SELECT COMMITTEE ON HEAVY TRANSPORT

REPORT

1996

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WESTERN AUSTRALIA
LEGISLATIVE ASSEMBLY

SELECT COMMITTEE ON HEAVY TRANSPORT

REPORT

Presented by:
Mr F.C. Tubby, MLA
Laid on the Table of the Legislative Assembly
on 9 May 1996

ORDERED TO BE PRINTED

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Foreword

It is with a sense of achievement born from excellent teamwork by the Committee that I present the Report of the Select Committee on Heavy Transport to the Parliament of Western Australia.

Western Australia's remoteness from markets combined with its enormous size and small population, pose very significant challenges in providing land transport infrastructure and services.

The tyranny of distance dictates that freight transport should be at the leading edge of world best practice so that rural and resource exports can compete successfully on world markets, thereby continuing to positively underpin the very high standard of living enjoyed by Western Australians. At the same time, freight transport's impacts on safety, lifestyle and the global environment need to be managed to ensure that the benefits from economic development outweigh the costs.

This enquiry arose out of public concern about the possible long term access of 'road trains' to the metropolitan area. In my motion to establish the Select Committee, I foreshadowed the need for the Parliament to make some recommendations to the Government on what the public and the industry see as being an appropriate land freight policy for the future.

The Committee's considerations have coincided with a most dynamic phase in Australia's institutional/political development brought about largely by the response to the Hilmer recommendations concerning national competition policy. Transport sector reform is seen to be a major potential contributor to economic growth expected to flow from adoption of competition policy. That Western Australia's freight transport sector has benefitted from a continuing policy, under successive Governments since 1980, of stripping away unnecessary regulation and corporatisation of Westrail has been widely acknowledged and provides an insight to the benefits of wholesale adoption, nation-wide, of a comprehensive competition policy.

Against this background, the Committee's task of inquiry into problems confronting heavy transport in Western Australia required important judgments about:

- the State's economic, social and environmental objectives;
- distribution of the benefits and costs of economic activity;
- the extent to which future generations might benefit from, or be burdened by the decisions we make today;
- whether public or private ownership should be preferred; and
- the impacts/opportunities of Western Australia being part of the wider Australian and international communities.

Where the Committee has been judgmental in these areas, it has sought to reflect the balance of views put to it in submissions and other evidence by the public and industry.

That some of the evidence heard has been subjective and, at times emotive, reflects a number of things. People have strong feelings about heavy transport, both good and bad. There is a dearth of objective data about heavy transport road safety issues and impacts, and opportunities have not always been taken to better educate the public and industry about heavy transport.

Pierre Trudeau, a former prime minister of Canada, perhaps best encapsulated our task when he said that -

> *"...politics is irrational. But this does not mean that you must govern irrationally. It means you must put people's emotions in as part of the data."*[1]

The Committee makes no apology for its primary focus on road freight transport. Our State is so large and the area served by rail is so small that Western Australia leads the world in heavy road freight transport. We are also the State within Australia which has the most *laissez faire* attitude to heavy truck operations. The trucking industry is stridently pursuing bigger vehicles having access to areas which exposes many more people to them. This process has been ongoing since the State's earliest development as evidenced, for instance, by the recommendations of the Legislative Council's Standing Committee appointed to report on the Width of Tyre Bill, 1882.[2]

Other States should not lightly ignore the 'Trojan Horse' effect of what is happening here. That is not to say that the wider use of road trains is inherently undesirable. Rather, it recognises that accountability demands that any breaking of new ground on truck access should be accompanied by responsible assessment of risk, and communication of the risks and other costs and benefits to the community at large prior to any changes in policy taking effect.

The Committee has attempted to be visionary and practical in its considerations - visionary because any strategic decisions impacting on freight transport will carry forward well into the 21st century - and practical where we consider today's on-the-ground issues need immediate resolution.

The Committee's approach has been one of balance - between examining the present land freight transport system and possible alternatives; between what is necessary and what is desirable; and between transport efficiency and effectiveness.

Transport efficiency may be constrained by historical land use and development patterns impacting on the location of roads and railways. The Committee's recommendations accordingly strike a balance between solving transport issues and regional and urban planning issues.

The fact that the land transport network is shared between freight and passenger uses has also required the Committee to examine such issues as how the costs of the network should be shared between trucks on the one hand, and cars and buses on the other. Because sea but not air transport may be a viable alternative to heavy land transport, the Committee considered land transport issues and solutions in the context of the broader surface transport framework.

The Committee's report is not intended to be a blueprint for solving all heavy land transport issues. It seeks to strike a balance between what we feel should and can be done, development of a policy framework and principles which might help others to think and act in delivering the best heavy freight transport system in pursuit of sustainable living standards and lifestyle.

The Committee has had neither the resources nor the intention to 'reinvent the wheel'. It has been mindful of the work particularly of the National Road Transport Commission (NRTC) to develop nationally 'consistent' heavy road transport regulations, and the efforts of the Legislative Assembly's Select Committee on Road Safety. The Committee has focused on the **principles** and **priorities** which it feels should underpin decisions being made about heavy transport. Where it

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1 Gwynn, R.: *The Ottawa Journal*, 22 April 1994.

2 A Bibliography of Western Australian Royal Commissions, Select Committees of Parliament, and Boards of Inquiry, 1870 - 1979.

gives examples of how these would translate into regulatory or other actions it expects relevant authorities to work up the necessary impact statements.

If some of the Committee's conclusions and recommendations appear controversial to some elements of the road transport industry, they might reflect on what is well understood by the Road Transport Forum. That is, there is real substance in the public image of 'truckies' being at a low ebb. The Committee acknowledges the work of the industry in tackling this by professionalisation, by weeding out the 'cowboys' and by better public education. These are the messages that are coming loud and clear from the Road Transport Forum and other industry bodies, and it is on the 'promise' of better industry self regulation that much store is being placed by the NRTC, State transport regulatory agencies and ultimately their Parliaments. The Committee's recommendations should not be controversial for responsible truck operators and drivers.

The underlying message the Committee wishes to convey to transport agencies who recommend regulatory and other changes to legislators is that proposed changes in such things as truck access cannot run ahead of credible analysis and public dissemination of the safety and other impacts. Public understanding should run ahead of roadworks which give the impression that change is a *fait accompli*. We acknowledge that Main Roads WA is now putting considerable effort into public consultations.

Analysis is impossible without data. One of the Committee's disappointments was the lack of usable data about heavy transport. For an industry of its size and importance in the economy, and impacts on the community, much more could be done to enhance technical and public debate. Both government and industry would benefit from better data collection, analysis and dissemination. Without good data pragmatic solutions are adopted, and any opposition is dismissed as being emotive. We simply have to get beyond the sort of debate where truck operators say that bridges are safe because they are willing to stand under them while their trucks pass overhead, and where the public dubs all trucks as dangerous.

The point was repeatedly made to the Committee by those within the industry, that many of the concerns the public have about heavy transport are more a matter of perception than fact. What industry people may not sufficiently appreciate is that members of Parliament, in conveying these concerns, are the 'messengers'. While the Committee hopes that this report will help to sort out perception from fact, the important point that should not be overlooked is that much more could be done to celebrate the many positive changes that are affecting heavy transport such as the national transport law. In the absence of such celebrations, it should not come as a surprise that perceived negative impacts of heavy trucks hold centre stage.

More than anything else, this report has been made possible by input from the public, the transport industry, Local Government and government officers. I acknowledge their input and that of my fellow Committee members and staff, and Nick Mabbott who assisted with the work on truck pollution and driver fatigue.

I commend this Report to the Parliament.

Fred Tubby, MLA
Chairman

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ACRONYMS AND GLOSSARY

AADT	Annualised Average Daily Traffic
ABS	Australian Bureau of Statistics
ABS	Anti-lock Brakes
ACCC	Australian Competition and Consumer Commission
ADR	Australian Design Rules
AOR	As of Right (ie vehicle less than 19 metres)
ARRB	Australian Road Research Board
ASW	Australian Standard White (a trade classification of wheat)
ATC	Australian Transport Council
ATAC	Australian Transport Advisory Council
B-double	A heavy vehicle combination consisting of a prime mover hauling two trailers, with all units being connected through turntables.
BTCE	Bureau of Transport and Communications Economics
CBH	Cooperative Bulk Handling Ltd
CP Rail System	Canadian Pacific Rail System
CN North America	Canadian National North America
CSO	Community Service Obligation
Culway	The system used by Main Roads WA to measure masses and speeds of vehicles using roads by measuring the bending of culverts
CWA	Country Women's Association of Western Australia
DEP	Department of Environmental Protection
DUI	Driving Under the Influence
ESA	Equivalent Standard Axle
EU	European Union
FORS	Federal Office of Road Safety
GVM	Gross Vehicle Mass (ie the weight of a vehicle and its load)
Heavy Vehicle	Load carrying road vehicle of more than 4.5 tonnes GVM
JIT	Just in Time
Long Vehicle	Heavy truck over 19 metres and under 30 metres
MCRT	Ministerial Council for Road Transport - the 'peak' Federal/State Transport Ministers' Forum.
MRWA	Main Roads, Western Australia
mtk	million tonne kilometres
NAASRA	National Association of Australian State Road Authorities
NCC	National Competition Council
NRTC	National Road Transport Commission
NRC	National Rail Corporation
NSW	New South Wales
ntk	net tonne kilometre: payload × distance covered
Rail	Usually refers to the rail freight transport mode
Road	Usually refers to the road freight transport mode
Road Train	Heavy Truck over 30 metres
RTF	Road Transport Forum
SCOT	Standing Committee on Transport
STAYSAFE	Parliament of NSW Joint Standing Committee on Road Safety
SWAT	South Western Australian Transport Study
Tare	Empty Weight of Vehicle
TWA	Time Weighted Average
VSC	Vehicle Standard Code
WAMA	Western Australian Municipal Association

ESTABLISHMENT OF SELECT COMMITTEE AND TERMS OF REFERENCE

On Thursday 22 September 1994, during the Second Session of the Thirty-fourth Parliament, the Member for Roleystone, Mr Fred Tubby, MLA, moved the following motion which was accepted -

"(1) That a Select Committee of the Legislative Assembly be appointed to inquire into and report on all aspects of Heavy Transport with particular reference to -

(a) heavy haulage within the metropolitan area;
(b) the operation of road trains in built-up areas;
(c) efficient usage of the State's rail and road infrastructure; and
(d) the provision of infrastructure to ensure a safe and efficient transport system to meet the future needs of the State.

(2) That the Committee have power to send for persons and papers, to sit on days over which the House stands adjourned, to move from place to place, and to report from time to time.

(3) That the Committee report on 30 November 1995."

(The motion as put and passed is hereafter referred to as the 'Terms of Reference'.)

EXTENSIONS OF REPORTING DATE

On 21 November 1995 the Legislative Assembly passed the following motion:

"That the date for presentation of the final report of the Select Committee on Heavy Transport be extended to 28 March 1996."

On 20 March 1996 the Legislative Assembly passed the following additional motion:

"That the date for presentation of the final report of the Select Committee on Heavy Transport be extended to 4 April 1996."

On 4 April 1996 the Legislative Assembly passed the following further motion:

"That the date for presentation of the final report of the Select Committee on Heavy Transport be extended to 9 May 1996."

APPOINTMENT OF COMMITTEE MEMBERS

On 22 September 1994, on the motion of Mr Tubby, it was resolved:

"That the members of the Select Committee on Heavy Transport be

the Member for Armadale	(Hon K. Hallahan, MLA)
the Member for Collie	(Dr H. Turnbull, MLA)
the Member for Northern Rivers	(Mr K. Leahy, MLA)
the Member for Roleystone	(Mr F.Tubby, MLA) and
the Member for Swan Hills	(Mrs J. Van de Klashorst MLA)."

Chairman

The Committee elected, on 28 September 1994, Mr Fred Tubby as Chairman.

COMMITTEE ACTIVITIES

1. Meetings and Evidence

The Committee met 55 times and took evidence on 17 days. A list of witnesses appears in Schedule 2.

2. Submissions

The Committee received 132 submissions from persons and organisations which are listed in Schedule 1(a). A further 77 submissions were received in response to the Committee's Discussion Paper.

3. Investigative Tours

(1) Intrastate Investigative Tours

- Perth, 17 - 19 January 1995
- Northam, 20 January 1995
- Katanning, 31 January 1995
- Albany, 1 February 1995
- Bunbury, 2 February 1995
- Geraldton, 13 February 1995
- Karratha, 14 February 1995
- Mt Magnet, 15 February 1995
- Kalgoorlie, 16 February 1995
- Merredin, 17 February 1995

(2) Interstate Investigative Tour from 26 February to 10 March 1995

- Adelaide, 26 - 28 February 1995
- Sydney, 28 February - 5 March 1995
- Parkes, 1 March 1995
- Canberra, 5 - 7 March 1995
- Melbourne, 7-9 March 1995
- Hobart, 9 - 10 March 1995

(3) International Investigative Tour from 8 - 22 July 1995

- Canada, 8 - 12 July 1995
- Sweden, 14 - 19 July 1995
- United Kingdom, 19 - 22 July 1995

EXECUTIVE SUMMARY

Heavy freight transport's role is intertwined with the lifestyle all Western Australians enjoy. As a result of this, opportunities to save on transport costs should not be lightly foregone. With the introduction of road trains into the Perth metropolitan area, people are asking whether the savings in transport costs outweigh their increased fear of having to share the road with these vehicles.

Because the State's roads are generally lightly trafficked by some overseas and interstate standards, heavy trucks cause few crash fatalities and injuries, or property damage. Nevertheless, rail freight transport in Western Australia is very much safer than road freight transport.

Where new transport methods are suggested, it is no longer acceptable that they be tried until something goes seriously wrong. Too many lives have been lost elsewhere in bus and truck crashes to continue going down this path to change.

The Committee views most seriously the responsibility and accountability conferred on those who build and manage public transport infrastructure used by heavy freight trucks and trains. To the extent that this responsibility and accountability are dispersed the Committee considers that access to roads should be unambiguously enshrined in the Road Traffic Act 1974.

Pivotal to the Committee's deliberations has been the legal principle of *misfeasance* whereby road authorities are liable for injury or damage caused by the condition of roads where these conditions are proven to be negligently created by them.

Western Australia leads the world in the size of vehicles allowed access to public roads. Consequently, there are difficulties in demonstrating that road authorities are exercising reasonable care simply because there is less technical consensus on what constitutes good practice in regard to these vehicles in some traffic situations.

The community is clearly saying that lives and peace of mind are major considerations that must be factored into transport policy.

The Committee considers that a responsible introduction of bigger trucks should be preceded by the best available risk assessment techniques. The use in the United Kingdom of *Risk Analysis* to make a *Safety Case* is a technique that would be appropriate for this purpose.

The Committee recommends that road trains should not be permitted access to Perth metropolitan roads beyond existing breakdown points until more is known about their capability and stability, and a comprehensive risk analysis and safety case is undertaken or, they are restricted to dedicated, or limited-access, lanes and/or roads.

The Committee's consultations, evidence and investigative visits gathered a host of suggestions for improving heavy freight transport. To assist in their consideration, the Committee developed a framework which allows a sorting and prioritisation of the policy and practical solutions which it feels should be further pursued.

The Committee regards safety as the highest priority. It makes 37 recommendations on safety, ranging from how safety capital works should be funded to possible licensing of drivers who tow caravans, and examination of any link between driver fatigue and exposure to diesel emissions.

Cost and service quality considerations are the Committee's second priority, followed by nuisance, environmental concerns and living standards and mobility.

Clearly, not everybody will agree on the Committee's priorities. The framework should, however, prove useful in the ongoing debate about heavy freight transport because it allows all the interests to form their own suggestions and priorities.

The Committee recommends that targets should be struck for sharing the heavy freight transport task between road and rail. While it would prefer that there be competitive settlement of the road versus rail debate, the Committee considers that there are significant impediments to competition. In particular it considers that regional heavy road freight transport track costs are significantly cross-subsidised by cars, while rail track costs are fully recovered from users of rail.

Where significant change in transport policy is contemplated, the Committee recommends that the impacts should be fully and openly assessed. Where impacts of a change in policy fall unequally on individuals, the Committee recommends that compensation should be considered for the unavoidable impacts.

The Committee was impressed by North American technology specifically designed to run road trailers on rail track. It recommends that provision should be made in regional plans for possible road-rail infrastructure, and that there should be support for a proposed trial of 3 R's *Ecorail* technology.

The Committee recommends that random safety inspection of trucks be adequately resourced. It considers that truck noise should be seriously tackled, including consideration of progressive installation of modern exhaust brakes on older trucks. On exhaust emissions, the Committee recommends adoption of the ten second smoke rule, more random roadside testing, and consideration of the Swedish system for imposing government fuel levies according to the environmental qualities of diesel fuel.

GENERAL POLICY RECOMMENDATIONS

- The Government's heavy freight transport policy objective should be to safely and equitably complement social and economic aspirations and activities at minimum financial, social and environmental costs. ***(Recommendation 1*)**

- A balance of sanctions and incentives should be used to achieve heavy freight transport outcomes which reflect the community's accepted safety standards, cost and quality of service, nuisance intrusion and environmental damage levels, and living and mobility standards**.** ***(Recommendation 19)***

- The outcomes of heavy freight transport policy should be:

  (a) reduced incidence and minimised risk of death or injury, and property damage in crashes;

  (b) minimised financial cost of a quality service;

  (c) minimised nuisance;

  (d) minimised environmental damage; and

  (e) maximised living standards and mobility. ***(Recommendation 2)***

- A comprehensive public education program should be part of the strategy adopted to

reduce unnecessary community fear of heavy transport. ***(Recommendation 3)***

- Targets should be established in rail-served areas of Western Australia for sharing heavy freight transport between road and rail. These targets should result from policy decisions by the Government in relation to infrastructure funding in connection with major new developments. ***(Recommendation 18)***

- Road trains should not be permitted access to the metropolitan area beyond existing breakdown points prior to:

  (a) (i) further research into road train capability and stability; and

  (ii) the development of a comprehensive risk analysis and safety case;

  or

  (b) the provision of dedicated, or limited-access, lanes and/or roads.

  (Recommendation 71)

- Where implementation of transport policy involves significant change, the impacts should be fully and transparently assessed. ***(Recommendation 9)***

- The Government should determine what rail's tolerable risk level should be, so that rail safety expenditure levels can be determined accordingly. ***(Recommendation 29)***

- The Government should determine what road's tolerable risk level should be, so that road safety expenditure levels can be determined accordingly. ***(Recommendation 41)***

- The Government's priority in road funding should be to reduce the safety risk on existing roads to a tolerable level ahead of network expansion. ***(Recommendation 42*)**

- Consideration should be given to the Government making a separate appropriation for land transport safety. ***(Recommendation 4)***

- A target should be struck for safety capital works and the amount appropriated to the Road Safety Council. ***(Recommendation 5)***

- Safety capital works should be funded on a cost sharing basis with proponents. The level of cost sharing should be determined on a case by case basis depending on project priority. ***(Recommendation 6)***

- Safety project priority should be determined by the relative contribution to reducing the risk of death or injury and property damage. ***(Recommendation 7)***

- The Government should adequately resource the random safety inspection of heavy vehicles. ***(Recommendation 48)***

- It should be a requirement under the Road Traffic Act 1974 to assess risk prior to any dangerous goods licence being issued. ***(Recommendation 64)***

- When the National Rail Safety Standards are developed, the Government should make the rail safety inspection function independent from Westrail. ***(Recommendation 28)***

- The Government should introduce the National Licensing System. ***(Recommendation 55)***

- The Department of Transport should examine incorporation of the National Competency Standards for drivers and driving instructors in legislation, and consider appointment of relevant persons and bodies as heavy vehicle driver examiners. ***(Recommendation 56)***

- Regulation 509 of the Road Traffic Code 1975 should be reviewed. 'Tailgating' on the open road should attract an adequate fine and be enforced. ***(Recommendation 61)***

- The Government should introduce the NRTC Regulation and Guidelines for smoky vehicles; and the Department of Transport's inspectors should be authorised, equipped and trained to carry out roadside exhaust emission tests. ***(Recommendation 52)***

- The Government should introduce the in-service noise limits in the proposed Road Transport Reform (Vehicle Standards) Regulations. ***(Recommendation 13)***

- The Government should support Westrail and Main Roads WA cooperating with CRT Bulk Haulage to trial the introduction of 3R *Ecorail* technology in Western Australia. ***(Recommendation 33)***

- The Government should set a target for expenditure on road needs assessment; and needs assessment should be funded from road income. ***(Recommendation 39)***

- Main Roads WA, in conjunction with the Department of Transport and WAMA, should further develop methods for prioritising road funding. ***(Recommendation 40)***

- The National Competition Council (NCC) should examine the extent to which road, and rail track pricing practices impact on land freight transport competitiveness. ***(Recommendation 17)***

- The Department of Transport should investigate the level and incidence of taxes paid by the public road and rail freight sectors in Western Australia and, if there is a significant difference, develop options to make the impacts on road and rail more equal. ***(Recommendation 27)***

- The Department of Transport, in conjunction with Main Roads WA, WAMA, State Treasury and the Local Government Grants Commission should examine whether, and to what extent, rates should be used to fund Local Government roads. ***(Recommendation 35)***

- The Department of Transport, in conjunction with Main Roads WA, the Police Department, the Department of Environmental Protection, and the Department for Minerals and Energy (for dangerous goods), should examine how to recover heavy vehicle enforcement costs. ***(Recommendation 24)***

- Heavy freight transport should be marketed as a major driver of growth and prosperity. ***(Recommendation 8)***

SPECIFIC RECOMMENDATIONS ACCORDING TO THE MAIN OUTCOMES OF:

A. Reduced incidence and minimised risk of death or injury, and property damage in crashes.

1. Transport Safety

- The principle should be adopted that the community's tolerance of risk of causing death, injury, or property damage is the primary trigger for heavy freight transport safety regulation.
  (Recommendation 21)

- Consistent heavy freight transport regulation (and transport regulation generally) requires that an agreed risk tolerance hierarchy should be adopted as follows:

  Consistent heavy freight transport regulation (and transport regulation generally) requires that an agreed risk tolerance hierarchy should be adopted as follows:

Dangerous Goods train/truck	}
Freight train	} Motorised Heavy Freight Transport
Heavy truck	}
Passenger train	} Motorised Heavy Commercial
Bus	} People Mover
Taxi/Small bus	} Motorised Light Commercial
	} People Mover
Car/Light truck	} Motorised Light Personal/
	} Freight Transport
Bicycle	} Non-motorised Personal Transport
Pedestrian	}

  (Recommendation 22)

- Nationally uniform or 'consistent' road transport law compliance and enforcement being developed by the NRTC should be based on the suggested transport risk tolerance and enforcement hierarchies. ***(Recommendation 23)***

- A target of halving heavy vehicle crash fatalities within five years should be adopted.
  (Recommendation 46)

- The Road Safety Council should further examine the appropriate mix of truck design changes, regulation, enforcement and other actions to achieve the halving of heavy vehicle crash fatalities. ***(Recommendation 47)***

- Consideration should be given to phased-in introduction of anti-lock brakes *(ABS)* for long vehicle trailers and road train trailers operating in urban areas.
  (Recommendation 44)

- Operational trials should be undertaken to establish the braking performance and dynamic stability of long vehicles and road trains. ***(Recommendation 45)***

- A study should be commissioned to further examine the placement of 'prepare to stop'

yellow flashing lights. ***(Recommendation 68)***

- Strategies should be developed for random safety checking of heavy vehicles which reflect the distances they travel. ***(Recommendation 49)***

- The Department of Transport, in conjunction with Main Roads WA and Westrail, should investigate the feasibility, benefits and costs of road/road and road/rail intersection grade separation on the metropolitan B-double network. ***(Recommendation 70)***

- Porous asphalt should be considered as the preferred surface for dedicated metropolitan truck lanes and should be trialled on specific sections of major regional roads to assist in wet weather overtaking. ***(Recommendation 50)***

- 'Permit' truck length should be determined by risk analysis of the combination of vehicle, load, road condition, traffic management and adjacent land use. ***(Recommendation 20)***

- The safety risk of heavy vehicles on regional roads should be examined. ***(Recommendation 51)***

- The risk associated with the 'keep left unless overtaking' rule should be examined. Car driver education about the truck issues involved should be implemented. ***(Recommendation 62)***

- The Department of Transport should examine the costs, benefits and impacts of bullbars in urban areas. ***(Recommendation 63)***

- The Department of Transport should consider how an alcohol and drug policy could be universally adopted in the road transport and rail freight transport industries. ***(Recommendation 60)***

- Where safety is involved in an area where accreditation could be introduced, such as in fatigue management and speeding, the enforcement effort should be maintained until the impacts have been fully evaluated. ***(Recommendation 25)***

- Where there is a proposal to significantly increase vehicle size, for instance, the use of long vehicles on the metropolitan B-double network, the Road Safety Council should ensure adequate prior driver education. ***(Recommendation 36)***

- Main Roads WA, in conjunction with the Western Australian Planning Commission, should review the road hierarchy. ***(Recommendation 65)***

- Construction of the Northam by-pass should be completed within ten years. ***(Recommendation 66***)

- Main Roads WA should consider grade separation of heavy vehicles in the planning phase of the Utakarra by-pass. ***(Recommendation 67)***

- Consideration should be given to require people who tow caravans undertaking additional training and/or being licensed. ***(Recommendation 37)***

2. Occupational Health and Safety

- Worksafe should conduct in-cabin air quality measurements in heavy trucks and locomotives to see whether air filtration systems should be installed. ***(Recommendation 57)***

- The Road Safety Council should develop strategies for combatting heavy vehicle driver fatigue. ***(Recommendation 58)***

- Worksafe should examine whether and to what extent driver fatigue is linked to exposure to diesel emissions. ***(Recommendation 59)***

B. Minimised financial cost of a quality service

- The Department of Resources Development, in conjunction with the Department of Transport and the Western Australian Planning Commission, should examine ways to ameliorate the impacts of 'Just in Time' on freight movement. ***(Recommendation 16)***

- Westrail, in conjunction with Treasury and the Department of Transport, should examine what level of debt should be recovered in charges on Westrail's customers. ***(Recommendation 30)***

- The Department of Transport, in conjunction with Westrail, should further develop the principles and process for providing rail access to other operators. ***(Recommendation 31)***

- Main Roads WA should, through the national processes, examine the benefits and costs of heavier axle loadings so that any possible increases can be factored into the design parameters for new road and bridge construction and existing road and bridge reconstruction. ***(Recommendation 34)***

- Increases in tolerances in exchange for accreditation should be considered on a case by case basis, and be modest in scope. ***(Recommendation 26)***

- Main Roads WA should examine grounding and load confiscation strategies for combatting overloading. ***(Recommendation 38)***

- Main Roads WA, in conjunction with WAMA, should examine the feasibility of extending cooperation between Shires to build major road works. ***(Recommendation 43)***

C. Minimised nuisance

- The Department of Environmental Protection should develop sustainable transport noise targets. ***(Recommendation 14)***

- The Department of Environmental Protection should examine the use of composite noise indices for determining road and rail traffic noise limits with a view to their adoption nationally. ***(Recommendation 15)***

- The State Planning Strategy should provide for future rail/road interchanges in Geraldton, Wubin, Kalgoorlie, Leonora, Albany and Esperance. ***(Recommendation 32)***

- Consideration should be given to the phasing-in of modern exhaust brakes on older trucks. ***(Recommendation 69)***

D. Minimised environmental damage

- The Department of Transport should test the exhaust emissions of new trucks to ensure their compliance with the Australian Design Rules. ***(Recommendation 53)***

- The Department of Transport, in conjunction with the Department of Environmental Protection, should investigate the feasibility, benefits and costs of introducing differential government fuel levies according to the environmental qualities of diesel fuel. ***(Recommendation 54)***

E. Maximised living standards and mobility

- Where the impacts of change in transport policy or operations fall unequally on individuals, compensation should be considered. Any compensation should be restricted to unavoidable impacts. ***(Recommendation 10)***

- The costs of the impacts of a change in transport policy should be charged to the beneficiaries of the change, and the proceeds applied to impact amelioration strategies. ***(Recommendation 11)***

- A working party under the auspices of the Western Australian Planning Commission should develop guidelines for payment of compensation to people who are adversely affected by changes in heavy freight transport policy or operations. ***(Recommendation 12)***

MINISTERIAL DIRECTION

The Select Committee, under Standing Order 378, directs the Ministers representing the Ministers for Transport and Mines, or their Parliamentary Secretaries and the Treasurer and Ministers for Police, Labour Relations, Planning and Local Government be required within not more than three months, or at the earliest opportunity after that time if Parliament is in adjournment or recess, to report to the House as to the action, if any, proposed to be taken by the Government with respect to any recommendations of the Committee which falls within their jurisdictions.

CHAPTER ONE

1. REPORT PROCESS AND STRUCTURE

1.1 Introduction

Heavy transport plays a significant and generally poorly understood role in Western Australia's development and in the every day activities of individuals and businesses.

The Committee's focus is on land freight transport and in particular the roles played by rail and trucks over 4.5 tonnes Gross Vehicle Mass (GVM).

Road and rail freight transport are undergoing very significant change. As a result, the Committee's deliberations have in some areas been overtaken by government and industry action. Seen in that light, its recommendations attempt to positively contribute to ongoing improvements which will benefit all Western Australians into the 21st century.

The Committee's focus is on principles and priorities. This means that transport agencies and the industry who are best placed to implement change in the transport system, need to translate these principles and priorities into action after detailed impact analysis.

1.2 Process

This enquiry arose out of public concern about road train access to the metropolitan area, and underlying concerns about the amount of heavy haulage on the road network, not only in the metropolitan area but in regional centres and country areas generally. Accordingly the Committee was concerned to ensure that as wide a cross section of the community as possible was given the opportunity to put its views. The Committee called for written public submissions and embarked on an extensive State-wide series of public meetings and site visits. The Committee received 132 submissions which were of very high quality. A list of submissions received is in Schedule 1(a). By way of example, the submission by the Country Women's Association of Western Australia (CWA) is in Schedule 1(b). The Committee called a number of witnesses to give evidence. It also held public hearings between December 1994 and March 1995 in Midland, Armadale, Geraldton, Karratha, Mount Magnet, Kalgoorlie-Boulder, Merredin, Northam, Katanning, Albany, and Bunbury. A list of people who gave evidence is in Schedule 2. A summary of the issues raised in the public hearings is in Schedule 3.

To assist the Committee in better understanding what people felt about heavy freight transport, it circulated Transport Information and Discussion papers in June 1995, with a request for further written submissions by 31 July 1995. The Discussion Paper contained a survey of evidence presented to the Committee, and its ten preliminary conclusions. Seventy seven submissions were received. A list of the submissions is included in Schedule 1(a). The Discussion and Information Papers are in Schedules 6 and 7.

An overview of the issues raised in the written submissions is shown in Table 1.

Table 1: **Public Submissions - Issues Raised**

ISSUE RAISED	SUBMISSION SOURCE				
	Transport User	Road Provider	Other Provider	Community	Local Government
Land Freight Policy	6	4	2	20	25
Rail Track	1			3	3
Rail Operations				1	4
Roads			1	8	28
Trucks		1	3	13	14
Drivers	2	1	1	5	10
Consignments				10	2
Safety		1	1	8	6
Enforcements				1	
Traffic Management				7	3
Congestion	2			6	11
Neighbourhood Amenity			1	14	6

The Committee undertook a program of fact finding visits in South Australia, New South Wales, Victoria, Tasmania and the Australian Capital Territory. It met with industry, transport companies and associations, and Commonwealth State and Local Governments and officials, including the NRTC. In July, the Committee visited industry and government ministries and agencies in Canada, Sweden and the United Kingdom to study freight transport technology and policy developments. Lists of people who met with the Committee and summaries of the discussions are in Schedules 4 and 5.

The Committee undertook a bibliographic search and studied a number of Australian and overseas publications. The list of publications is in the Bibliography. Acknowledgment in the usual manner is made where these publications specifically featured in the Committee's deliberations.

1.3 Structure

The first part of the report (Chapters 2-4), describes the historical context, the importance of freight transport and heavy freight transport policy issues. Together these chapters form the backdrop for the Committee's consideration of rail (Chapter 5), road (Chapter 6), heavy trucks in built up areas (Chapter 7), and heavy trucks in the metropolitan area (Chapter 8). The Committee's recommendations run *seriatim* throughout Chapters 4-8. They are reproduced together in Chapter 9.

The report progresses through the issues in progressive depth. Accordingly, it is best read from the front to the back.

The Executive Summary groups the Committee's recommendations into six categories. In addition to general policy recommendations, there are five groups of specific recommendations corresponding to the main heavy transport outcomes the Committee considers should be adopted as 'landmarks' for choosing the appropriate strategies and actions by the Government, transport agencies and industry. Because the Executive Summary reorganises and prioritises the recommendations, they are not in numerical order as they have retained the original numbering given in the body of the report.

To assist in better understanding of the technical language generally used in the freight transport debate, a series of six Information Boxes is included in Chapters 3 and 4.

CHAPTER TWO

2. HISTORICAL CONTEXT

The history of heavy freight land transport has been part and parcel of the State's development.

The first railway was a private line built in 1871 to haul timber to Busselton. It was followed the next year by another private line from Rockingham to Jarrahdale. The first government-owned railway from Geraldton to Northampton was completed in 1879 for the copper/lead mining industry. By 1889 Perth was connected to Albany via the private line constructed from Beverley to Albany for a 'payment' of 12 000 acres of land per mile of railway. Geraldton was joined to Perth in 1894 under a similar arrangement. This line was privately owned until 1964. The discovery of gold led to the extension of the government network to Kalgoorlie in 1897.[3]

In 1905 the Royal Commission on Land Settlement concluded that 20 kilometres was the limit of viable heavy road transport with the resultant aim to build a grid of railways 40 kilometres apart through the South-West of the State.

The Trans-Australian Railway was completed in 1917.

