Fleet Driver Safety

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Abstract

Improving truck fleet safety through driver education requires a very different approach to that used to improve the safety of private motorists. Not only are the truck drivers' tasks more complex and varied, but the organisations the drivers work for have a major influence on the level of safety that is achieved. It is the transport operator who selects the driver, decides on how much training will be undertaken, sets the hours of work and is responsible for the selection of the vehicles and vehicle maintenance. The need for improved driver education is greater now than it has ever been before because of the changing nature of the industry, the regulations governing it and, the continuing highly competitive nature of the industry in an environment where there is a severe shortage of drivers.

A life-long learning approach needs to be taken. This needs to encompass the teaching of the Essential Skills in schools to ensure people who want to become drivers have the basic attributes required to undertake the work. Sadly many people who could potentially be truck drivers lack these Essential Skills. It also needs to include educating new recruits in both formal and in-formal ways to ensure they understand what is required of them and gain from the considerable experience good drivers have that can only be learnt on the job. It also includes investing in the development of existing drivers throughout their careers. All aspects of their job keeps changing including the introduction of new Rules and Regulations, advances in vehicle technology, and increasing sophistication in freight logistics A wide range of mechanisms need to be used to support the on-going development of drivers, including the use of the trade press, formal training to National Certificate level, newsletters, and workplace discussion groups.

1 Introduction

The vast majority of crashes can be attributed partially or completely to some form of human error (Rothengatter, 1997; Sabey and Taylor, 1980). Driving errors however are not confined to bad drivers or drivers with a lack of ability. In fact distance travelled is a key factor in determining how many collisions a driver will have (Persaud, Bahar et.al. 1999). All drivers are at risk of causing a crash, albeit some more than others depending on their abilities, attitudes and circumstances and the driving conditions, quality of the road and the condition of their vehicles. It is not simply a case of "the nut behind the wheel" who just needs to drive more carefully, pay more attention or undertake more driver training.

There is also no well-defined boundary when driving is safe or unsafe. Rather it is a continuum with multiple factors contributing to the level of risk. For example, unrealistic

schedules result in pressure to speed and hence a higher level of risk. Similarly poorly performing brakes increase the degree of difficulty in stopping a vehicle in time and narrow roads reduce the margin for error.

In many ways it is surprising that crashes are relatively infrequent events given the complexity of the driving task. Reported truck crashes occur, on average, only once in every one million km. Fatal crashes occur only once in every 420 million km of travel. The driving task requires the driver to appraise the situation, make decisions constantly as the situation changes, control the vehicle and attend to a number of secondary tasks all at speeds where just glancing at just one major word or number on a sign means that 15m of road has been traversed largely unobserved. Major reductions in crash rates will only occur if the unexpected or unrealistic demands on the driver are reduced. Essentially the driving task itself cannot be changed except through automation. What can be changed are vehicle, road, human and operational aspects of the transport system.

2 Risk

Commercial transport differs markedly from private transport in that there is an organisation involved that ultimately determines the level of safety in that company. It is the company that controls driver selection, driver training, attitudes to safety, driving hours and schedules, and vehicle selection and maintenance. It is these institutional factors that determine risk. This is shown diagrammatically in Figure 1. For each set of factors the holes represent failings in the system. For a crash to occur the failings must all occur together at the same time.

