

RELATIONSHIP BETWEEN PROFESSIONAL

DRIVING AND ROAD SAFETY

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1. INTRODUCTION

This paper is not intended to raise all road safety issues faced by the professional driver. The subject is much too broad for that. Rather, it is intended to focus on a number of areas identified by overseas research and look at their applicability to the current New Zealand situation, while at the same time identifying some areas where improvements need to be made.

2. STATISTICAL TRENDS

2.1 INDUSTRY COMPARISONS

Transport accidents clearly make up a high proportion of work accidents. The British Factory Inspectorate in their report, "Transport Kills", noted with concern that while the number of reported deaths in industry has been steadily declining over the last few years, the proportion involving non-rail transport has been increasing. In 1967, one in seven workers died in non-rail transport accidents, while by 1979 this figure had increased to one in four. This represents eighty fatalities out of a total of approximately three hundred and twenty.

In New Zealand it is virtually impossible to make this comparison. Accident statistics from the various industry sectors are scattered and notoriously difficult to put together. As Dr I K Walker noted in his State Services Commission sponsored enquiry "Occupational Safety" (P 38):

"When it comes to comparison of New Zealand Safety figures with those in other countries, the situation is even worse. This would be best done by comparing occupational fatalities. Although these totals are only about 100 per year, the data are so buried in official archives that no inquiring citizens can see for himself the status of occupational safety in New Zealand".

If Dr Walker's estimate of 100 deaths per year in New Zealand is correct then transport fatalities make up a particularly high proportion of these. Figures from the Ministry of Transport of drivers involved in truck accidents who stated their occupation as a driver, truck driver or articulator driver are listed in Appendix One. This shows a marked increase in fatalities of drivers involved in truck driving accidents. In 1980, thirty eight fatalities were recorded, in 1981 forty three and in 1982 there were fifty six fatalities recorded.

2.2 ACCIDENT TRENDS WITHIN THE TRANSPORT INDUSTRY

The American study "Large Truck Accident Causation" released by the US National Centre for Statistics and Analysis, is a particularly comprehensive study of the role of large trucks in accidents in the United States. It reveals about 20 percent

of the estimated 27 million trucks in use in the United States were large trucks. These represented 4.0 percent of all registered vehicles and accounted for 6.7 percent of all vehicle miles travelled. In 1979-80 accidents involving large trucks accounted for about 5.7 percent (385,000) of all police-reported accidents and 12.4 percent (6,332) of all traffic fatalities. Large trucks were involved in fewer traffic accidents per mile of travel than passenger cars yet they experienced almost twice the fatal accidents per mile of travel than did passenger cars. When a passenger car is involved in a fatal accident with a large truck the car occupant is 29 times more likely to be killed than the truck occupant. The risk of fatal accidents with large trucks has increased each year from 1977 to 1980.

2.3 THE FUTURE

Despite major changes which are currently in the process of being implemented in the Transport Industry, little concrete research seems to have been done on the question of truck accidents in New Zealand. W J Frith, of the Road Transport Division of the MOT in a paper entitled "Truck Accidents in New Zealand" predicts, somewhat cautiously and on somewhat limited data, that the safety impact of removing the 150 km limit will not be large. He notes that about 9 percent of reported injury accidents in New Zealand involved trucks and that severity increases with the size of truck. In 1982 there were more than twice the fatalities on New Zealand roads involving articulated vehicles as opposed to single trucks.

This is in line with American Statistics. In the United States, while single unit large trucks experienced almost twice the fatal accidents per mile of travel of passenger cars, combination trucks were involved in fatal accidents at a rate of three and one-half times that of single-unit trucks. One in every three combination trucks are involved in an accident each year.

It is anticipated that fatalities resulting in large-truck accidents will continue to represent 11-14 percent of all American Traffic Fatalities through the 1980's, and the consequences of large-truck collisions with automobiles will continue to be a major safety problem.

