for local streets in Pune. The PCI will be used to prioritize maintenance and repair activities based on the pavement condition.

V.CONCLUSION

In conclusion, the "Development of Pavement Condition Index for Local Streets of Pune" project is significant in developing a comprehensive and reliable index to measure pavement condition for local streets in Pune, India. The proposed system involves field surveys, data analysis, validation, implementation, and recommendations for sustainable and efficient pavement management strategies.

The new PCI specific to local streets in Pune will provide a standardized and objective approach for evaluating pavement conditions,which can contribute to the development of sustainable and efficient pavement management strategies

for local streets in Pune. The new system can provide decision-makers with objective and reliable data for prioritizing maintenance and repair activities, ultimately leading to improved road safety, reduced maintenance costs, and increased user satisfaction.

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