

Framework for Incorporating Environmental Performance in Network-Level Pavement Maintenance Program

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Abstract : The reduction of material consumption and greenhouse gas emission when maintain and rehabilitating road networks can achieve added benefits including improved life cycle performance of pavements, reduced climate change impacts and human health effect due to less air pollution, improved productivity due to an optimal allocation of resources and reduced road user cost. This is the essence of incorporating environmental sustainability into pavement management. The functionality of performance measurement approach has made it one of the most valuable tool to Pavement Management Systems (PMSs) to account for different criteria in the decision-making process. However measuring the environmental performance of road network is still a far-fetched practice in road network management, more so an ostensive agency-wide environmental sustainability or sustainable maintenance specifications is missing. To address this challenge, this present research focuses on the environmental sustainability performance of network-level pavement management. The ultimate goal is to develop a framework to incorporate environmental sustainability in pavement management systems for network-level maintenance programming. In order to achieve this goal, this paper present the first step, the intention is to review the previous studies that employed environmental performance measures, as well as the suitability of environmental performance indicators for the evaluation of the sustainability of network-level pavement maintenance strategies. Through an industry practice survey, this paper provides a brief forward regarding the pavement manager motivations and barriers to making more sustainable decisions, and data needed to support the network-level environmental sustainability. The trends in network-level sustainable pavement management are also presented, existing gaps are highlighted, and ideas are proposed for network-level sustainable maintenance and rehabilitation programming.

Keywords : pavement management, environment sustainability, network-level evaluation, performance measures

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