In New Zealand the number of motor vehicles on the road has continued to increase. Motor vehicles of all types have increased by 11 percent over the last five years. It is agreed that the number of larger heavy trucks on the road will increase and there will be more long distance driving involved for professional drivers. With the statistics showing that accidents involving heavy trucks reveal several disturbing tendencies, we should now look at the identified causes and factors involved in such accidents.

3. CONTRIBUTING FACTORS TO ACCIDENTS

Overseas material shows a number of common threads in analysing accident data involving professional drivers. These can be divided into major causal headings such as driver-related, vehicle-related and road or environmental-related factors. This paper will largely concentrate upon several issues arising out of driver-related factors which are seen as contributing to accidents:

3.1 DRIVER RELATED CONTRIBUTING FACTORS

3.1.1 TRAINING

Studies have consistently shown that younger drivers of large trucks are more likely to be involved in accidents. One American study involving North Carolina and California data indicates that 17 percent of all large truck drivers under 25 are involved in fatal large truck accidents. Generally, while passenger car drivers under 25 are twice as likely to be involved in an accident as could be expected from their share of miles driven, drivers of trucks under the age of 25 were about six times more likely to be involved in an accident than would be expected if their accident experience were comparable to their proportion of the truck-driving population.

New Zealand truck accident statistics (see Appendix One) generally support these findings with the greatest number of driving fatalities in the three years listed being in the 20 - 25 year age group.

There is a clear need for formal training for those younger and inexperienced truck drivers in particular. American data shows many accident involved drivers have not had formal driver education. The US National Centre for Statistics and Analysis data for 1979, showed more accident-involved truck drivers (59%) than car drivers (45%) were reported as having no formal driver training. Only 15 percent of the accident-involved truck drivers had any kind of commercial driver education.

The British study, Transport kills, which looks in detail at some 362 deaths in the Transport Industry, concludes "inadequate training, information and instruction, failure to provide and follow a safe system of working and poor management organisation, are among the most commonly quoted causes underlying the transport accidents studied for this report. In 244 of the 362 fatalities the above were recognised by the factory inspector as a causative factor. By comparison in only 53 of the fatalities was human error considered to be a causative factor".

The lack of training for professional, and in particular, heavy truck drivers is of major concern. The industry itself has been reluctant to take responsibility in

this area. The New Zealand Road Transport Association, representing many employers within the industry, has recently withdrawn its representation on the Road Transport Industry Training Board after cuts in government funding. This will have the effect of reducing the effectiveness of training within the industry. With the Heavy Duty Commercial Drivers, group scheme, which had over the last seven years provided training opportunities for almost 2,000 drivers coming to an end this year there is a major vacuum in the area of training for drivers.

At the same time, it is anticipated a deregulated transport industry will mean a large number of smaller operations entering the Transport Industry. American studies have shown that small transport operators are less likely to provide training for their employees, or in the case of owner-drivers, themselves, than are the large employers.

3.1.2 DRIVER FATIGUE/DRIVING HOURS

Fatigue arises from the need to keep a relatively high level of concentration until the body reaches a state where - both for physical and psychological reasons - rest or even sleep becomes imperative. In driving it is naturally the psychological load involved in maintaining alertness which is the major factor.

In the United States, regulations were passed limiting the hours of driving of interstate drivers after fatigue was identified as a major contributing factor in accidents. This was reinforced by Dr Ivan Brown (Driving Fatigue in Endeavour, New Series, Volume 6, No. 2, 1982) in his study of available literature on this question. He maintains heavy goods vehicle drivers may be seriously at risk from fatigue effects:

"because they are not free to determine their own work schedules and their job demands involve irregular hours of work. It follows that, in attempting to reach a given destination, they may well be forced to drive beyond the point at which they can match traffic demands to their own capabilities. In addition their irregular shifts will necessarily force them to continue driving during troughs in their circadian rhythm of physiological activation, so that performance may reach sub-optimal levels. Irregular working schedules will also curtail the periods available for continuous rest and sleep. Furthermore, shift working will require them to take day-time sleep under day-time conditions which are not conducive to rest. Finally their driving cabs are likely to be the source of other stressors, interacting with fatigue, such as heat, noise and vibration.

