Analysis of Existing Road Surface on the Basis of Pothole Characteristics

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Abstract

This project will help to classify the condition of road pavement surface on the basis of characteristics of pothole namely depth, area and volume. Now a days in India there is no specific criteria for road maintains and road construction. Due to no specific criteria any representatives do unnecessary reconstructions or maintenance and vice versa. There is a need for a specific criterion for limiting the expenses made on this. There is need for developing such classification criteria for making choices regarding the maintenance of roads. In this project firstly we select the road and collected the information about there characteristics such as area, volume, depth and perimeter of pothole by using traditional methods but for area we use the android software in which by taking a photograph it will give us the area and perimeter of pothole.

Index terms—

1 Introduction

oads make important contribution to economic development and growth and bring important social benefits. They are of vital importance in order to make a nation grow and develop. In addition, providing access to employment, social, health and education services makes a road network crucial in fighting against poverty. Roads open up more areas and stimulate economic and social development. For those reasons, road infrastructure is the most important of all public assets. A good transport system plays an important role for development of country. Such transport system consists of Asphalt, Concrete or combination of both in proportion. This system may have many defects such as potholes unevenness of manholes with road, skid resistance i.e. friction, improper drainage considerations and deflection. Pavement fail because of many factors, there are four primary reasons pavement fail prematurely. Failure in design, construction, materials and maintenance. There are different types of problems creating on existing road surfaces like as cracking, rutting, potholes and delimitation The major impact of the maintenance will be in the form of area improvement, reduction in vehicle operating costs and travel time, performance of certain core sectors (cement, steel, construction equipment) and employment generation

The formation of potholes is degenerated by low temperatures, as water expands when it freezes to form ice, and puts greater stress on an already cracked pavement or road. Once a pothole forms, it grows through continued removal of broken chunks of pavement. If a pothole fills with water the growth may be accelerated, as the water "washes away" loose particles of road surface as vehicles pass. Potholes can grow to feet in width, though they usually only become a few inches deep, at most. If they become large enough, damage to tires and vehicle suspensions occurs. Serious road accidents can occur as a direct result, especially on motorways where vehicle speeds are greater. Potholes begin after snow or rain seeps into the soil below the road surface.

It is important to distinguished the types of potholes in order to choose the most suitable treatment and assign the appropriate property. Some jurisdiction classifies the potholes severity and assign priority levels based solely on their depth. Hence, we are dealing with potholes characteristics such as area, length, volume, depth. There are several reasons for potholes formation such as environmental, traffic loading and road pavement type and materials used for construction.

? Objective To study the pothole characteristics namely depth, area, volume and according ? to the characteristics of pothole to classify the road.

? To develop an index on the basis of pothole characteristics which will give guideline for maintenance and reconstruction of road.

II.

2   Methodology

Global Journal of Researches in Engineering ( ) Volume XIx X Issue III V ersion I going to analysis it's depth, area, volume and classify them according to collected information and use this for maintenances purpose or for reconstruction. Firstly, we are going to find the depth of potholes. The method used for its calculation is taking a thread and scale for measuring depth, arrange the thread parallel to the road surface from one end of pothole to other end of pothole and tight the thread. Then put the scale perpendicular to the thread and note down the depth of it at different position. The position at which we get highest reading of depth is consider as the depth of that pothole.

Secondly, after this we are taking the measurement of volume of potholes. For this we are using two methods for small size potholes we are taking polythene and pouring water in it up to the surface level and taking this water in measuring cylinder to calculate volume of particular pothole, according to the depth of water in cylinder and area we have getting its volume.

Another method used for large size potholes. In this firstly are going to cover this pothole by cloth. And then pour the sand up to the road surface and remove this sand and place in container. Then by using volume container we will get the volume of large pothole.

For area, we are taking the photos of pothole at a fixed level and using android application known as "Sketch and Curves" we will get the accurate area of that pothole. Sketch And Calc TM is the application capable of calculating areas of uploaded images. 1. To calculate the area of a pothole, import the image from main menu in the top right corner, or paste an image saved in the clipboard. 2. Identify and draw the 'known length' using the rule tool from the toolbar. 3. Enter the known length and chosen measurement system, then submit with the tick. 4. With the scale now set, select 'add to canvas' to begin drawing your area. 5. After completing the drawing, we will get the perimeter of the draw area on field and its field area. 6. By taking the reference from various industry experts, engineers, professors we will assign a reaction number for the specific ranges of area & volume to decide the severity scale for the characteristics of various potholes and assessment of road condition. By combining the area and volume characteristics data to determine the severity index for road pavements. 7. After that we will classify the pothole severity and assign the priority levels which helps to analysis the pavement of existing roads on scale such as tolerable, discomforting, intense, extreme and very severe. Classification of characteristics of pothole and assign them the priority levels will serve as a selection factor for the maintenance and reconstruction of the pavement.

III. According to the calculation by the priority method the results for different roads are as follow:

3   Analysis of Data

For case study 1, X =157.61 For case study 2, X =125.15 For case study 3, X =95.48 For case study 4, X =187.39 For case study 5, X = 226.57 IV.

4   Conclusion

From the survey and result, we got the reaction number for the different ranges of area, volume and depth & values for the priority of different roads mentioned in the case studies we have provided the different priority for roads

5   Priority order

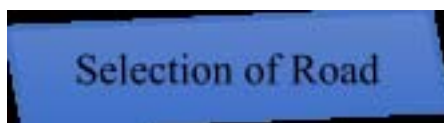Range of rating

6   Results

Volume [1] [2]

Figure 1:

6 RESULTS

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94   *For Case Study 3: X=95.48, the above road is Discomforting form the above order. For Case Study 4:*
95   *X=187.39, the above road is Extreme form the above order*, (For Case Study 5: X=226.57, the above road is
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