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**Submission to the Senate Rural and Regional Affairs and Transport
Committee**

**re Inquiry into Australia's Future Oil Supply and Alternative Transport Fuels
(February 2006)**

The Railway Technical Society of Australasia (RTSA) is a technical society of Engineers Australia. The RTSA has over 800 members nationwide.

The RTSA practices the study of rail in the transport and logistics sector, and identifies opportunities to promote rail, where appropriate in the wider economic, social and environmental context for communities.

The RTSA conducts a number of activities, including monthly meetings and presentations on rail engineering matters in each state and a major conference on rail engineering every every two years. The next conference will be in May of this year, in Melbourne. The RTSA also articulates its position on rail matters through its Government Relations Sub-Committee, work with the Australian Rail Association and submissions to various government / industry enquiries.

This submission provides the RTSA an opportunity to highlight energy usage and fuel inputs. In this regard this submission will focus on *part d* of the Terms of Reference ('options for reducing Australia's transport fuel demand'), rather than new sources of oil or new transport technologies. Better intergration of transport and modal shift are areas where significant savings in oil can occur.

This submission builds on previous submissions to Federal Government inquiries (including to this Committee re AusLink in 2005 and the Productivity Commission's inquiry into Energy Efficiency).

Background

The importance of oil on sustainable development cannot be over-emphasised. Australia's industry, commerce, domestic and transport requirements are now heavily dependent on oil.

Overall energy consumption for transport amounted to 1,272 Petajoules (PJ) or 43% of Australia's total energy consumption in 2001-02¹. Transport is Australia's dominant energy user. Not surprisingly, oil was the major source of this energy (1,237 PJ or 97%).

1 *The Private Cost Effectiveness of Improving Energy Efficiency* – The Productivity Commission Inquiry Report August 2005 pp 29-31

Viewed from the energy side, across all fuel types, oil-for-transport-use accounted for 41% of Australia's total energy usage.

Of concern, energy increases in transport from 1973-74 to 2001-02 were larger than any other sector. Whilst manufacturing and mining increased usage by 21% and 15% respectively, transport increased by 39%. Not only was transport the dominant energy user (of all sectors) in 1973-74 but by 2001-02 it became even more important. Oil continued to be the primary source of this energy increase.

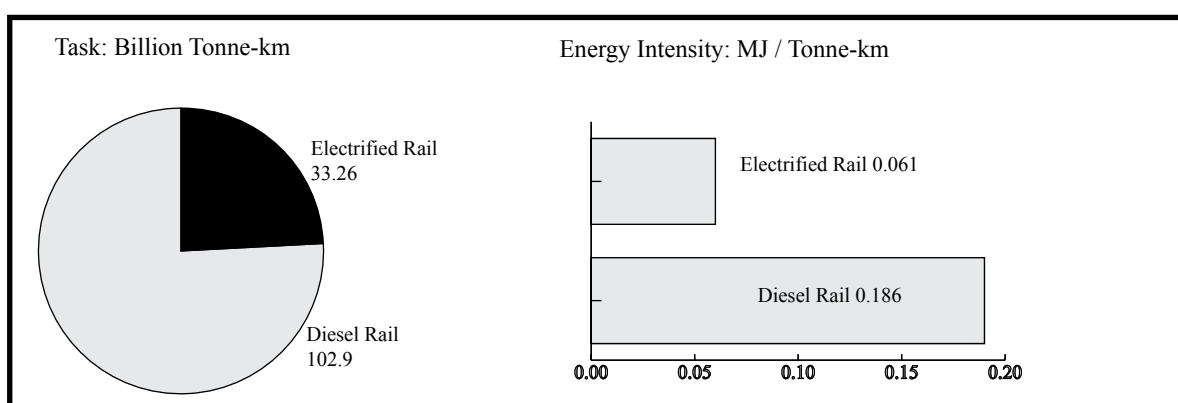
Whilst the Australian economy changed in nature during this period it is clear that energy usage was moderated only because of structural changes in the economy (moving out of heavy energy-using industries to lighter ones) and some switching of fuels (higher calorific value fuel for power stations). There does not appear to be evidence of general economywide improvements in energy efficiencies².

