Use of an analytical hierarchy process in pavement maintenance priority ranking

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Abstract: This paper describes the use of an analytical hierarchy process (AHP) in determining the rational weights of importance of pavement maintenance priority ranking factors. These weights were obtained by capturing the local people's perception towards this vital part of the pavement management system (PMS). In this regard, different groups of individuals were asked to estimate the weight of importance in pavement maintenance of different factors for ranking pavement sections. These factors were road class, pavement condition, operating traffic, riding quality, safety condition, maintenance cost, and the overall importance of the road section to the community. The AHP method of pair-wise comparison was employed to get the factor weights, which were compared with the weights obtained from the direct assignment method. It was concluded that the two methods were statistically similar which confirms that the results of the direct assignment method can be used safely with a sound reliability and consistency. This conclusion comes from the fact that the AHP method has a high reputation and applications, and it uses a high-precision technique for obtaining the weights (priorities) of alternatives or items. Priority factor weights were used in developing a pavement maintenance priority ranking procedure for a road network. This procedure was validated by real case studies, and found to be logically and efficiently able to handle the ranking of a huge number of pavement sections for maintenance and repair.