The majority of existing bridges in Australia were designed according to historical standards, where the design vehicles are significantly lighter than the current oversize over mass (OSOM) vehicles operating on our ageing bridge network. Consequently, to protect our bridge assets from deterioration and ensure public safety, OSOM operators must obtain heavy load permits from road authorities. Furthermore, the traffic volumes of OSOM vehicles are increasing on the bridge networks.

According to AS5100-2017 Part 7, bridge assessments must be performed by professional bridge engineers, including the assessment of heavy load permits, which requires considerable resources. To optimize the assessment process while limiting resource use, an automated assessment tool has been successfully developed using the Finite Element Method. This tool was demonstrated at the 11th Austroads Bridge Conference. However, some limitations of the previous version have been addressed through significant upgrades. The new features of the tool represent considerable improvements.

The aim of this paper is to introduce the upgraded tool, which incorporates new features such as combining line load analysis and the 2D-frame analysis module into a unified module. The tool can now perform structural analysis for various bridge types, including 2D grillage models, line beams, and all types of 2D frame bridges such as box culverts (both with and without fill), 2D truss bridges, and 2D arch bridges. Additionally, the tool is capable of presenting load rating results on Google Maps. This presentation also briefly discusses optimizing resources and targeting net-zero in software development of the bridge assets by efficiently utilizing appropriate databases and programming languages.