

## GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES PERFORMANCE EVALUATION OF NATIONAL HIGHWAY PREVENTIVE MAINTENANCE USING BPT

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### ABSTRACT

Currently, national highways are difficult to apply preventive maintenance method due to severe fluctuation of public performance depending on the pavement condition, climate (region) condition, and traffic condition. As result, the preventive maintenance method is applied from 2007 to present, and the road pavement condition evaluation is carried out every year. At the present, preventive maintenance method in the PMS (pavement management system) of the national highway is applied only to the section of less than 1,000 (number / day) of the dual lane road and the converted lane ESAL (Equivalent Single Axial Load), and the quality standard and the construction method are studying. In this paper, the slip resistance test was conducted to evaluate the performance of each section according to area and construction method.

**Keywords:** *Pavement Management System, Maintenance, National Highway, British Pendulum Tester.*

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### I. INTRODUCTION

Recently, the increase in road managers and the increase in the volume of cargo has caused a rapid increase in damage caused by road pavement. In Korea, as a part of preventive maintenance from 2007 to present, it is applied to the section where the function is deteriorated or the pavement breakage is continuously occurred by the micro-surfacing and polymer slurry sealing method. This is known as a way to reduce the cost of road pavement maintenance and improve the road function. In this paper, we conducted the evaluation of about 40 precautionary maintenance sites located throughout the country and analyzed the results.

### II. SELECTION OF THE PUBLIC PERFORMANCE EVALUATION SECTION

In this study, we collected the information of the sections constructed by the preventive maintenance method, and conducted the performance evaluation in about 40 sections considering the yearly deviations. As a result, the BPN (British Pendulum Number) at the time of drying and wetting was compared using BPT (British Pendulum Tester) as shown in Fig. 1 and Fig. 2. Some sections have been reworked with regular asphalt, and some sections have surface defects such as severe cracks and delaminations that require reworking.



*Figure 1BPT equipment*



*Figure 2BPT experiment*

III. ANALYSIS OF SLIP RESISTANCE TEST RESULT

The results of the slip resistance test are summarized in Fig. 3 and Fig. 4. The average slip resistance for each method shows that the difference between the dry state and the wet state BPN of the microsheet facing method is slightly higher than the BPN difference of the polymer slurry method except for 2014. In addition, the average of the sections constructed between 2010 and 2015 shows that the longer the construction year, the greater the difference in BPN. From 2007 to 2009, it is difficult to analyze the same data because there is no section where the BPN difference is relatively large.

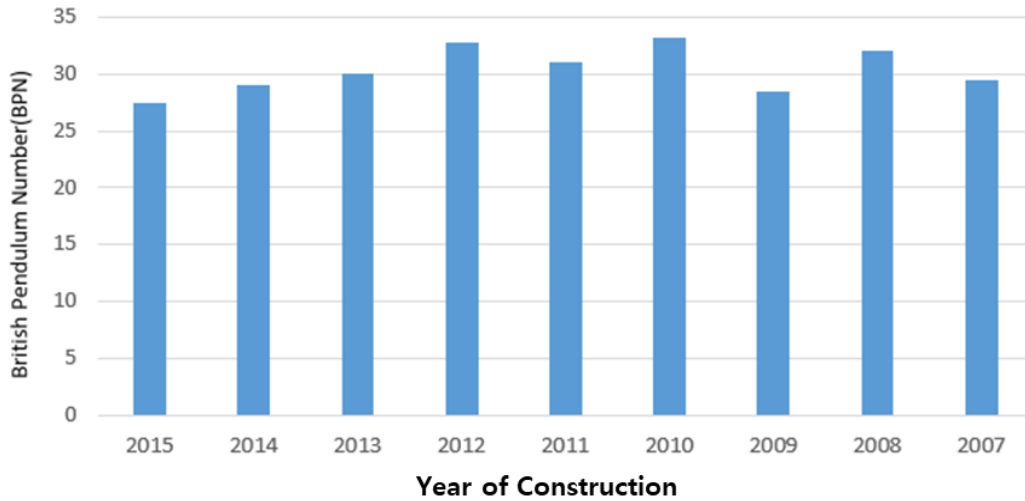


Figure 3 Maintenance method slip resistance average by year

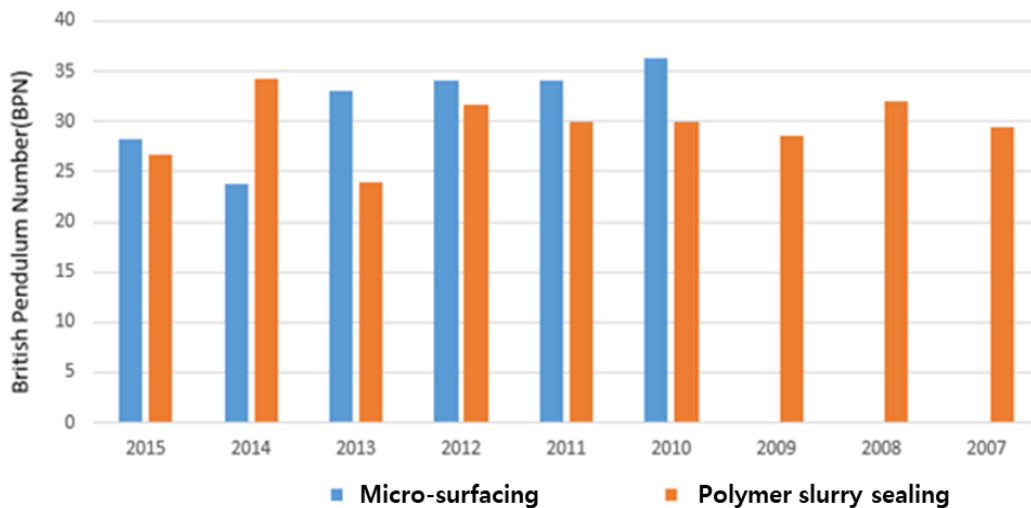


Figure 4 Maintenance method average by slip resistance

#### **IV. CONCLUSION**

In this study, the publicity survey of 40 sections with preventive maintenance method was conducted. The data were analyzed by year and method, and the following results were obtained.

1. For the sections constructed from 2010 to 2015, the BPN difference tended to increase as the construction year became longer.
2. In the case of the polymer slurry sealing, the deviation by the year was not large. In the case of the micro-surfacing, the BPN difference tends to increase as the construction year becomes longer.
3. Future monitoring will be conducted to evaluate the effectiveness of the preventive maintenance method.

#### **V. ACKNOWLEDGEMENTS**

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