

A Study on the Quantitative Evaluation Method of Asphalt Pavement Condition through the Visual Investigation

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Abstract : In recent years, due to the environmental impacts and time factor, etc., various type of pavement deterioration is increasing rapidly such as crack, pothole, rutting and roughness degradation. The Ministry of Land, Infrastructure and Transport maintains regular pavement condition of the highway and the national highway using the pavement condition survey equipment and structural survey equipment in Korea. Local governments that maintain local roads, farm roads, etc. are difficult to maintain the pavement condition using the pavement condition survey equipment depending on economic conditions, skills shortages and local conditions such as narrow roads. This study presents a quantitative evaluation method of the pavement condition through the visual inspection to overcome these problems of roads managed by local governments. It is difficult to evaluate rutting and roughness with the naked eye. However, the condition of cracks can be evaluated with the naked eye. Linear cracks (m), area cracks (m²) and potholes (number, m²) were investigated with the naked eye every 100 meters for survey the cracks. In this paper, crack ratio was calculated using the results of the condition of cracks and pavement condition was evaluated by calculated crack ratio. The pavement condition survey equipment also investigated the pavement condition in the same section in order to evaluate the reliability of pavement condition evaluation by the calculated crack ratio. The pavement condition was evaluated through the SPI (Seoul Pavement Index) and calculated crack ratio using results of field survey. The results of a comparison between 'the SPI considering only crack ratio' and 'the SPI considering rutting and roughness either' using the equipment survey data showed a margin of error below 5% when the SPI is less than 5. The SPI 5 is considered the base point to determine whether to maintain the pavement condition. It showed that the pavement condition can be evaluated using only the crack ratio. According to the analysis results of the crack ratio between the visual inspection and the equipment survey, it has an average error of 1.86%(minimum 0.03%, maximum 9.58%). Economically, the visual inspection costs only 10% of the equipment survey and will also help the economy by creating new jobs. This paper advises that local governments maintain the pavement condition through the visual investigations. However, more research is needed to improve reliability. Acknowledgment: The author would like to thank the MOLIT (Ministry of Land, Infrastructure, and Transport). This work was carried out through the project funded by the MOLIT. The project name is 'development of 20mm grade for road surface detecting roadway condition and rapid detection automation system for removal of pothole'.

Keywords : asphalt pavement maintenance, crack ratio, evaluation of asphalt pavement condition, SPI (Seoul Pavement Index), visual investigation

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