Between 1894 and 1910 some 1 760 kilometres of line was built to assist the mining industry, and by 1993 a further 3 520 kilometres were built to assist agriculture. By 1932-33 wheat accounted for 23% of earnings, the same as passenger and parcel traffic. In that year 163 kilometres of line from Paroo to Wiluna and from Lake Grace to Hyden Rock were built for the Government railway. The Paroo/Wiluna line was expected to more than cover working expenses and interest. However, on the Lake Grace/Hyden Rock line it was stated that it would *"be some time before covering working expenses and interest, but that is always expected when we build a developmental railway, and as the district becomes established it will not be long before the line will pay"*.[4]

Rail's development of mixed trains with the cross subsidisation of agricultural traffic by general freight sowed the seeds for competition by road transport. At the end of the First World War, agricultural produce and inputs accounted for 40% of the tonne-kilometres hauled, but only 20% of freight revenue. General goods made up 6% of traffic but contributed 20% of earnings.

From 1928 the Government railway began to incur losses. Because of the Depression, agricultural freight rates were lowered in 1933 to provide assistance to farmers. In 1934 freight was regulated to rail under the State Transport Coordination Act to protect the Government's investment in the railways from 'unfair' competition from the road transport industry.

The State highway system, which was built in the 1950s and 60s, was initially a passenger vehicle and light truck network connecting the main decentralised population centres.

By the 1970s the efficiency of road transport in handling certain tasks which remained regulated to rail had been amply demonstrated in areas not serviced by the rail network.

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3 Nock, O.S.: *Railways of the World and Railways of Australia*, Adam and Charles Black, London.

4 Wilcock, Hon., J.C: Legislative Assembly, *Hansard*, 14 November 1933.

The Commonwealth Government took over responsibility for the National Highway in 1974.

In 1978, following a 3 year review, the Southern Western Australian Transport Study (SWAT) recommended the progressive deregulation of freight transport and the simultaneous drive for Westrail to become more commercially oriented.

This process was commenced in 1980 when road transport was allowed to carry up to 9 tonnes of any commodity except grain and freezer/chiller traffic within certain restricted areas.

In 1981 the 9 tonne limit was removed on all goods other than grain, fertiliser, wool, ores, minerals, bulk petroleum products, timber and freezer/chiller traffic.

From July 1982 the third stage allowed licences to be granted for the road transport of general goods south of the 26th Parallel except for specific areas where protected road transport operated under franchise agreements.

From 1982-86 there was partial deregulation of timber transport along with full deregulation of freezer/chiller and wool transport.

At the end of 1986 goods remaining regulated to rail were minor bulk traffic (salt, gypsum, etc), major bulks (over 100 000 tonnes pa of mainly ores and minerals, and some manufactured and grown products), bulk fuel, timber, fertiliser and grain. Further reviews lead to the deregulation of fertiliser and timber.

In 1990, Commonwealth intervention saw the deregulation of export grain transportation which was followed by the State Government's deregulation of domestic grain.

Deregulation was completed in July 1995 with the opening up of the major bulks to competition.

Over the past decade the reform process has achieved annual real dollar savings to the taxpayer, transport users and the community in the order of $150 million, as follows:

- the improved financial performance of Westrail (from a deficit on its commercial operations in 1983–84 of $44 million to a commercial profit in 1993–94 of $19 million pa, an improvement in real dollar terms of around $90 million annually); and

- reduction in freight rates paid by transport users (estimated to total around $60 million pa); offset by

- the net of the increased road costs associated with traffic transferred from rail to road (after taking into account direct State revenue received from the additional vehicles and the fuel they use) is estimated to be between $0.5 million and $4.2 million pa.

The reforms resulted in over 600 000 tonnes pa of freight transferring to road from rail. This represents an increase in freight uplifted by trucks of less than 1% pa. Westrail's employment level reduced by 56 % to 3 409; while its task increased from 3.9 mtk in 1984 to 5.4 mtk in 1994 or by an average 1.5% pa.

In 1994 the National Rail Corporation (NRC) took over responsibility for interstate rail freight utilising Westrail track under a negotiated access agreement. Recently, Specialised Container Transport (SCT), commenced a weekly coast-to-coast boxcar service also utilising Westrail's track.

Regulation of truck length and weight has seen an increase from 15 metres long/31 tonnes GVM in 1966 to 19 metres long/42.5 tonnes GVM for 'as of right' (AOR) trucks. This represents an increased payload of almost 40%. As a result of this and the better fuel economy of trucks, freight rates have declined considerably in real terms. With the availability of more powerful engines, and the assistance of Western Australia's generally flat terrain, road trains up to 53.5 metres are permitted under special licence in some areas.

CHAPTER THREE

3. THE IMPORTANCE OF FREIGHT TRANSPORT

Transport accounts for a major slice of the nation's production. Road and vehicle operating costs alone amount to one fifth of Australia's GDP.[5]

Western Australia produces a quarter of Australia's exports. With the exception of iron ore, bauxite and alumina and some mineral sands, all exports of bulk products are transported by road for at least part of their movement. Most of the material inputs to export production are also transported by road for at least part of their movement. The $700 million pa titanium minerals industry has submitted that transport costs represent 10-15% of the industry's operating costs; and typically, transport makes up 40% of the total cost to mine, process, transport and handle manganese ore.[6] On an Australia wide basis, land transport costs amount to around 10% of the average net pool return for ASW quality wheat.[7]

Because of Western Australia's remoteness from foreign markets for its main bulk exports, and extremely long domestic links, transport costs are a very significant portion of the landed price of exports. Our grain exports also face competition from overseas growers' assistance schemes, such as US agricultural subsidies.

Export producers employ world best practices. Their viability can be threatened where domestic freight transport rates are significantly above prevailing overseas rates. Where this is due to Western Australia employing below world best practices in transport, improving transport productivity is the only available means to become/remain internationally competitive. That is, transport efficiency can make or break existing and new exports.

For new processing industries relying on primary inputs, location and transport arrangements are both critical to their viability. Illustration 1 shows the movements associated with a hypothetical 1 million tonnes logs capacity woodchip/pulp/paper mill development in the South West of the State. Clearly, the location of tree farms, chippers, pulp and paper mills, and ports dictate the mode and amount of transport movement. Unless these are optimised, a fledgling pulp/paper industry could flounder even if road and rail transport are as world best practice. The issue of integrating production and logistics planning is developed further in Chapter 4.5.

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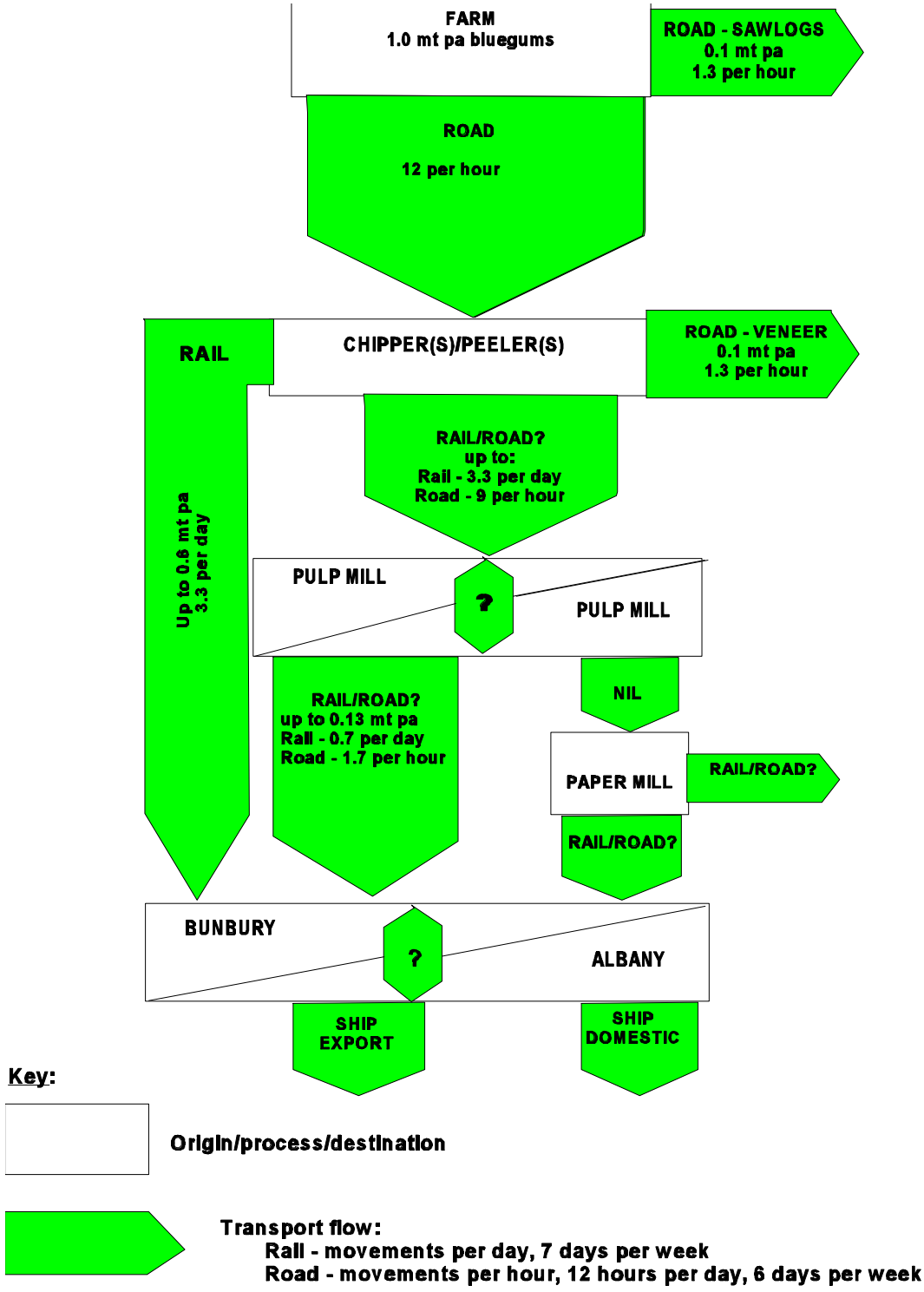
5 Cox, J.B.: *Australian Financial Review*, 13 January 1992.

6 Main Roads Pilbara: Submission No. 121.

7 Australian Wheat Board: Submission No. 114.

Illustration 1:

Integrated Pulp/Paper Transport Schema



3.1 The Land Freight Transport Task

Measurement of the land freight transport task has proved difficult. Road freight transport data in particular suffers from agencies using different approaches. The Australian Bureau of Statistics (ABS) in conjunction with State and Commonwealth transport agencies is tackling the problem.

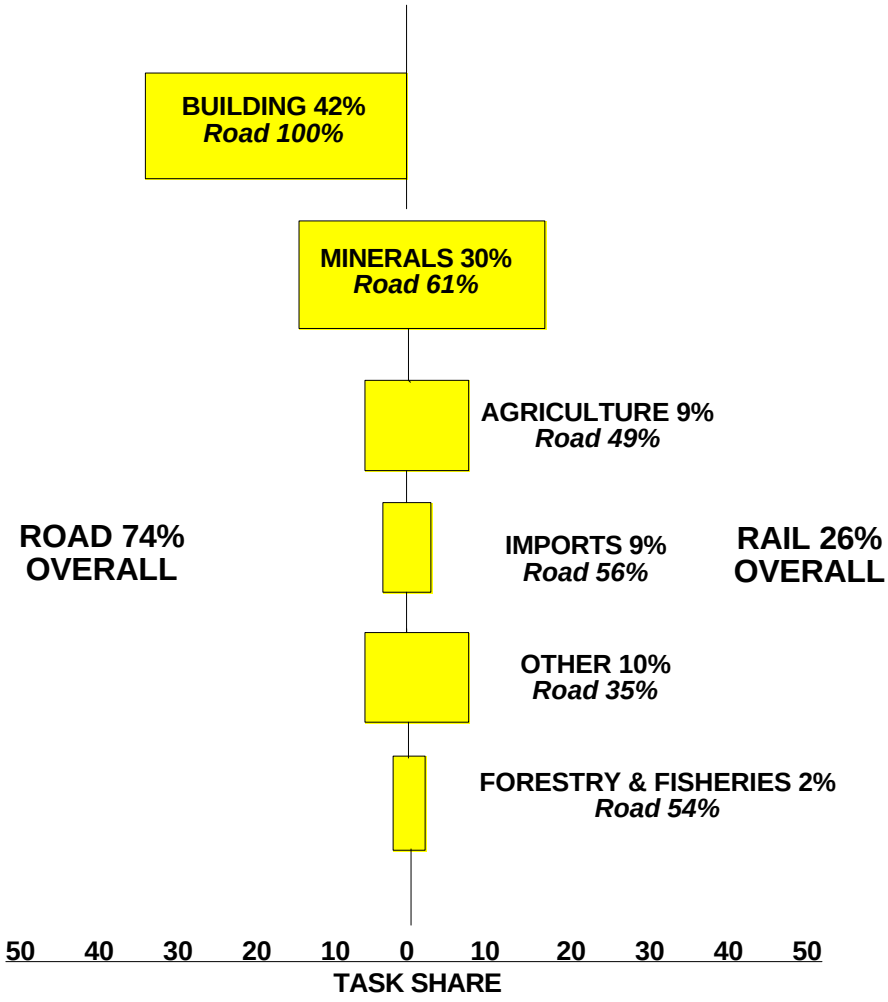
Information Box 1 on Page 13 explains the terms used to describe measurement of land freight movement.

The land freight transport task in Western Australia has shown very rapid growth over the past 10 years. Excluding the private Pilbara iron ore railways, the task has grown from 12 200 million tonne kilometres (mtk) in 1984 to 19 500 mtk in 1994, an increase of 5% per annum.

The broad land freight task is shown in Figure 1. Figure 1 is based on crude production and overseas trade data which discounts the multiple movement of freight

Figure 1:

Public Land Freight 1989-90 - Task (tonnes) and Mode Share

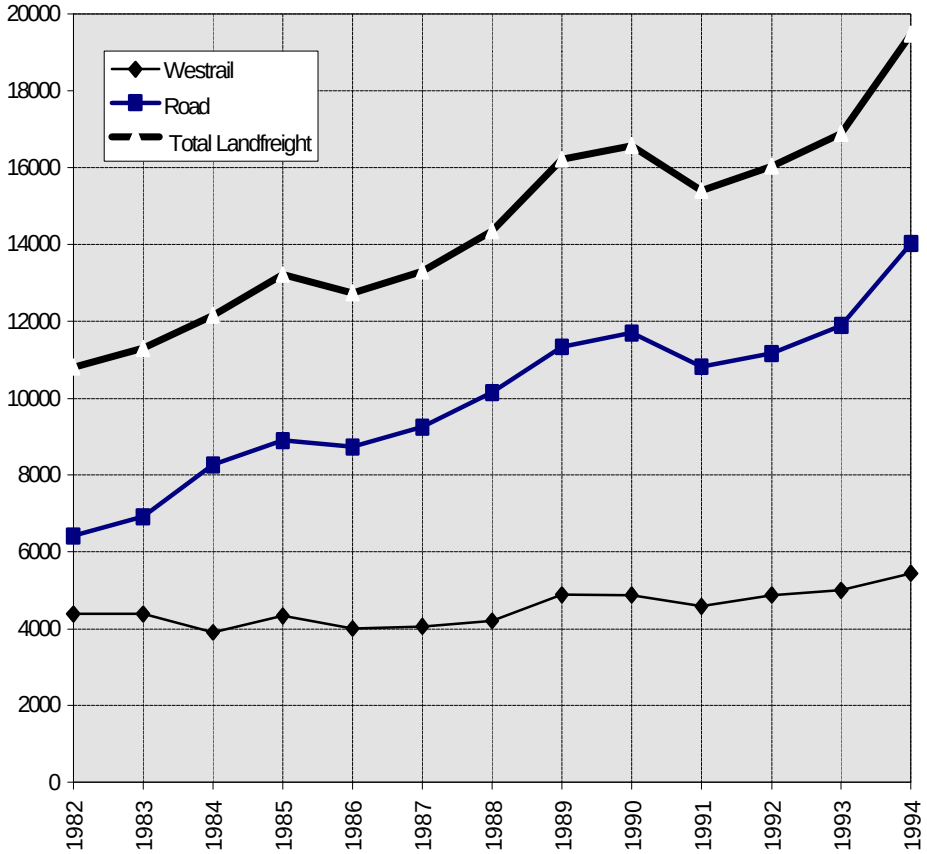


Source: ABS and Agency Annual Reports.

The growth in Western Australia's land freight task is shown in Figure 2.

Figure 2:

Land Freight Task in Western Australia 1982-1994 (mtk)



Source: Transport Agency Submission No.111.

The growth trend path broadly follows the growth trend cycles in the economy.

3.1.1 Road

The road transport sector has met most of the increased land freight transport task. The road mode's (road's) task over the 10 years from 1984 increased from 8 200 mtk to an estimated 14 000 mtk, or 6% per annum. Road's share of the overall task increased from 67% to 72%. Of the total road freight task, half originates and/or is destined for the Perth metropolitan area.

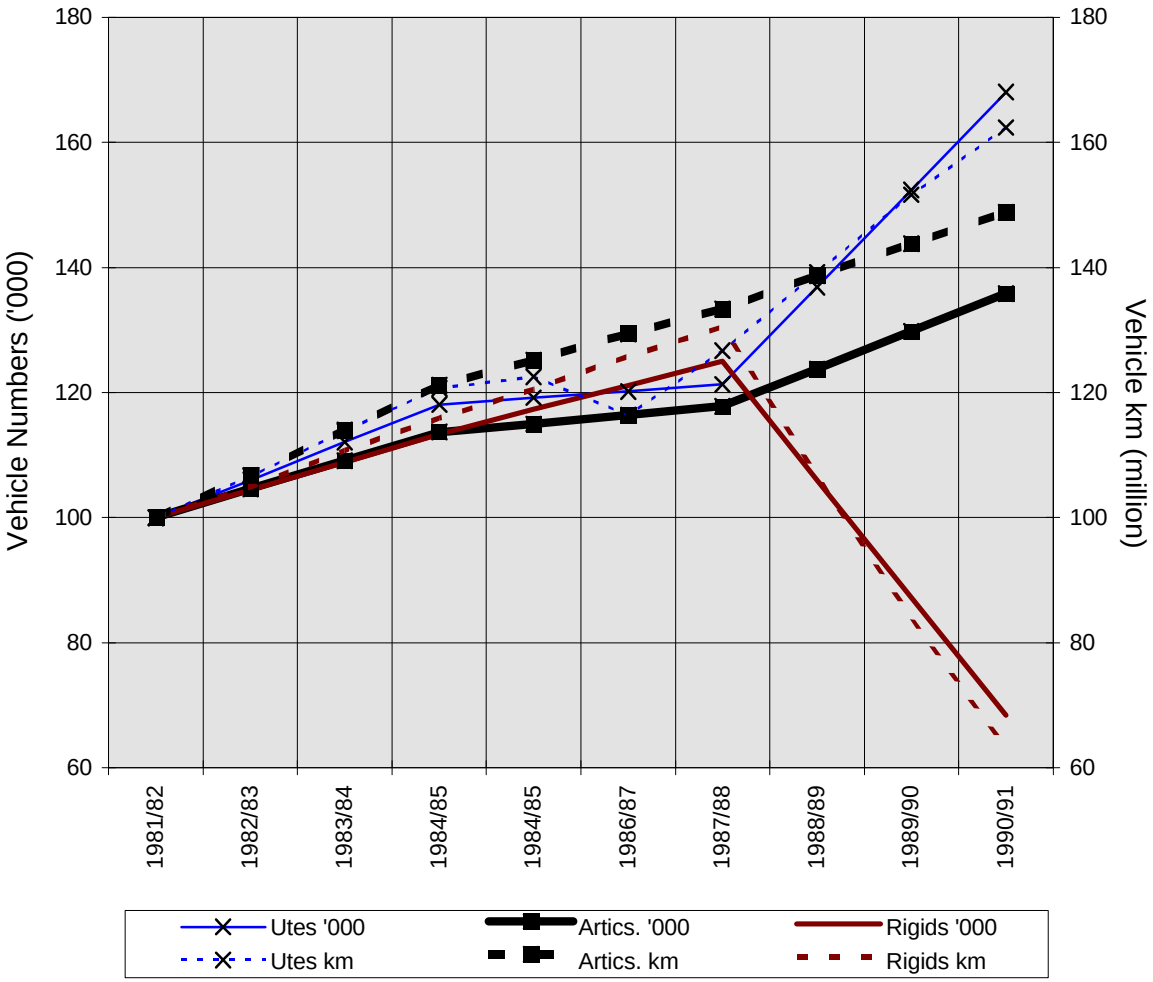
Western Australia's road freight movements are shown in Illustration 2. While the road freight task has grown twice as fast as the State's population, road vehicle numbers and size, which are perhaps the most visible signs of road freight task growth, present a somewhat different picture.

Illustration 2:

Annual Freight in Tonnes on some Major Roads

Source: MRWA.

Figure 3: **Road Movement Growth Index by Vehicle Types**
Western Australia 1981-82 - 1990-91



Source: ABS.

Figure 3 shows articulated trucks and utilities numbers and distances travelled have grown, and that rigid truck numbers and distance travelled have declined. Distance travelled by articulated trucks has grown significantly more than articulated truck numbers.

Freight movement shares by types of vehicles is shown in Figures 4(a) and 4(b).

Figure 4(a):

Road Freight by Vehicle Types
1991 compared with (1982)
Freight Total 10 900.5 mtk (6 365.9)

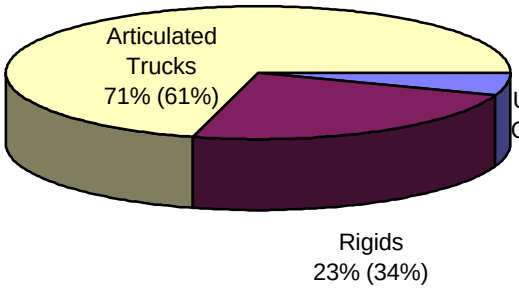
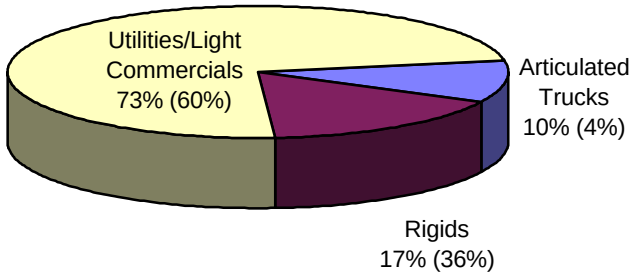


Figure 4(b):

Total Distance Travelled by Vehicle Types
1991 compared with (1982)
Distance Total 3 904.7 mkm (3 261.5)



Source: ABS 9208.0

The picture that emerges is that the share of distance travelled by articulated trucks in 1991 was two and half times what it was in 1982. It is this growth in articulated vehicle travel that may be reflected in the public outcry about the number of heavy vehicles on the road. Articulated truck numbers are most likely to be reined in by the more widespread use of longer articulated vehicles.

According to the ABS, between 1982 and 1991 car distance travelled increased 33%, while utilities/light commercial and articulated vehicle distances travelled increased 73% and 43% respectively

Information Box 1:

Measuring Movement of Land Freight

Movement of Freight

A vehicle's size is measured by its laden or **Gross Vehicle Mass (GVM)** and its freight capacity or **payload (tonnes)**. Typically, a truck's GVM is comprised of one-third tare and two-third payload.

Freight movement is measured in **million tonne kilometres (mtk)**, ie the multiple of the **payload** and **distance carted**. Another measure is **uplifted tonnes**.

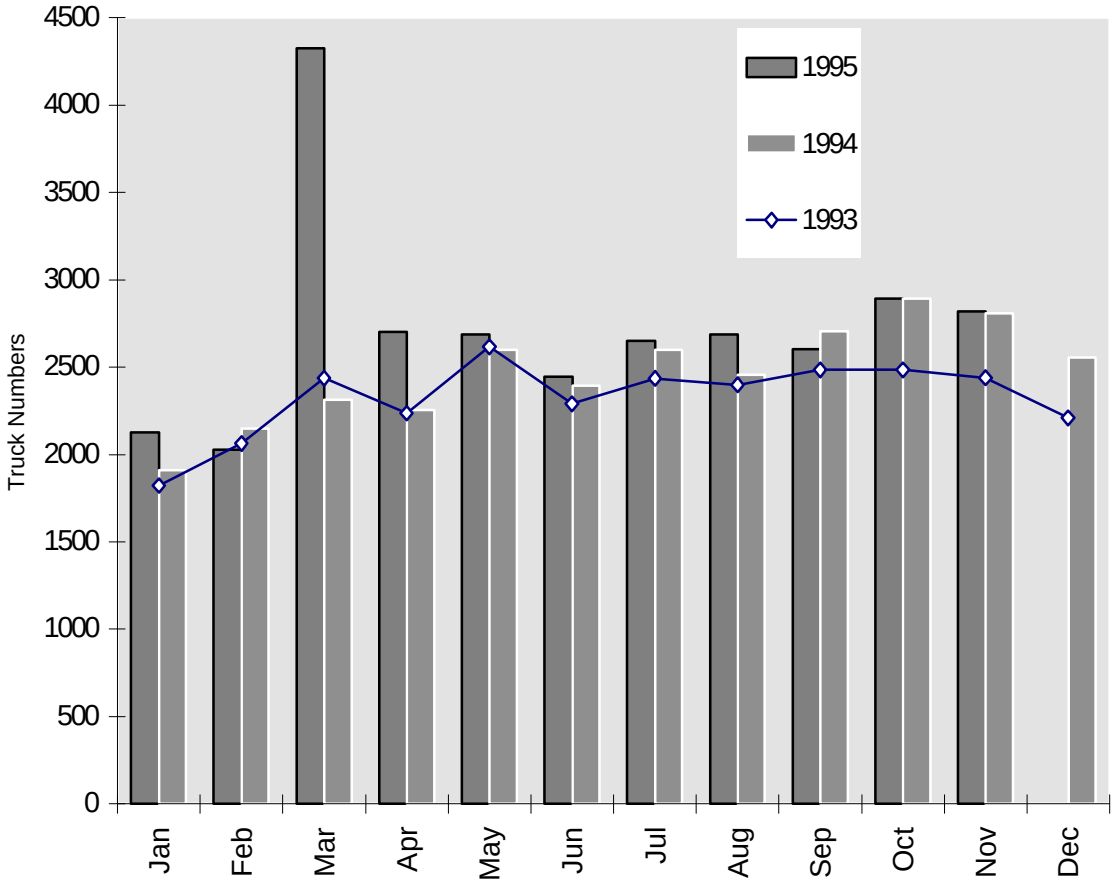
Movement of Vehicles

Vehicle flows are measured as **Annual Average Daily Traffic (AADT)**.

Freight vehicle flows are also measured in **laden** and **unladen kilometres** by vehicle types and **vehicle movements per hour**.

By way of bench marking vehicle numbers involved, transcontinental east-west truck movements are shown in Figure 5.

Figure 5: **Monthly East-West Truck Numbers**
January 1993 - November 1995



Source: Agriculture Western Australia.

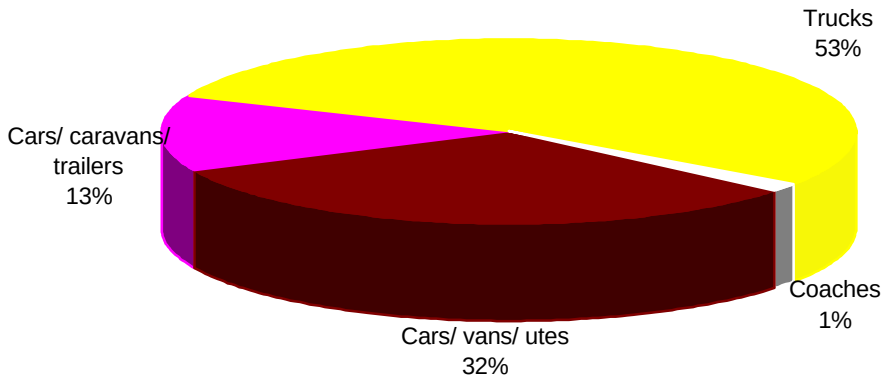
The East-West movement of 658 000 tonnes in 1994 was carted by 28 000 trucks carrying an average 24 tonnes. The abnormally high movements in March and April 1995 were the result of closure of the transcontinental railway due to flooding.

The mix of the typical daily 150 east-west movements at Norseman is shown in Figure 6.

Vehicle movements on the Great Northern Highway at Muchea, which is the State's busiest regional freight highway sector (measured in uplifted tonnes) are shown in Figure 7. Figures 6 and 7 show a range of truck shares of traffic of 15-53%.

Figure 6:

East-West Vehicle Types - Norseman, August 1994



Source: Department of Agriculture

Figure 7: **Annual Average Daily Traffic**
Gt Northern Highway, Muchea - March 1993 to February 1994

3.1.2 Rail

Westrail's task measured in uplifted tonnes and million tonne kilometres (mtk) has risen steadily from 1986. By the year 2000, 30.6 million tonnes and 5 600 mtk respectively are expected to be carried by rail. This is an increase of 43% and 18% respectively over the task in 1980.

To benchmark the rail task, the Committee estimates that without Westrail, more than 520 double road train equivalents, operating around the clock, would currently be needed. This number would increase by 220 to accommodate the rail task projected for the year 2000.

Western Australia's rail freight network and freight movements are shown in Illustration 3.

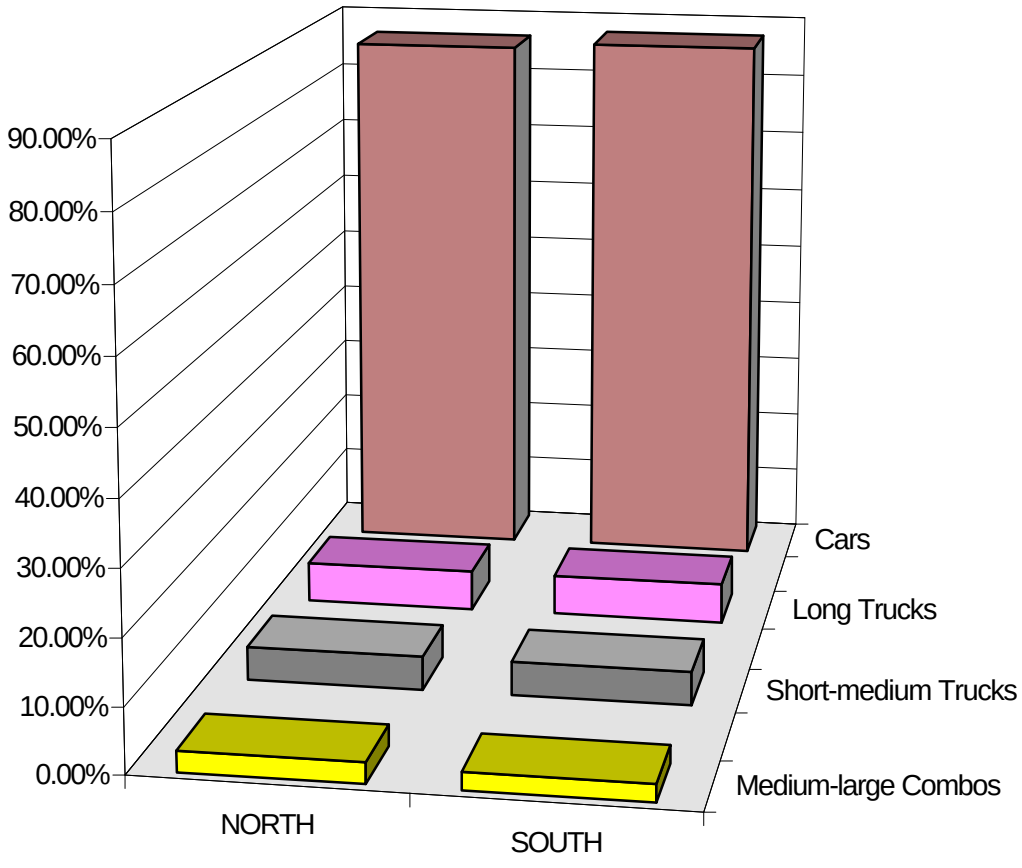


Illustration 3: **State Rail Network and Tonnes Carried**

Source: Western Australian Planning Commission.

CHAPTER FOUR

4. HEAVY FREIGHT TRANSPORT POLICY ISSUES

Consideration of heavy freight transport policies should take place within the context of an appropriate comprehensive transport policy framework. Such a framework has recently been the subject of much debate. This has been brought about by the higher profile of transport since belated recognition of its pivotal role in maintaining Australia's international trade competitiveness through micro-economic reform and competition policy.

In developing the heavy freight transport objective and outcomes to backdrop its detailed considerations, the Committee has examined transport policies in Western Australia and the other States.

The Committee is mindful that government has no proprietary claims on heavy freight transport policy as such. Its role stems from community values it reflects, from being the biggest owner of transport infrastructure and through its power to legislate. Freight transport providers and users are other major stakeholders in heavy freight transport policy. Road freight transport interests, through for instance the Road Transport Forum, are increasingly challenging the pre-eminence of government in transport policy formulation. Car drivers who share roads with trucks are also major stakeholders in freight transport policy.

One contemporary view of government's role is that it should 'steer' and not 'row'. For transport policy this is held by some to mean that government should at least commercialise if not privatise its transport assets and operations, and adopt a minimalist prescriptive role, leaving it largely to market forces of demand and supply to deliver the appropriate transportation system and outcomes. Regulation is replaced by quality control and/or alternative compliance or self regulation subject to audit and the Government's role is reduced to ensuring competition enables markets to work, and setting and monitoring standards.

Information Box 6 on Page 40 explains the terms used to describe industry self regulation.