There is growing evidence that this group of drivers presents an increasing problem for road safety".

Dr Brown goes on to quote studies which suggest fatigue effects become evident after about eight hours on regular schedules and considerably earlier when work was irregular. He notes that studies show twice as many truck accidents as expected happened in the second half of trips and almost twice as many accidents arise from night driving.

Dr Brown, after quoting from a number of studies on this question concludes "these conclusions suggest that the fatigue problem among commercial drivers is at least, and possibly in large part, the result of bad law".

Dr Brown's conclusions refer to the situation in EEC countries, yet in most areas the New Zealand Transport Regulations are more lax than the EEC Regulations (see Appendix Two for comparison). For example, a New Zealand Driver can do up to 5½ hours driving without a legally required break, compared to four hours in the EEC, while New Zealand truckies can drive for eleven hours in any one day compared to ten in the USA and eight in the EEC.

American sources have noted that in addition to open-ended legislation, the enforcement system there is limited due to manpower shortages. New Zealand statistics tend to suggest that the question of long driving hours has not been a high priority here. The 1983 Transport Department Report shows that for the 1980, 1981 and 1982 years, a total of only 135 offences relating to breaches of driving hours' regulations were reported.

Yet is it clear that drivers in many situations have been pressured to break driving hours regulations for some time. This pressure has increased with the deregulation of the Transport Industry.

A recent accident highlighted the serious implications of long driving hours. The accident occurred after the driver fell asleep at the wheel, south of Waikanae on 2 April. The truck was a writeoff and the driver was fortunate to receive only minor injuries. According to the police report, the driver had been at the wheel of the vehicle from 5.30pm on Monday 5 March, 1984 until 3.15am on Tuesday 6 March, when he had the accident. Between these times he was out of the vehicle only twice to obtain a meal and to refuel the vehicle. These breaks from driving came to about 15 minutes each. Before that the vehicle was loaded by the driver between 8am and 5.30pm in Auckland before the driver set out on the journey.

The driver's load included chlorine liquid, chlorine crystals and bulk petroleum. Had any of these items come into contact in the accident it is estimated a major explosion would have resulted.

It is acknowledged that the problem of enforcement of driving hours regulations is difficult particularly in a period of intense competition within the Road Transport Industry and high unemployment which puts pressure on drivers to work long and unsafe hours. One of the alternatives considered to monitor driver performance is the tachograph (an on-board mechanical recording device). This is now a requirement in EEC countries and is now being used among a number of transport firms in New Zealand. The reaction to the device has been mixed from drivers. There could be advantages in the Transport Department looking at a full study as to the viability of the use of tachographs in New Zealand. This would need to involve full consultation with professional drivers and, if introduced, a compulsory and fully standardised system. Another example could be the use of Transport Department Administered log books.

3.1.1 ALCOHOL USE

It does not appear a full study has been carried out on the relationship between alcohol and accidents involving heavy transport drivers. One United States study (SC Partyka "Heavy Truck Report to Congress Working Group Papers, Number 1 through 8" - June - September 1981) indicated that alcohol-related accidents among truck drivers ranged from less than one percent to three percent of total reported accidents, whereas police reported, alcohol-related accidents for passenger car drivers was seven percent.

A conviction for an alcohol related driving offence is of major concern to a professional driver since in many cases it leads to the loss of the drivers job, since the employer is reluctant to keep the driver on until a special licence is granted. This occurs not only when the driver is prosecuted for an alcohol related offence while driving his employers vehicle but also his private vehicle. This concern about the possible double penalty incurred means that professional drivers tend to be particularly careful in this area.

Some studies in the United States have looked at the use of drugs while driving. One survey showed a fairly high use of "pep pills" particularly many younger drivers. For example 20.2% of drivers under 25 indicated they used "pep pills" occasionally. At the moment there does not seem to be any studies specifically relating drug involvement to accidents involving trucks.

4. VEHICLE RELATED FACTORS

It is not the intention of this paper to deal with the range of vehicle related factors involved in accidents in any great detail.

