

Environmental Performance Measurement for Network-Level Pavement Management

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Abstract : The recent Canadian infrastructure report card reveals the unhealthy state of municipal infrastructure intensified challenged faced by municipalities to maintain adequate infrastructure performance thresholds and meet user's required service levels. For a road agency, huge funding gap issue is inflated by growing concerns of the environmental repercussion of road construction, operation and maintenance activities. As 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 optimal allocation of resources and reduced road user cost. Incorporating environmental sustainability measure into pavement management is solution widely cited and studied. 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 study reviewed 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 sustainable network-level pavement management.

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

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