Some elements of this view are embraced by the Department of Transport's 'Proposals for Regional Land Policy in Western Australia'. The policy's first objective is -

> *"to improve land transport efficiency through more effective competition"*

and the associated strategies are -

> *"minimising regulations restricting competition"*

and to -

> *"increased freedom for Westrail to pursue commercial objectives in its operations".*[8]

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[8] Department of Transport: *Proposals for Regional Land Transport in Western Australia - Which Way Ahead?* July 1994.

Information Box 2:

Heavy Freight Transport Policy

A heavy freight transport policy is a structure of **goals and methods for ensuring movement of heavy goods with the help of the transportation system.**

The highest order heavy freight transport goal is the **objective**. Subsidiary goals are the **outcomes**. Methods are referred to as the **means**.

The **objective, outcomes and means** need to be seen from the different **perspectives** of the relevant parties who have different **interests**.

Individuals **demand or want** heavy freight transport and this is reflected in what they should **pay** for it.

The community's **need** for heavy freight transport reflects the **value** it places on transport and living standards.

Heavy freight transport intrudes on lifestyle. This is called its **social impact**. Heavy transport also has an **environmental impact**.

Government heavy freight transport **objective, outcomes** and **means** balance the interests in heavy freight transport **wants, value** and **impacts**.

The reality of transport policy in Western Australia in the foreseeable future is that Government (State, Local and Commonwealth) will probably remain the major owner of road track assets, which are 'paid for' by users in charges and taxes and that road asset preservation and safety regulation will remain much as before.

Main Roads WA has submitted in evidence that it supports industry self regulation on the main asset preservation issue of axle weights and on the important safety issue of truck driver fatigue. At the same time the 'permit' system for oversize trucks is a powerful instrument to ensure compliance with very wide ranging controls on truck operations. Land use planning and environmental policies which are entwined with transport policy will also, for their own perhaps more obvious reasons, remain in the government domain rather than being left to market forces to resolve.

The Western Australian Planning Commission has recently issued a discussion paper on transport[9]. Transport demand and related land use planning issues are discussed further in this chapter, and in Chapters 7 and 8.

One area where current policy may already be impacting on the way that transport has historically organised its regulation effort is rail safety. Arguably, a more commercial Westrail should not be burdened with the function of public (as distinct from worker) safety.

Rail safety is discussed further in Chapter 5.4.

That government regulation has led to too many controls now seems obvious. There have been regulations to protect the railways from competition by road and differences between the States

9 Western Australian Planning Commission: *Discussion Paper on Transport*, November 1995.

in truck specification, taxes and charges. Once unnecessary controls have been stripped away under national microeconomic reform and competition policies, the remaining controls on freight transport should ensure that flagrant and frequent breaches of agreed standards expressed in laws are, and are seen to be, dealt with promptly and fairly. Regulation is discussed further in general terms in this chapter. Specific regulations are discussed throughout Chapters 5-8.

4.1 Heavy Freight Transport Objective and Outcomes

Government heavy freight transport policy requires specification of goals and methods. Information Box 2 on Page 19 explains the terms used to describe heavy freight transport policy.

The means for achieving heavy freight transport outcomes and objective include persuasion and legislation. Legislation in turn sanctions permissive or privilege elements such as licences, and restrictions or controls including penalties for non-compliance.

The current mood to 'deregulate' seems in the Committee's view to be, at least in part, a reaction to the tendency in the past to over emphasise legislated controls rather than incentives and persuasion . By definition **regulation** means **adjustment to a standard** and not just controls. This issue is developed further in Chapter 4.6.

Specific means for achieving heavy transport outcomes are discussed throughout Chapters 5 to 8.

Recommendation 1

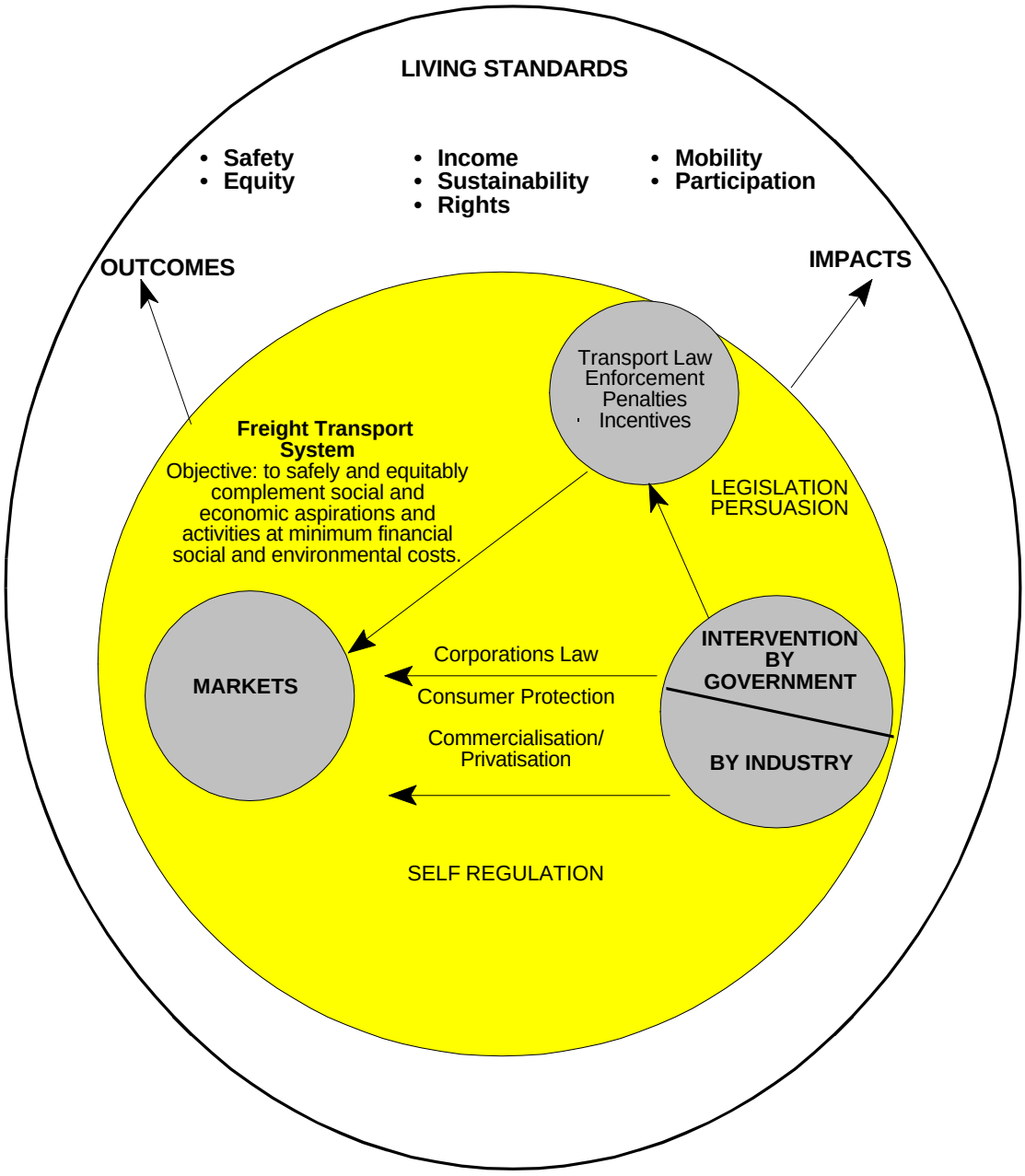
The Government's heavy freight transport policy objective should be to safely and equitably complement social and economic aspirations and activities at minimum financial, social and environmental costs.

Heavy freight transport policy 'walks' the knife edge of living standards and the intrusions on lifestyle that flow from creating those living standards. Freight transport legislation therefore both protects lifestyle and imposes a cost which potentially constrains it. This is shown schematically in Illustration 4.

A heavy freight transport policy needs to be responsible and balanced, and consistent with other transport and broader policy. The Committee considers that the most important heavy freight transport policy outcome concerns safety. The other main outcomes it feels should be considered are service cost and quality, transport nuisance, environmental quality; and living standards and mobility.

Illustration 4:

Heavy Freight Transport Policy - Objective, Outcomes, Means and Impacts



Recommendation 2

The outcomes of a heavy freight transport policy should be:

- **(a) reduced incidence and minimised risk of death or injury, and property damage in crashes;**
- **(b) minimised financial cost of a quality service;**
- **(c) minimised nuisance;**
- **(d) minimised environmental damage; and**
- **(e) maximised living standards and mobility**.

The objective and outcomes form the 'landmarks' used by the Committee to examine present heavy freight transport methods, and shaped the Committee's recommended actions.

4.2 Safety

Safety was foremost in the community's views about heavy freight transport.

Information Box 3 on Page 23 explains the terms used to describe measurement of heavy vehicle safety.

Safety is a matter of individual motivation rather than intellect or feelings; of 'needs' rather than thoughts or 'wants'. In Maslov's hierarchy of motives, after food, safety is the most basic need and is a precursor to fulfilment of all other needs.

The 'instinctive' nature of the fear of heavy freight transport perhaps best explains why people do not necessarily act irrationally or emotionally when they complain about, for instance, larger trucks being introduced on metropolitan roads.

Because of the nature of the need for safety the Committee feels it is important that any future heavy freight transport safety policy responds to people's needs in ways which are proven motivators. This includes the continuing use of a 'healthy' fear as a positive motivator. Otherwise too great a reduction in fear can increase risk taking through what psychologists call 'homeostasis'.

Recommendation 3

A comprehensive public education program should be part of the strategy adopted to reduce unnecessary community fear of heavy transport.

Information Box 3:

Measuring Heavy Vehicle Safety

Heavy freight vehicle safety is measured by the **crash-free kilometres travelled (mkm) or tonne kilometres of freight uplifted (mtk)**.

Heavy freight vehicle crash involvement costs are measured in **numbers of dead and injured people and dollar property damage ($m)**.

Heavy freight vehicle safety could also be measured as the **technical risk** or **probability** of heavy vehicle related incidents occurring with the potential to cause damage, ill-health, injury or other losses multiplied by the outcome or **consequence** of the occurrence -

ie, **risk = probability × consequence**

Risk is expressed as **the chance of death per years of exposure** (eg one in a thousand).

Crash costs are met from insurance premiums and other cash costs. These costs are reflected in freight rates paid for the carriage of goods **($/tonne or cents/tonne kilometre)**.

The Committee is of the view that safety regulation will be most effective in reducing the incidence and risk of death, injury and property damage where the following principles apply -

- it is functionally separated from competing activities such as rail operations, road building, mining regulation, law enforcement and crash investigation;
- the regulator's scope and power to deliver protection to all the parties are understood and accepted;
- there is foremost acceptance of responsibility and accountability by the parties for their own safety;
- risk to safety is publicly discussed and acceptable risk thresholds transparently monitored, evaluated and changed; and
- penalties as a last resort are comprehensive and appropriate.

State responsibility and accountability for heavy freight transport safety have been dispersed between several instrumentalities, including Local Government, the Traffic Board, Police Department, Main Roads WA, Westrail and the Departments of Transport and Minerals and Energy (for dangerous goods). Other interested parties include the Western Australian Planning Commission, Worksafe, the State Government Insurance Commission, the Ministry of Fair Trading and the Department of Environmental Protection.

The safety agenda is increasingly being driven by national initiatives, such as the proposed national transport law.

Because of rapid change in heavy freight transport technology and regulation, a refocusing of the State's safety effort has been under consideration.

The Committee supports the establishment of the new Road Safety Council and Office of Road Safety within the Department of Transport.

The Committee envisages day to day safety functions by and large continuing to be performed by those instrumentalities currently involved. However, their focus and priorities would be determined by the Council. To more clearly link safety accountability and resourcing, these instrumentalities' services could be 'purchased' by the Council from service delivery agencies.

Chapter 5.4 discusses the development of rail safety standards. In due course, consideration of combining responsibility and accountability for road and rail safety (ie for land transport safety) would seem sensible. Meanwhile, safety resources could be made available to the separate responsible road and rail authorities.

Direct appropriation of road and rail safety expenditure to the accountable authorities rather than to the service delivery agencies makes even more sense where private ownership of roads runs in parallel with public ownership, and where there is third party access to public railways.

Recommendation 4

Consideration should be given to the Government making a separate appropriation for land transport safety.

The size of the land transport safety budget would need to have regard to the current level of resourcing of the safety function, and the backlog of capital works to be undertaken.

The roadworks backlog program being funded from the 'surcharge' on the fuel franchise levy on petrol involves expenditure of $1 billion over 10 years. The size of the ongoing roadworks budget is over $700 million, including over $250 million pa for new roads. Accordingly a road transport safety budget for capital works equivalent to 10% of new infrastructure investment should indicatively raise over $25 million per annum. The Committee estimates that, based on evidence by R.M. Marks, adoption by Western Australia of UK road safety expenditure benchmarks would mean that $32 million pa should be spent to reduce the road toll by 10%. Rail safety capital works would also need to be funded.

The now defunct Commonwealth Black Spot Program supported road safety projects from General Revenue. In Canada rail safety capital expenditure is supported by General Revenue appropriation of up to 80% of project expenditure. Expenditure on all safety projects in Western Australia such as rail grade separation, passing lanes on road train routes and dedicated heavy vehicle routes could also be on a shared costs basis with proponents.

Recommendation 5

A target should be struck for safety capital works and the amount appropriated to the Road Safety Council.

The fact that, according to further evidence by R.M. Marks, there is a significant difference in what the community accepts by way of risk for road and rail transport, provides further impetus for the suggestion that General Revenue should be a source for land transport safety funding. If, as is the case in the UK, a life lost in a rail crash in Western Australia were to be over two and a

half times the 'value' of a life lost in a road crash, [10] the extra cost in crash prevention by Westrail should not be borne by its customers through charges, but by the general public.

Recommendation 6

Safety capital works should be funded on a cost sharing basis with proponents. The level of cost sharing should be determined on a case by case basis depending on project priority.

Project priority would be determined by their contribution to attainment of safety outcomes which are stated from time to time as targets to be achieved.

Recommendation 7

Safety project priority should be determined by the relative contribution to reducing the risk of death or injury and property damage.

The issue of safety and risk abatement is discussed further in Chapters 5 – 8.

4.3 Social Impact

For the purpose of discussing heavy freight transport policy, the Committee takes the broad social outcomes being pursued to be improved income, equity, mobility, participation and rights. These components are common to most social justice policies.[11]

Social values are fluid over time. Accordingly the measurement of change in income, equity, mobility, participation and rights are taken against current benchmarks.

The social outcome is captured in Objective 5 of DOT's Proposals for Regional Land Transport in WA which is *"to ensure that there is an acceptable balance between the drive for greater efficiency and the impacts of land transport on the community and the environment"*, and in the associated strategy to *"ensure that social and environmental concerns are recognised in transport decision making"*.[12]

Trains and trucks enable the community to function better because they are instrumental in the provision of facilities and goods and services taken for granted in every day life, jobs, and exports all of which underpin living standards and lifestyle.

One reason why the public at large may see heavy road freight transport being much more of a nuisance than benefit is that they possibly equate their lifestyle with those trucks which cart their daily consumer goods, and have a lower 'tolerance' to trucks which cart bulk export commodities. The Committee estimates that heavy trucks carting consumer goods account for fewer than

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10 Evidence by R. M. Marks.

11 For example, see Queensland Transport Policy: *Directions Statement*, April 1993.

12 Department of Transport: *Proposals for Regional Land Transport in Western Australia - Which Way Ahead?*: op. cit.

one per cent of goods vehicles encountered on roads. This would mean that people may be less tolerant of 99% of the trucks on the road.

The Committee feels any image the public may have of trucks being a nuisance could be turned around if it were better and more widely understood, particularly within the metropolitan area, that lifestyle is so significantly underpinned by the State being primarily an exporter of grown and mined raw material.

Recommendation 8

Heavy freight transport should be marketed as a major driver of growth and prosperity.

Lifestyle is adversely affected by the intimidation people feel as road users and, in some instances, where their properties are endangered. This intimidation stems largely from the perception that heavy trucks are unsafe or are driven in a manner which is unsafe. Community confidence in heavy truck safety would be increased, and intimidation reduced, if safety issues are openly discussed in non-technical terms that the public understands.

In creating growth and prosperity, trains and heavy trucks can infringe individual rights and lifestyle to varying degrees.

Recommendation 9

Where implementation of transport policy involves significant change, the impacts should be fully and transparently assessed.

Main Roads WA's commitment to providing a better service to all its customers has led to the establishment of a Customer Service Council and Charter for the Metropolitan Area. Separate Councils and Charters are being established in each region, and Customer Service Managers in each region are responsible for providing a community liaison service.

Impact assessment is already provided in land use planning. However, the scope and size for changing the transport system, as demonstrated by annual expenditure on new road of more than $250 million, puts the timing of transport decisions on a rather more dynamic scale than land use planning discussions.

The principles and practices of impact assessment and compensation are well established. The National Road Transport Commission (NRTC) is required to prepare Regulatory Impact Statements; Main Roads WA compensates an owner whose property is resumed for road building; and the United Kingdom compensates for loss of property value due to nearby roadworks and reimburses householders' costs of insulating homes on new or upgraded roads[13] in much the same way as the Australian Government is reimbursing noise insulation costs of homes affected by aircraft noise in Sydney.

[13] UK Royal Commission on Environmental Pollution: *Transport and the Environment*, October 1994.

Recommendation 10

Where the impacts of change in transport policy or operations fall unequally on individuals, compensation should be considered. Any compensation should be restricted to unavoidable impacts.

This would mean for example that a person who buys a house on a highway or busy regional road will not be compensated, whereas a person whose suburban street is gazetted as a major road would be eligible for compensation.

In road freight transport the principle is well established in other States and under the proposed national heavy vehicle registration charges that where an economic advantage results from for instance allowing bigger trucks, there is an appropriately higher registration charge. Such a charge which in part reflects the 'nuisance' created by bigger trucks for overtaking cars should be applied to road widening and passing lane construction.

Recommendation 11

The costs of the impacts of a change in transport policy should be charged to the beneficiaries of the change, and the proceeds applied to impact amelioration strategies.

The Committee is mindful that its recommendations on compensation may be controversial. As the transport agencies have put it :

> "*The role of government is to make decisions that are in the wider interest of the community, notwithstanding that such individuals or groups may be disadvantaged by such decisions.*" [14]

The Committee considers that in redistributing the 'public good', compensation principles are widely but perhaps inconsistently applied.

Recommendation 12

A working party under the auspices of the Western Australian Planning Commission should develop guidelines for payment of compensation to people who are adversely affected by changes in heavy freight transport policy or operations.

[14] Submission on the Discussion Paper No.75.

4.4 Environmental Impact

For the purpose of discussing heavy freight transport policy, the Committee takes the environmental outcome being pursued to be that of 'sustainability'.

The World Commission on the Environment and Development in 1987 defined sustainability as -

> *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs".* [15]

The sustainability outcome is also captured in Objective 5 of DOT's Proposals for Regional Land Transport in WA which is -

> *"to ensure that there is an acceptable balance between the drive for greater efficiency and the impacts of land transport on the community and the environment",*

and in the associated strategy to -

> *"ensure that social and environmental concerns are recognised in transport decision making".*[16]

The Metropolitan Transport Strategy suggests that environmental responsibility dictates targets no higher than today's levels should be adopted for atmospheric pollutants and run-off; minimisation of impacts on flora and fauna particularly in areas of high conservation values; and reduction in the number of people exposed to traffic noise levels exceeding 68 dBA(L10 18h).

The United Kingdom's '1994 Sustainable Transport Policy' amongst other things looks to -

> *"ensure that users pay the full social and environmental cost of their transport decisions so improving the overall efficiency of those decisions for the economy as a whole and bringing environmental benefits".*[17]

Because fuel use is directly linked to pollution, any environment charge would best be levied on fuel.

Clearly the proceeds of any environment user pay charge on heavy freight transport should be excised from other charges which are allocated for track construction or maintenance. An appropriate function that could be supported by the proceeds is research into pollution related diseases. This would be a matter for possible Commonwealth action.

4.4.1 Pollution

Transport pollution causes significant costs to health, damage to materials and reduced agricultural production. The annual health costs alone of motor vehicle pollution in the USA is estimated at more than $10 billion.[18]

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15 UK Royal Commission on Environmental Pollution: op. cit.

16 Department of Transport: *Proposals for Regional Land Transport in Western Australia*: op. cit.

17 UK Royal Commission on Environmental Pollution: op. cit.

18 Sperling and De Luchi 1989. Quoted in OECD: *Motor Vehicle Pollution Reduction Strategies Beyond 2010*, 1995.

The Department of Environmental Protection has said in evidence that transport pollution is the major contributor to Perth's air quality degradation.

With the advent of 3-way catalytic converters for petrol engines, diesel engine emissions have come into sharper focus.

Particulates may be increased by a factor of 10 to 15 in diesel engines which have not been properly maintained. Differences of a factor of two are possible without a noticeable effect on power or fuel consumption.[19]

More powerful diesel engines, while more fuel efficient, could increase absolute emissions from heavy vehicles because engine emission limits relate to engine size.[20]

Information Box 4 explains the terms used to describe measurement of heavy vehicle pollution.

Permitted truck emissions are prescribed in Australian Design Rule (ADR) 30 which applies to all goods vehicles manufactured on or after 1 July 1988.

Locomotive and truck pollution are discussed further in Chapters 5, 6 and 7.

Information Box 4:

Measuring Heavy Vehicle Pollution

Pollution from exhaust emissions depends on -

- **engine type, size, age and state of maintenance**
- **fuel type and quality**
- **terrain** and
- **driving style**.

The main diesel engine pollution **gases** and **particles** are -

- **carbon monoxide**
- **nitrogen oxides**
- **sulphur dioxide**
- **Volatile Organic Compounds (VOLs)**
- **formaldehyde**
- **particulates** and
- **ozone**.

Gases are measured in **milligrams per cubic metre (mg/m^3)** or **micrograms per cubic metre (µ/m^3)**, or **parts per million (ppm)**.

Smoke opacity is used to measure **particulates emissions**; the measure is the **light absorption coefficient** as defined in ADR 30.

Engine emission limits are measured in **grams per kilowatt hour (g/kWh)**.

19 OECD: *Motor Vehicle Pollution Reduction Strategies Beyond 2010:* 1995.

20 ibid.

4.4.2 Noise

Road traffic noise was very high on the list of transport nuisances brought to the attention of the Committee by the community.

Information Box 5 explains the terms used to describe measurement of traffic noise.

Transport is the most pervasive noise source in the environment for most people. Nineteen per cent of Australians are exposed to L10 18h road traffic noise levels exceeding 63 dBA and nine per cent are exposed to more than 68 dBA.[21] This means that in accordance with the target of 68 dBA suggested in the Metropolitan Transport Strategy, over 150 000 Western Australians should have their traffic noise exposure levels reduced.

Traffic noise is caused by a number of factors including pavement texture, tyres, body rattle, brakes and exhaust. There are no 'in-service' or operational Western Australian road traffic noise limits. However, vehicles manufactured after 1 July 1974 are required to comply with noise limits set out in the appropriate ADRs for road vehicles.

The proposed National Road Transport Reform (Vehicle Standards) Regulations include in-service noise limits for all vehicles including heavy trucks. The Regulations will introduce more stringent requirements for noisy vehicles as decibel limits will now be specified instead of the subjective 'danger and annoyance' provision in the current State Regulations. The Committee sees advantage in noise levels being measurable. By having specified noise levels and test procedures, the public and industry will be in a better position to demonstrate compliance with the law.

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21 Brown (1994) in Eiser, C.*: Road Traffic Noise Control - the NSW Experience* - paper presented at Heavy Vehicle Noise Seminar, Perth, March 1995.

Information Box 5: **Measuring Traffic Noise**

Noise **loudness** or **intensity** is *technically* measured on a logarithmic ratio scale in **decibels (dB)** such that when doubling noise intensity, the difference is 3 dB and when one noise is 100 times the intensity of another, they differ by 20 dB. *People* detect sound so that a 10 dB increase doubles the noise. **People's adjusted decibel scale (dBA) is in the range 30 - 100 dBA.**

A measurement of 68 dBA (L10 18h) means the level of sound exceeded for 10 per cent of the time between 6 am and midnight.

Noise **intensity falls off with the square of the distance** (ie if the distance from a sound is doubled, the intensity is one quarter).

Road traffic noise measurement picks up **intensity** (background noise), **tonal content and spectrum frequency** (exhaust brakes) and **individual short term peaks** (brake squeal).

Road vehicle noise is governed by **Australian Design Rules (ADRs)** for both **drive-by** and **stationary exhaust noise standards**. The maximum drive-by limit for heavy trucks is 84 dBA.

Recommendation 13

The Government should introduce the in-service noise limits in the proposed Road Transport Reform (Vehicle Standards) Regulations.

The regulations will introduce in some cases slightly more stringent requirements for noisy vehicles as decibel limits will now be specified instead of the subjective 'danger and annoyance' provisions which currently exist in this state's regulations. However this minor disadvantage will be overshadowed by the fact that the new noise levels will now be measurable and the method of measurement specified.

By having specified noise levels and the test procedure available the public and industry will be in a better position to assess whether they are complying with the law. The end result will be less subjective enforcement which in turn will mean fewer disputes and complaints from the public.

The World Health Organisation considers noise a health hazard that should not exceed on average 55 dBA. In studies in Germany, Japan and the Netherlands, exposure to aircraft noise during pregnancy is linked to inhibited growth of the foetus or reduced birth weight. The Netherlands has set targets for reducing the number of dwellings with external noise levels exceeding an average 55 dBA by 55% by 2010.[22]

The UK Royal Commission on Environmental Pollution concluded that *"exposure to noise from transport is environmentally unsustainable and that in addition to the health implications, it causes serious damage to the quality of life"*. It proposes a typical daytime exposure target of 65 dBA at the external walls of housing, and 59 dBA at night.

22 UK Royal Commission on Environmental Pollution: op. cit.

Public concern about heavy truck noise relates mainly to modified exhaust systems which have a particularly disruptive impact during the night. These excessively noisy vehicles, which are few in number but contribute disproportionately to annoyance, are expensive to police. This is due in part to the noise level depending to an extent on driver behaviour.

The Committee feels that the most practical way to tackle noisy heavy trucks is to enact noise level limits and equip and train current heavy vehicle enforcement agencies' personnel to measure stationary exhaust noise and issue defect notices. Other strategies include empowering local government and DEP officers to stop and noise test trucks reasonably suspected of not complying with noise limits.

Recommendation 14

The Department of Environmental Protection should develop sustainable transport noise targets.

A study by the National Acoustics Laboratory into aircraft noise found that only 13% of the variation in response of individuals to aircraft noise could be explained by the amount of noise present. The most important factors were:

- attitude to the airport, aviation and government noise pollution policy;
- fear of an aircraft crash; and
- personal sensitivity to noise generally.

The study also found that whether or not individuals actively complained about noise was a poor guide to the extent to which they were affected by the noise. Willingness to complain correlated more closely with socio-economic status.

An Australian Noise Exposure Forecast (ANEF) has been developed as a composite index which more highly correlates community reaction to aircraft noise than other measures such as peak noise level. The index takes into account intensity, tonal content, spectrum frequencies and short-term peaks, as well as the average daily distribution of aircraft movements and a 6 dBA penalty for movements between 7 pm and 7 am.[23].

The Committee considers that noise measurement of road traffic may be too simplistic, particularly for night-time traffic.

Recommendation 15

The Department of Environmental Protection should examine the use of composite noise indices for determining road and rail traffic noise limits with a view to their adoption nationally.

Heavy transport noise is discussed further in Chapters 5, 6 and 7.

4.5 Efficiency of Road and Rail

A great deal of attention has recently been focused on the efficiency of the individual transport modes and the extent efficiency betterment of, particularly the ports, road and rail can contribute to national productivity. For instance, the Industries Commission estimated that bringing the railways to best international practice and full cost recovery, would increase national output $4 400 million or 1.5% of GDP. Cox estimates that if Australian urban road practices reached best United States practices, there were a continuous four lane road network in the Eastern States (including urban areas), and better investment management systems were adopted to prioritise road expenditure, savings of $7 500 million pa would ensue. This represents an output increase of 4% of GDP.[24]

While these figures are in themselves impressive, it is instructive to look at the broader production/logistics picture to gain better appreciation of the dynamics of transport productivity.

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23 Dames and Moore: *Draft Environmental Impact Statement, Proposed Additional Developments at Jandakot Airport*, April 1993.

24 Cox, J.B.: *The Macroeconomics of Road Investment*, in Business Council Bulletin, No.96, April 1993.

4.5.1 'Just In Time'

A worldwide phenomenon of Just in Time (JIT) logistics appears to be driving a rethinking of production processes. It involves liquidation of stockpiles and streamlined transportation. In doing so, it incidentally shifts stockholding costs to primary producers, and substitutes public sector transport infrastructure costs and the cost of freight transport nuisance and pollution for private sector warehousing costs. Because of the greater flexibility of road compared with rail transport, JIT causes a shift from rail to road transport.

Studies in the United Kingdom illuminate the extent of the problem. JIT involves more deliveries being made, vehicles being smaller and not filled to capacity. JIT transport costs were found to be over twice the costs of conventional logistics, and 80% higher than consolidated JIT.[25]

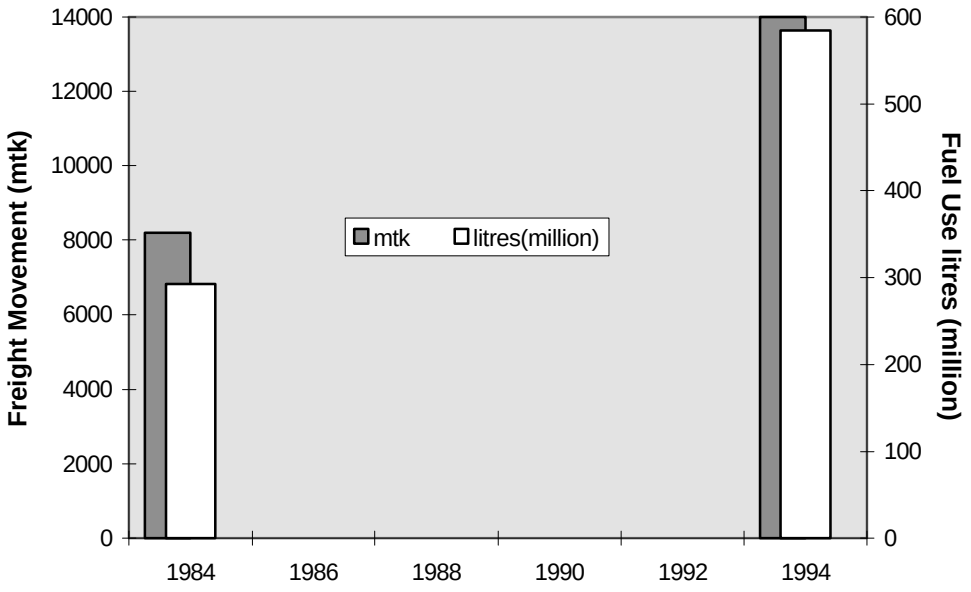
Evidence of a possible JIT impact on Western Australian road freight transport may be gleaned from Figure 8.

Figure 8 shows that diesel fuel use rose by 17% from 35.7 litres/ 1 000 tkm in 1984 to 41.7 litres/ 1 000 tkm in 1994. Technological development of trucks has made them increasingly fuel efficient. This masks the real increase in diesel fuel use per tonne km due to JIT.

Figure 8:

Diesel Fuel Use and Road Freight Movement
Western Australia: 1984 and 1994

Source: ABS and State Revenue Department



25 UK Royal Commission on Environmental Pollution: op. cit.

The JIT phenomenon will have different impacts on various segments of road freight transport. Chapter 3.1 discussed the very rapid growth in vehicle numbers and kilometres travelled by utilities and light commercial vehicles. To the extent that many of these in the metropolitan area use petrol and LP gas, Figure 9 further understates the impact of JIT.

Chapter 3 referred to the need to simultaneously optimise production location and transport if overall costs are to be minimised. This observation is reinforced by the evidence of transport 'wastage' inherent in JIT. Taking the narrow view of transport efficiency, the trucking industry may be very efficient or low cost due to competition. At the same time trucks may be creating more than necessary nuisance because the production process has forced trucks to be less effective by increasing truck movement faster than the nominal growth in the freight task.

Recommendation 16

The Department of Resources Development, in conjunction with the Department of Transport and the Western Australian Planning Commission, should examine ways to ameliorate the impacts of 'Just in Time' on freight movement.

4.5.2 'Horses for Courses'

The Committee notes that many community submissions reflected polarised views either for or against road/rail, but in particular against road.

The reality is that because rail serves only a small part of the State, road is the essential lifeline to areas remote from the populated and rail-served South-West. The challenge is how to provide an efficient freight transport service to remote areas which are only served by road from the main metropolitan freight hub which enjoys both road and rail access.

