



Minimisation of maintenance-related disruption to bridge serviceability by the use of the right key structural components

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Abstract

Maintenance of bridges, and of their key components, is a major cause of disruption to traffic, whether it be for the purposes of inspection, regular maintenance and repair, or – most significantly, in the case of key components such as expansion joints – during replacement works. Ways in which such disruption to traffic can be minimised are presented, including maximising the performance of key components through proper selection, installation and maintenance, and minimising disruption during replacement of components by the use of optimised designs and methods.

Keywords: Bridge; bearings; expansion joints; seismic isolators; dampers; traffic disruption; performance; durability.

1. Introduction

Disruption to traffic on bridges should always be minimised, considering the enormous accumulated financial costs and other impacts of traffic congestion and diversions. A significant cause of disruption to bridge traffic is the maintenance, repair and replacement work required by their key structural components – their bearings, expansion joints, seismic isolators and dampers. Therefore, care should be taken to maximise the long-term performance of such components, as described in Section 2. And considering the great disruption to traffic that can be caused by component replacement work in particular, consideration should be given to using components that are designed for easy replacement, or for easy installation in an existing structure, as described in Section 3.

2. Limiting disruption by maximising performance of key components

Poorly performing components require more maintenance and repair, and may need to be replaced much earlier, than ones that perform well – and this can impact strongly on bridge users. In the case of expansion joints, for instance, some authorities consider the initial cost of supply and installation to be insignificant in relation to the long-term costs of poorly performing joints, considering in particular the user costs resulting from traffic disruption etc. [1]. In the case of bearings and seismic isolators, traffic can be affected by bridge lifting during replacement works, and bearings, isolators and dampers or STUs that do not support/protect a bridge as required can have devastating consequences, making the bridge unusable for an extended period.