However, there are a number of common concerns frequently raised by drivers. These include ensuring the chance of accidents, by tyre blowouts is minimised by not

using retreads on the front tyres of vehicles and the need for engine brakes in all vehicles to ensure safe braking systems (it has been found a number of employers have these removed as it is believed they damage the engine) and the more general question of the need for regular maintenance for vehicles.

There have been improvements in the area of truck design in recent years, however, many drivers are still subjected to varying degrees of heat, noise and vibration. All of these cause the potential to incur stress induced fatigue and have accidents. Noise, particularly has been identified as an issue by New Zealand drivers and as a result the NZ Drivers Federation has approached the Health Department with a view to setting up a full scale study in this area looking at a range of vehicles.

Hazardous goods are also an area of concern. One study of Californian truck accidents showed 2.6% of accidents involved hazardous material, a large number of which involved serious spillages. A United States Bureau of Motor Carrier Safety (BMCS) study showed truck accidents involving hazardous cargoes resulted in 22% more fatalities per accident and 61% greater property damage than did all other truck accidents.

In the United States, comprehensive training courses have been prepared for drivers involved in the handling and transportation of hazardous materials by the Transport Companies in conjunction with the Transport Unions. The situation in New Zealand is that employers take little or no responsibility for training in this area and there is no legislative compulsion for them to do so. A code of practice for the handling and transportation of hazardous goods in New Zealand has been finalised, however, despite approaches to Government from the Drivers Federation, it has no legislative standing.

Finally, the area of truck "crashworthiness" is important. In other words to ensure that large trucks are designed in such a way that danger is minimised, in the result of a crash, both to the driver and the occupants of any other vehicle involved. In the former situation recent American studies have come out strongly in favour of compulsory seat belts for truck drivers. The majority of 1131 fatalities of truck drivers in a United States study revealed the main cause of death to be from the truck from rolling over or ejection from the cab. About 97% of fatally injured occupants were not wearing seat belts.

Similarly, there is a need to ensure maximum protection for smaller vehicles when struck by large trucks. Particularly important is to ensure guards are compulsory, particularly for flat deck vehicles to improve the survival chances of occupants of cars that impact the rear of larger trucks.

5. CONCLUSION

The basis of this paper is to raise a number of safety related issues applicable to professional large truck drivers. With the number of accidents involving large trucks increasing, this has serious implications for all road users. A number of areas of improvement are suggested particularly in regard to training of drivers as well as the urgent need to look at the hours some drivers are currently on the road and the dangers inherent in this situation. Finally, a number of vehicle related safety concerns are raised.

The role of large trucks and their operators in the wider question of road safety is often overlooked. It is an area characterised by a lack of information, inadequate regulations and even worse communication. Due to its important implications the last issue needs to be addressed first, via the establishment of a group involving the Transport Department, the Road Transport Association and the Drivers Federation to discuss means by which improvements in can be brought about in this important area of road safety.

Main Bibliography

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| Brown ID | "Driving Fatigue" published in Endeavour, New Series, Vol. 6, No. 2, 1982 (8p) |
| Eicher JP, Robertson HD and Toth GR | "Large Truck Accident Causation" (Rpt No DOTHS 806 300) prepared by the (US) National Centre for Statistics and Analysis, Washington DC. (July 1982) 215p. |
| Frith WJ | "Truck Accidents in New Zealand". (18p). |
| Hamner JDG | "Transport Kills" published by HM Factory Inspectorate, Great Britain (1982) 80p. |
| D I K Walker | "Occupational Safety" published by the States Services Commission (1981) 142p. |

Report of the Ministry of Transport for year ended 31 March 1983.