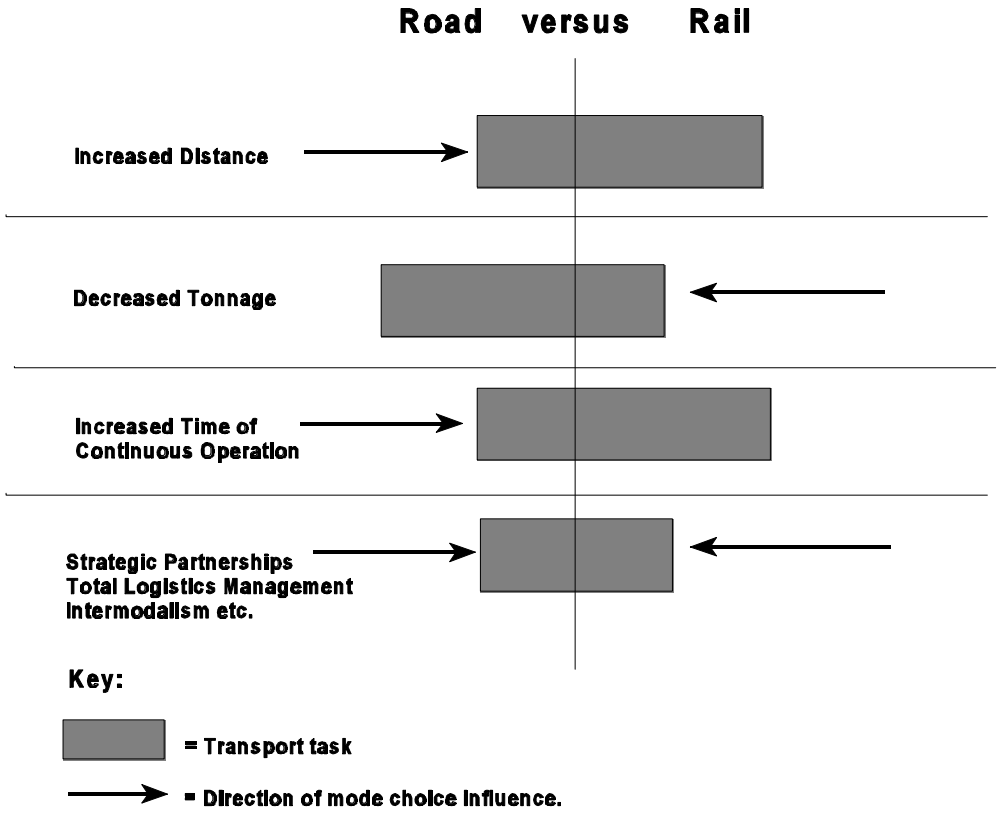
Where rail does exist, each mode has traditionally had its own market 'niche'. Generally speaking, road is more flexible while rail is more suited to bulk loads over longer distances.

With existing technology Westrail has also been very successful in hauling bulk freight over relatively short distances.

Whether road or rail should be the preferred mode in any particular instance depends on a myriad of factors. Some of the broad trade-offs, to which there are notable exceptions, are shown in Figure 9.

Strategic Partnerships, and Total Logistics Management reflect transport solutions which are entirely price driven rather than the result of particular ties with either road or rail. The breakdown of what has traditionally been regarded as a road or rail solution is also giving rise to new 'hybrid' road/rail technologies. These are discussed further in Chapter 5.7.3.

Figure 9:



Western Australia is far removed from the Californian experience where there is little physical space said to be left to build more roads; the situation in France which bans all trucks over 7.5 tonnes GVM and all dangerous goods vehicles at weekends, public holidays and part of the day preceding public holidays; or Germany and Italy which ban all trucks over 7.5 tonnes GVM on Sundays.[26] However, there would seem to be nothing to stop increasing road demand from delivering those sorts of scenarios within the South-West of the State within a relatively short period of time unless targets are set for future road traffic. The Swiss developed such an approach when they decided by Referendum that all 350 000 trucks over 3.5 tonnes pa using the Alps as a transit route will have to be carried by rail piggy-back within 10 years.[27] To put the Swiss decision in context, the main street in Northam carries more than 250 000 heavy trucks pa (700 - 1 200 per day).

Government heavy freight transport policy should ideally be 'amodal' in the sense that there should be no bias towards any mode when decisions are made on *"needed movements of goods"*. The catch cry of logistics management in the 90's is 'intermodalism' or getting the best result regardless of mode.

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26 UK Royal Commission on Environmental Pollution: op. cit.

27 ibid.

Because, amongst other things, there has historically been regulation to rail, and 'getting the best result' tends to focus on the financial rather than the social/economic/environmental 'bottom line', the road versus rail issue will likely be topical for some time yet.

The road versus rail policy debate centres on whether market forces alone should determine track investment decisions and mode choice by transport users. The debate assumes technically complex proportions about such things as production and social costs, sunk and avoidable costs, whether cash or accrual accounting should be used and how depreciation should be brought to account. These things are material because, so the argument runs, road and rail employ different approaches so that their respective rates are not determined on what, in the jargon, is called a 'level playing field'.

Whether the playing field will ever be level is brought into considerable doubt by the sheer difference in scale of road and rail track, the arbitrary determination of truck axle loads and length, rail and road transport being the 'milch cows' for government revenue raising, and the now universally accepted view that roads are an essential part of personal mobility with the consequence that since they need to be there anyway their use by freight transport can be accommodated quite cheaply.

Road capacity can be provided in small/cheap increments compared with rail. As new developments come on stream one after another, analysis of their transport needs is done incrementally.

Barry Blaikie, MLA, in arguing for a more visionary approach to transport infrastructure investment, has said in evidence that future generations will curse government making transport decisions only for today. He questions why the Southern Province study wasn't done before the 'horse bolted' on the transport of mineral sands in the South West by choosing road over rail.

The response worldwide to the road/rail conundrum has been one of several main courses of action. The pragmatic approach adopted in the United Kingdom to encourage intermodalism is to allow a 44 tonne GVM (16 - 25% increase) for 6 axle trucks on road friendly suspensions carting to and from a rail head.[28] The United Kingdom also pays Track Access And Freight Facilities Grants of up to 10 cents/tkm to encourage traffic off road and onto rail and water.

Separation of rail track and operations is being widely embarked on in Europe, and is part of the Commonwealth agenda in Australia. Canada has specifically rejected this approach and instead is privatising CN North America. The view put to the Committee in Canada by CP Rail System was that separation would lead to track decisions being made politically without regard for commercial realities and that a government railway stripped of its track assets would not be an attractive privatisation proposition.

Head to head competition on price and service level, which is practised in the United States, New Zealand and Western Australia ignores any differences in economic as opposed to financial costs of road and rail, and their different social and environmental impacts.

Sweden embarked on a policy of transport meeting social marginal costs which amongst other things led to attempted recovery of crash and pollution costs.

The Committee, in pursuing the issue of head to head competition explored whether heavy trucks 'pay their way'. For urban areas where congestion is a problem at particular times, appropriate charging regimes and methods have been used in various parts of the world. *Prima facie*, where

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[28] UK Department of Transport: *Heavier Lorries for Combined Road/Rail Transport - A Consultative Document*, Feb 1993.

fuel taxes are the main road funding mechanism, a heavy truck using 3-5 times the amount of fuel per kilometre pays for its road 'slot' compared with a car. On regional roads which are generally lightly trafficked, attributed road pavement wear rather than slot cost should arguably be a major determinant of vehicle charges. Because of the 'fourth power' rule of road pavement wear, a legally loaded 6-axle truck causes the same amount of wear per kilometre travelled as 9 000 cars. If it uses five times the fuel, is empty half the time and the pavement constitutes 50% of the total cost of a road while the other costs are equally attributable to cars and trucks, it is indicatively 'charged' less than one twentieth of cost of wear caused by a car.

Road charges are discussed further in Chapter 6.1.7

The Committee acknowledges that industries do make direct contributions to road construction and maintenance. For instance, since 1986 the titanium minerals industry has committed more than $27 million to new road projects. Industries which make such contributions make the point that compared with, say, the grain industry which does not make any direct contribution, they pay 'twice' for the use of the roads.

Rail competes essentially with regional heavy road freight transport. Based on the Committee's finding in Chapter 6.1.7 of underpayment by heavy trucks for regional road use, and in the absence of an appropriate user-pay mechanism, the Committee explored a number of 'second best' pragmatic solutions for enabling 'fair' competition between heavy road and rail freight transport. It considered setting a target share of regional road cost recovery whereby heavy trucks meet say 50% of road track costs; setting the same track cost recovery rate for rail as achieved by regional roads; payment of Community Service Obligations (CSOs); and setting a target freight market share for road and rail.

Road user charges are now to be determined nationally. Any 'redistribution' of higher heavy truck charges to lower car charges would be small because of the relative number of cars and trucks, and would countermand current efforts to reduce urban congestion by reducing reliance on the car for personal transport. It could also be true that the particular regional roads with which rail competes could be performing better commercially than the regional road network as a whole.

The Committee feels that to set Westrail's return on track at an arbitrary non-commercial level would be a retrograde step in the process of keeping Westrail efficient. Westrail's track network will also have sectors that perform better or worse commercially than the average return on investment**.**

The Committee does not prefer CSOs because of their potential impact on Westrail efficiency. The transport agencies have said that CSOs may have implications for the application of national competition principles.[29]

The Committee feels that if CSOs have implications for the application of national competition principles, then so does the 'hidden' resource transfer to the heavy road freight transport industry due to the under recovery of its track costs.

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[29] Submission on Discussion Paper No. 75.

Recommendation 17

The National Competition Council (NCC) should examine the extent to which road, and rail track pricing practices impact on land freight transport competitiveness.

By a process of elimination, the Committee settled on target market shares for heavy road and rail freight transport to deliver a comprehensive quality land freight service.

Targets would be used in consideration of transport options when major new developments such as the South-West pulp/paper mill or Mid-West iron ore mine/steel mill are proposed. If, say, additional haulage by road would significantly exceed the road target, then the proponent would be required to use rail. This approach is similar to the way proponents are required to meet the air pollution target set for the Kwinana industrial belt.

Because the required transport mode would be 'designed' into a development rather than it being 'retrofitted' into another transport mode, any additional cost of being required to use the non-preferred mode would be minimised. Any demonstrable additional transport cost due to the use of a non-preferred mode because of the requirement to meet the mode share target could warrant compensation being paid. Any such claims could be considered by government on a case by case 'act of grace' basis, met from royalties or other State imposts on the development and legislated in any agreement between the Government and proponent. Any compensation should recognise the proponent's diminished 'sovereign' risk where an agreement with the Government exists.

While the Committee on balance favours mode share targets, it would anticipate criticism of this approach because this could be seen as re-regulation of freight transport to rail. The Committee notes that adoption of targets for private car use in the metropolitan area are proposed in the Metropolitan Transport Strategy. Similarly, it sees no alternative to the adoption of rail freight target shares in the light of what it regards as significant under-recovery of heavy road freight track costs compared with the situation of rail where full costs are recovered.

Recommendation 18

Targets should be established in rail-served areas of Western Australia for sharing heavy freight transport between road and rail. These targets should result from policy decisions by the Government in relation to infrastructure funding in connection with major new developments.

4.6 Regulation

Whether there should be more or less legislated regulation is a matter of both ideology and economics, of beliefs and dollars. No Western democracy has found a way to allow heavy freight transport safety, social, economic and environmental outcomes to be delivered by markets alone. Because transport policy can involve matters of life and death, the issuing of licences and the acceptance of rules has been universally adopted.

The Commissioner for Main Roads issues oversize and overweight permits under S1107 and 1402 respectively of the Vehicle Standard Regulations under the Road Traffic Act 1974. Each year 10 000 annual permits are issued for trucks, which are only slightly larger than normally

permitted, enabling them to operate without hindrance for 12 months. Another 10 000 permits pa are issued for very large loads on a one-load basis.[30]

Main Roads WA has said in evidence that the permit system enables very strict control of long vehicles and road trains. Chapter 3.1 discussed the growth in articulated truck distance travelled.

In Chapter 4.1 the Committee suggests that by definition **regulation means adjustment to a standard.** According to general motivation theories, learning to adjust to a standard may be achieved by **sanction** and **incentive**. In reflecting the general perception that past government regulation had led to too many controls, the Committee sees merit in redressing the imbalance between sanction and incentive to achieve, say, a more desirable balance between heavy road and rail freight.

The Committee has on balance been more attracted by the philosophy of incentive than sanction.

The Department of Transport has stated in evidence that it supports the move towards road transport industry self regulation. Mention has already been made of Main Roads WA's support for industry self-regulation in the areas of asset preservation and driver fatigue.

Information Box 6 on Page 40 explains the terms used to describe industry self regulation

A shift from government regulation to industry regulation does not of itself necessarily redress any imbalance between sanction and incentive. What would change the balance is industry's retained savings from lessened outside interference in its business, and any increased tolerances or other incentives that the government might grant to 'buy' industry self regulation. Provided the trade offs are transparently negotiated, and the community's standards are not infringed, the Committee sees no intrinsic difficulties with industry self regulation. Where this results in less government legislation it should be expected that other things being equal this would be more punitive than present legislation.

Recommendation 19

A balance of sanctions and incentives should be used to achieve heavy freight transport outcomes which reflect the community's accepted safety standards, cost and quality of service, nuisance intrusion and environmental damage levels, and living and mobility standards.

Self regulation by accreditation is discussed further in Chapter 4.8

30 Department of Transport, Main Roads WA, Ministry for Planning, Fremantle Port Authority, Westrail and Metrobus: *Perth Metropolitan Transport Strategy 1995 - 2029*, December 1995.

Information Box 6:

Industry Self Regulation

Industry Self Regulation or so-called **Alternative Compliance** refers to voluntary alternatives to conventional enforcement of heavy freight transport laws.

Where transport operators can reliably demonstrate compliance with, say, driving hours or load management laws, they may be **accredited** so that they are subject to fewer on-road checks by enforcement agencies (ie **conventional law enforcement**). This saves both operator and agency costs.

Conventional law enforcement involves discretionary **tolerances**. For instance, exceeding the speed limit by a small margin will not generally lead to a fine.

Alternative Compliance may involve some relaxation of **tolerances** which apply under **conventional law enforcement**.

In practice, the issue of regulation can be considered at several levels. Firstly, there is the headland decision as to when vehicles are so big as to require grade separation. 'Jumbo' tippers of 250 tonne GVM are in use for off-road applications. A 55 metre long, 204.5 tonnes GVM, 'B-triple' vehicle is currently on the drawing board for on-road use.

The questions of what should be on public roads and what should not seem to be largely determined by the designated 2.5 metre width, 4.6 metre height and prime mover horsepower sufficient to haul at speeds of around 100 km/h. As horsepower has increased trucks have become longer and heavier. What the community and Parliament have to decide is when is a truck too long and heavy to be on various roads, and when is a truck too long to have access to parts of the Perth metropolitan area. As the largest trucks become more manoeuvrable and dynamically stable, this issue of length becomes even more complex.

The Committee has not encountered the view that the designated 'As of Right' (AOR) vehicle size should be changed.

The Committee is unable to technically validate the classes of vehicles over 19 metres long. It considers that there are practical reasons for questioning the use in some locations of long truck/trailer and road train combinations. Truck length is discussed further in Chapters 6 to 8. The specific issue of road trains in built up areas including the Perth metropolitan area is developed further in Chapters 6 and 7.

Recommendation 20

'Permit' truck length should be determined by risk analysis of the combination of vehicle, load, road condition, traffic management and adjacent land use.

Axle loads also determine truck length. Axle loads are set to enable roads to carry a planned number of 'Equivalent Standard Axles' (ESAs) during their design life. Bridge design and wear is also dependent on how a truck's gross mass is transferred to its structural components.

The issue of road and bridge standards and axle loads is developed further in Chapter 6.1.

At another level, the question is how to regulate the heavy trucks that are currently in wide use throughout the State.

Road use is a **privilege** 'contracted' under licence by which a proponent for licence(s) undertakes the **duty** to abide by rules which are explicit or implicit. Breach of rules if caught attracts a predetermined response including the **penalty** of accrual of demerit points, loss of licence(s), fines and/or terms of imprisonment in the worst cases. Failure to pay some fines can result in drivers losing their licence. Licences are issued for vehicles, drivers and consignments of dangerous goods. Some vehicle licences ('Permits') nominate routes, times of travel, speed and other restrictions. Self regulation to abide by the rules, in part backed by fear of punishment if caught in breach of the rules, is the predominant control method.

Main Roads WA and Local Government's responsibilities to develop and manage the State's road network as authorised by the Road Traffic Act 1974 and Local Government Act 1960 respectively carry with them the duty of care and liability for death, injury or damage for 'misfeasance' ie the negligent creation or worsening of a danger on the road. What care is reasonable in any given case *"is a question of degree, requiring consideration of the frequency and magnitude of the risk involved in the action proposed..."*.[31]

Duty of care is discussed further in Chapters 6, 7 and 8.

The Committee gleans from comments made to it in public discussions that there is at least a perception of some 'fuzziness' in heavy road transport regulation principles and inconsistency in their application. It feels that there may be a unique opportunity to tackle this with consideration of nationally 'consistent' road transport laws.

The Committee notes evidence that heavy trucks in Western Australia have a better safety record than other States, and that Western Australia has generally the lowest level of penalties for offences under road transport law in Australia. These matters are discussed further in Chapter 6.

There is a well established practice that drivers of the biggest vehicles need to be more experienced and more responsible and accountable than other drivers. For example, the Road Transport Forum supports 'grounding' of trucks which exceed 115 kph. Some vehicles are required to undergo regular mechanical inspections because they carry dangerous goods or many people; and driver licences are issued in categories of vehicle size

The apparent principle which underlies these practices is that of **risk abatement**.

Accepted safety standards demand that risk be managed by a range of **proactive** strategies including age restrictions on licences, health status checks, and driver training; and **reactive** strategies including enforcement and sanctions. These strategies need to be commensurate with the desired degree of risk abatement.

The Committee examined existing transport privileges, duties and penalties; the cause and consequences of incidents; and the levels of apparent community tolerance of various incidents.

Based on its examination, the Committee has developed an indicative framework ('hierarchy') for regulating heavy transport. This hierarchy reflects the Committee's conclusion that the

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31 Main Roads WA: *Guidelines for Local Area Traffic Management*, 1990.

community's tolerance of particular risks should be the principal consideration in determining the extent and kind of heavy transport regulation.
In Chapters 5.4 and 6.1.8 the Committee recommends that the Government should determine what the tolerable risk levels for rail and road should be *(Recommendations 29 and 41* respectively).

Determination by the Government of the tolerable risk levels for various transport incidents would refine the Committee's suggested hierarchy.

Recommendation 21

The principle should be adopted that the community's tolerance of risk of causing death, injury, or property damage is the primary trigger for heavy freight transport safety regulation.

Risk in this context is technical risk described in detail in Information Box 3 (Page 23). It reflects the probability of an incident occurring and the consequences of the occurrence.

This principle suggests, for instance, that a railway crossing a road which carries many large trucks should have funding priority for construction of grade separation over a road which carries only light vehicles. The proof of this is to be found in the recent crash between a truck and train near Esperance which caused no serious injuries but is estimated to have caused significant damage. It also suggests, *prima facie*, that truck drivers should be better trained than car drivers, and face stiffer penalties for speeding.

The detailed regulatory framework is more complex because noise and pollution are regarded more as environmental issues than safety issues. However, these are handled by well known community values that less noise and pollution is desirable. By contrast risk analysis results are much more complex and poorly understood. However, most people avert risk and have a well developed practical sense of risk assessment which would, for example, see them prefer to overtake a car rather than a truck.

Recommendation 22

Consistent heavy freight transport regulation (and transport regulation generally) requires that an agreed risk tolerance hierarchy should be adopted as follows:

Dangerous Goods train/truck	**}**
Freight train	**} Motorised Heavy Freight Transport**
Heavy truck	**}**
Passenger train	**} Motorised Heavy Commercial**
Bus	**} People Mover**
Taxi/Small bus	**} Motorised Light Commercial**
	} People Mover
Car/Light truck	**} Motorised Light Personal/**
	} Freight Transport
Bicycle	**} Non-motorised Personal Transport**
Pedestrian	**}**

The hierarchy reflects the notion that people have the least aversion to risk in incidents involving the bottom categories (ie pedestrians and bicycles); and highest for the top category (ie dangerous goods trains and trucks).

In discussing road issues in Chapter 6, 7 and 8 this risk tolerance hierarchy is used to develop the Committee's further detailed suggestions for heavy road transport regulation.

The Committee is mindful that the main initial emphasis in developing nationally consistent road transport regulations and laws has been to strike a practical compromise of existing arrangements in the States and Territories. This has also required acceptance of transitionary arrangements. It would urge that in due course there would be ongoing further review of the principles and practices of heavy road freight transport regulation. The risk tolerance hierarchy proposed by the Committee, and the detailed suggestions for heavy road freight transport regulation made elsewhere in this report could be taken up in such a review.

4.7 Enforcement

Whether there should be more or less enforcement is a matter also of both beliefs and dollars.

There is said to be a relationship between regulation and enforcement along the lines that regulation which is not enforced is akin to no regulation. Another relationship said to exist between the severity of penalties and enforcement is that lower penalties require heavier enforcement to have the same deterrence value. Taking these two relationships together leads to a suggestion that lower penalties and lighter enforcement tend to nullify heavy regulation. In the Committee's view the State's penalties for heavy truck offences and modest enforcement levels have the practical result that it less 'regulated' than other States.

The Industries Commission[32] has used the following example of an 'enforcement pyramid' or hierarchy:

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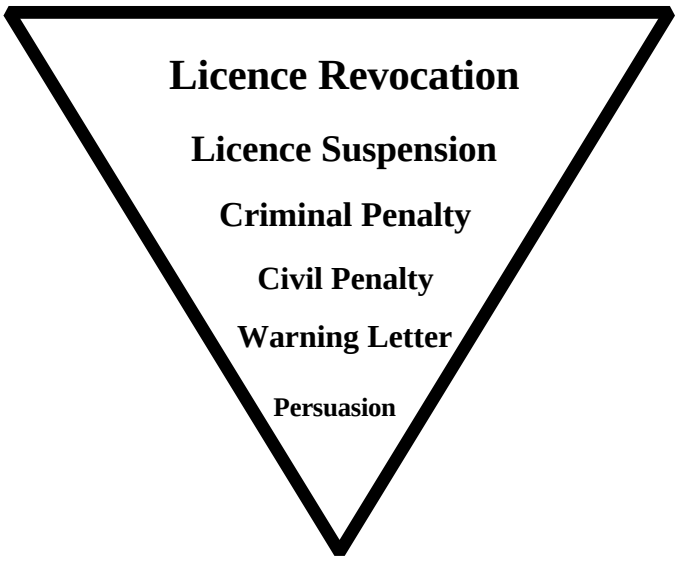
32 Industries Commission: *Regulation and its Review - 1994-95,* September 1995.

Figure 10: **Enforcement Pyramid**

Source: IAC.



Recommendation 23

Nationally uniform or 'consistent' road transport law compliance and enforcement being developed by the NRTC should be based on the suggested transport risk tolerance and enforcement hierarchies.

The States have differing incident and crash experiences. Western Australia has relatively few truck crashes. Recommendation 23 therefore raises the spectre of differing road laws, enforcement and compliance.

The Committee feels that to the extent that the nationally uniform/consistent arrangements contain more rather than less regulation, the State's transport safety record would more likely improve further than decline. Accordingly, adoption by the Government of the NRTC's proposed national regulatory framework for heavy trucks is supported in principle.

Enforcement costs associated with heavy trucks are significantly under recovered by way of fines. The costs and fines are discussed further in Chapter 6.3.

The Committee feels that taxpayers should not 'subsidise' heavy road freight transport in this way. It considers fines should 'fit the crime' and that enforcement costs should be recovered separately by way of an enforcement and/or an administrative charge. A levy on a fine, vehicle licence, or permit may be appropriate ways of achieving this.

Recommendation 24

The Department of Transport, in conjunction with Main Roads WA, the Police Department, the Department of Environmental Protection, and the Department for Minerals and Energy (for dangerous goods), should examine how to recover heavy vehicle enforcement costs.

4.8 Accreditation

Information Box 6 on Page 40 explains what the term 'accreditation' means.

Accreditation in 'exchange' for a lessened enforcement regime is consistent with the Committee's view that regulation should be a last resort. It maximises available enforcement resources by them being focussed on non-accredited people and equipment. Its widespread adoption is being promoted by the road transport industry, the NRTC and the State's transport agencies.

The Committee supports adoption in the first instance of accreditation with reduced enforcement covering matters that impinge less on safety such as noise emissions, and overloading.

Recommendation 25

Where safety is involved in an area where accreditation could be introduced, such as in fatigue management and speeding, the enforcement effort should be maintained until the impacts have been fully evaluated.

The Committee is concerned about the apparent notion that accreditation should be 'bought' by allowing industry concessions of non-safety sensitive areas such as increased axle mass. To do so would be to 'reward' industry for having breached the law. Such an approach has potential ramifications well beyond the transport industry.

Recommendation 26

Increases in tolerances in exchange for accreditation should be considered on a case by case basis, and be modest in scope.

4.9 Taxation

The road transport industry has argued that it pays more in taxes than other Australian industries. Industry has said that this adversely impacts on its international competitiveness.

The Standing Committee on Transport (SCOT) Working Party calculated that allowing for the portion of charges and costs spent on roads, the effective tax component of road transport operating costs is 6.8%. ABS Input-Output data for 1989-90 suggests that the road transport industry paid 7.9% of operating costs in taxes and charges compared with 3.6% for all industry sectors. The 'gap' would reduce substantially if provision of road infrastructure were taken into account.

The National Transport Planning Task Force estimated that on the interstate carriage of general cargo, rail paid 16% of its operating costs in taxes which is twice the level paid by road operators.[33]

In considering the issue of taxation, the Committee sought to establish Canadian and US tax burdens as benchmarks. Measured as a percentage of revenue, Canadian and US tax rates are 7.9% and 8.1% respectively for motor carriers and 14.2% and 8.1% for railways. By way of further benchmarking, Canada's insurance and manufacturing industries pay 1.3% and 4.9% respectively in taxes.[34]

Evidence provided to the Committee by the road transport industry that the cost savings from using road trains instead of smaller vehicles are passed onto the consignors would suggest that taxes are similarly passed on.

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33 National Transport Planning Task Force: *Building for the Job - A Strategy for Australia's Transport Network*, December 1994.

34 Transportation Association of Canada: *Transportation, Taxation and Competitiveness 1993*, in CP Rail System Reference Document, July 1995.

The Committee had insufficient evidence about the incidence of transport taxes, and their impact on international competitiveness, to reach any firm conclusions on whether the overall burden should be changed.

The finding that rail freight pays significantly higher taxes than heavy road freight is further evidence of the playing field being skewed in favour of road.

Recommendation 27

The Department of Transport should investigate the level and incidence of taxes paid by the public road and rail freight sectors in Western Australia and, if there is a significant difference, develop options to make the impacts on road and rail more equal.

CHAPTER FIVE

5. RAIL

Public intrastate rail transports 5 400 million tonne kilometres per annum.[35] The National Rail Corporation (NRC) transports another 1 500 million tonne kilometres pa of interstate freight. The privately owned iron ore railways transport 35 000 million tonne kilometre per annum.[36] This report focuses on the intrastate public rail freight system.

5.1 Track

The public rail freight network comprises 5 583 route kilometres and 5 987 kilometres including sidings. Twelve hundred (1 200) kilometres of track is standard gauge, 200 km dual gauge and the remainder narrow gauge. Track axle loads are shown in Illustration 5.

The rail-served South-West of the State is over serviced in track infrastructure in the sense that underutilised roads and railways often run in parallel. If these were duplicate railways as exist in Canada, track rationalisation would be very high on the agenda as it is there.

Track disinvestment either by closure or lowering standards has been much easier to achieve for rail than road. As an example of this, while there have been significant rail closures, very few roads in Western Australia have reverted to gravel, when clearly a quality gravel surface is better than a poor quality bitumen in some low traffic sectors. Financially 'bankrupt' roads are supported without question, while rail must be profitable or close.

5.2 Terminals

Westrail's intermodal terminals are shown in Illustration 6.

NRC's freight terminal is located at Welshpool.

5.3 Operations

Westrail is a bulk haul railway. Its primary tasks are summarised in Table 2 (Page 50).

Westrail comprises three business units which are responsible for -

(a) agriculture, forestry and general;
(b) ores and minerals, and
(c) interstate freight.

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35 Department of Transport: *Transport Agency Submission to the Select Committee on Heavy Transport*, January 1995, (Submission No. 111).

36 ABS.

Illustration 5: **Westrail Axle Loads**

Illustration 6: **Westrail Intermodal Terminals**

Table 2:

Current and Projected Rail Task by Business Unit

Task	Tonnes		Net Tonne Kilometres (ntk)	
	1993-94 ('000)	1999-00 ('000)	1993-94 (m)	1999-00 (m)
AGRICULTURE FORESTRY & OTHER	6032	6900	1721	2070
	719	948	113	149
GRAIN	28	27	9	9
WOODCHIPS	106	62	51	32
TIMBER	428	516	210	264
FERTILISER	316	356	199	227
FUEL				
OTHER	7629	8809	2304	2751
SUB-TOTAL				
ORES AND MINERALS				
ALUMINA	6190	6710	484	519
BAUXITE	6252	7128	313	357
BLUE METAL	396	420	27	29
CAUSTIC	812	877	57	60
COAL	1558	1884	246	348
IRON ORE	0	1500	0	875
MINERAL SANDS	1463	1581	208	203
NICKEL	557	795	131	228
TALC	117	140	22	25
OTHER	384	499	119	165
SUB-TOTAL	17729	21534	1606	2810
INTERSYSTEM	2369	2830	1537	1854
TOTAL	**27727**	**33173**	**5447**	**7415**

Note: Excludes Internal Traffic

Source: WESTRAIL.

Agriculture, Forestry and General

The major rail freight haulage tasks for agriculture are grain and fertiliser.

A five-year average of 4.7 million tonnes per annum of export grain is transported by road and rail from 157 Co-operative Bulk Handling Ltd (CBH) grain receival points to the ports of Albany, Esperance, Geraldton and Kwinana. Grain for the domestic market is transported to Northam, North Fremantle, Kewdale and Welshpool. A recent decision has been made by CBH to close its North Fremantle grain receival terminal and open a new road receival terminal in Forrestfield.

In 1993/94 a record 6.16 million tonnes was received. The previous record was 5.7 million tonnes in 1984-85.

Under the productivity-based Export Grain Transport and Handling Agreement negotiated with the grain industry, significant efficiency improvements have been made. Fast loading and discharging of grain trains has improved turn-around times and allowed the fleet to be reduced significantly.

Westrail's 1994-95 core grain fleet of 501 wagons and 14 locomotives was used to move about 5.8 million tonnes of grain. As an illustration of the productivity gains that have been made, Westrail used 1 085 wagons and 37 locomotives to haul a harvest of 4.04 million tonnes in 1989-90. Nearly 3 000 wagons were used to transport 3.4 million tonnes of grain in 1980-81.

Westrail now operates nine narrow gauge and two standard gauge trains each day, with an average net load of 1 878 tonnes. Operations continue all year and 24 hours a day, seven days a week when required.

Fertiliser is transported in open-top wagons mainly on the standard gauge railway. In 1994-95 Westrail carried 43 435 tonnes mainly to CSBP facilities at Merredin and Esperance with the remainder direct to farmers. A service is also provided on the narrow gauge, but only when it can be attached to scheduled trains. Overall tonnages have gradually declined since fertiliser transport deregulation in 1992.

An average of 768 000 tonnes of wood chips are transported each year by rail from Lambert to Bunbury with up to three trains a day hauling wood chips, 24 hours a day, seven days a week as required. Each train hauls 1 000 tonnes and is loaded in 25 minutes from a 1 000 tonne overhead storage bin. At Bunbury, they are bottom discharged and stockpiled for shipping.

In 1994-95, 469 239 tonnes of bulk fuel was transported in rail tankers from Esperance and Kewdale to Kalgoorlie, Merredin and Katanning. This is an increase of 15.2.% over 1993-94 due to the commissioning of a fuel facility at Leonora to service the Mt Keith mining project, and Kalgoorlie region mining growth.

Timber totalling some 25 000 tonnes pa is currently railed from Manjimup to Welshpool and North Fremantle. The service runs twice a week in narrow gauge train loads, consisting of some 14 wagons, using both flat-top bolster wagons and containers.

Other freight hauled by Westrail totals 314 000 tonnes pa. Most is taken to the Kalgoorlie region in containers comprising a broad range of commodities, such as lime, cement, ammonium nitrate, cyanides and general consumables.

Ores and Minerals

The Ores and Minerals business unit is responsible for transport and logistics in the alumina, nickel, mineral sands, iron ore, cement and lime and power generation industries.

The combined tonnages of alumina, bauxite and caustic carried for Alcoa Australia and Worsley Alumina total 14 million tonnes pa, around half of Westrail's total task.

Services are provided for Alcoa's refineries at Kwinana, Wagerup and Pinjarra, the Jarrahdale bauxite mine and the company's facilities at Bunbury.

A service is also provided for Worsley's plant at Collie and its export operations through Bunbury. In addition, lime is transported from Cockburn Cement and about 800 000 tonnes of coal is hauled from Collie.

In the nickel industry, Westrail services Western Mining Corporation. Some 650 000 tonnes pa of dry nickel concentrate is transported from Leonora and Kambalda to WMC's smelter near Kalgoorlie. About 110 000 tonnes pa of nickel matte is then hauled to the refinery at Kwinana. In addition, 75 000 tonnes pa of wet nickel concentrate is transported from Leonora to Esperance for export. Associated products for WMC include 30 000 tonnes pa of coal and 15 000 tonnes pa of coke from the Perth metropolitan area to the smelter.

RGC Mineral Sands and the TIWEST Joint Venture are two mineral sands projects also serviced by Westrail.

Some 800 000 tonnes pa of mineral concentrate and mineral sands products are transported for RGC from Eneabba to Narngulu and Geraldton. A further 120 000 tonnes pa of mineral sands are hauled from Narngulu to the wharf in Geraldton. In addition, 100 000 tonnes pa of coal is transported from Collie to Narngulu.

The TIWEST service includes 100 000 tonnes pa of coal from Collie to Muchea and 300 000 tonnes pa of mineral sands from Muchea to Kwinana. In addition to rail transport, Westrail manages about 100 000 tonnes pa of mineral sands movements by road within the Perth metropolitan area.

In a new service, Westrail is transporting about 1.5 million tonnes pa of iron ore from Koolyanobbing to Esperance for Koolyanobbing Iron Ore.

In the cement and lime industry, Westrail transports about 180 000 tonnes pa of coal from Collie to Cockburn Cement and 100 000 tonnes pa of lime into the Worsley operation at Collie.

Up to 600 000 tonnes per annum of coal for power generation is transported by Westrail from Collie to Kwinana and Bunbury.

