



## **ABSTRACT OF PAPER**

**Title of Paper** (*limited to 15 words in CAPITALS*):

ASSESSING THE IMPACT OF INCREASED AXLE LOADS USING CONTINUOUSLY MEASURED PERFORMANCE DATA

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**Nominated Theme:**

Vehicle/Track Systems and Train Dynamics

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**Abstract** (*max 350 words*):

The continuous drive for increased efficiencies and throughput within heavy haul railways has led to demands for higher and higher axle loads.

However, as the ability of the network to sustain such loads is largely dependent upon the state of the existing infrastructure, which itself is often changing due to environmental conditions.. The ability to assess the state of the existing infrastructure is often difficult. Indeed, this is particularly the case when it is necessary to assess the impact of higher axle load rollingstock at elevated speeds on an existing network, in the absence of any data from these vehicles on the same network at comparable or higher speeds.

This paper discusses the use of continuously measured dynamic response data to assess and compare the performance of a 30tal locomotive with an existing 23tal locomotive, across a range of speeds in both the Upper and Lower portions of ARTC's Hunter Valley Network.

In this case the continuously measured dynamic response data from two locomotive types (23tal and 30tal) using an ENSCO Inc Vehicle/Track Interaction system. This system essentially measures accelerometer responses at a number of locations around the locomotive. The paper will describe the dynamic wheel loads inferred from this data and the



correlation between the observed wheel loads and the operating speed which enabled to build models which were used to predict the responses at elevated speeds under the Upper and Lower portions of ARTC's Hunter Valley Network operating conditions.

The analysed and the predicted data from the models were integrated into a visualization tool for the interactive interrogation of these results and an estimate of the appropriate speed profile that should be used, on both the loaded and empty journeys, by each of the locomotive types to restrict the responses to within acceptable thresholds for the existing ARTC infrastructure.