APPENDIX ONE

DRIVERS INVOLVED IN ACCIDENTS WHO STATED THAT THEIR OCCUPATION WAS
DRIVER, TRUCK DRIVER OR ARTICULATOR DRIVER
WHERE TWO TRUCK DRIVERS ETC WERE INVOLVED IN THE SAME ACCIDENT
BOTH DRIVERS WILL APPEAR IN THE TABLE
YEAR ENDED 31 DECEMBER

TABLE OF DRAGE BY AXTYPE
CONTROLLING FOR AXYEAR=1980,1981 & 1982

	<u>DRAGE</u>	<u>AGE OF DRIVER</u>	<u>AXTYPE</u>	<u>TYPE OF ACCIDENT</u>	
	FREQUENCY		FATAL ACCIDENT	INJURY ACCIDENT	TOTAL
1980	15 AND UNDER 20 YRS		0	15	15
	20 AND UNDER 25 YRS		9	57	66
	25 AND UNDER 30 YRS		3	73	76
	30 AND UNDER 35 YRS		5	68	73
	35 AND UNDER 40 YRS		7	35	42
	40 AND UNDER 45 YRS		5	28	33
	45 AND UNDER 50 YRS		3	18	21
	50 AND UNDER 55 YRS		2	13	15
	55 YRS AND OVER		1	17	18
	UNKNOWN AGE		3	5	8
	TOTAL		38	329	367
1981	15 AND UNDER 20 YRS		0	15	15
	20 AND UNDER 25 YRS		8	65	73
	25 AND UNDER 30 YRS		6	67	73
	30 AND UNDER 35 YRS		8	50	58
	35 AND UNDER 40 YRS		7	25	32
	40 AND UNDER 45 YRS		7	35	42
	45 AND UNDER 50 YRS		4	18	22
	50 AND UNDER 55 YRS		2	11	13
	55 YRS AND OVER		1	16	17
	UNKNOWN AGE		0	5	5
	TOTAL		43	307	350
1982	15 AND UNDER 20 YRS		4	18	22
	20 AND UNDER 25 YRS		4	50	54
	25 AND UNDER 30 YRS		18	66	84
	30 AND UNDER 35 YRS		11	57	68
	35 AND UNDER 40 YRS		6	29	35
	40 AND UNDER 45 YRS		5	38	43
	45 AND UNDER 50 YRS		6	16	22
	50 AND UNDER 55 YRS		1	17	18
	55 YRS AND OVER		1	22	23
	UNKNOWN AGE		0	7	7
	TOTAL		56	320	376

* THE DRIVERS WERE DRIVING TRUCKS OR ARTICULATED TRUCKS WHEN INVOLVED IN THE ACCIDENT.

APPENDIX TWO

COMPARISON OF USA, EEC AND NZ REGULATIONS
GOVERNING HOURS OF SERVICE BY INTERSTATE OR INTERNATIONAL
DRIVERS OF COMMERCIAL VEHICLES

	USA	EEC ²	NZ ³
1. Maximum daily duty time.	15 hours	Unspecified (U/S)	14 hours
2. Maximum daily driving time	10 hours	8 hours	11 hours
3. Maximum period of continuous driving.	U/S	4 hours	5½ hours ⁵
4. Maximum cumulative duty for driving time.	60 hours/7 days 70 hours/8 days (duty)	48 hours/7 days 92 hours/14 days (driving)	66 hours 7 days (driving)
5. Minimum on-duty rest periods.	U/S	1 hour (1x) or ½ hour (2x)	½ hour
6. Minimum off-duty rest periods between consecutive duty periods.	8 hours ⁴	Goods transport 11 hours or 10 hours (2x/week) ¹ or 9 hours (2x/week) ² Passenger Transport: 10 hrs or 11 hours plus 10 hours (2x/week) and 9 hours (2x/week) ³	10 hours
7. Location of rest while off-duty.	U/S	Not in moving vehicle	U/S

1) Code of Federal Regulations, Title 49 - Transportation Part 395.

2) EEC Regulation 543/69

3) 1976 Traffic Regulations SI33

NOTES

1. If rest is taken at the place where crew is based (including within vehicle).
2. If rest is taken at some place other than where crew is based.
3. If transport operation includes one scheduled break exceeding four hours duration, or two scheduled breaks exceeding two hours duration.
4. The off-duty period can be divided in two parts by drivers using truck sleeper-berth, so long as the shortest part is larger than two hours and at least eight hours are taken within each consecutive 24-hour period.
5. This can be extended if the defendant proves the break was due to unavoidable