Although changes in fuel mix and movement into industries less reliant on energy are important outcomes for oil, it is clear that demand for transport services, efficiencies within the transport/logistics task and efficiencies in converting energy into work need to be tackled if further reduction in Australia's oil dependency is to occur.

The RTSA supports investment in research and development that will reduce energy use (for example a new Energy Research and Development Corporation).

The following sections detail market transport tasks, energy intensity³, oil usage and describes some mitigation measures.

Bulk Freight⁴



Although Queensland uses electricity as the energy source for bulk (coal) rail, the RTSA does not see this translating to other jurisdictions. In fact NSW retreated from electric locomotive for its coal haulage some decades ago. Diesel locomotives for the haulage of iron ore and coal in WA and NSW continues to be the prime tractive effort.

² *The Private Cost Effectiveness of Improving Energy Efficiency* – The Productivity Commission Inquiry Report August 2005 P. 35

³ Energy Intensity is defined as the amount of energy in Mega joules per unit transport task. For freight this is Mega joules/net Tonne-km. For passenger transport it is Mega joules/passenger-km. Note energy includes coal from power stations converted to electricity and is termed secondary fuel. Diesel oil in engines is termed primary fuel.

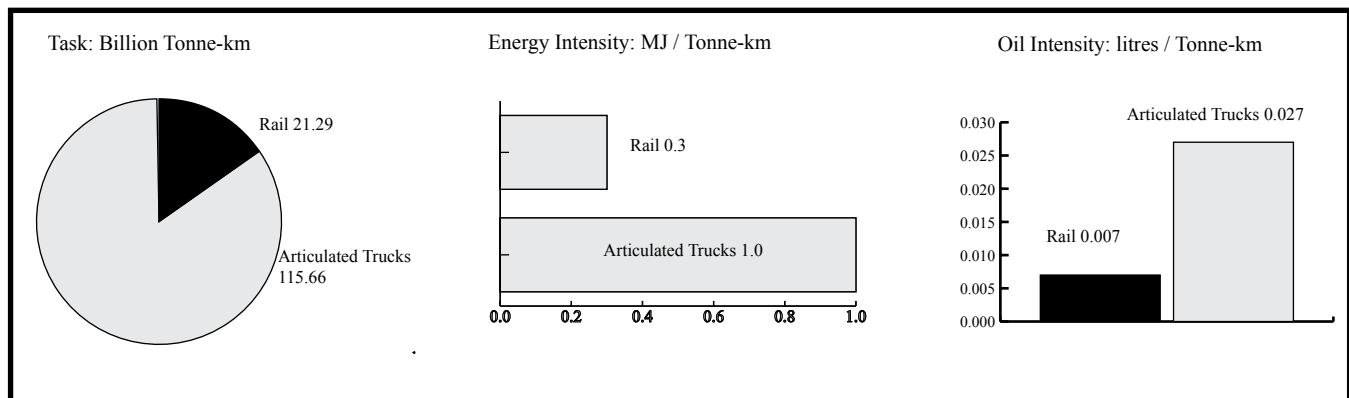
Note also that to generate electricity from coal-fired power stations requires significant amounts of energy. In fact the net energy delivered is only 30% of gross energy produced from coal-fired power stations. Energy intensity data above, for electricity, takes into account this grossed up value (the Full Fuel Cycle)

⁴ Reference ARA Australia Rail Industry Report 2003

Although electricity is a less intense form of energy for bulk rail, coal (both black and brown) as a fuel for base-load power stations present particular environmental challenges. These environmental challenges need to be balanced with the abundant and secure supply of coal.

Thermal efficiencies and environmental performance of diesel engines are likely to continue with marginal savings in oil.

Non-Bulk Freight



The RTSA has long campaigned for improved rail performance in the non-bulk freight area, particularly in interstate intermodal logistics. On the important Brisbane, Sydney, Melbourne, Adelaide and Perth corridors use of the rail systems (with its less energy intensive technology) will have a direct benefit in reduced oil consumption.

Rail mode share between the major capital cities of Sydney and Melbourne are in the mid to low 20% range whilst Sydney to Brisbane is in the mid 10% range. Measures to shift modal share to rail will have a direct bearing on oil usage.

