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ABSTRACT

This paper proposes an Analytic Hierarchical Process (AHP) theory based method to determine the weight of the decision-making influence factors, considering their relative significance and generating an overall ranking for each road section. A case study on the highway network maintenance priority was conducted to illustrate the proposed procedure. A total of five pavement maintenance decision-making related factors were considered in the study, including pavement performance, pavement structure strength, traffic loads, pavement age and road grade. The weightings of the five factors were quantified through AHP method. Then, the comprehensive ranking index value Ui was determined, which indicated the maintenance priority of a road section in network level decision-making. From the aspect of maintenance cost, the sensitivity analysis results were in accordance with the weightings of different maintenance decision-making factors. The pavement maintenance cost was significantly sensitive to the change of pavement performance. The case study clearly demonstrated the applicability and rationality of the AHP theory based decision-making method and it can be used as a guideline for pavement maintenance agencies.