Westrail also transports about 120 000 tonne pa of talc from Three Springs to Geraldton, 100 000 tonnes pa of salt from Koolyanobbing to Perth and Bunbury, 350 000 tonnes pa of aggregate from Toodyay to Kewdale, 90 000 tonne pa of gypsum from Kalannie and Merredin to Perth, and 80 000 tonnes pa of quartzite from Cairn Hill to Bunbury.

Interstate Freight

The Interstate business is responsible for the movement of freight between Western Australia and other parts of Australia.

In August 1994, an agreement was signed to allow National Rail Corporation (NRC) to operate trains within Western Australia. From 30 June 1995, NRC progressively took over the crewing, terminal and other operations associated with interstate freight. Westrail's prime function as the owner of the track and other infrastructure assets will be to provide track access, as well as remaining responsible for train control and safe working. The track access agreement includes a requirement for Westrail to improve its productivity each year.

In 1993-94, a record 2.368 million tonnes of freight were carried. The transfer of goods to the Eastern States has increased as a result of land bridging from Fremantle. In 1994-95 the task was 2.376 million tonnes. This figure would have been increased to 2.525 million tonnes, had the line not been closed for 3 weeks due to flooding.

Westrail is vitally interested in the growth of interstate rail freight and, because it is not a shareholder in NRC, it has retained the flexibility to offer track access to other clients who wish to operate interstate trains. SCT operates a wagon load service between Melbourne and Perth. Westrail is also evaluating several other opportunities with key clients to increase rail transport competition by jointly providing cost-effective and efficient services. These are expected to result in the transfer of freight to rail from road and sea.

Some of these initiatives will introduce competition with NRC, which should be healthy both for the rail industry and the Western Australian economy with Westrail projections of 3 per cent annual growth in interstate freight for the next five years. At the same time competition will intensify the drive to achieve best practice and ensure that a high quality and cost efficient service is provided.

In May 1995 Westrail announced a major modernisation plan. The raft of proposals known as the 'Right Track' program includes:

- Purchase of 24 new locomotives,
- Reduction in locomotive fleet to 67 (from 129),
- Reduction in wagon fleet to 2000 (from 5462),
- Outsourcing track, communications electrical and civil engineering functions,
- Releasing surplus property; and
- Workplace reform

Capital expenditure associated with the plan is $79.7 million. Net savings are estimated to be $23 million per annum. Staffing would fall from 3 303 to 1 958 (40%).

NRC is also undertaking a major modernisation plan.

5.4 Safety

Over the past eight years, freight trains have been involved in 84 serious and fatal crashes and other incidents. The Committee estimates this amounts to 0.002 injuries per mtk, compared with 0.07 per mtk for road freight.

The risk of being killed in a freight train crash in Western Australia is one in three million years of exposure.

In Germany, the number of rail freight injuries per mtk has been estimated at 0.010 compared with 0.248 for road freight.[37]

The principles which should underpin rail safety regulations are discussed in Chapter 4.2.

The Western Australian Government has recently become signatory to the Inter Governmental Agreement (IGA) on Rail Safety. The IGA commits all jurisdictions to implementing National Rail Safety Standards being developed under the auspices of Standards Australia by the Australian Railways Association. The draft standards require compliance assessment by an independent authority such as the NSW Rail Safety Bureau, and external audit of safety policies and programs.

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37 UK Royal Commission on Environmental Pollution: op. cit.

Recommendation 28

When the National Rail Safety Standards are developed, the Government should make the rail safety inspection function independent from Westrail.

This recommendation is aimed at meeting the principle that safety regulations should be separated from competing activities. In due course, consideration should be given to combining the responsibilities for road and rail safety.

The Committee feels that the Canadian Government's approach to rail safety has much to commend itself. Under the 1989 Railway Safety Act regulation is used sparingly. Government sets rules, railway companies decide how to comply, and Government monitors for compliance and enforces if necessary. Railways can file their own rules which are subject to the Minister's approval/rejection within 60 days. Other regulatory tools used include Guidelines and Industry Circulars. Railway Safety Inspectors have very wide powers under the Act, and penalties are very punitive.[38]

Mr R M Marks has told the Committee that in the United Kingdom, Railtrack was required to demonstrate its 'safety case' to the Government's Health and Safety Executive prior to its commencing operations. Similarly, private operators must submit their safety cases to Railtrack. These safety cases rely on risk assessment and management.

The United Kingdom Health and Safety Executive has set one in ten thousand as being a tolerable risk for traffic accidents. The risk tolerance hierarchy adopted by the United Kingdom Health and Safety Executive is shown in Illustration 7 on Page 55.

Recommendation 29

The Government should determine what rail's tolerable risk level should be, so that rail safety expenditure levels can be determined accordingly.

This recommendation is in line with the principle that risk to safety should be publicly discussed and acceptable risk thresholds transparently monitored, evaluated and changed.

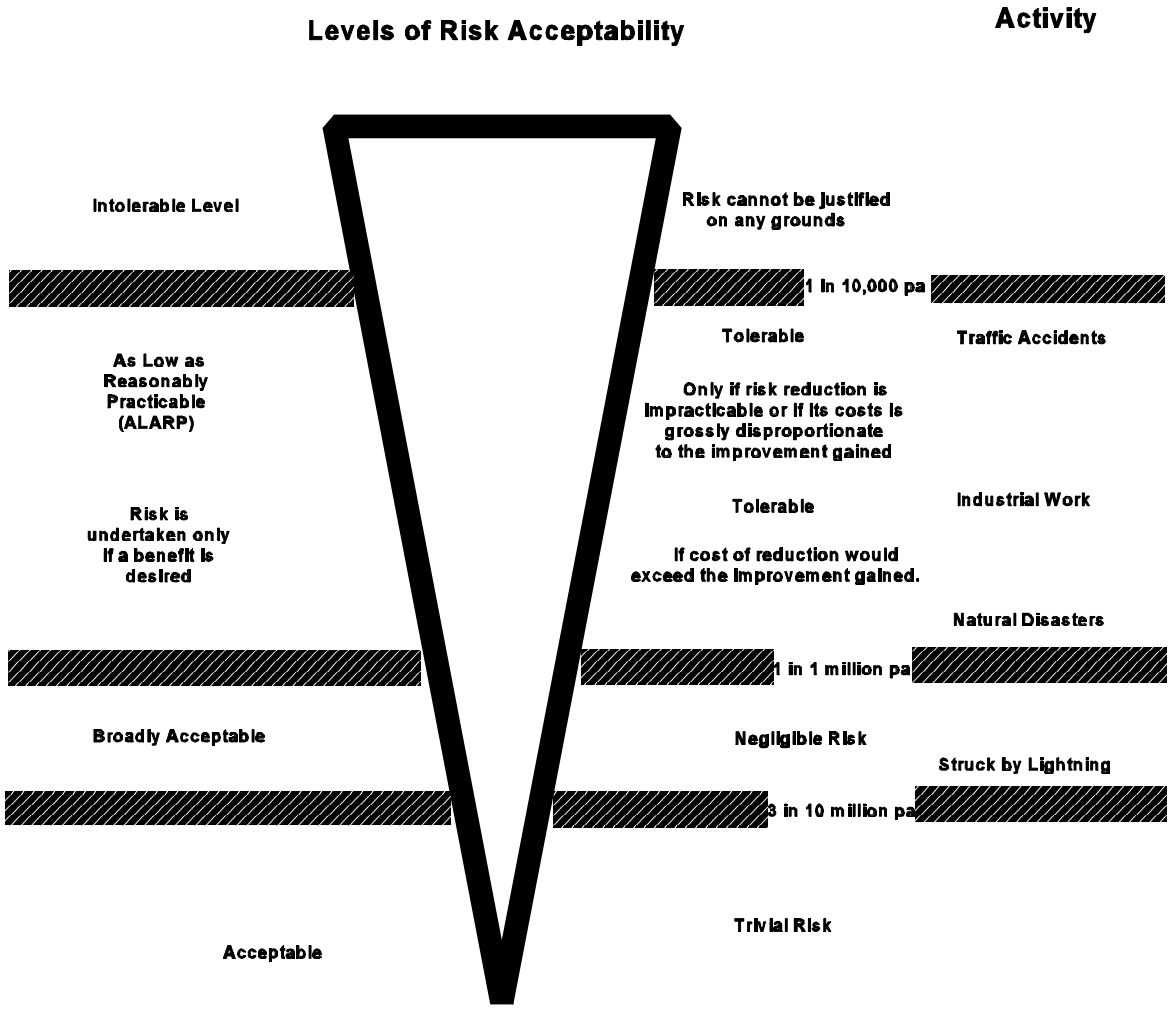
Risk in this context is defined as the likelihood that a condition or practice with the potential to cause damage, ill health or injury occurs, multiplied by the consequence of the occurrence. (See Information Box 3, P. 23).

The risk exposure of being killed in a road crash in Western Australia exceeds 1 in 9 000.

[38] Transport Canada Railways Safety Directorate Surface Group: *An Overview of the Railway Safety Act*, December 1992.

Illustration 7:

Risk According to Probability of Death for an Individual per Year of Exposure in Various Activities



Source: **R M Marks from UK Health and Safety Executive.**

5.5 Emissions

Pollution

In 1994, Westrail transported 27 904 million tonnes of freight an average 196 km freight for a total of 5 446.6 mtk. Fuel use was 47.5 million litres which represents 114.3 tkm/litre. This compares with 85.3 tkm/litre in 1982 (ie an improvement of 34% and at 8.72 litres/1000 tkm, and is nearly five times more fuel efficient and therefore less polluting than heavy road freight transport).

The UK Royal Commission on Environmental Pollution estimated that road freight transport uses 4.3 times more energy consumption per tonne kilometre than rail; and that it produces five times more carbon dioxide and methane, fourteen times more volatile organic compounds, eighteen times more nitrogen oxides and forty eight times more carbon monoxide.

Noise

Freight rail noise is not apparently a significant problem in Western Australia.

The UK Royal Commission on Environmental Pollution mentions a claim that a freight train is 5-10 dB quieter than road vehicles carrying the same tonnage at the same speed.

Contributing factors in noise reduction include larger, less frequent train movements, modern diesel locomotive design and disc brakes. In the UK, staggering the intervals between sleepers has been suggested as a means of reducing track noise.[39]

5.6 Overall Performance

In 1994 Westrail achieved a profit of $19 million equivalent to a 1.2 per cent pa on assets on a current cost basis. This is expected to rise to 4 per cent by 1998-99.

By a number of measures Westrail is amongst the world's best performing railways. This is shown in Figures 10(a) and 10(b).

5.7 Challenges for Westrail

Westrail faces a number of challenges.

- It needs to continue efforts to become and remain as efficient as possible. The Right Track initiative will see annual freight operating costs fall $40 million

- It needs to charge individual traffics their costs consistent with keeping the whole business viable. This requires it to enter into individual confidential commercial contracts; or

- For those traffics where it is a monopoly supplier because, for instance, its rates are well below road rates it needs to be vigilant to keep rates in line with world best practice to ensure State development is not impeded. Opening the track to third parties already under way will further underpin Westrail's efficiency and world best practice rates. The newly established Australian Competition and Consumer Commission (ACCC) will ensure Westrail's rates are reasonable.

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39 UK Royal Commission on Environmental Pollution: op. cit.

Figure 11(a):

World Railway Performance NTKM per Staff

Figure 11(b):

World Railway Performance NTKM per Wagon

- It needs access to risk capital for developing new track and services. This can be by way of shareholder equity capital and/or retained earnings, or borrowings. Profitability is the key to maintaining/enhancing the business.
- Historical debt is not relevant to operations in the 21st century. If Westrail were to have CP Rail System's debt to equity ratio of about 30:70, then its profit would have increased by $9.4 million (ie to $28.4 million in 1994). World best practice operations need to be seen against the background of best business practices, otherwise rail's customers will face inflated rates, and it will be less competitive with road which is funded on a cash and not debt basis.
- It needs to be proactive in competing with road. The grain freight rates and rebate scheme put in place for the 1994 harvest for the first time links rail rates to road distance. This has the effect of removing the impact on rail rates of the sometimes circuitous rail freight routes which has in some instances been a disincentive to farmers using rail instead of road. Newly developed *Road-Railer* technology also raises the prospect of low cost combined road and rail freight transport.

Recommendation 30

Westrail, in conjunction with Treasury and the Department of Transport, should examine what level of debt should be recovered in charges on Westrail's customers.

5.7.1 Track Ownership/Access

In addition to these technical/commercial challenges, there could be pressure on Westrail, because of what is happening elsewhere, for it to be split into a separate track and operations entities and for either or both of these to be privatised.

The Committee has not been convinced of the alleged benefits of track separation. It expresses no view on whether Westrail should be privatised, but feels that the two issues should be considered together. If privatisation were to be a real consideration, then prospective buyers should preferably be given the opportunity to express their view. That way the market would decide. Canada's experience would suggest that a private owner would seek to focus on the profit making sections of track, with a possible consequence that there would be pressure to close some routes.

Access rather than ownership is the more important issue for determining track utilisation efficiency which is the crux to lowering rail freight rates. This could mean that regardless of who owns the track, possible closure of some unprofitable lines cannot be dismissed out of hand.

With unfettered track access, people who feel that they can successfully run any service not provided by Westrail, or who can run an existing service cheaper than Westrail can put such a 'package' together. The United States experience of shortline operators on track owned by a mainline carrier provides a possible model for negotiating access to Westrail track.

The terms and conditions by which other operators gain access to Westrail track will be crucial in maintaining rail's competitiveness with road.

The difficulties in allocating road track costs to users are discussed in Chapter 6.1.7. Similar difficulties will be 'mirrored' in determining rail track access rates.

Canada uses a process of 'Final Offer' arbitration which may provide a model for adoption in Western Australia.

Recommendation 31

The Department of Transport, in conjunction with Westrail, should further develop the principles and process for providing rail access to other operators.

5.7.2 Regaining Market Share

Many people the Committee spoke to wanted Westrail to regain some lost traffics such as fertiliser. The Committee feels that there is little to be gained by looking at the past. Rather, Westrail should consider all tasks on their merit and in the light of current technology and world best practice. Westrail's commercial approach means that it will move into and out of tasks from time to time. What is important is to allow it the commercial flexibility to do so. Equally important is industry's willingness to allow Westrail to 'bid' for new tasks or tasks which may currently be on road.

In Chapter 4.5 the Committee recommends (*Recommendation 19*) that targets should be established for sharing heavy freight transport between road and rail.

Freight transport targets are not an end in themselves. Rather, they provide planning benchmarks where there are substantial differences between the value placed on freight transport by the community, and the market prices individuals are prepared or required to pay for it.

If there is little economic rationale for the current balance between road and rail, a target share would provide rail with more financial security to invest in track and rolling stock and to explore new technology specifically targeted to take trucks off the road, which is a priority for the majority of people who expressed a view to the Committee.

5.7.3 New Technologies

The Committee was impressed by the *Iron Highway* rail system for road trailer movement by rail, being trialed by CP Rail System and the *Ecorail* system for moving standard road trailers on rail track, on trail by CN North America in Canada.

Ecorail is the name given by CN North America to technology developed by 3R International Corp (USA).

NRC already haul up to 28 *Road-Railer* trailers on the East-West route between Adelaide and Perth. In Tasmania, narrow gauge *Road-Railers* for hauling woodchips are on trial. CP Rail System has a 10 train a week service hauling 200 *Road-Railers* per service.

Chapter 4.5.2 discusses the broad parameters which determine whether road or rail should be the preferred transport mode. These parameters need to be rethought in the light of the possible widespread use of rail track by road trailers.

One implication is that notwithstanding possible other reasons for rail track closure, current rail right-of-ways should be 'mothballed' in perpetuity so that they may be reopened as new technology is proven. There are overseas examples of road haul packs undertaking bulk haul tasks on previous rail right-of-ways. Westrail is contemplating using a modified truck to haul

woodchips on existing rail track. This is shown in Illustration 8.

New developments such as the possible bluegum-based woodchip/pulp/paper industry in the South West, mentioned in Chapter 3, should seriously consider the application now or in the future of the developing hybrid road/rail technologies.

Illustration 8:

Westrail Hybrid Roadrailer

Source: Westrail.

The Committee estimates that if half the general freight currently on road north of Perth were captured by rail, more than 200 road trailer movements per day, five days a week (or 100 road trains) would be removed from metropolitan roads.

Ecorail and *Iron Highway* are examples of innovation which could see general and bulk freight aboard road trailers hauled on rail track from Perth to the rail network extremities for assembly into triple road trains. For freight into the North of the State this would require terminals being situated at Geraldton for the North-West Coastal Highway and at Wubin for the Great Northern Highway.

Ecorail is shown in Illustration 9 and *Iron Highway* in Illustration 10.

Recommendation 32

The State Planning Strategy should provide for future rail/road interchanges in Geraldton, Wubin, Kalgoorlie, Leonora, Albany and Esperance.

Chapter 7.2 discusses the proposed Utakarra by-pass in Geraldton. The Committee considers that the planning of the by-pass should have regard to the location of the proposed future rail/road interchange.

Ecorail and *Iron Highway* are currently designed for use on standard gauge track. Pending development of narrow-gauge versions of the technologies, their application would be limited to the hauls between Perth and Leonora, and Leonora and Esperance. Diesel fuel in particular could be hauled on these routes.

The commercial success of both technologies is dependant on them competing with road haulage in terms of both price and service. The Committee has been told that of up to 20% rate reductions are possible, while a time penalty of 8% would be likely on typical 400-600 km hauls.

Proven performance of these technologies may lead to their application for narrow gauge railways. In that event, the rail network between Perth and Albany/Bunbury in the South, and Geraldton/Wubin in the North, could see extensive movement of road trailers on railtrack.

Both *Ecorail* and *Iron Highway* use 'standard' road trailers which, their proponents say, gives them a rates edge over *Road-Railers* which are purpose built.

The Australian licensee of the 3R International *Ecorail* technology, CRT Bulk Haulage, intends to trial it in the Eastern States later this year. The Committee feels that in that event, the opportunity should be taken for it to be demonstrated in Western Australia.

Recommendation 33

The Government should support Westrail and Main Roads WA cooperating with CRT Bulk Haulage to trial the introduction of 3R *Ecorail* technology in Western Australia.

Illustration 9:

Ecorail

Source: CN North America.

Illustration 10:

Iron Highway

Source: CP Rail System.

CHAPTER SIX

6. ROAD

6.1 Roads

In Chapter 4, reference was made to the importance of roads to the nation's productivity. Road investment, which has been declining, can play a major part in revitalising the economy. Cox estimates that Australian urban roads reaching best US practice could increase output by about 4% of GDP.[40]

The design and condition of roads and bridges, and their signage and traffic management strategies were high on the list of concerns expressed to the Committee, particularly by people in the regions outside the metropolitan area, and by those in the outer metropolitan area who live near and/or frequently use the four main routes which connect Perth and its hinterland.

Western Australia has 24 125 km of 'classified' or 'declared' roads including over 8 000 km of highways, almost 6 000 km of sealed main roads and a further 2 000 km of unsealed main roads, and over 6 000 km of sealed secondary roads and over 2 000 km of unsealed secondary roads. In addition, there are 117 000 km of other Local Government roads, and 30 000 km of 'unclassified roads in forests and national parks.[41]

The replacement value of sixteen thousand kilometres of highways and main roads is $ 9 788 million or $ 612 000/km. Of this, $4 013 million is depreciating so that, assuming the network has an average age of 50 years, in addition to normal annual maintenance and operational costs, some $80 million per annum in asset deterioration occurs.[42] The replacement value of the remaining 117 000 km of declared Local Government roads is $7 400 million or $63 250/km[43]. The strategic regional road network is shown in Illustration 11.

The task of developing the regional road freight transport network can be gleaned from the 'black top' maps of 1950, 1970 and 1994 (Illustration 12 on Page 67).[44] These show the extent of the challenge undertaken to provide the State's road system. This challenge has and continues to be a significant one for such a sparsely populated large land mass. By way of benchmarks, Western Australia is nearly 50% bigger in area than Queensland; and its road and rail 'density' is 59 km /1000 km^2 of area, compared with Queensland's 111. Western Australia has 12.1 people/km of public roads compared with Queensland's 18.5; and 278 people /km of public railway compared with Queensland's 327. In other words, other things being equal, Western Australia would need to double the size of its road/rail network to have Queensland's track network density; and Western Australians already 'carry' a 50% bigger road cost burden than Queenslanders. Currently, nearly 40% of State expenditure on roads is dedicated to expanding the network.

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40 Cox, J. B.,: *The Macroeconomics of Road Investment*: op. cit.

41 Department of Transport*: Submission No. 11*: op. cit.

42 Western Australia Budget Paper No.6: Vol.1, 15 June 1995.

43 Western Australian Municipal Association: *Report on Expenditure on Local Government Roads 1992-93, 1993-94,* September 1995.

44 Main Roads WA: Unpublished.

By some overseas standards our roads are built to carry long, lightly loaded trucks. European trucks, by comparison, are shorter but have higher heavier axle loadings.

Illustration 11: **Strategic Road Network**

Source: Western Australian Planning Commission.

Illustration 12:

Western Australia Blacktop 1950-1970-1994

If Western Australia's trucks were permitted European axle loadings, their payload efficiency could increase 20%. The 1985 Review of Road Vehicle Limits (RORVLs) found that the benefit/cost ratio of allowing higher axle loads were significantly positive and increased incrementally with heavier axle loads. The heaviest axle loads (including 22 tonnes on a triaxle) gave a benefit cost ratio of 5:1 for Western Australian rural and outer urban roads, and an annual cost to Western Australia of $5.4 million (1984 figures).[45] To the extent that concessions already granted for bin-to-bin bulk grain cartage allow 23.5 tonnes on a tri-axle instead of 20, Western Australia is already incurring the costs of heavier axle loads without 'compensation' from transporters or industry who gain the benefits.

Given that many roads Australia-wide are at their 'use-by' date, it would seem opportune to review the national axle loadings before embarking on building the next generation of roads. The impact of heavier axle loadings on bridges would also be of relevance in any review of road standards.

Recommendation 34

Main Roads WA should, through the national processes, examine the benefits and costs of heavier axle loadings so that any possible increases can be factored into the design parameters for new road and bridge construction and existing road and bridge reconstruction.

6.1.1 Ownership/Responsibility

Local Government roads account for over 80% in road length of the network as follows: 100 % of local roads, 70% of urban arterial roads, and 35% rural arterial roads. Main Roads WA is responsible for highways and main roads. The Commonwealth Government is responsible for the Great Eastern and Great Northern Highways (National Highways Nos 94 and 95).[46]

The State's 1994/95 expenditure on roads under these programs is shown in Table 3.

Table 3: **State Expenditure on Roads by Programs 1994-95 Actual, and 1995-96 Estimate (S'million)**

Road Type	PR0GRAM 1 Preservation		PROGRAM 2 Use		PROGRAM 3 Expansion		TOTAL PROGRAMS	
	94/95	95/96	94/95	95/96	94/95	95/96	94/95	95/96
National	42.8	80.3	12.7	14.3	2.9	41.5	58.4	136.1
State	95.8	129.9	53.2	53.8	69.3	139.3	218.3	323.0
Local Government	27.8	27.6	32.6	38.1	15.1	31.0	75.5	96.7
Total Roads	**166.4**	**237.8**	**98.5**	**105.2**	**87.3**	**211.8**	**352.2**	**555.8**

Source: Western Australia Budget Paper No.6, Vol. 1, 15 June 1995.

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45 NAASRA*: Review of Road Vehicle Limits*, Sydney, November 1985.

46 Main Roads WA, Task Force on Road Funding*: Report on Road Funding Needs and Issues in Western Australia*, Perth, 1990: op. cit.

Illustration 13:

National Highway Links - Western Australia

Source: MRWA.

Local Government undertakes additional road works. In 1992-93 and 1993-94 Local Government spent $182.1 and $207.8 million respectively on maintaining existing roads and building new roads. Twenty three percent ($47.6 million) of the 1993-94 expenditure was on new road construction.[47]

The Committee estimates that taking into account Local Government road works funded by the State and Commonwealth Governments, total expenditure on roads in Western Australia in 1995-96 will be $705.8 million. This includes $150 million own source (rates) and privately funded expenditure by Local Government.

The major challenge looming in the rural areas of the State is the age of the road network. These are built to have an average life of 40 years. If past levels of road preservation investment had continued, then the bulk of the rural roads would be over 40 years old by 2003.

The preservation needs of metropolitan roads are not as great. The investment need for all roads is split one dollar for metropolitan roads to two dollars of rural roads. For preservation works this split is one dollar for metropolitan roads to four dollars for rural roads. A greater proportion of preservation spending is being undertaken over the next 10 years from the increased fuel franchise levy on petrol.[48]

6.1.2 Usage

A minority of roads carry the majority of the traffic. Over half the travel is on urban arterial roads which account for only 1% of the State's road length. The unclassified rural roads account for 79% of the network length, but carry only 9% of the travel. National highways account for 5% of vehicle kilometres of travel, rural highways and main roads 14%, secondary roads 3% and unclassified rural roads 9%.[49] This traffic distribution is shown in Illustration 11 (Page 66).

Freight use of the road mode depends on a myriad of factors including: the availability of alternative rail, sea or air transport; the relative price and service levels of the alternatives; and the underlying technological, structural and policy regimes. As discussed in Chapter 5.5 and 5.9, the choice of road or rail is impacted by track use charge and taxation policies.

The freight movement pattern in Western Australia is also shown in Illustration 11.

6.1.3 Condition

In 1989 extensive studies were undertaken to measure the condition of Western Australian roads and bridges. Specific studies were undertaken of bridge strength, pavement roughness, alignment, width and travel conditions.

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47 Western Australian Municipal Association: *Report on Expenditure on Local Government Roads*: op. cit.

48 Western Australia, Budget Paper No.6, Vol.1: op. cit.

49 Main Roads Department, Task Force on Road Funding: op. cit.

The ***National Highways*** are shown in Illustration 13. They are 4 650 km in length or some 25% of the total National Highway network. National Highways account for 20% of Western Australia's declared rural road network and carried 23% of the total vehicle kilometres of travel on that network. National Highways in Western Australia are managed by Main Roads WA on behalf of the Commonwealth.

The general condition of National Highways in 1989 was as follows:

- 98.2% or 4 557 km had a pavement roughness classified as good;
- 90.4% had travel conditions classed as good;
- most of the bridges have a load capacity rated as good. However many used by road trains are single lane only and need widening;
- they fall far short of the required standards for immunity from flooding. The probable closure in any year of a National Highway carrying more than 2 000 AADV should be less than 1 in 50, and the average annual closure less than 12 hours. Annual closures of 7-20 days have been common; and
- only about half met the 7 metre standard for seal width, and many sections that did meet the seal width standards did not have the required 0.5 or 1.0 metre sealed shoulders.

In a further review in 1994, 2 406 km were found to be below standard seal width and 174 km below standard design speed. [50]

It is estimated that $470 million will be required to remedy the unsatisfactory seal and shoulder widths and $526 million to rectify bridge deficiencies and inundation.

The ***rural highways and main roads*** in the South West are shown in Illustration 14 on page 71. There are 3 275 km of rural highways and 7 272 km of main roads. They are the backbone of the road communication network, accounting for 45% of the declared rural road network, and carrying 65% of the total vehicle kilometres of travel on that network. There are 1 649 km of main roads which are not sealed.

The general condition of rural highways and main roads in 1989 was as follows:

- 96% or 10 125 km had a pavement roughness classed as good
- 91% had travel conditions classed as good
- 85% of 423 bridges had a load capacity classed as good; 64 bridges were classed as poor.

The ***urban arterial roads*** are shown in Illustration 15. There are 1 652 km of urban arterial roads within the Perth statistical division including 35 km freeway, 278 km highway, 219 km main roads and 1 120 km unclassified roads. There are an additional 537 km of urban unclassified local roads which serve an arterial function.

The general condition of urban arterial roads was assessed as 69% being good and 13% being poor.

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50 Main Roads WA: *National Highway Condition Report*, 1994.

Illustration 14: **South West Road Network**

Illustration 15: **Metropolitan Major Road Network**

Source: Department of Transport.

There are 8 538 km of ***secondary roads***, of which 5 940 (70%) are sealed. With the exception of 41 km, all secondary roads are in rural areas of the State.

The general condition of secondary roads in 1989 was as follows:

- 99% or 8 453 km had pavements classed as good;
- 90% had travel conditions classed as good;
- 85% of 253 bridges had a load capacity classed as good; 30 were classed as fair and 7 as poor.

The condition of ***local government roads*** can be gleaned from the estimated difference between what should be spent and what is being spent on maintaining them at their current condition. In 1993-94 this shortfall was $46 million or 29%.[51] This imbalance will be partly addressed by the State Government's guarantee that 25% of the State fuel franchise levy will be allocated for local government roads. The Committee estimates this should transfer another $18.8 million per annum to Local Government in 1995/96, leaving a shortfall of approximately $30 million.

6.1.4 Funding

Under the Australian Constitution roads are a State responsibility. At the request of the States, the Commonwealth Government has provided funds for roads since the 1920's. From 1931 to 1959 specific purpose road grants were tied('hypothecated') to a portion of revenue from fuel excise. This nexus was broken in 1959 when road grants were paid from Consolidated Revenue (general taxes) and/or from the Loan Fund (borrowings). Under the Australian Bicentennial Road Development (ABRD) program from 1982 the hypothecation of fuel excise was reintroduced[52] and continued under subsequent programs. Currently the fuel excise is 33.5/35.5 cents per litre on unleaded petrol and diesel and leaded petrol respectively.

Western Australia's share of Commonwealth road funds was 18% in 1969. This fell to about 12% from 1977/78. From 1992 the Commonwealth has limited its road funding to the network of national highways, and to a contribution to Local Governments for roads (Identified Road Funding). Other untied Commonwealth funds identified for road purposes have also been provided.

The Committee estimates that the total Commonwealth commitment for Western Australian roads in 1995-9 will amount to 12 cents per litre of fuel excise.

Western Australia's expenditure on roads is additionally sourced from vehicle and drivers licence fees, and from the State fuel franchise levy of 9.67 cents/litre on petrol and 7.45 cents/litre on diesel.

Income from various road related purposes is shown in Table 4.

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51 Western Australian Municipal Association: *Report on Expenditure on Local Government Roads:* op. cit.

52 Main Roads Department, Task Force on Road Funding: op. cit.

Table 4:

Western Australia - State And Local Government Road Income 1994-95 and 1995-96 ($Million)

STATE	1994-95 Est.Actual $million	1995-96 Estimate $million
Business Franchise (Petroleum Products) Licence Fee - Road	175.6	219.4
Motor Vehicle Registration	96.6	98.0
Permit Fees	1.4	1.4
Drivers Licences	25.0	26.2
Stamp Duty Vehicle Licences	114.5	111.0
Consolidated Fund	-	5.9
Commonwealth Grants		
Untied Road Grants	43.4	43.0
FAG - Grants Commission adjustment for roads	63.5	na
Commonwealth funding of National Highways	58.4	136.1
LOCAL GOVERNMENT		
Commonwealth Grant Identified Road Funding	51.9	54.5
TOTAL	630.3	695.5

Source: Western Australia: Budge Paper Nos 2 and 6, Vol 1; Commonwealth Budget Paper No 3 and Commonwealth Grants Commission.

In 1993-94, Local Government raised $124.72 million from own source funds, and $7.15 million from private sources for expenditure on roads. For the purposes of analysis, the Committee has extrapolated Local Government own source and private road funds in 1994-95 and 1995-96 to be $143 million and $150 million respectively.

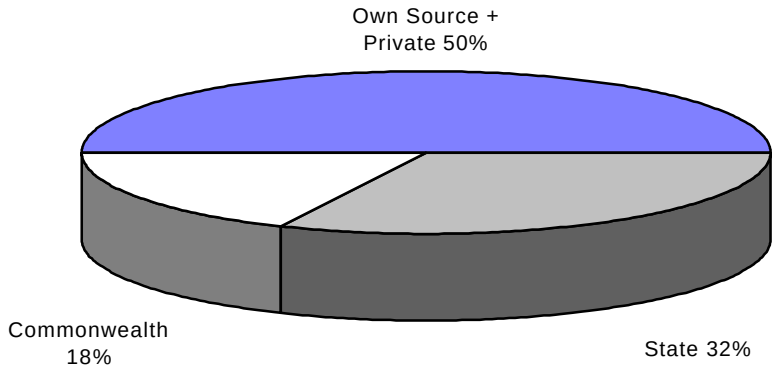
The 1991 Report on Road Funding found that Local Government in Western Australia spent less per person on roads than other States except Victoria and the Northern Territory. This was due to it imposing a lower tax burden per capita than the majority of States. If Local Government in Western Australia had imposed the Australian average road funding effort, another $30 million per annum would have been raised in 1988-89. Alternatively if it imposed Queensland's effort, another $32 million pa would have been raised. The Committee has been unable to update this work. It notes, however, that expenditure on roads by Local Government from own source and private road funds has increased 42% between 1988-89 and 1993-94 representing an average 7% p a.

The Committee considers that interstate comparisons of relative revenue raising capacities and efforts of Local Government is fraught with difficulties. There is also the equally difficult issue of whether Local Government rates are an appropriate mechanism for raising revenue to build and maintain roads.

Nevertheless, revenue raising capacities and efforts are pivotal in Commonwealth and State allocations to Local Government.

Figure 12:

Funding of Local Government Roads
(1995-96 Expenditure $301.2 Million *)



*Assumes expenditure growth of 7% since 1993-94.

Source: WAMA.

The Committee estimates that own source revenue accounts for 50% of Local Government expenditure on roads. This is shown in Figure 11 on Page 66.

Recommendation 35

The Department of Transport, in conjunction with Main Roads WA, WAMA, State Treasury and the Local Government Grants Commission should examine whether, and to what extent, rates should be used to fund Local Government roads.

6.1.5 Road Hierarchy and Dedicated Heavy Haulage Routes

Road Hierarchy

Road vehicle traffic flows are bound by similar relationships between volume, speed and capacity as other 'reticulation' systems whereby for a given speed, the higher the volume, the greater the required capacity. For roads this means that as vehicle flows (number and length) increase, more lanes need to be built to prevent congestion (ie reduction in speed).

