

Use of the Digital Image Analysis in Determination of Deterioration of Thermoplastic Road Marking

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Abstract

Road safety is a major component of the highway sector and it should be well considered in highway planning, designing, construction and maintenance. The visibility of road marking is essential for efficient traffic flow and road safety. There are complaints that road markings of many roads in Sri Lanka have poor visibility and no effective remarking process in action. The major reason for the poor visibility is the low reflection levels of road markings. The visible area of road marking is the main factor for visibility. It is necessary to determine the deterioration patterns of road marking to maintain an adequate remaining area of road marking on the road surface. However, there is no guideline or methodology available for road agencies in Sri Lanka to follow when deciding on the road marking repainting period. It is difficult to allocate funds, resource management along with stock material, manpower and machinery utilization in the most effective manner without a well-established guideline. The main objective of this research is to obtain a comprehensive study of digital image analysis in the determination of deterioration rate of lane marking which will help to; identify the optimum frequency of time for repainting. The measurements are taken in the selected section on Colombo - Horana (B084) road, Etulkotte - Mirihana - Kohuwela (B120) road, Galagedera - Horana (B123) road and Colombo - Galle - Hambanthota - Wellawaya (A002) road which are considered as urban roads. Digital images are captured on specific locations over a considerable period of time such as one month for deeply analyzing purposes on Colombo - Horana road. The GPS coordinates are checked to verify the specific locations. The relationships between the time period and the remaining area of paint are developed based on digital photo-based measurements according to types of lane marking. The software of 'ImageJ' is used to analyze digital photos. The percentages of road marking remaining areas are taken using the software. The mathematical relationships between percentages of remaining areas of road marking on different types of lanes with respect to the time period after the initial application of thermoplastic paint are found by using digital image analysis. The behaviour of road marking wearing pattern is also be found relevant to the type of lane marking with respect to time period.

Keywords: *visibility of road marking, deterioration of road marking, digital image analysis*

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