Although engine technology will see fuel efficiencies improvements in rail locomotive and significantly in road prime movers, these fuel savings will be far outstripped by increases in transport demand.

A number of pricing, infrastructure and regulatory measures need to be put in place for this mode shift to occur.

Urban Passenger Systems

The nature of the urban passenger task is complex. Transport patterns between 'attractors' (employment, education, health services and recreations) and residential centres place pressures on cities (not least transport pressures). Providing graphs of energy intensity and oil usage does not illustrate these complex drivers.

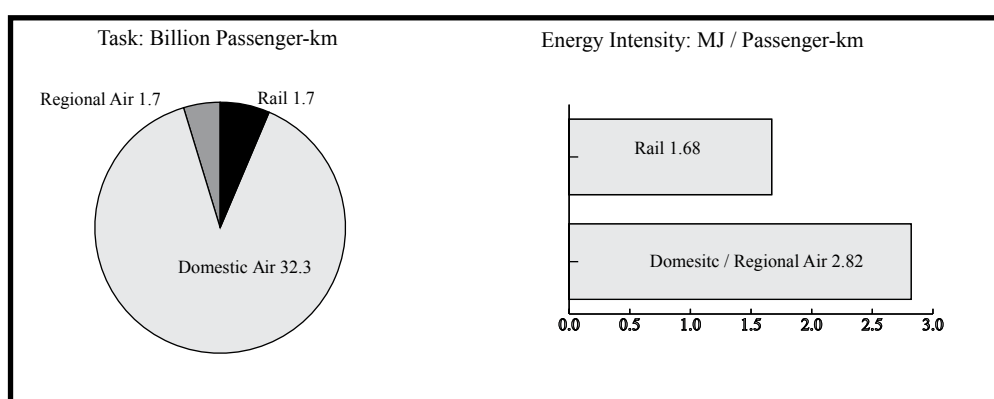
Access to services and employment is fundamental for communities, whilst mobility continues to be an important part of an individual's freedom.

The RTSA believes balancing the needs and integrating the functions across private and public transport services as well as planning transport infrastructure within the fabric of cities, will provide a number of social and environmental benefits, as well as moderating oil usage.

The RTSA promotes the use of heavy and light rail systems within the urban context, where appropriate. Aspects of congestion, air pollution, accident costs and amenity (wider social, environmental and economic costs) provide rail systems with many contemporary opportunities.

Hybrid cars, cars with blended fuels and light commercial vehicles using LPG also play a role in the reduction of oil dependency.

Long Distance Passenger Service



High-speed rail is not a significant feature of Australia's landscape. Other than in Queensland where tilt trains have been a success in regional transport since the 1990's, no other jurisdiction has developed high-speed rail.

The importance of time-savings and interstate business travel, along with deregulation of the airline industry has seen strong volume growth in the aviation sector. The decade up to 2002-03 revenue passenger-km growth averaged 7% pa to a total of 32,265⁵.

Although evidence of energy intensity (above) highlights the benefits of rail, rail's quality of service does not currently satisfy market demand between the major capital cities.

A useful study would be the comparison of high-speed rail passenger transport using AC traction electricity with air travel (within the context of a strategic assessment of oil supply and market demand). The impacts of sudden shocks in oil supply / pricing would have major consequences for domestic air travel and may constrain growth within the Australian economy. The RTSA would support such a study and assessment of inter-capital city passenger transport (including an assessment of electricity generation).

Previous Inquiries

The RTSA supports many of the recommendation of the Productivity Commission in its 2005 final report on energy efficiency, particularly: *Australian governments should investigate the feasibility of introducing congestion pricing where it is likely to improve the economic efficiency of road use (including greater energy efficiency). It may be appropriate for such a study to be incorporated in a wider examination of efficient road pricing or in a review of passenger transport reform as a whole.*

However, as recognised by this Senate Committee in its 2005 report on AusLink, and the House of Representatives Standing Committee on Environment and Heritage in its 2005 report on Sustainable Cities, more is needed. The RTSA also supports the seven transport recommendations in the 2005 Sustainable Cities report, and trusts that the Government will make a positive response to them.