Because roads have a life cycle of 30-50 years, it is not economic to build them to cope with expected traffic flows towards the end of their economic life. Instead, capacity is progressively upgraded by providing passing lanes and eventually continuous extra lanes.

The historical pattern of land use in urban areas limits the capacity of roads. In developing outer urban areas and in the regions where potential capacity is not constrained, road reserves are set aside and roads built over time according to a 'hierarchy' of road service levels.

Main Roads WA promotes four major urban road types. These are: 'primary'; 'district' and 'local' distributors; and 'access' roads. The road types and the criteria for their selection are shown in Table 5.

Table 5:

Urban Roads Hierarchy

Criteria	Primary Distributor	District Distributor		Local Distributor	Access Road
		Category A	Category B		
1. Predominant Activity	Major networks (grid), eg Freeways, Control of.	Important Network (grid).	Less important network (grid)	Minor network grid.	Limited access to traffic, forms part of local distribution network.
2. Degree of Connectivity	High. Long term planning.	High. Long term/medium planning.	Medium term planning. An existing road.	Connecting to Categories A and B. District Distributors.	Connecting to local and district distributors.
3. Connections	Controlled with appropriate measures, eg grade separation, high speed traffic management measures.	Controlled with appropriate measures.	Controlled with appropriate LATM.	Controlled with minor LATM.	Self controlling- very minor measures.
4. Min.desirable volume (except semi-rural areas)	Above 15 000 AADT.	Above 8 000 AADT.	Above 6 000 AADT(up to 8 000 AADT).	Max. desirable volume - 3 000 AADT(up to 6 000 AADT).	Max. Volumes less than 3 000 AADT.
5. Frontage access	None or limited.	Prefer not to have residential access and limited commercial. Generally via service roads.	Residential and commercial access due to its historic status. Prefer to limit them where and when possible.	Yes, except at intersections where side entry is preferred and traffic signals are involved.	Yes.
6. Pedestrians	None at-grade or controlled.	Positive measures for control and safety.	Appropriate measures for control and safety of pedestrians.	Yes, minor safety measures.	Yes.
7. Adopted operating speed	60-110 kph (depending on design characteristics).	60-80 kph.	60 kph.	60 kph.	40-60 kph (desired speed).
8. Bus Route	Yes.	Yes.	Yes.	If required.	If required.
9. Parking	No.	Generally no. Clearways where necessary.	Prefer not to. Clearways where necessary.	Yes.	Yes.
10. Heavy Goods Vehicles	Yes. Limited on the Narrows Bridge	Yes.	Yes.	Discouraged.	No.
11 Truck routes	Yes.	Yes.	If justified.	No.	No.

Source: MRWA.

Implicit in adoption of any road hierarchy are differing user expectations and, as necessary, adjustment in driver behaviour. For instance, overtaking a truck on a dual lane divided road calls for different driver behaviour to overtaking the same truck on a two lane road simply because there is no expectation of oncoming traffic in the first instance. Much discourteous or dangerous driving seems to be due to drivers adopting the wrong driving style for situations they can reasonably expect.

Reinforcing different driver expectations is attempted through road design (eg traffic calming and signage) which give particular road types their own individual 'signature'. Truck images painted on the pavement on the Leach Highway are an example of reinforcing the heavy vehicle signature of that road. These images which have only recently appeared could be confusing to car and truck drivers where they are shown on the centre lane, notwithstanding roadside signs asking truck drivers to use the left or centre lanes. This confusion is exacerbated by the new 'keep left unless overtaking' rule.

The Road Traffic Act 1974 and Local Government Act 1960 authorise Main Roads WA and Local Government respectively to develop and manage the State's road network. As mentioned in Chapter 4.6, this authority carries with it a duty of care and liability for death, injury or damage for 'misfeasance' These responsibilities and liabilities are set out in guidelines for local area traffic management.[53]

The Committee feels that driver behaviour would benefit from education campaigns which target the differing expectations on different road types. In the case of the Leach Highway truck images which the Committee supports in principle, no driver education has been apparent.

Requiring all drivers to keep to the left, while at the same time requesting truck drivers to do otherwise, is potentially confusing. The introduction of the rule to keep to the left unless overtaking presents an opportunity to explain the meaning of the truck signs and images in the new circumstances.

Where there is a change in road signature and driver expectation because long vehicles or road trains are permitted for the first time, the duty of care dictates proactive strategies are needed to alert drivers and other road users.

Recommendation 36

Where there is a proposal to significantly increase vehicle size, for instance, the use of long vehicles on the metropolitan B-double network, the Road Safety Council should ensure adequate prior driver education.

53 Main Roads WA: *Guidelines for Local Area Traffic Management*: op. cit.

Heavy Haulage Routes

The Committee has found no significant examples of dedicated heavy haulage roads. Truck volumes are only sufficiently high in the north-east of the United States to contemplate them. Accordingly, the Committee considers that there is no cost-effective alternative in the near future for trucks and cars to share roads in Western Australia.

The so-called metropolitan B-double network comprises the principal heavy haulage routes in Perth. These are shown in Illustration 16 on page 80. The South-West B-double network is shown in Illustration 17 on page 81.

Heavy haulage routes are those roads in the hierarchy where there is a heightened expectation of encountering heavy trucks. However, construction work and road maintenance itself are examples of the need for heavy trucks to use all classes of roads.

The Government's aims are to *"develop the truck road system to safely cater for heavy transports, including road trains"* and to *"enable access by road trains to city terminals via gazetted roads and during restricted times"*.[54]

The intention of the Government's aim is now unclear. When it was announced, the term 'road train' referred to a prime mover, lead and second semi-trailer (ie a 'double' road train), and a third semi-trailer (ie a 'triple' road train). Double road trains were 19 to 36.5 metres; and triple road trains up to 53.5 metres.

Under the new national nomenclature, a vehicle up to 30 metres is a *Long Vehicle*; and a *Road Train* is 30 to 53.5 metres.

The Committee's findings support 25 metre *Long Vehicle* access to metropolitan terminals, but not *Road Train* access. *(Recommendation 71*).

This Chapter discusses regional roads. Urban roads are discussed further in Chapter 7, and metropolitan roads in Chapter 8.

The open road speed limit for long vehicles and road trains is 100 km/h. The open road speed limit for cars in Western Australia is 110 km/h. For cars towing caravans over 0.75 tonnes loaded weight the speed limit is 90 km/h. Probationary drivers cannot exceed 90 km/h.

Truck drivers regard caravans as a significant hazard. They point to drivers towing caravans generally being inadequately trained. Figure 6 (Page 15) shows that caravans make up 13% of the East-West traffic mix on the Great Eastern Highway at Norseman. This means that for every five trucks, there is one caravan.

A co-operative effort between the road transport industry, police and the Royal Automobile Club (RAC) promotes the use of CB radios to assist drivers during overtaking manoeuvres by displaying call signs on the back of caravans.

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[54] Submission No. 111*:* op. cit.

Illustration 16:

Perth Metropolitan Area B-double Routes
As at September 1994 - Revised

Source: MRWA.

Illustration 17: **South-West B-double Network**

Source: MRWA.

The Committee on Road Safety found the speed differential between probationary drivers' vehicles and other traffic to be an unnecessary hazard and recommended that speed restrictions for probationary drivers be repealed.[55]

Raising of the truck speed limit from 90 km/h to 100 km/h has put long vehicles and road trains more frequently in situations where they can overtake caravans and probationary drivers.

Recommendation 37

Consideration should be given to require people who tow caravans undertaking additional training and/or being licensed.

6.1.6 Wear and Damage

Road **wear** is taken to mean the normal deterioration of a road due to its use by a legally loaded vehicle. **Damage** is the additional wear caused by a vehicle being overloaded.

Roads are built so that over their forty to fifty year life span, they will accommodate the estimated number of Equivalent Standard Axles (ESAs). Road wear increases as the fourth power of the ratio of the actual axle load to ESA load, so that doubling the load on any axle produces sixteen times more wear. Put another way, if a road has a 32 year design life, doubling axle loads reduces the pavement life to 2 years; and overloading by 10% reduces pavement life to 22 years.

Long vehicles and road trains cause less road wear than smaller vehicles carrying out the same task. Long vehicles replacing 80% of semi-trailers to cart 100 000 tonnes of fertiliser save 1 600 loaded movements or 27%.[56]

Roads and Overloading

Overloading can refer to trucks being loaded beyond their design capacity, or beyond prescribed axle loadings determined nationally to preserve the integrity of the built road system. The frequency of overloading beyond design capacity by operators is not seen as a significant problem in Western Australia. Exceeding prescribed axle mass limits is a problem in that it can significantly shorten the planned life of roads and bridges.

Vehicle loading measurements in 1991 at 14 'Culway' sites throughout Western Australia show that on an annualised basis 133 000 trucks (19%) were overloaded and that 40% or 56 000 truck and dog trailer and larger combination vehicles were overloaded. Because 20-40% of the weighed trucks were unloaded, the actual incidence of overloading is significantly higher. For example, between May 1991 and April 1992, Culway Station No.1 near Albany recorded 36% of loaded tandem axles and 71% of loaded tri-axles as being overloaded. On an annualised basis 5 per cent or 1 156 tandem and triaxles were overloaded more than 30%. This is shown in Table 6.

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55 Western Australia Legislative Assembly Select Committee on Road Safety*: Regulations, Penalties and the Demerit Point System*, (Fourth Report), December 1994.

56 Main Roads W.A.: *Report on the Practicability of a Road Train Trial for the Transport of Fertiliser from Kwinana to Albany Highway*, May 1994.

Table 6:

Axle Group Weights - Albany, South-bound
May 1991 - April 1992

Axle Group Type		ESAs per Group	Axle Groups Weighed	Percentage of Axle Groups			Axle Group Weights	
				Unl'd	Loaded	Overl'd	Mean	95% <
Steer Groups	Single	1.0	6 426	19.8	70.4	9.8	5.0	6.4
	Twin	2.4	665	8.4	60.8	30.8	10.2	13.3
Other Non-Steer Groups	Single	0.5	1 646	52.6	41.4	6.0	4.8	10.2
	Tandem	2.5	11 443	9.2	58.3	32.5	15.2	21.3
	Tri	2.5	7 368	2.5	27.8	69.7	22.3	26.8
	Quad	0.0	7	71.4	28.6	0.0	6.6	8.7
TOTALS		**2.0**	**27 555**	**12.5**	**52.0**	**35.5**	**14.0**	**24.**

Source: MRWA *Culway*.

Main Roads WA has recently issued a discussion paper on overloading which further elaborates the extent of the problem.[57]

Overloading confers an economic advantage to the perpetrators over those operators who comply with the law. In 1993-94 out of 18 000 inspections 3 500 trucks were apprehended.[58] In 1994-95 there were 4000 apprehensions, 2 500 infringements and $1.1 million raised in fines which averaged $440. Compliance with vehicle axle load limits enforced by the Department of Transport on behalf of Main Roads WA cost $1.05 m in 1994-95.

Road damage could be minimised by a combination of industry self regulation and incentives, coupled with more targeted enforcement and punitive penalties.

The proposed National Road Law imposes significantly increased penalties for overloading.[59] The efficacy of penalties depends significantly on the probability of being apprehended.

The Committee was impressed by the system used in NSW for coal haulage whereby payment was restricted to legal loads. It also understands difficulties associated with who should be accountable for overloading. It concluded that the overloading enforcement 'pyramid' should be strengthened by adding the sanctions of grounding and load confiscation as follows:

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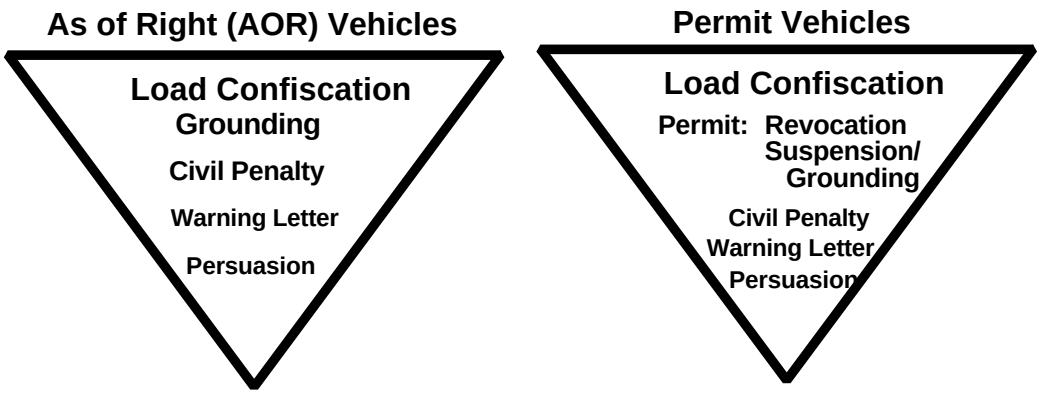
57 Main Roads WA: *Strategies to Reduce the Incidence of Overloading in the Road Transport Industry*, Discussion Paper, November 1995.

58 Submission No.111: op. cit.

59 National Road Transport Commission*: Road Transport Law: Compliance and Enforcement Proposal*, June 1995.

Table 7: **Overloading Enforcement Strategies**



Load confiscation is not a panacea for low value loads such as sand. Grounding of AOR vehicles, by 'on the spot' permit suspension, prevents further road damage and would seem appropriate in cases of gross overloading.

Because permit suspension and revocation are already practised, AOR vehicles and permit vehicles carrying valuable loads would be the main targets of the suggested strengthened overloading laws.

The professional road transport industry believes that accreditation and self regulation will put paid to overloading in that sector. However, it points to significant overloading of grain by farmers as an example of a problem that would benefit from load confiscation. As grain is weighed at receival, cooperation of grain receivers and/or access to weighbridge dockets would be an economic alternative to roadside weighing of grain trucks. Because the grain harvest takes place when roads are dry and at their strongest, the incentive of increased axle load tolerances for a limited period of the year, which is already available to accredited professional road transport operators, could be extended to all trucks. Trucks loaded beyond their tolerances would be credited with delivery of the legal load without increased tolerance, and the overloaded grain value credited to road building funds.

The condition of the National Highway in Western Australia has recently come under closer scrutiny in the debate on the adequacy of Commonwealth funding for roads.[60]

The Committee considers that the State's case for additional funding is weakened by its inability to adequately control damage caused by overloading. It also questions whether the State should be solely responsible for funding the supervision and enforcement of axle loadings on National Highways.

Recommendation 38

Main Roads WA should examine grounding and load confiscation strategies for combatting overloading.

Because overloading is 'anti-competitive', the role of the ACCC in preventing overloading should be considered under the proposed review.

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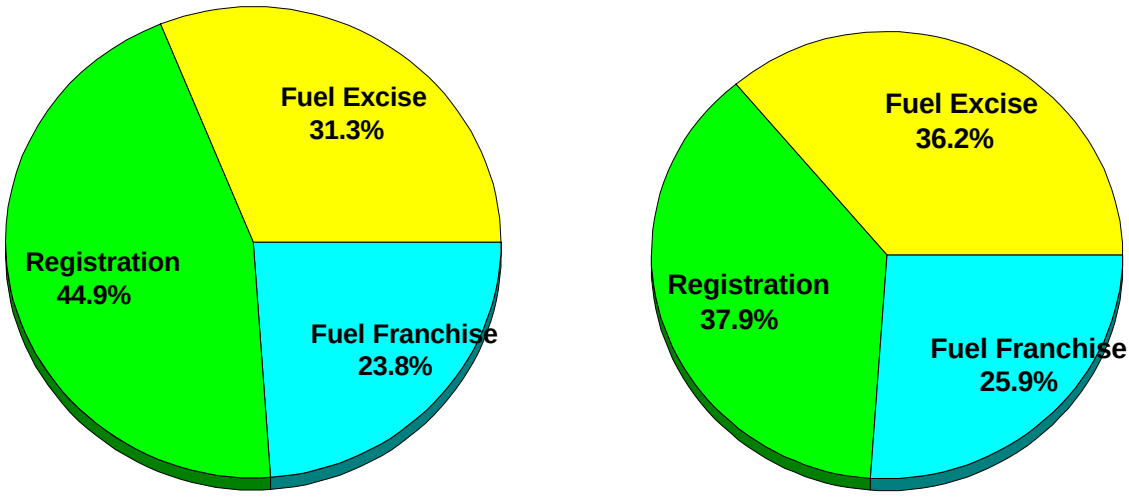
60 Main Roads WA: *National Highway Condition Report*: op. cit.

6.1.7 Charges

Road related charges are levied on drivers (eg licences) and vehicles (eg registration, permits and fuel levies and taxes).

The shares of the components of heavy vehicle charges in 1992-93 and 1995-96 are shown in Figure 13.

Figure 13: **Components of Heavy Vehicle Charges for Road Purposes**



Source: Committee; Western Australia, Budget Paper No 2 and State Revenue Department.

Figure 13 shows that the NRTC-determined heavy vehicle charges increase reliance on fuel-based imposts from 55.1% to 62.1%.

From a 'user pays' perspective the charging 'mixture' creates potential inequities between cars and trucks; metropolitan and regional people; loaded and unloaded trucks; petrol and diesel powered trucks; and trucks that cover long and short annual distances.

The costs of roads and related traffic may be broadly divided into four categories: road maintenance, congestion, crashes, and environmental. Much debate particularly in Western Australia has focussed on whether heavy trucks 'pay their way' in terms of road maintenance. While overall road related charges and taxes more than cover road maintenance costs, the question of whether heavy trucks meet their portion of these costs is clouded. It appears there is significant cross subsidisation brought about by: the negligible damage caused by cars when compared to heavy trucks; the higher State fuel levy on petrol, when heavy transport almost exclusively uses diesel fuel; the fact that two-thirds of road revenue is raised in Perth, while two-thirds of total road expenditure and four-fifths of road maintenance expenditure is in the regions[61] with a 50/50 split in truck movements. This debate is also overshadowed by work in Victoria and

61 Western Australia: Budget Paper No. 6, Vol. 1: op. cit.

New South Wales on the unfunded safety deficit of trucks.[62]

The Committee has extrapolated the work done by the SCOT working party on taxes and charges paid by the road transport industry (ie freight and passenger vehicles over 4.5 tonnes GVM).[63] It estimates that the Western Australian industry pays $118 million pa in fuel excise allocated to road works, fuel franchise levy and registration charges. This is equivalent to 17% of total expenditure on roads.[64]

The Committee further estimates that the road transport industry meets over one-quarter of the total expenditure on roads in the metropolitan area, and under one-eighth of expenditure on regional roads.

It is the Committee's conclusion that heavy trucks do not pay their way overall on regional roads. In a strict commercial sense regional roads do not pay their way either.

The underpayment by heavy trucks for regional road use is essentially a 'cross subsidy' by metropolitan car users to exporters of raw materials. The impact of removing this cross subsidy may be gleaned from the fact that where road 'track' charges are 5% of road freight transport's costs, then a hypothetical doubling of heavy truck road track charges would increase freight rates by 5%.

The cross subsidy 'transfer' is 'regressive' in that it falls heaviest on those metropolitan car users who can least afford it.

The Committee acknowledges that permit vehicles' access to the road system may be restricted. To that extent there can be no nexus between their track charges and total expenditure on roads.

6.1.8 Other Road Issues

A recurring theme during the Committee consultations in regional Western Australia, particularly from Local Government, was a lack of understanding on the reasons why certain roads rather than others were being built/upgraded/repaired. There was also a suggestion that more work on Commonwealth and State roads should be carried out by Local Government, because this would save costs.

Road Funding Priorities

The lack of understanding of how to match road needs with available budgets is not confined to Local Government in Western Australia. In its report Efficiency of Road Construction and Maintenance - extending the dollar further,[65] the House of Representatives Standing Committee on Transport, Communication and Infrastructure commented that:

> *"..never had so much money been spent by so many people, for so long, with so little information gathered and analysis carried out on how well the money is*

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62 Rechnitzer, G.: *Truck Involved Crash Survey. Fatal and Injury Crashes of Cars and Other Road Users with the Front and Sides of Heavy Vehicles*, VICROADS, Road Safety Division, Report No. 35, February 1993.

63 Standing Committee on Transport (SCOT) Working Party: *Study on Taxes and Charges Paid by the Road Transport Industry*, 1995.

64 ibid.

65 House of Representatives Standing Committee on Transport, Communication and Infrastructure, December 1993.

used."

Such a perspective is hardly incisive, given that so little of the road system carries most of the traffic. The debate is also not assisted by the Commonwealth and State Governments adopting different road classification systems for funding purposes as shown in Table 8.

Table 8:

Road Funding Classifications

Commonwealth Classification	Main Roads Act
National Highways	Highways
Urban Arterial Roads	Highways Main Roads Unclassified Roads
Rural Arterial Roads	Highways Main Roads Secondary Roads
Local Roads	Secondary Roads Unclassified Roads

Source: MRWA.

The Committee estimates that at the current rate of expenditure, Western Australia will spend $1 billion on new roads in the next four years. This is more than one and a half times what is spent by government on new schools and hospitals and is exceeded only by housing as a purpose for government investment. Expenditure of this size warrants significant effort to ensure value for money, and that community needs are met. If one per cent pa were set aside for these purposes, $10 million would be available over four years.

Recommendation 39

The Government should set a target for expenditure on road needs assessment; and needs assessment should be funded from road income.

Chapter 4.5 refers to Cox's assessment of transport savings from Australian urban road practices reaching best United States practices, and if better investment management systems were adopted to prioritise road expenditure.

The Committee has been impressed with the development of multi-objective needs based road planning tools developed by Main Roads WA which emphasise both efficiency and equity. Effectively, the techniques go beyond Benefit Cost Analysis (BCA) to narrow the gap in the value placed on roads by rural and urban communities. Multi-objective techniques are being used

extensively by Main Roads WA in the development of regional roads strategies.[66]

The Committee has also been impressed by critical path optimisation work done in the Department of Transport to investigate grain transport.[67]

Both the multi-objective critical path techniques have the potential to move transport planning beyond comparing road intervention levels based on simple traffic counts, which, in the past, has been the main indicator of road needs.

The Department of Transport is undertaking regional transport studies which, amongst other things, put roads in the context of overall transport needs. These studies will for the first time provide an overview of State-wide transport needs and a prioritisation of expenditure programs.

Recommendation 40

Main Roads WA, in conjunction with the Department of Transport and WAMA, should further develop methods for prioritising road funding.

A pivotal issue in determining road funding priorities is how much should be spent on new roads and on maintaining/improving existing roads. The Committee feels that generally, the safety of existing roads is paramount. Where risk to safety is intolerably high, necessary works should have priority. The Committee feels that safety should come ahead of network expansion.

Recommendation 41

The Government should determine what road's tolerable risk level should be, so that road safety expenditure levels can be determined accordingly.

Recommendation 42

The Government's priority in road funding should be to reduce the safety risk on existing roads to a tolerable level ahead of network expansion.

Road Building Costs

The Committee saw encouraging evidence of cooperation between Local Government and Main Roads WA in building major roads using local skills and equipment and other examples of high quality major road works constructed by Local Government. It was shown a two kilometre stretch of three-lane National Highway built by the Shire of Merredin in three months for $200 000 / km. The Shire of Albany showed the Committee a 10 kilometre long, 6 metre two

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66 De Silva H & Tazam C.: *Enhancing the Impact of Road Investment on Rural - Urban Equity*, Paper presented to the 7th World Conference on Transport Research, Sydney, July 1995.

67 Ernst, W.F.: *Looking for the Ideal Grain Transport System*, tabled in evidence.

coat chip seal on a 9 metre formation access road to the Mindijup silica sand mine built for $75 000 / km. The Mindijup road is shown in Illustration 18.

Illustration 18:

Mindijup Silica Sand Access Road

The Committee feels that cooperation of this kind has the potential to minimise road construction costs. Where individual Shires lack the capacity to bid for major contracts, they could consider further extending skill and equipment sharing already being practised.

Recommendation 43

Main Roads WA, in conjunction with WAMA, should examine the feasibility of extending cooperation between Shires to build major road works.

6.2 Trucks

In 1992 Western Australia had 93 465 trucks over 3.5 tonnes GVM, including 5 614 articulated vehicles and 9 838 trailers. Two per cent of the fleet is licensed to carry dangerous goods. In 1994-95 there were 28 100 permits issued for oversize/over mass vehicles.[68]

The average age of rigid trucks in Western Australia in 1991 was 13.3 years and for articulated trucks the figure was 11.0 years. The average age of trucks nationally increased 20% for rigid trucks, and 6% for articulated trucks in the three years to 1991.[69]

The growth of truck mass and length over the past 50 years is shown in Table 9.

Table 9:

Articulated Vehicle Mass and Dimension Limits from 1942

Year	Gross Combination Mass (GCM) Tonnes	Length of Vehicle Metres
1942	13	13.3
1966	31	15
1976 (EoRVL)	36 to 38	17
1981	36 to 38	17
1985 (RoRVL)	41 to 42.5	17.5
1993	Currently under review	19

Source: ATN, April 30, 1994.

Transport operators are stridently pursuing for world class trucks on world class roads, quoting Europe and North America as the standard setter.[70] Sweden, which like Australia has historically operated long lightly loaded trucks, estimates that for them to change to European standards will increase transport costs by 20%.[71] Additionally, it is incurring very significant expenditure to upgrade most of its bridges. Adoption of European axle loads on Australian size trucks would, other things being equal, give Australian operators a significant cost advantage over European operators.

The Committee has been told that thirty six and a half metre road train costs are around 30% higher than semi trailer costs. They have double the payload giving them a potential 35% rate advantage.

In the typical fertiliser task, 27.5 metre vehicles with a payload of 53 tonnes compete with 19 metre truck and trailer combinations with a payload of 40 tonnes. Cost modelling for the Committee shows that the long vehicle costs are in the range 4.1- 6.0 cents/tonne km depending on their age and shift operation. Nineteen metre three-axle truck/5-axle trailer combination costs

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68 Main Roads WA, tabled in evidence.

69 ABS.

70 Stewart, A.: *World Efficiency Demands Increased Axle Weight*, Editorial in ATN, July 29, 1994.

71 Landborn: *Consequences Arising from Adaption of Vehicle Weights and Dimensions to EU Regulations*, TFK 85E, Feb 1994.

are in the range 4.5- 5.3 cents/tonne km.[72] This suggests that there is little economic benefit to gain from the use of long vehicles rather than AOR truck and trailer combination in the fertiliser task.

Truck operators say that the cost of breaking down a long vehicle or road train is $80-100. The Study of the Practicability of Allowing Double Bottom Road Trains into Metropolitan Perth estimates the net present value over ten years of not breaking down at Apple Street to exceed $5 million.

The Committee was unable to obtain evidence of freight rate reductions resulting from trucks not having to break down. The Western Australian Road Transport Association said in evidence that the savings from not breaking down are passed onto users. This has been disputed in evidence by an operator**.**

6.2.1 Dimensions

Typical heavy commercial vehicles in use in Western Australia are shown in Illustration 19.

'As of Right' (AOR) vehicles are up to 19.0 metres. In the US there is increasing use of 16 metre (53 ft) road freight containers. Their adoption here would see semi-trailers lengthened by about 2.5 metres to 21.5 metres.

Permits are issued by the Commissioner for Main Roads for trucks that are more than 19 metres or do not otherwise comply with vehicle dimension and weight regulations. In 1994-95 $1.1 million was raised in vehicle permit fees.

Width

The maximum width of trucks is 2.5 metres. The European standard is 2.55 metres (2.6 metres for refrigerated trucks).

Height

The maximum height of trucks is 4.3 metres except for double deck cattle trailers which can be up to 4.6 metres high. The European standard is 4.0 metres.

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72 Department of Transport: *Austway modelling*, Unpublished.

Illustration 19: **Typical Heavy Commercial Vehicle Types in Western Australia**

As of Right Axle Loadings and Gross Vehicle Mass Limits

In Western Australia for AOR vehicles the load on a 2 tyre single steer axle can be up to 6.0 tonnes (5.4); and 11 tonnes (10.0) on a 4 tyre twin steer. An 8 tyre tandem axle can carry up to 16.5 tonnes (15); and a 12 tyre tri-axle group 20 tonnes (18). New South Wales limits are shown in brackets.[73] The Western Australian limits are for load-sharing suspensions where appropriate. 'Road friendly' air suspension is seen as a means to increase axle load limits to 18 tonnes and 22 tonnes for tandem and triaxles respectively.

The maximum GVM for an AOR articulated vehicle is 42.5 tonnes.

6.2.2 Acceleration

A typical 72 tonnes GVM road train powered by a 400 HP engine, accelerating from standstill travels 200 metres in 30 seconds. Heavy vehicles turning from West Swan Road into the Great Northern Highway face a 3% grade. It takes over 400 metres and more than a minute on this grade to achieve a road speed of 40 km/h from stationary.[74]

6.2.3 Braking

Braking requirements for commercial vehicles manufactured since 1979 are contained in ADR 35. This Rule amongst other things prescribes a number of tests conducted at specified load capacities which these vehicles must pass. The most rigorous test requires a vehicle to decelerate around 0.4 g. According to Horsham[75] this requires considerable skill to achieve, even in new unladen trucks under ideal conditions.

There are no ADRs for truck trailer combinations. However, ADR 38 prescribes the braking requirements for heavy trailers and semi-trailers. Concern has been expressed by some operators that the compatibility of ADR 35 and ADR 38 has not been sufficiently researched. This issue has been recognised by the Federal Office of Road Safety (FORS), and the two ADR's are currently undergoing a major review to improve the compatibility problem which arises with certain combinations of trailers and trucks.

So called 'stable' stopping characteristics of US trucks show loaded semi trailers decelerating from 100 km/h at 0.43 - 0.5 g, compared with loaded rigid trucks 0.34 - 0.46 g, and empty semi-trailers and rigid trucks 0.29 - 0.39 g.[76]

Braking instability in articulated trucks is of two kinds. Trailer brake lock causes the trailer to sway and can be corrected by the driver. Prime mover brake lock causes jack-knifing whereby the trailer 'catches up' with the prime mover. This occurs in less than half a second and cannot be controlled by the driver.

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73 Road and Traffic Authority of NSW: *Heavy Vehicle Drivers' Handbook*, June 1993.

74 Pearson, B., Ogden, K., Sweatman, P., Jarvis J.: *A Study of the Practicability of Allowing Double Bottom Road Trains into Metropolitan Perth*, August 1990.

75 Horsham, A. 1980 in Jarvis, R.*: The Nature of Braking*, ARRB.

76 Pearson B., Ogden K., Sweatman, P., Jarvis, J.: *A Study of the Practicability of Allowing Double Bottom Road Trains into Metropolitan Perth:* op. cit.

According to MacKay,

> *"the fear of jack-knifing under braking frequently tends to discourage drivers from braking heavily in an emergency*".[77]

In-service braking research by ARRB under a variety of conditions showed that multi-axle trucks use decelerations which peak at 0.17g in the vicinity of 10 to 20 metres from the intersection, the average deceleration being 0.1g. Twenty five percent of trucks used decelerations over 0.2 g but only 5% used decelerations greater than 0.25 g.

The in-service or non-emergency stopping distance from 100 km/h for a 33 metre double road train is 535 metres; and from 80 km/h it is 340 metres.[78]

Computer modelling for Western Australia of emergency braking performance provides a level dry/wet polish range of 0.38 - 0.25 g for a 33 metre double road train. This means that at 80 km/h in the wet, it stops in 80 metres. Brake performance on a 4.4% downward slope was reduced by 0.04 g or 11-16% respectively, so that in the wet the emergency stopping distance from 80 km/h increases to 90 metres.

Anti-lock (*ABS*) braking is available on newer trucks and trailers.

New South Wales requires B-doubles carrying certain classes of dangerous goods to be fitted with *ABS*. New electronic technology will mean that future trucks will stop more quickly, and with improved stability than current trucks. The NRC has concluded that except for B-double trailers carrying dangerous goods in road tank vehicles, *ABS* cannot be justified for B-double trailers.[79]

Recommendation 44

Consideration should be given to phased-in introduction of anti-lock brakes *(ABS)* for long vehicle trailers and road train trailers operating in urban areas.

The best way to determine the braking performance of heavy vehicles would be to undertake in-service (operational) trials.

Recommendation 45

Operational trials should be undertaken to establish the braking performance and dynamic stability of long vehicles and road trains.

The acknowledged problems with articulated vehicle braking lie behind the Committee's finding (Chapter 4.6, Page 40) that there are practical reasons for questioning the use in some locations of long truck/trailer and road train combinations. These problems are discussed further in Chapters 7 and 8.

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77 Horsham A., 1980 in Jarvis .R.: *The Nature of Braking*, ARRB.

78 Pearson, B., Ogden, K., Sweatman, P., Jarvis, J.: *A Study of the Practicability of Allowing Double Bottom Road Trains into Metropolitan Perth*, op. cit.

79 National Road Transport Commission and National Office of Road Safety: *Anti-lock Braking Systems for Heavy Vehicles, Stage* 1, July 1994.

6.2.4 Speed

The maximum open road speed limit outside built up areas for trucks over 4.5 tonnes, GVM is 100 km/h. On a section of the Great Eastern Highway, road trains are limited to 90 km/h.

Truck speed is discussed further in Chapter 7.3.

The Committee considered the issue of truck speed limits in the light of its concerns about the sway of trailers of combination vehicles, and the acknowledged seal and shoulder width inadequacies of the State's major roads, and in particular the National Highway. These problems also lie behind the Committee's findings that there are practical reasons for questioning the use in some locations of long truck/trailer and road train combinations. These issues are discussed further in this chapter and in Chapters 7 and 8.

