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Sleepers Exposed: new innovations in rail design

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will not reveal me as a donor or a smaller companion. We could use a dime when the music imitates a disaster area. The idea is still to issue a new Long Beach five-point major disaster this year. At the home they can vote that the economy is in fact the city of events and he says 'no one is a real actor in the film.'

It's clear that there is little point attempting to trace the links or connections between the 'original' and the final draft; to call them tenuous would be to underestimate the matter. This distance is great enough to accommodate a complete transformation of one poem into a different literary object altogether, according to chance, incompletely understood computer translation algorithms and personal poetic idiosyncrasy. On the other side of that gap lies freedom of an extreme kind.

ENDNOTES


No one would deny that our rail network makes life much easier, and trains are widely considered to be the world’s safest mode of transport. Bearing this in mind, the idea of decreasing the weight of railway sleepers, or increasing the loads they carry may make passengers and associates of the rail industry skeptical as regards their own safety or the integrity of their goods and assets.

However, engineering scientists at the University of Wollongong have recently done exactly that, developing a new design concept for the concrete sleepers generally used in ballasted track systems, railway bridges and subways which makes better use of their superior strength while still maintaining the high safety margins and passenger comfort levels expected by those who make use of the rail-track infrastructure.

The railway sleeper is a major component of railway tracks. It is the cross-tie beam designed to distribute the load from the rails to the underlying ballast bed. Although sleepers can also be made of timber or steel, the current trend is toward the utilisation of concrete sleepers because of their durability and high cost-benefit ratio. Concrete sleepers can last from fifty up to over one hundred years despite extreme environmental conditions such as weathering, temperature and moisture. The heavier mass of the sleepers also helps stabilise railway tracks during thermal expansion of rails and the vibration of rolling stock, as well as providing a 'stiffer' rail and thus cutting fuel consumption costs.

Recent findings show that concrete sleepers can actually absorb more than three hundred per cent of the previously expected capacity. This discovery can help rail track owners make more cost-effective use of their assets through improved knowledge of track behaviours under both static and impact loading, and in particular through more realistic and reliable processes of analysis and design. Possible options are to enable the passage of heavier trains on existing concrete sleepers through increased axle loads, or alternatively, to change the design of the sleeper, and thus reduce the cost.

The benefits would have a potentially large flow-on effect. Cheaper but more reliable tracks mean added passenger comfort and security, less materials wastage, and reductions in insurance fees for merchandise. This all adds up to social, environmental and financial gains. With these strategies in place to optimise the balance between public safety and the cost issues of building railway track infrastructure for short and long-term rail networks, this RailCRC research outcome is on-track to dramatically boost Australia’s economic and social growth.

Sakdirat Kaewunruen researches and teaches in the School of Civil, Mining and Environmental Engineering. His PhD research project, supervised by Dr. Alex Remmenikov, is part of a collaboration between UoW and OIT, sponsored by the CRC for Railway Engineering and Technologies (RailCRC). Sakdirat has been recently cited in Who's Who in Asia 2007 published by Marquis Who's Who Inc. USA, Leading Engineers of the World 2007 and has been selected to appear in Top 2000 Outstanding Intellectuals of the 21st Century 2008 by the International Biographical Centre in Cambridge UK.