

Editorial

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Stakeholders of public infrastructure deserve that infrastructure managers use the minimal resources possible to provide the level of service they expect, and if the resources are constrained, use the resources at their disposition to provide them with the best service possible. This requires that infrastructure managers determine long-term maintenance strategies for individual assets, and short-term maintenance programs that include combinations of interventions on multiple assets that optimally balance the costs of intervention and the provided service.

The determination of these optimal strategies and programs requires the use of state-of-the-art models to predict the ability of the assets to provide service, including mid- to long-term asset performance, environmental conditions taking into consideration the changing climate, and societal needs taking into consideration changing demographics, technological possibilities and expectations. These models, of course, have to be based on data that is as extensive and accurate as possible. Additionally, and perhaps most importantly, it is essential that the service to be provided is clearly defined so that it can be quantified, measured and modelled over time. It is only through such endeavors that clear, consistent and stakeholder-aligned decisions can be made over large numbers of assets, by large numbers of individuals, for long periods of time.

The five articles in this issue of *Infrastructure Asset Management* help infrastructure managers as they strive to find the best possible ways to provide stakeholders with the service they expect.

In the first article, Adey *et al.* (2020) provide an extensive overview of how the service provided by roads can be quantified per unit time so that it can be compared with intervention costs. It provides an excellent point of reference for managers looking to develop their own definitions of service.

In the second and third articles, the authors provide mathematical tools to integrate the consideration of service into the determination of optimal maintenance strategies and programs. Omura and Kaewunruen (2020) demonstrate how production and cost functions can be used, together with service considerations, to assess the optimality of maintenance strategies and identify the principal

influencing factors. Kielhauser and Adey (2020) show how service can be modelled to enable the running of algorithms to determine optimal intervention programs for multiple municipal infrastructure networks simultaneously. The key to the success of their model, which is demonstrated through the speed of calculation, is that the service provided by five networks is modelled in the same way.

The final two articles contain aspects to improve the estimation of the likely losses in service in the future. Torbaghan *et al.* (2020) give insight into the effect of open trenches for maintenance on future road performance. Yang *et al.* (2020) show how to model the effects of maintenance on traffic flow to determine the best traffic configurations to use during maintenance. The understanding of these issues is of considerable importance in the determination of both optimal maintenance strategies and programs.

In summary, the work presented in these five articles, as well as that presented in the first part of this special issue, are helping to define, quantify, measure and model infrastructure service, in ways that help infrastructure managers strike the optimal balance between the provision of expected service and costs of intervention. Regardless of whether you are an infrastructure manager, or a developer of tools for infrastructure managers, I encourage you to read the articles and be inspired.

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