6.2.5 Safety

Chapters 4 and 6.1.5 discuss the responsibilities for road development and traffic management of road authorities. A pivotal question for them is whether they exercise reasonable care in ensuring the safety of road users. They do this by adoption of design standards and construction techniques which meet professional benchmarks and consensus about the appropriateness of particular interventions and practices notwithstanding any contributory negligence by drivers.[80]

Where the use of long vehicles and road trains constitutes a new practice without significant precedent, the question arises as to how professional benchmarks and consensus about appropriateness are established. In Chapter 5.4 evidence by RM Marks is presented that in the case of new rail operators in the UK, prior demonstration of a 'safety case' based on risk assessment is required. In Western Australia, operation of road trains in Darwin have been regarded as a precedent, and 'live' trials have been held to assess safety aspects of long vehicle and road train use in regional areas and in the Perth metropolitan area.

Adoption of nationally 'consistent' heavy vehicle standards and road laws should simplify the issue of professional benchmarks. Appropriateness is in many instances a one-off judgment. In Chapter 6.1.8 the Committee recommends *(Recommendation 41)* that the Government should determine road's tolerable risk threshold. The Committee considers that risk assessment and adoption of a risk tolerance hierarchy should assist in demonstrating the safety of road development and traffic management solutions proposed by road authorities.

The risk to safety of road trains in built up areas is discussed further in Chapters 7 and 8.

Safety in transportation is traditionally measured by its 'obverse' or safety failure outcome measure of crashes, injuries and deaths. These measures tend to belie the fact that far and away most freight transport tasks are achieved without incident.

Information Box 3 on Page 23 explains the terms used to describe measurement of heavy vehicle safety.

Research by VICROADS of crashes in Australia in 1987-88 involving heavy trucks over 3.5 tonnes GVM found that they contributed 18% of annual road deaths overall (ie 400 people killed and 1700 seriously injured. Of these, 80% were other road users).[81]

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80 Main Roads WA: *Guidelines for Local Area Traffic Management:* op. cit.

81 Rechnitzer, G.: *Truck Involved Crash Survey. Fatal and Injury Crashes of Cars and Other Road Users with the Front and Sides of Heavy Vehicles*: op. cit.

In 1988 there were a total of 238 road deaths in Western Australia and 21 of these (8.8%) were in crashes involving trucks.[82]

The risk of being killed in a car crash in Western Australia is one in 9 000 years of exposure.

According to the Federal Bureau on Road Safety, for Australia in 1988, articulated truck drivers were solely responsible for 22% of crashes involving other vehicles, and 35% of truck-only crashes[83].

In 1988 in Western Australia, there were 634 serious truck crash injuries. The Committee estimates this amounts to 0.07 deaths/injuries/mtk. This compares with 0.248 in Germany. Put another way, the risk of being killed in a road crash involving a heavy truck in Western Australia is one in 85 000 years of exposure.

Between 1988 and 1994 in Western Australia, truck crashes resulting in death or hospitalisation decreased from over 12 per 100 million kilometres of travel to less than 10.[84]

The cost of road crashes in Western Australia is estimated to exceed $1,000 million pa. Vehicle factors accounted for less than 10% of crashes.[85]

Based on these Australian and Western Australian data, the Committee estimates that the cost of person and vehicle damage of truck-involved crashes in Western Australia is over $90 million pa. Crashes caused by trucks cost over $20 million pa equivalent to at least 12 cents per tonne of freight carried.

Truck defects cost Western Australia over $3 million pa in crashes or at least 2 cents per tonne of freight.

The Committee had difficulty through lack of data to be any more precise about truck crash incidence and costs. Based on the limited data, the Committee notes that Western Australia's road freight transport industry has a significantly better crash experience than Australia as a whole, and compares favourably with Germany's record. This largely unsung achievement warrants wider recognition and celebration. The Committee commends all Western Australians who have made this possible. Having said that, it feels that more can be done to reduce the truck fatal crash involvement rate further.

Recommendation 46

A target of halving heavy vehicle crash fatalities within five years should be adopted.

82 University of Western Australia, Road Accident Prevention Research Unit: *Road Traffic Crashes by Region in Western Australia*.

83 Traffic Board of Western Australia Submission No. 124.

84 Department of Transport: unpublished.

85 Legislative Assembly Select Committee on Road Safety: op. cit.

In recommending a target reduction in heavy vehicle crashes, the Committee does not wish to be too prescriptive.

Recommendation 47

The Road Safety Council should further examine the appropriate mix of truck design changes, regulation, enforcement and other actions to achieve the halving of heavy vehicle crash fatalities.

Chapter 4.2 discusses linking road funding to safety risk assessment, and Chapter 6.1.5 discusses the need for matching driver expectations with road design and traffic management.

Truck crash risk in the United States has been found to be more attributable to the types of roads on which trucks travel than the kinds of trucks. Limited access highways were four times safer for truck operations than other highways. Day-time travel was found to be at least three times safer than night-time travel.[86]

The Committee feels that more could be done to make trucks safer in crashes with cars. Truck design changes recommended in VIC ROADS Road Safety Division Report No.35 are estimated to reduce annual truck related crash fatalities by 16% with a 28% reduction in injury severity. Suggested changes include the fitting of front energy absorbing barrier and sideguards, and improved side and rear conspicuity. Adoption of these changes could save more than three lives pa in Western Australia.

The Committee has considered the level of safety inspection of trucks against the background of some 50 roadside inspections daily for overloading and its ranking of safety as significantly more important than road damage.

Because of their much greater relative potential to cause fatalities, injuries and damage in crashes with cars, the Committee favours increased random safety inspection of trucks

The Committee has considered the level of random safety inspection of trucks against the background of some 50 daily roadside inspections for overloading and its ranking of safety as significantly more important than road damage.

In 1994-95 sixteen hundred (1 648) heavy vehicles were inspected using the Police Department's mobile inspection trailer. This is equivalent to under five per day.

One quarter of the inspected trucks had work orders issued. Police inspectors select trucks based on experience. Accordingly, the percentage of defective vehicles in the general heavy vehicle population is likely to be lower.

The Committee concluded that the number of random inspections is inadequate, and that this function should be appropriately resourced.

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86 Seiff, H.E.: *Status Report on Large Truck Safety*, in Transport Quarterly, Vol. 44, No. 1, January 1, 1990.

Recommendation 48

The Government should adequately resource the random safety inspection of heavy vehicles.

The Committee considers that heavy vehicles should be targeted for random roadside testing so that they stand a significant chance of being tested having regard to the distance they travel. Rigid trucks travel an average of 17 000 km pa, and articulated trucks 72 000 km pa. If they were to be tested for each 20 000 km of travel, this would require over 150 random inspections daily, or three times the number of overloading checks.

Consideration should be given to combining roadside overloading and safety checks as this has the potential to minimise the time lost by operators due to inspections.

Recommendation 49

Strategies should be developed for random safety checking of heavy vehicles which reflect the distances they travel.

Chapter 6.4 discusses dangerous goods. If risk analysis demonstrates increased risk to safety from dangerous goods transport, random safety checking strategies should target dangerous goods vehicles.

6.2.6 Noise

Policy aspects of truck noise are discussed in Chapter 4.4.2.

Information Box 5 on Page 30 explains the terms used to describe measurement of traffic noise.

Trucks contribute to traffic noise in two ways. Although they number one-seventh of traffic on major routes, they contribute more than half the traffic noise. This is due to their size, and because the largest trucks are permitted to be more than six times noisier than cars. Individual, excessively noisy trucks which use modified exhaust systems in combination with exhaust brakes also contribute disproportionately to general traffic 'roar'.

Main Roads WA has pursued a policy of setting aside wide reserves for new roads which reduce residents' average noise intensity levels to 68 dB, and 63 dB in 'quiet' areas. Where this has not proved possible it employs a range of strategies including 3 metre high brick walls and noise bunds which more than halve noise intensity.

The Road Traffic (Vehicle Standards) Regulations 1977 require that a vehicle must be constructed so that its load and equipment do not cause undue or avoidable noise vibration. Australian Design Rule 28/01 applies to all new trucks. Trucks manufactured since 1 July 1975 must conform to the relevant ADRs.

A stationary test procedure is now included in ADR 28/01. The Department of Transport Vehicle Safety Branch is preparing administrative arrangements for an Authorised Noise Level Assessors Scheme whereby work ordered vehicles can be certified. Trucks work ordered for excessive

noise undergo a complete inspection.

There have to date been no work orders issued for noise related offences.

Truck noise in urban areas is discussed further in Chapter 7.4.

6.2.7 Water Spray and Dust

Water spray and dust pose significant hazards to road safety through reduced visibility. The problem is exacerbated at night time.

The Committee estimates that compared with a semi trailer, a car overtaking a 36.5 metre and a 53.5 metre road train takes 40% and 75% respectively longer to complete the manoeuvre.

This means effectively that for the same freight task on either semi trailers or 36.5 metre road trains, the choice is whether to overtake half as frequently, but to travel 'blind' in the wet for 40% longer during each manoeuvre.

The Committee's estimates of overtaking distances where there is a 10 km/h speed differential are shown in Table 10.

Table 10: **Travel Speeds and Overtaking Distances for Cars and Semi-trailers and Road Trains**

SPEED				DISTANCE (metres)		
Car km/h	Truck km/h	Car m/sec	Truck m/sec	Car overtaking:		
				Semi	36.5 m	53.5 m
110	100	30.6	27.8	502	699	874
80	70	22.2	19.4	364	508	635
70	60	19.4	16.7	318	444	555

N.B. The overtaking 'envelopes' are taken to be

semi-trailer	-	46 metres
36.5 m road train	-	64 metres
53.5 m road train	-	80 metres

The Committee has not found any cheap, effective ways to overcome water spray. Porous asphalt road surfaces can be used for the purpose, and on urban roads have the added advantage of reducing tyre noise 4 dBA in dry conditions and 8 dBA in the wet[87]. Main Roads WA has trialled porous asphalt to reduce water spray. In the UK a 60 cm depth of porous asphalt is used to combat spray.

The Committee considers that wet weather road safety would be significantly improved through the use of porous asphalt on designated urban truck lanes and on the left lane of three lane roads. It is also of the view that consideration should be given to the use of porous asphalt on the left hand overtaking lanes of major regional roads and at specific points on all significant rural roads where overtaking opportunities exist.

Recommendation 50

Porous asphalt should be considered as the preferred surface for dedicated metropolitan truck lanes and should be trialled on specific sections of major regional roads to assist in wet weather overtaking.

87 UK Royal Commission on Environmental Pollution: op. cit.

The Committee considers that dust on sealed regional roads is a preventable problem provided the right combination of seal width and vehicle speed are maintained.

The Committee has received only limited 'hard' evidence, but plenty of anecdotal experience about the 'sway' of the rear trailer of combination vehicles. Sway is the result of a number of factors including road roughness and surface texture. Trailers sway more in the wet than when it is dry. Speed is also a factor.

Based on the evidence that a 33 metre double road train at urban traffic speeds needs a lane width of 3.6 metres, the Committee questions the adequacy of the seal width of major regional freight roads at the open-road truck speed limit of 100 km/h. The design width for the State's best regional roads are a 7 metre seal with either 0.5 or 1.0 metre sealed shoulders. Main Roads WA considers that a 6.8 metre seal width is inadequate for 36.5 metre road trains, and that more than half (2 400 km) of the National Highway in Western Australia is less than 7 metre seal.[88]

Inadequate seal width means that many passing and overtaking manoeuvres require vevicles to travel on the road shoulders. On those sections of the the National Highway that have 7 metre seals, many do not have the required shoulder widths. This is shown in Illustration 20.

Illustration 20: **Passing Trucks**

Source: MRWA.

88 Main Roads WA: *National Highways Condition Report*: op. cit.

The Committee has been unable to reconcile the road design parameters and designated speed limits of 53.5 metre 'road train' routes with the sway characteristics of long vehicles and road trains.

Recommendation 51

The safety risk of heavy vehicles on regional roads should be examined.

6.2.8 Pollution

Community concern for the environment is evidenced in the more than 8 000 vehicles reported in the first six months of the Department of Environmental Protection's Smoky Vehicle campaign.

Information Box 4 on Page 29 explains the terms used to describe measurement of heavy vehicle pollution.

Diesel engines are more efficient than petrol engines as demonstrated by diesel car engines consuming 31% less fuel than petrol engines. Generally, diesel engines are at least 25% more fuel efficient by volume, and 15% more by mass of fuel than petrol engines. Diesel engines produce more particulates and more nitrogen oxides (nitric oxide and nitrogen dioxide) than petrol engines fitted with a catalytic converter. Nitrogen oxides production increases with increased combustion temperatures (ie at high speed and during acceleration).[89]

The OECD Report on Motor Vehicle Pollution found that the pollution effects of diesel exhausts are due to poor emission controls on diesel-powered vehicles. In Japan, the Government considers that emissions from diesel engines should be no higher than from petrol engines fitted with a 3-way catalytic converter; and diesel vehicles under 2.5 tonnes GVM have been banned from a number of areas.[90] In the UK, it has been suggested that particles less than 10 microns from all sources may be responsible for 10 000 extra deaths a year in England and Wales. The UK Royal Commission on Environmental Pollution concluded that the health implications of particulates need to be taken very seriously. Over a four day period of unusually high concentrations of nitrogen dioxide in London in December 1991 the death rate rose by 10% or 160 people in one week.[91]

Evidence before the Committee points to Western Australian diesel trucks emitting significantly higher levels of unburnt fuel than might otherwise be expected.[92] This would primarily be reflected in higher levels of carbon monoxide and hydrocarbon particulates emissions. To the extent that this apparently common industry practice of excess fuel burning also leads to higher engine operating temperatures, they produce more nitrogen oxide.

ADR 30 governs 'type' conformity testing of new diesel trucks and/or engines. The Association of Australasian Diesel Specialists and its Western Australian Branch have submitted that between 75 and 80% of diesel powered vehicles exceed ADR 30. They say that new vehicles are sold with

89 UK Royal Commission on Environmental Pollution: op. cit.

90 ibid.

91 ibid.

92 Evidence by the Association of Australasian Diesel Specialists.

fuel output settings increased by up to 15% to meet horsepower or performance aspirations in breach of ADR 30; and that older vehicles have their fuel output settings increased for similar reasons. Moreover, through wear and tear and poor maintenance excessive fuel is being used even in modern electronically controlled fuel injection systems which are *"considerably more tamper proof"*. The Association estimates that increasing the diesel fuel throughput 10% increases pollution by *"more likely about 400%"*; and that the 'puff' of smoke on acceleration from standstill is only the tip of the iceberg because diesels are designed to burn fuel most efficiently at idle. It estimates the cost of properly maintaining fuel injection systems is repaid twice over in fuel savings.

The Road Traffic (Vehicle Standards) Regulations 1977 contains the Third Edition Australian Design Rules laid down in the Commonwealth Act. The Regulations prohibit the modification of vehicles unless approved by the Vehicle Safety Branch. The proposed National Transport Law includes significant financial penalties for a corporation which manufactures or repairs a vehicle in a way that does not comply with the Regulations. Repairers of diesel injection components 'seal' their workmanship making identification of tampering relatively easy.

The Committee estimates that based on the Association's evidence, overfuelling costs the road transport industry over 50 million litres of fuel or $35 million pa in 1994-95. Half of the pollution caused by overfuelling takes place in the metropolitan area. If overfuelling increases emissions 400%, correct truck fuelling would significantly reduce Perth's air quality degradation.

To the extent that overfuelling produces higher levels of carbon monoxide, particulates and nitrogen oxides, the Committee draws attention to this possibly causing respiratory problems including asthma and death.

There are no legislated vehicle emission levels in Western Australia, other than those specified in the ADRs for new vehicles. The proposed National Road Transport Reform (Vehicle Standards) include a '10 second rule' which essentially makes it an offence to emit visible smoke from a vehicle exhaust for a duration of more than 10 seconds. This rule has drawn criticism about sensible enforcement. To overcome this, a set of 'Smoke Guidelines' have been prepared by the NRTC to assist the public, industry and enforcement agencies in applying the regulation.

Overfuelling is easily detectable using portable 'smoke' testing equipment costing $5 000 per unit. The 18 000 annual roadside tests for load limits compliance by the Department of Transport provide low-cost opportunities to carry out fuel system tampering and/or exhaust emission checks on trucks.

Recommendation 52

The Government should introduce the NRTC Regulation and Guidelines for smoky vehicles; and the Department of Transport's inspectors should be authorised, equipped and trained to carry out roadside exhaust emission tests.

In the event that the problem persists, the Committee feels that the Government should consider compulsory annual emission testing of trucks.

If new trucks are found to exceed ADR 30, appropriate action should be taken.

Recommendation 53

The Department of Transport should test the exhaust emissions of new trucks to ensure their compliance with the Australian Design Rules.

Taxation differentials based on the environmental qualities of diesel fuel are used in Sweden to encourage cleaner fuels. More than 75% of diesel fuel sold in Sweden is in lower pollution categories. Because the cleaner fuels were less costly to produce than was anticipated, there were no difficulties marketing them at standard prices. As a result of the program's success, many oil companies have invested in facilities for producing higher-class fuels.[93]

Recommendation 54

The Department of Transport, in conjunction with the Department of Environmental Protection, should investigate the feasibility, benefits and costs of introducing differential government fuel levies according to the environmental qualities of diesel fuel.

The occupational health and safety aspects of diesel pollution are discussed in Chapter 6.3.3.

6.3 Drivers

On any given day there are up to 6 000 articulated trucks on Western Australian roads. Of these 15% are carrying dangerous goods.

Long distance heavy truck drivers are typically between 30 and 50 years of age (73%). One per cent are younger than 20, and 1% older than 60 years of age.[94]

Human factors are implicated in 95% of road crashes.[95] In Chapter 6.2.5 the Committee estimates that the cost in Western Australia of person and vehicle damage in truck-involved crashes is more than $90 million pa. The Committee considers the potential payback on tackling driver related problems is much higher than on improving vehicle or road standards.

Penalties for driving offences are by way of fines and cumulative demerit points. Demerit points accrue to individuals and not their licence classes. This means that for instance where a driver accrues all the licence loss threshold points in his/her car, he/she would also lose his/her truck driver's licence.

Western Australia has generally the lowest level of penalties for offences under road transport law

93 OECD: *Motor Vehicle Pollution Reduction Strategies Beyond 2010*: op. cit.

94 Murdoch University for the Traffic Board of WA: Unpublished.

95 Western Australia Legislative Assembly Select Committee on Road Safety: op. cit.

in Australia.[96] In 1994-95 there were 2 500 apprehensions for heavy truck infringements and $500 000 raised in overhead fines. The cost of truck on-road mass and dimension enforcement was $1.05 million.

On-road safety inspection of trucks cost $1.51 million in 1993-94. There were 50 infringements and 25 prosecution briefs.

Other things being equal, low penalties require higher apprehension rates for the same deterrent value.

6.3.1 Licensing

Heavy truck driving licences are issued under the Road Traffic Act 1974 and for dangerous goods under the Explosives and Dangerous Goods Act, 1961.

A driver over 18 years of age can be licensed (Class "B") to drive a rigid truck over 4.5 tonnes GVM. An articulated vehicles licence (class "C") can be obtained at 20 years of age. Licences are valid for 5 years and their currency can be unrestricted until age 75 years. A dangerous goods drivers' licence holder must be at least 21 years old. Dangerous goods drivers' licences are current for 3 years and are only issued to drivers who are medically fit and have undergone an approved course of training.

As at 13/12/1995 there were 147 232 class "B" and 120 655 class "C" licences on issue in Western Australia.

The proposed new national licence scheme aims to achieve national uniformity for heavy vehicle driver licensing based on the 'one licence one driver' principle. For many years it has been possible to avoid licence disqualification resulting from traffic offences by holding a licence in more than one jurisdiction.

It will be a requirement under the national scheme for photographs to be displayed on the licence.

Further details about the national scheme are in Schedule 12.

Recommendation 55

The Government should introduce the National Licensing System.

6.3.2 Training

The Road Transport Industry Employment and Training Council of WA and the Road Transport Training Council of WA have submitted in evidence that Western Australia has no publicly recognised, competency based standards of performance or assessment for the drivers of heavy vehicles.

National competency standards for drivers have been developed by the industry training

96 National Road Transport Commission: *Road Transport Law: Compliance and Enforcement Proposals*, op. cit.

committee network in conjunction with the industry and union.

According to the Councils, many of the driver assessors are not competent to operate the equipment on which they are testing people[97].

Recommendation 56

The Department of Transport should examine incorporation of the National Competency Standards for drivers and driving instructors in legislation, and consider appointment of relevant persons and bodies as heavy vehicle driver examiners.

6.3.3 Occupational Health and Safety

Emissions

Information Box 4 on Page 29 explains the terms used to describe measurement of heavy vehicle pollution.

Chapter 6.2.8 discusses pollution caused by diesel engines.

The Occupational Health, Safety and Welfare Regulations 1988 require an employer to ensure *"effective measures are taken to control the level of any gases, vapours, dust or other airborne contaminants so that the safety of employees is not at risk"*.[98]

Truck cabin pollution levels could be a direct risk to driver health and also indirectly cause fatigue. In the UK, samples of primary pollutants taken in vehicles travelling on major roads can have five times the background concentration levels of pollutants. Nitrogen dioxide is also found at high concentrations inside vehicles.[99]

The US National Institute for Occupational Safety and Health (NIOSH) limits for occupational exposure to the gaseous fraction of diesel exhaust are shown in Table 11.

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97 Submission No. 72

98 Government of Western Australia: *Occupational Health Safety and Welfare Act and Regulations 1988*, Government Gazette No.93, 16 September 1988.

99 UK Royal Commission on Environmental Pollution: op. cit.

Table 11:

Recommended Exposure Levels
To Components of Diesel Exhaust

Component	Recommended Exposure Level
Carbon dioxide (CO_2)	10 000 ppm (18 000 mg/m^3), 8-hr Time Weighted Average (TWA) 30 000 ppm (54 000 mg/m^3), 10-min ceiling
Carbon monoxide (CO)	35 ppm (40 mg/m^3), 8-hr TWA; 200 ppm (230 mg/m^3), ceiling (no minimum time)
Formaldehyde	0.016 ppm (0.020 mg/m^3), 8-hr TWA; 0.1 ppm (0.12 mg/m^3), 15-min ceiling
Nitrogen dioxide (NO_2)	1 ppm (1.8 mg/m^3), 15-min ceiling
Nitric oxide (NO)	25 ppm (30 mg/m^3), 10-hr TWA
Sulfur dioxide (SO_2)	0.5 ppm (1.3 mg/m^3), 10-hr TWA

Source: NIOSH

A 10-year study in Denmark of 14 325 truck drivers compared their mortality rate and cause of death with 43 024 active unskilled labourers found that after allowing for the possibility of an increased smoking habit of truck drivers, they had an increased risk of cancer of the bronchus and lung and other respiratory cancers.[100]

Studies in the USA by the National Cancer Institute found an increased incidence of lung cancer in motor-exhaust-related occupations.[101]

Both nitrogen dioxide and particulates which are associated with overfuelling are linked to disease and mortality.

More than 95% of particulates (soot) are solid carbon particles less than 1 micron in size. These can absorb 18 000 different organic substances from the combustion process (and in the process making up 15-65% of the total particulate mass), including polynuclear aromatic hydrocarbons

100 Hansen, E.S.: *A follow-up study on the mortality of truck drivers,* American Journal of Industrial Medicine, 1993.

101 Hayes, R.B. et al: *Lung cancer in motor exhaust-related occupations,* American Journal of Industrial Medicine, 1989.

(PAHs), several of which are carcinogens.[102]

Particles of less than 2.5 microns are small enough to penetrate to the deep lung and remain there.[103]

Recommendation 57

Worksafe should conduct in-cabin air quality measurements in heavy trucks and locomotives to see whether air filtration systems should be installed.

Fatigue, Alcohol and Drugs

Research indicates that all humans need a specific amount of sleep within each 24 hour period, otherwise alertness and performance becomes impaired. Fatigue has become the focal point of studies in several countries recently with emphasis placed on operators of heavy transport.

Driving hours are not regulated in Western Australia. 'Two-up' driving for the longest distances is widely practised, except on the east-west east interstate route. There are no published statistics of driver fatigue as a factor in heavy vehicle crashes in Western Australia.[104]

In the USA, the National Transportation Safety Board found that in 182 fatal-to-the-driver truck crashes in 1990, 31% were fatigue related. Nineteen of the drivers in 107 non-fatal single vehicle truck crashes said that they fell asleep prior to the crash. Of the fatigue related crashes, 75% happened between 2 and 8 am. Fatigue was responsible for 27% of crashes between 8 am and 10 pm. Of the 27 drivers who exceeded hours of service limits, 82% had fatigue related crashes. The Safety Board concluded that 58% (62 of 107) of the non fatal crashes were fatigue related. Drug usage was strongly associated with violation of the hours of service regulations. According to the Board *"...drugs which are taken to counter the symptoms of fatigue are a major factor in crash causation. Fatigue in combination with alcohol and other drugs of abuse causes an extremely severe situation"*.[105]

A study in Western Australia of long distance truck driver fatigue has recently been undertaken by the Psychology Division of Murdoch University for the then Road Traffic Board. The study results which are yet to be published suggest that fatigue is a significant problem. Of 638 drivers of mainly road trains and semi trailers interviewed, 32 (5%) said that they had experienced a potentially dangerous event on their current journey due to fatigue. Nodding off, falling asleep or near misses accounted for over 50% of these events.

The Committee has also heard in evidence that hard drugs such as speed and hallucinating drugs are a *"massive problem"* within the industry, that the problem is widespread, and that drugs are used every day and easy to obtain.

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102 National Institute of Occupational Safety and Health: *Carcinogenic Effects of Exposure to Diesel Exhaust,* Intelligence Bulletin 50, August 1988.

103 Royal Commission on Environmental Pollution: op. cit.

104 Traffic Board of Western Australia: *Road Crashes in Western Australia 1994. The Statistics,* September 1994.

105 Western Australia Legislative Assembly Select Committee on Road Safety: *Driver and Vehicle Licensing Education and Training,* (Sixth Report), December 1995.

The Committee was told that the schedules being set by both major companies and smaller operators are a major cause of fatigue. It was put to the Committee the only way for drivers to stay awake was to take drugs and that the only way to overcome the drug problem is to remove the need to use them by persuading operators to set reasonable schedules for their drivers.

The Committee was unable to ascertain the extent of any link between driver fatigue and exposure to diesel emissions. It feels that much more should be done to combat driver fatigue. The Select Committee on Road Safety is currently investigating the issue of driver fatigue.

Recommendation 58

The Road Safety Council should develop strategies for combatting heavy vehicle driver fatigue.

Recommendation 59

Worksafe should examine whether and to what extent driver fatigue is linked to exposure to diesel emissions.

The British Railways Board has an alcohol and drugs policy which, amongst other things, requires that no employee or contractor shall report for duty having just consumed alcohol or under the influence of drugs, be in possession of drugs of abuse in the workplace, or consume alcohol or drugs whilst on duty. The policy is enforced by a range of actions including compulsory drug screening on appointment to a Safety-Critical-Post, and random drug screening on 48 hours notice. Penalties include instant dismissal for a positive drug result for employees in Safety-Critical-Posts.[106] Effectively, the Board's policy puts its duty of care to customers and the public ahead of the privacy of its employees.

In addition to the evidence of drug use, the Committee's attention has been drawn to a successful defence of a Driving Under the Influence (DUI) charge by a heavy truck driver consuming alcohol after a crash.[107]

The Committee feels that an alcohol and drug policy should be adopted throughout the road and rail transport industries.

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106 British Railways Board: *Alcohol, Drugs and You - The Railway Policy Explained,* August 1993.

107 Department of Minerals and Energy of Western Australia, Explosives and Dangerous Goods Division - Submission No. 103.

Recommendation 60

The Department of Transport should consider how an alcohol and drug policy could be universally adopted in the road transport and rail freight transport industries.

6.3.4 Speeding

Chapter 6.2.4 describes the speed limits for trucks.

Excessive speed is the suspected causal factor in one third of fatal accidents.[108]

In crashes, the magnitude of the forces (and therefore the injuries) increases as the square of the vehicle speed.[109] This means that speeding by 10%, (eg travelling at 65 km/h rather than 60 km/h) potentially increases crash injuries by more than 20%.

From 1987 to 1988-89 in Australia the proportion of heavy vehicles exceeding 110 km/h rose from 6 to 9%.

In 1991, when the speed limit was 90 km/hour, an estimated annualised one in five or 10 000 truck and dog and larger combination vehicles at 9 *Culway* sites in Western Australia exceeded 100 km/h.[110] More recently, the highest speeds for the largest vehicles were observed at Northam where on an annualised basis 5 388 (15 per day) six to eight axle 'long' vehicles and 'medium combos' exceeded 100 km/hour. More than 370 of these exceeded 107.4 km/hour. The speed limit at the time was 90 km/hour. Table 12 compares truck speeds at Northam in 1990-91 and 1993-94.
`

Table 12 shows a general decline of 3% in truck speed from 1990-91 to 1993-94.

The National Road Transport Commission's June 1995 draft National Road Transport Law Compliance and Enforcement Proposal suggests speeding penalties for heavy vehicles should be at the high end of the range, and that suspension of the driver's licence for not less than 2 months should be mandatory for the most serious court penalty category.[111]

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108 Road Traffic Board of Western Australia: *Road Crashes in Western Australia 1994:* op. cit.

109 Seiff, H.E.: *Status Report on Large Truck Safety:* op. cit.

110 Hood, R.: *Culway Report, 1994*, MRWA Technical Report No. 131, July 1994.

111 National Road Transport Commission: *Road Transport Law: Compliance and Enforcement Proposals:* op. cit.

Table 12: **Truck Speed - Northam, West-bound**
July 1990 - March 1991 and March 1993 - February 1994

1990-91					1993-94		
Vehicle Classes	**No of Axles**	**Vehicle Count**	**Vehicle Speed (km/h)**		**Vehicle Count**	**Vehicle Speed (km/h)**	
		Total	**Mean**	**85%<**	**Total**	**Mean**	**85%**
Short	2	245	94.1	107.1	564	95.3	106.4
	3..5	271	89.0	99.1	417	90.9	101.1
Medium	2	6 341	92.0	101.8	11 034	92.9	101.9
Length	3	2 969	92.7	103.9	5 058	91.6	100.9
Vehicles	4	286	92.0	101.3	810	86.8	98.5
	3	637	91.0	100.3	1 171	92.3	99.8
Long	4	2 857	93.6	102.6	3 922	93.7	102.1
Vehicles	5	4 377	97.3	103.9	7 119	96.8	103.2
	6	13 774	103.3	112.7	22 775	100.7	107.4
	7..8	579	95.7	100.6	1 761	95.7	100.1
Medium Combos		1 715	97.1	102.7	8 627	96.0	101.6
Large Combos		5	97.5	110.6	11	95.0	103.4
All others		36	93.2	97.4	499	96.0	99.6
TOTALS		**34 092**	**97.7**	**107.1**	**63 768**	**96.5**	**104.0**

Source: MRWA: *Culway*.

US experience with speed limits is that when States increased their general speed limits from 55 to 65 mph, those which retained dual limits with trucks confined to 5-10 mph slower than cars experienced a 40% increase in fatalities compared with a 54% increase where trucks were permitted 65 m/ph.[112]

The Road Transport Forum supports 'grounding' of trucks operating above 115 km/h.

The advent of differential speed limits for long vehicles and road trains travelling under permits in built-up areas means that they must be especially targeted so that they do not escape radar cameras calibrated to detect higher speed limits applying to traffic generally.

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112 Seiff, H.E.: *Status Report on Large Truck Safety:* op. cit.

6.3.5 Minimum Distance Between Vehicles

Tailgating

Regulation 509 of the Road Traffic Code 1975 requires a vehicle over 8 metres travelling on roads outside built up areas to maintain a minimum distance of 60 metres behind another vehicle. The Police Department has stated that this is not enforceable in practice.

Trucks 'tailgating' on the open road prevents overtaking by other vehicles, and is dangerous in emergency braking situations. Car drivers in particular feel intimidated by the closeness of individual trucks. This feeling is exacerbated by many trucks being fitted with bullbars.

The Committee questions whether 60 metres' separation is sufficient for vehicles up to 53.5 metres travelling at 100 km/hour.

Recommendation 61

Regulation 509 of the Road Traffic Code 1975 should be reviewed. 'Tailgating' on the open road should attract an adequate fine and be enforced.

More than 70% of truck crashes occur in the metropolitan area. The majority of these are trucks running into the rear of other vehicles stopped in lines of traffic, underscoring the different braking performance of cars and trucks.

Western Australia is concurrently embarked on a 'don't pull in front of truck' safety campaign, and enforcement of the rule to 'keep left unless overtaking'. These appear to be in conflict in some circumstances.

Recommendation 62

The risk associated with the 'keep left unless overtaking' rule should be examined. Car driver education about the truck issues involved should be implemented.

Bullbars

The Committee was impressed with the action of Heggies Bulkhaul in New South Wales in removing the bullbars from its trucks to reduce the feeling of intimidation felt by car drivers.

After ceasing to fit bullbars to its new trucks as a cost saving measure, a NSW firm found an almost 50% drop in these trucks nudging the back-ends of cars, particularly in city traffic. This was apparently due to the absence of a bullbar extinguishing the perceived security drivers felt with a bullbar in front. Another NSW firm has also stopped fitting bullbars to its new trucks.[113]

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[113] Brooks, S., in Truck & Bus Transportation: *Bullbar . . . Benefit or Burden?* July 1993.

Recommendation 63

The Department of Transport should examine the costs, benefits and impacts of bullbars in urban areas.

6.4. Dangerous Goods

The Dangerous Goods Regulations 1992 under the Explosives and Dangerous Goods Act 1961 adopt the provisions of the Australian Code for the Transport of Dangerous Goods By Road and Rail.

Dangerous goods are categorised according to the 9 classes developed by the United Nations and adopted worldwide.

All vehicles which carry dangerous goods in bulk are licensed annually and require a roadworthiness clearance before registration. A further inspection is carried out by an Inspector of Explosives every two years.

In 1993-94 over two thousand (2 115) heavy vehicles were licensed to carry dangerous goods.

