

Innovation in Bridge Management

Bridge assets deteriorate over their lifetime from the effects of age and passage of traffic. Although overloading bridges in excess of their design or assessed capacity rarely causes collapse or even visible damage, it severely reduces their useful life and increases the requirements for costly bridge maintenance and eventually replacement.

One government study has suggested that the passage of a 40 tonne truck has the same damage effect as 9,000 cars.

To minimise deterioration of bridge assets within the UK, statutory regulations require that, for vehicles weighing in excess of 44 tonnes, advance notification must be made to each highway authority on the proposed route. This enables the authority to ensure that the load bearing capacity of their bridges are not exceeded by the particular vehicle.

Because each vehicle has differing axle configurations, and bridges have different span and articulation arrangements, checking a proposed movement cannot ever be a simple process if it is both to protect the bridge and maximise availability of the national and local road network to hauliers.

Unhappily, budget and staffing constraints within highway authorities often mean abnormal load notifications are overlooked or not checked and responded to within the prescribed two or five day notice period. Sometimes for these reasons authorities impose unnecessary very conservative overall weight limit restrictions, which can be unfair and costly to the haulier. Furthermore, if the bridge owner doesn't respond within the notice period, the haulier is free to move, and the damage done.

This is where AbLoads® steps in to provide the solution.

AbLoads is a unique, innovative software package written by engineers with the single purpose of providing authorities with every facility they need to receive, check and respond to abnormal load notifications. AbLoads does not need a qualified engineer operator and a single AbLoads operator can safely check around 200 notifications each day.

AbLoads compares the effects of the vehicle notified with those of the designed and/or assessed capacity of the bridge, modelling each bridge using runtime versions of Cascade's Analyse and Arch programs. Generally, just the complete deck of the structure is modelled, but for more complex bridges the support structure can be included in the model. For an average three span structure, as many as 80 load cases are checked as the vehicle is positioned across the bridge in both directions.

The AbLoads checking engine uses assessed or design capacity (ALL/HA/HB loading), BD86 Special Order and Special Vehicle loading, plus other Special Vehicles for which the bridge has been fully assessed.

Cascade Software Limited

CIVIL & STRUCTURAL ENGINEERING SOFTWARE



AbLoads also provides two levels of default checking where adequate structure data is not available.

In the short term, checking abnormal load notifications is a non-revenue earning process for bridge owners. In the longer term, the requirement to check the movement of heavy loads over bridges is a priority to reduce ongoing maintenance costs and minimise bridge closures along our road network. AbLoads provides bridge owners with a low cost, safe, secure and very fast checking process without taking up valuable structural engineering resources.

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500 words, excluding the title