A MULTI-OBJECTIVE DECISION-AID TOOL FOR ROAD NETWORK MAINTENANCE MANAGEMENT

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ABSTRACT
This paper presents a Multi-Objective Decision-Aid Tool (MODAT) tested with data from the Estradas de Portugal's Pavement Management System (PMS).

Nowadays, the PMS used by the main Portuguese concessionaire (Estradas de Portugal, S.A.) uses a deterministic section-linked optimization model with the objective of minimizing the total expected discounted costs over the planning time-span while keeping the road pavements within given quality standards. The MODAT considers three different possible goals: minimization of agency costs (maintenance and rehabilitation costs); minimization of user costs; and maximization of the residual value of pavements. This new approach allows PMS to become interactive decision-aid tools, capable of providing road administrations with answers to "what-if" questions in short periods of time.

The MODAT also uses the deterministic pavement performance model used in the AASHTO flexible pavement design method that allows closing of the gap between project and network management. The application of the MODAT is illustrated with a case study involving the main road network of Castelo Branco, a district of Portugal.

KEY WORDS: Road Assets, Pavement Management System, Pavement Performance Models, Optimization Model, Maintenance & Rehabilitation.