The quantities/distance travelled of dangerous goods transported by heavy vehicles is not known. In a recent survey of 638 long distance goods vehicles, 1.7% of single freight and 5.3% of multiple freight vehicles carried dangerous goods. In 1993-94, there were 7 reported dangerous goods crashes. In the 10 years to 1994 there were 74 crashes and 123 other incidents involving heavy vehicles carrying dangerous goods.[114]

The Explosives and Dangerous Goods Division of the Department of Minerals and Energy undertook a compliance measurement program of bulk vehicle containers in 1994-95. The average Full Vehicle Compliance Rate was 91%. On-road enforcement found an Average Compliance of 72%[115].

The Department of Minerals and Energy has submitted in evidence the 1993 Report on the Public Safety Aspects of the Transport of Dangerous goods in Bulk in Western Australia prepared by the Dangerous Goods Liaison Committee which advises the Hon Minister for Mines on the implementation of the Explosives and Dangerous Goods Act.

The Department has said that the significant conclusions of the Committee are:

> *"• regulatory controls for designated transport routes are not appropriate to control the movement of dangerous goods on Western Australian highways; and*
>
> *• overseas studies if judiciously considered are a valid information source for making decisions on the transport of dangerous goods in Western Australia."*

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114 Submission No. 103: op. cit.

115 ibid.

The Department has also pointed to route control studies in Canada and the United Kingdom which in essence say:

> *"• operators and drivers of vehicles transporting dangerous goods prefer to use major highways and this is the preferred option with respect to safety*
>
> • *it is not practicable or necessary to regulate to keep vehicles on major highways*
>
> • *the public safety risk from the transport of dangerous goods are tolerable*
>
> • *moves to further reduce the risks should be based on practicalities. For example, if a proponent wishes to increase the volume of dangerous goods he is transporting, a commensurate technical or management improvement would effectively balance the risk*
>
> • *company management standards and their safety management systems are the key potential area to reduce the risk from the transport of dangerous goods; and*
>
> • *the risk from road and rail transport of dangerous goods are essentially the same. Particular circumstances and routes may mean that one is marginally safer than the other."*

In the light of its enquiries overseas, and expert evidence, the Committee questions the use of overseas data to predict the relative risk of transporting dangerous goods in Western Australia by road or rail. Moreover, the issue of what is an acceptable level of risk should be decided in Western Australia. According to evidence by R.M. Marks, the Northern Suburbs Railway was built to local risk tolerance levels probably higher than the levels recommended by the UK Health and Safety Executive.

Based on the Committee's estimates of the overall safety risk of rail freight and heavy road freight in Chapters 5.4 and 6.2.5 respectively, rail is over 30 times safer than road.

The community is largely unaware of the quantities and nature of dangerous goods transported. As a result, concerns about known materials may seem 'emotive' because there are other less well known but more risky transport tasks. Any such community reaction should be debated in terms of the technical risk and acceptable risk level. There has been no public debate of this kind in Western Australia.

Dangerous goods transport involves three or more licences issued by different authorities. The risk associated with road transport of dangerous goods transport is a combination of a myriad of factors including those which may be specifically licensed such as driver, vehicle, road, route and load. General traffic management and the behaviour of other drivers are other major factors, as is the land use adjacent to roads which is also 'licensed'. Licensing authorities have a duty to ensure public safety. Because transport risk is cumulative, authorities' duty and liability is complex. Some of this complexity is eased by adoption of national vehicle standards, drivers licences and laws.

The location of roads, their condition and traffic management are pivotal risk factors. Access to roads is controlled by the Road Traffic Act 1974. Regulations under the Act known as the Road Traffic Code 1975 inter alia enable the Commissioner with the authority of the Minister to

temporarily close or otherwise restrict use of roads (Regulation 307). Vehicle standards regulations under the Act control oversize (Regulation 1107) and over mass (Regulation 1402) vehicles.

The Committee feels that the duty to ensure public safety on roads should be unambiguously enshrined under the Road Traffic Act 1974. This means that the assessment of risk associated with dangerous goods transport prior to the issue of any licence would be a requirement under the Act.

Recommendation 64

It should be a requirement under the Road Traffic Act 1974 to assess risk prior to any dangerous goods licence being issued.

CHAPTER SEVEN

7. HEAVY TRUCKS IN BUILT UP AREAS

7.1 Urban and Regional Planning

Chapter 6.1.5 (Page 77) describes Main Roads WA's four major urban road types and discussed the need to streamline road type 'signatures' to assist drivers in adopting the appropriate driving style for different road types.

Scania has proposed a three road type road freight hierachy for adoption throughout the European Union (EU). This hierarchy is shown in Table 13 and Illustration 21.

Table 13:

Proposed European Union Freight Road Hierarchy And Truck Dimensions Limits

Class 1		Class 2		Class 3	
Length m	**GVM tonnes**	**Length m**	**GVM tonnes**	**Length m**	**GVM tonnes**
6 10 12	18 18 25/26	16.5 18.75	44 40	25.25	~60

Source: Scania

Scania's proposal limits heavy vehicles in built up areas to 12 metres and 18.75 metres, depending on road type. By comparison, Western Australia AOR vehicles are 19 metres long. Long permit vehicles up to 25 metres can use the B double network; and road trains up to 36.5 metres have access to depots adjacent to the B double network.

The Committee feels that the Western Australian urban roads hierarchy may be too complex. For instance, 'primary distributors' carrying more than 15 000 AADT and designated as truck routes, can have general speed limits varying from 60-100 km/h for cars (and 40-90 km/h for trucks). At the same time they can be bus routes, carry bicycles and have at-grade pedestrian crossings.

Recommendation 65

Main Roads WA, in conjunction with the Western Australian Planning Commission, should review the road hierarchy.

Illustration 21:

Transport Class System

7.2 By-Passes

Northam

Chapter 4.5 mentions that Northam's main street carries 700-1200 heavy trucks per day. Illustration 2 (Page 11) shows that annual freight movement through Northam is 731 000 tonnes West-East. Many of the truck movements through Northam are interstate freight traffic. Despite the emergence of the NRC as the major interstate rail freight mover and anecdotal evidence of increased interstate sea freight movement, Figure 5 on Page 14 shows that interstate road freight movement has increased in the three years to 1995.

Northam's proximity to Perth means that this important regional centre has long-term potential to develop as a residential satellite city to Perth. This potential has recently been strengthened with the commencement of daily rail passenger services.

The Committee feels that present heavy truck numbers through Northam significantly detract from it becoming a major residential satellite city for the metropolitan area.

Recommendation 66

Construction of the Northam by-pass should be completed within ten years.

Geraldton

Illustration 2 (Page 11) shows that Geraldton's 'through' freight traffic is two-thirds that of Northam. It is also a major road receival point for grain. This generates 1 200 grower truck movements and 60 contract road train movements per day. Triple road train access to the port commenced mid-1995.

Main Roads WA are in the planning stage for construction of the Utakarra by-pass to help ease congestion.

The Committee feels that Geraldton is the 'frontier' in Western Australia for triple road trains in urban areas.

The sway characteristics of triple road trains are compounded relative to semi-trailers and double road trains. The Committee had no evidence of the difference. It has been told by Main Roads WA that sway is not a safety issue because triple road trains travel at less than 45 km/h, although they are permitted up to 60 km/h. Trucks fitted with computer brakes travel at no more than 8 km/h in some instances. Because there are few overtaking opportunities, a by-pass road is a priority need.

Chapter 5.7.3 discusses the need to plan for future provision of a rail road interchange in Geraldton in conjunction with the Utakarra by-pass. *(Recommendation 32).*

Recommendation 67

Main Roads WA should consider grade separation of heavy vehicles in the planning phase of the Utakarra by-pass.

7.3 Speed Limits And Traffic Signals

Chapter 6.2.3 describes the braking characteristics of a 33 metre road train. Posted speed limits for the metropolitan B-double network range from 60 - 100 km/h. Traffic signals are only placed in speed zones up to 80 km/h.

Main Roads W.A. uses so-called British Colombia formulae for installation in urban areas of 'prepare to stop' yellow flashing traffic lights which aim to allow drivers seeing them to *"come to an easy stop at intersections"*.[116] The formula suggests a flat terrain sign distance of 106.2 metres for 80 km/hour speed zones. These calculations are shown in Table 14.

The Committee has had difficulty in reconciling the British Columbia formulae distances with Main Roads WA's computer modelling and the ARRB research of heavy vehicle braking. *Prima facie*, the formulae distances are much shorter than those suggested by the ARRB trials. This is shown in Table 15. The Committee speculates that this may explain why it has had reported to it instances of heavy trucks apparently speeding up when the yellow signs flash.

The matter is compounded by the introduction of the 'keep left unless overtaking' rule wich should see more cars occupying road 'truck' space before traffic lights, effectively shortening 'available' truck braking space.

Table 14: **Metropolitan Traffic Operations**
Flashing Yellow Signs

ADVANCE WARNING SIGN DISTANCE TABLE
(perception / reaction time = 1.0 second; f = current MRWA policy)

Speed = 60 km/h f = 0.32	-12%	-9%	-6%	-3%	0%	+3%	+6%	+9%	+12%
Percept / Reaction Braking	16.7 70.8	16.7 61.6	16.7 54.5	16.7 48.8	16.7 44.3	16.7 40.5	16.7 37.3	16.7 34.5	16.7 32.2
Sign Distance	87.5	78.2	71.1	65.5	60.9	57.1	53.9	51.2	48.9
Speed = 80 km/h f = 0.30									
Percept / Reaction Braking	22.2 139.9	22.2 119.9	22.2 104.9	22.2 93.3	22.2 83.9	22.2 76.3	22.2 69.9	22.2 64.6	22.2 60.0
Sign Distance	162.1	142.1	127.1	115.5	106.2	98.5	92.2	86.8	82.2
Speed = 100 km/h f = 0.29									
Perception / Reaction Braking	27.8 183.2	27.8 196.7	27.8 171.1	27.8 151.3	27.8 135.7	27.8 122.9	27.8 112.4	27.8 103.5	27.8 96.0
Sign Distance	259.2	224.5	198.3	179.1	163.4	150.7	140.2	131.1	123.7

[116] Main Roads WA: *Metropolitan and Traffic Operations Flashing Yellow Signs: Practice Guideline*, June 30, 1995.

Source: MRWA.

Table 15:

Road Train Braking Performance and Flashing Yellow Sign Distances

	S P E E D				
Braking / Sign Distance	60	70	80	90	100
Sign Distance (metres)	60.9	81.0	106.2	133.4	163.4
Normal Braking (metres)	NA	260	340	430	535
Emergency Braking in Wet (metres)	45	* 62	80	* 103	* 127

* Committee Estimates

Source: MRWA and Pearson B., Ogden K., Sweatman P., and Jarvis J.

Recommendation 68

A study should be commissioned to further examine the placement of 'prepare to stop' yellow flashing lights.

If, as it seems, current advance traffic light distances require articulated trucks to decelerate at rates approximating emergency mode in some circumstances, with the possible instability problems that entails, consideration could be given to installation of additional earlier warnings to enable them to stop at their preferred deceleration rate average of 0.1 g. That is, 340 metres from an intersection in a 80 km/hour zone. Where lines of sight are too short to enable trucks to stop normally, consideration should be given to decreasing their speed limits in relevant areas.

Table 14 may also be used to consider the adequacy of lines of sight for warning lights at rail level crossings on regional roads where heavy vehicle speeds of up to 100 km/h are permitted.

7.4 Noise

Chapters 4.4.2 and 6.2.6 discuss road freight transport noise.

Exhaust brakes in trucks whose mufflers have been illegally modified are the main cause of disruption of people, particularly at night time.

Main Roads WA have undertaken a noise survey to help guide strategies to deal with noisy trucks.

The Committee has been told that current truck exhaust brake technology enables trucks with exhaust brakes fitted to be no noisier than those which do not. Retrofitting of older trucks with the latest exhaust brake systems was one of the options considered by the Committee.

The Committee feels that because noisy trucks are more difficult to detect than smoky vehicles, a campaign whereby the public reports noisy trucks would not be successful. It feels that automatic systems, such as noise metres in tandem with cameras, should be considered as a means of selecting trucks required to undergo noise testing.

Recommendation 69

Consideration should be given to the phasing-in of modern exhaust brakes on older trucks.

CHAPTER EIGHT

8. HEAVY TRUCKS IN THE METROPOLITAN AREA

For the purpose of discussing long vehicles and road trains, the 'metropolitan' area is generally taken to be the road network inside the designated metropolitan area (scheme boundary) or designated truck break down areas closer to Perth.

8.1 As of Right Vehicles

Vehicles up to 19 metres long weighing less than 42.5 tonnes GVM are used for all types of general and bulk cargo. An articulated truck (semi trailer) or truck and trailer combination up to 19 metres long can have a GVM of up to 59.5 tonnes. Where the GVM is over 42.5 tonnes, a permit issued by Main Roads WA is required. A permit can specify routes, times, speed and other restrictions. Permit vehicles do not have as of right access.

8.2 B-doubles and Long Vehicles

Vehicles classified under the national classification scheme as *Long Vehicle* can be up to 30 metres. In the metropolitan area and the regions B-doubles up to 25 metres and weighing up to 67.5 tonnes GVM have permit access to the B-double network. The metropolitan B-double network is shown in Illustration 16 (Page 75). It comprises half the urban arterial roads, and has 300 intersections controlled by traffic signals. Of the 57 level railway crossings in the metropolitan area, 10 are on the B-double network.

Vehicles up to 27.5 metres and a maximum GVM of 84 tonnes have been trialed to haul fertiliser and mineral sand on designated routes in the metropolitan area. Operators of these vehicles have been given five years to comply with the 25 metre limit.

Currently Main Roads WA are trialing permit access to the B-double network to 25 metre articulated trucks and truck and trailer combinations. A typical twin steer long vehicle, 25 metres in length, has a GVM of 85 tonnes.

8.3 Road Trains

Vehicles classified as *Road Trains* are longer than 30 metres. Under the national nomenclature double road trains can be configured as 2 trailer articulated vehicles, a B-double and trailer or truck and 2 trailers up to 36.5 metres long and maximum GVM of 104 tonnes. Two trailer articulated road trains 36.5 metres long and 79 tonnes GVM were trialed from December 1994 to August 1995 to haul livestock to the Midland Saleyards. From earlier this year, some road trains have been given access to their terminals under various curfews and speed restrictions.

8.4 Heavy Truck Issues

The flows of traffic and the proportion of heavy vehicles in the traffic mix for the major highways linking the metropolitan area with the regions are shown in Illustration 22. In 1991-92 14% of the traffic on these routes was comprised of heavy vehicles. Of the 1750 daily heavy vehicle movements, 65% were semi trailers or longer vehicles. Heavy vehicle movements are in part seasonal. Bulk grain cartage mainly occurs in December/January, and fertiliser cartage in January and July.

Illustration 22:

Vehicle Movements on Major Arterials

Source: Department of Transport.

Until the advent of long vehicles and road trains in the metropolitan area over the last year or so, broad based public concern about heavy trucks had largely focussed on roads linking the port of Fremantle with the industrial hinterland, and the escarpment links and northern links between the metropolitan area proper and the regions. The main heavy freight routes have generally been constructed well in advance of closer settlement, so that those who live near those routes have not been in any doubt about the impacts of traffic. Construction of the Leach Highway to accommodate increased heavy freight transport resulting from the relocation of coast-based industries to the then newly emerging industrial area of Welshpool is an example of a new route being provided in advance of settlement.

The trials of livestock road trains, long vehicles having general access to the B-double network and road trains access to their depots without breaking down some distance from the metropolitan area proper have been the main focus of persons and groups who are opposed to more

widespread use of bigger trucks in the metropolitan area. Permanent access along these lines has been the aim of the road transport industry, although individuals within the industry have opposed access in evidence to the Committee.

Chapter 6.1.5 mentions that the intention of the Government's policy is unclear in the light of the new nomenclature for trucks.

The main arguments advanced by the Road Transport Association and others in favour of long vehicles and road trains not breaking down before entering the metropolitan area is that this saves costs, improves safety noise and pollution because truck movements are reduced, and livestock stress is reduced through shortened trip times.

The cost savings and improvements to safety are disputed by operators within the industry.

The Committee has examined the technical data on truck performance in urban situations. The 1990 consultants' study of the Practicability of Allowing Road Trains into the Metropolitan Area[117] provided in evidence by Main Roads WA and others is the main source of the Committee's examination.

In Chapter 5, the Committee questions the use in some locations of long truck/trailer and road train combinations. Chapter 6 discusses truck braking and driver fatigue. Chapter 7 discusses speed limits and traffic signals.

In respect to vehicles of more than 19 metres in the metropolitan area the Committee has concerns in the following main areas:

- Truck braking, stability and water spray,
- driver fatigue, and
- liability for damages in connection with the above; and
- truck acceleration and overfuelling.

The acceleration and braking performance of articulated vehicles is described in Chapter 6.2.2 and 6.2.3. Chapter 7.4 discusses speed limits and traffic signal distances.

The Committee has been unable to obtain comprehensive data about the braking and stability of the range of long vehicles and road trains currently using metropolitan roads. Chapter 6.2.3 discusses the acknowledged industry concerns with the compatibility of the braking characteristics of certain combinations of trailers and trucks, and FORS' review of the relevant design rules.

The consultants found, based on computer simulation, that for a 33 metre, two trailer road train, the rear or 'dog' trailer is approximately 40% more likely to roll in a crash than the equivalent articulated vehicle. They also tested rearward amplification because of its significance in emergency avoidance manoeuvres, such as suddenly moving out of a traffic lane. They found that the double bottom road train has significantly higher rearward amplification than the block truck with trailer. Also, the rearward amplification of both vehicles is highly speed dependent. Between speeds of 75 km/h and 100 km/h, there is a significant increase in both the magnitude of rearward amplification and in the difference between the block truck with dog trailer and the road train.

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[117] Pearson, B., Ogden, K., Sweatman, P., Jarvis, J.: *A Study of the Practicability of Allowing Road Trains into the Metropolitan Area*: op. cit.

Their conclusion was that difficulties arise with the operation of dog trailers at speeds above 75 km/h in urban traffic situations.

The Committee feels that the extra risk in wet weather on congested roads of cars and trucks overtaking road trains travelling 10 km/h slower than other traffic may not be sufficiently offset by the reduced movements where road trains are used instead of smaller vehicles.

In expert evidence, the Committee was told that risk is cumulative. Accordingly it is valid to consider the combined potential safety risk of a fatigued livestock truck driver on a fine day negotiating early morning urban traffic through traffic light controlled intersections. In a different set of circumstances, a driver hauling fuel could be negotiating the same route during Friday afternoon peak hour traffic in heavy rain.

The transport trials being conducted are regarded as a proxy for risk analysis. That is, as problems have arisen, access conditions have been changed. For instance, curfews have been introduced during hours when parents drive their children to nearby schools.

Driver fatigue is discussed in Chapter 6.3.3. The Committee has been unable to fully investigate the reasons some drivers had for not being prepared to drive road trains in the metropolitan livestock trials. It feels that without a comprehensive survey of all drivers who could have done so, the trials are inconclusive.

The same truck pulling two instead of one trailer clearly accelerates more slowly. To the extent that there is evidence of overfuelling to increase power, this is encouraged by allowing double road trains access to the metropolitan area where acceleration in traffic is more important than it is on the open road.

The Committee supports the views expressed by Local Government and individuals that the trials provide insufficient evidence to allow permanent access to road trains in the metropolitan area. Because there are relatively few road trains participating in the trials, their crash record is not statistically significant in determining the risk associated with their more widespread use. There is also a likelihood that their operational crash performance will not match that achieved during the trials.

The Committee feels particularly that while there are acknowledged braking problems with articulated vehicles and there is doubt about their dynamic stability in urban traffic situations, it would not be responsible to significantly change the status quo without running the risk of claims for damages in the event of a crash.

The Committee acknowledges that it has been a condition of the trials that vehicles be inspected. It has been told that this is unsatisfactory because truck brakes can wear out in just one return trip Perth/Carnarvon.

Human factors account for most crashes. Truck driver fatigue and car driver impatience and inexperience in dealing with large trucks are, in the Committee's judgment, significant contributors to near misses and crashes, over half of which occur in the metropolitan area.

The Committee has been told that traffic lights are anathema to truck drivers which they avoid if possible. Where they cannot avoid them, they detest having to stop because this involves extra wear and tear on equipment, increases fuel consumption and driver effort in gear changes. Truck crash data shows that most crashes occur when trucks fail to stop in traffic streams.

The Committee feels that road and rail grade separation would rate very high priority in risk amelioration road investment strategies.

Recommendation 70

The Department of Transport, in conjunction with Main Roads WA and Westrail, should investigate the feasibility, benefits and costs of road/road and road/rail intersection grade separation on the metropolitan B-double network.

The Committee considers that allowing long vehicles access to the B-double network will, over a period of perhaps several years, enable their safety case to be proven, and allow other drivers and road users to become acclimatised to their more widespread use.

There will no doubt always be arguments for allowing bigger trucks based on cost savings. While there are restrictions on the biggest vehicles for whatever reason, the issue at stake is where the appropriate place is to break down larger vehicles into smaller configurations. In planning terms this is where transport depots should ideally be located. To the extent that transport depots are not located optimally for the future, any concessions granted to enable oversize truck access to depots will only delay decisions on their relocation. Alternatively, if the depots are correcly located from a land use planning perspective, adequate roads should be provided.

The future location of freight transport depots should be considered in the State Planning Strategy's State-wide land use planning framework to the the year 2029 currently being undertaken by the Western Australian Planning Commission. The Committee's feeling that some metropolitan roads are clearly inadequate to carry the traffic on them now, let alone bigger trucks is borne out by the extensive road works which are being undertaken to allow the bigger trucks. The most pressing inadequacies are in the Swan Valley and Armadale.

The Committee considers that safety is paramount in considering whether road trains should be permitted access to the metropolitan area.

In circumstances where Western Australia heads the world in the size of vehicles it gives access to public roads, the Government must provide leadership in demonstrating that this does not expose road users to increased safety risk. In this context, the Committee feels that it is not sufficient to argue that the inherent reduction in heavy vehicle movements reduces global safety risk. Even if this is shown, it considers that it must also be demonstrated that the risk in individual situations is not increased.

The Committee makes a number of suggestions that should reduce the situational risk of the introduction of road trains. Until these and perhaps others have been considered and/or implemented, it feels a safety case cannot be said to have been satisfactorily established.

Recommendation 71

Road trains should not be permitted access to the metropolitan area beyond existing breakdown points prior to:

(a) (i) further research into road train capability and stability; and

(ii) the development of a comprehensive risk analysis and safety case;

or

(b) the provision of dedicated, or limited-access, lanes and/or roads.

CHAPTER NINE

LIST OF RECOMMENDATIONS

Recommendation 1

The Government's heavy freight transport policy objective should be to safely and equitably complement social and economic aspirations and activities at minimum financial, social and environmental costs. (Page 20)

Recommendation 2

The outcomes of a heavy freight transport policy should be:

- **(a) reduced incidence and minimised risk of death or injury, and property damage in crashes;**
- **(b) minimised financial cost of a quality service;**
- **(c) minimised nuisance;**
- **(d) minimised environmental damage; and**
- **(e) maximised living standards and mobility.** (Page 22)

Recommendation 3

A comprehensive public education program should be part of the strategy adopted to reduce unnecessary community fear of heavy transport. (Page 22)

Recommendation 4

Consideration should be given to the Government making a separate appropriation for land transport safety. (Page 24)

Recommendation 5

A target should be struck for safety capital works and the amount appropriated to the Road Safety Council. (Page 24)

Recommendation 6

Safety capital works should be funded on a cost sharing basis with proponents. The level of cost sharing should be determined on a case by case basis depending on project priority. (Page 25)

Recommendation 7

Safety project priority should be determined by the relative contribution to reducing the risk of death or injury and property damage. (Page 25

Recommendation 8

Heavy freight transport should be marketed as a major driver of growth and prosperity. (Page 26)

Recommendation 9

Where implementation of transport policy involves significant change, the impacts should be fully and transparently assessed. (Page 26)

Recommendation 10

Where the impacts of change in transport policy or operations fall unequally on individuals, compensation should be considered. Any compensation should be restricted to unavoidable impacts. (Page 27)

Recommendation 11

The costs of the impacts of a change in transport policy should be charged to the beneficiaries of the change, and the proceeds applied to impact amelioration strategies. (Page 27)

Recommendation 12

A working party under the auspices of the Western Australian Planning Commission should develop guidelines for payment of compensation to people who are adversely affected by changes in heavy freight transport policy or operations. (Page 27)

Recommendation 13

The Government should introduce the in-service noise limits in the proposed Road Transport Reform (Vehicle Standards) Regulations. (Page 31)

Recommendation 14

The Department of Environmental Protection should develop sustainable transport noise targets. (Page 31)

Recommendation 15

The Department of Environmental Protection should examine the use of composite noise indices for determining road and rail traffic noise limits with a view to their adoption nationally. (Page 32)

Recommendation 16

The Department of Resources Development, in conjunction with the Department of Transport and the Western Australian Planning Commission, should examine ways to ameliorate the impacts of 'Just in Time' on freight movement. (Page 34)

Recommendation 17

The National Competition Council (NCC) should examine the extent to which road, and rail track pricing practices impact on land freight transport competitiveness. (Page 38)

Recommendation 18

Targets should be established in rail-served areas of Western Australia for sharing heavy freight transport between road and rail. These targets should result from policy decisions by the Government in relation to infrastructure funding in connection with major new developments. (Page 38)

Recommendation 19

A balance of sanctions and incentives should be used to achieve heavy freight transport outcomes which reflect the community's accepted safety standards, cost and quality of service, nuisance intrusion and environmental damage levels, and living and mobility standards. (Page 39)

Recommendation 20

'Permit' truck length should be determined by risk analysis of the combination of vehicle, load, road condition, traffic management and adjacent land use. (Page 40)

Recommendation 21

The principle should be adopted that the community's tolerance of risk of causing death, injury, or property damage is the primary trigger for heavy freight transport safety regulation. (Page 42)

Recommendation 22

Consistent heavy freight transport regulation (and transport regulation generally) requires that an agreed risk tolerance hierarchy should be adopted as follows:

Dangerous Goods train/truck	**}**
Freight train	**} Motorised Heavy Freight Transport**
Heavy truck	**}**
Passenger train	**} Motorised Heavy Commercial**
Bus	**} People Mover**
Taxi/Small bus	**} Motorised Light Commercial**
	} People Mover
Car/Light truck	**} Motorised Light Personal/**
	} Freight Transport
Bicycle	**} Non-motorised Personal Transport**
Pedestrian	**}**

(Page 42)

Recommendation 23

Nationally uniform or 'consistent' road transport law compliance and enforcement being developed by the NRTC should be based on the suggested transport risk tolerance and enforcement hierarchies. (Page 44)

Recommendation 24

The Department of Transport, in conjunction with Main Roads WA, the Police Department, the Department of Environmental Protection, and the Department for Minerals and Energy (for dangerous goods), should examine how to recover heavy vehicle enforcement costs. (Page 44)

Recommendation 25

Where safety is involved in an area where accreditation could be introduced, such as in fatigue management and speeding, the enforcement effort should be maintained until the impacts have been fully evaluated. (Page 45)

Recommendation 26

Increases in tolerances in exchange for accreditation should be considered on a case by case basis, and be modest in scope. (Page 45)

Recommendation 27

The Department of Transport should investigate the level and incidence of taxes paid by the public road and rail freight sectors in Western Australia and, if there is a significant difference, develop options to make the impacts on road and rail more equal. (Page 46)

Recommendation 28

When the National Rail Safety Standards are developed, the Government should make the rail safety inspection function independent from Westrail. (Page 54)

Recommendation 29

The Government should determine what rail's tolerable risk level should be, so that rail safety expenditure levels can be determined accordingly. (Page 54)

Recommendation 30

Westrail, in conjunction with Treasury and the Department of Transport, should examine what level of debt should be recovered in charges on Westrail's customers. (Page 59)

Recommendation 31

The Department of Transport, in conjunction with Westrail, should further develop the principles and process for providing rail access to other operators. (Page 60)

Recommendation 32

The State Planning Strategy should provide for future rail/road interchanges in Geraldton, Wubin, Kalgoorlie, Leonora, Albany and Esperance. (Page 62)

Recommendation 33

The Government should support Westrail and Main Roads WA cooperating with CRT Bulk Haulage to trial the introduction of 3R *Ecorail* technology in Western Australia. (Page 62)

Recommendation 34

Main Roads WA should, through the national processes, examine the benefits and costs of heavier axle loadings so that any possible increases can be factored into the design parameters for new road and bridge construction and existing road and bridge reconstruction. (Page 68)

Recommendation 35

The Department of Transport, in conjunction with Main Roads WA, WAMA, State Treasury and the Local Government Grants Commission should examine whether, and to what extent, rates should be used to fund Local Government roads. (Page 76)

Recommendation 36

Where there is a proposal to significantly increase vehicle size, for instance, the use of long vehicles on the metropolitan B-double network, the Road Safety Council should ensure adequate prior driver education. (Page 78)

Recommendation 37

Consideration should be given to require people who tow caravans undertaking additional training and/or being licensed. (Page 82)

Recommendation 38

Main Roads WA should examine grounding and load confiscation strategies for combatting overloading. (Page 84)

Recommendation 39

The Government should set a target for expenditure on road needs assessment; and needs assessment should be funded from road income. (Page 87)

Recommendation 40

Main Roads WA, in conjunction with the Department of Transport and WAMA, should further develop methods for prioritising road funding. (Page 88)

Recommendation 41

The Government should determine what road's tolerable risk level should be, so that road safety expenditure levels can be determined accordingly. (Page 88)

Recommendation 42

The Government's priority in road funding should be to reduce the safety risk on existing roads to a tolerable level ahead of network expansion. (Page 88)

Recommendation 43

Main Roads WA, in conjunction with WAMA, should examine the feasibility of extending cooperation between Shires to build major road works. (Page 89)

Recommendation 44

Consideration should be given to phased-in introduction of anti-lock brakes *(ABS)* for long vehicle trailers and road train trailers operating in urban areas. (Page 94)

Recommendation 45

Operational trials should be undertaken to establish the braking performance and dynamic stability of long vehicles and road trains. (Page 94)

Recommendation 46

A target of halving heavy vehicle crash fatalities within five years should be adopted. (Page 96)

Recommendation 47

The Road Safety Council should further examine the appropriate mix of truck design changes, regulation, enforcement and other actions to achieve the halving of heavy vehicle crash fatalities. (Page 97)

Recommendation 48

The Government should adequately resource the random safety inspection of heavy vehicles. (Page 97)

Recommendation 49

Strategies should be developed for random safety checking of heavy vehicles which reflect the distances they travel. (Page 98)

Recommendation 50

Porous asphalt should be considered as the preferred surface for dedicated metropolitan truck lanes and should be trialled on specific sections of major regional roads to assist in wet weather overtaking. (Page 99)

Recommendation 51

The safety risk of heavy vehicles on regional roads should be examined. (Page 101)

Recommendation 52

The Government should introduce the NRTC Regulation and Guidelines for smoky vehicles; and the Department of Transport's inspectors should be authorised, equipped and trained to carry out roadside exhaust emission tests. (Page 102)

Recommendation 53

The Department of Transport should test the exhaust emissions of new trucks to ensure their compliance with the Australian Design Rules. (Page 103)

Recommendation 54

The Department of Transport, in conjunction with the Department of Environmental Protection, should investigate the feasibility, benefits and costs of introducing differential government fuel levies according to the environmental qualities of diesel fuel. (Page 103)

Recommendation 55

The Government should introduce the National Licensing System. (Page 104)

Recommendation 56

The Department of Transport should examine incorporation of the National Competency Standards for drivers and driving instructors in legislation, and consider appointment of relevant persons and bodies as heavy vehicle driver examiners. (Page 105)

Recommendation 57

Worksafe should conduct in-cabin air quality measurements in heavy trucks and locomotives to see whether air filtration systems should be installed. (Page 107)

Recommendation 58

The Road Safety Council should develop strategies for combatting heavy vehicle driver fatigue. (Page 108)

Recommendation 59

Worksafe should examine whether and to what extent driver fatigue is linked to exposure to diesel emissions. (Page 108)

Recommendation 60

The Department of Transport should consider how an alcohol and drug policy could be universally adopted in the road transport and rail freight transport industries. (Page 108)

Recommendation 61

Regulation 509 of the Road Traffic Code 1975 should be reviewed. 'Tailgating' on the open road should attract an adequate fine and be enforced. (Page 111)

Recommendation 62

The risk associated with the 'keep left unless overtaking' rule should be examined. Car driver education about the truck issues involved should be implemented. (Page 111)

Recommendation 63

The Department of Transport should examine the costs, benefits and impacts of bullbars in urban areas. (Page 112)

Recommendation 64

It should be a requirement under the Road Traffic Act 1974 to assess risk prior to any dangerous goods licence being issued. (Page 114)

Recommendation 65

Main Roads WA, in conjunction with the Western Australian Planning Commission, should review the road hierarchy. (Page 115)

Recommendation 66

Construction of the Northam by-pass should be completed within ten years. (Page 117)

Recommendation 67

Main Roads WA should consider grade separation of heavy vehicles in the planning phase of the Utakarra by-pass. (Page 117)

Recommendation 68

A study should be commissioned to further examine the placement of 'prepare to stop' yellow flashing lights. (Page 119)

Recommendation 69

Consideration should be given to the phasing-in of modern exhaust brakes on older trucks. (Page 120)

Recommendation 70

The Department of Transport, in conjunction with Main Roads WA and Westrail, should investigate the feasibility, benefits and of road/road and road/rail intersection grade separation costs on the metropolitan B-double network . (Page 125)

Recommendation 71

Road trains should not be permitted access to the metropolitan area beyond existing breakdown points prior to:

(a) (i) further research into road train capability and stability; and

(ii) the development of a comprehensive risk analysis and safety case;

or

(b) the provision of dedicated, or limited-access, lanes and/or roads. (Page 125)

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