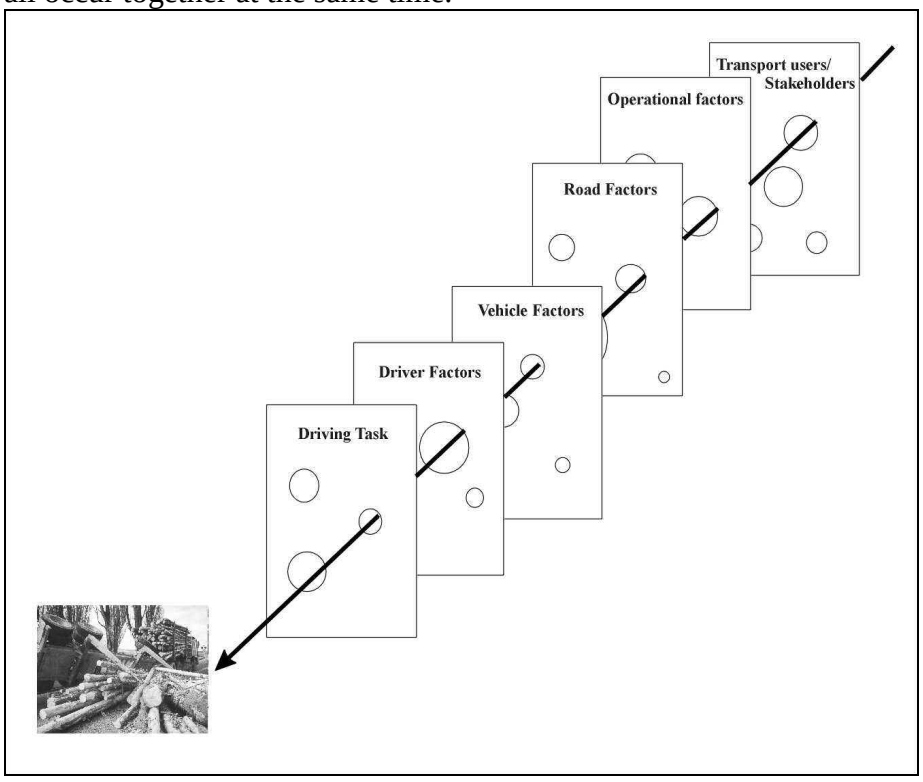

Figure 1: Crashes are due to failures throughout the safety chain.

Interviews with drivers and managers have highlighted the influence company culture has on safety. Operators who disregard safety also tolerate drivers that violate the law and pay little attention to vehicle maintenance. Expediency is all-important to them. Organisational behaviour has been divided by Investors in People into three groups:

1. Pathological organisation: failure is covered up, information is suppressed.
2. Bureaucratic organisation: information is ignored, new ideas create problems, a blame culture is used to sidestep responsibility.
3. Learning organisation: information is sought, failures are investigated and acted on, new ideas are welcomed, continuous improvement.

As evidence of the importance of the operator in improving safety, Moses and Savage (1994) found that trucking firms that did not report crashes and took no steps to investigate them with the view to determining whether disciplinary, educational or other steps were required had crash rates nine times higher than firms that took the appropriate actions. Moses also found that operators who were unfamiliar with the hours of service requirements and did not keep records of driver duty had crash rates 30% higher than operators who did.

Research on driver behaviour has found that inappropriate driving behaviours could be classified into three different categories; errors, lapses and violations (Reason, Manstead, Stradling, Baxter and Campbell, 1990).

- Lapses involve problems with attention and memory and are relatively harmless (Parker, Lajunen and Stradling, 1998). These include such things as attempting to pull away from the lights in an incorrect gear, and switching on one thing when you meant to switch on something else. Lapses are reported more by elderly and female drivers (Parker et al., 1998).

- Errors are a type of driving mistake involving failures of observation and misjudgement (Parker et al., 1998). This includes such behaviours as failing to notice a Stop or Give Way sign or failing to check your mirrors before pulling out or changing lanes, or misjudging the speed of an oncoming vehicle when overtaking. Errors are not associated with any particular demographic group, but are potentially more serious that lapses (Parker et al., 1998). Errors are typically associated with a lack of training or experience.

- Violations are defined by Reason et al. (1990) as “deliberate….deviations from those practices believed to be necessary to maintain the safe operation of a potentially hazardous system”. This includes such behaviour as speeding, tailgating, and running red lights. Male drivers, younger drivers and high mileage drivers generally report violations with higher frequency.

The crucial difference between violations, errors and lapses is that it is those drivers who score high on violations that are more likely to have been accident involved in the past

(Reason et al, 1990; Parker, Reason, Manstead and Stradling, 1995a) and to be accident involved again in the future (Parker, West, Stradling, and Manstead, 1995b).

3 Driver shortage

A major study has recently been completed on the shortage of truck drivers in New Zealand (Oliver, Baas, Ludvigson and Bolitho, 2003). This study was undertaken by TERNZ and Oliver Hatton for the Road Transport Forum, Forest Owners Association and the Log Transport Safety Council.

The study has found that there is currently an estimated shortage of over 1,250 truck drivers or 5.5% of the drivers required to move the country's goods on the road. This shortage is placing considerable pressure on existing drivers and the industry as a whole with existing trucks under-utilised and truck purchasing being delayed. The industry is able to recruit enough drivers to replace those that leave through normal attrition but is unable to recruit additional drivers to meet the increasing demand for freight transport. The demand for freight transport is expected to grow by about 4% per year, requiring an additional 840 drivers in 2003.

Unless action is taken to meet the increasing shortfall, there will be a cumulative shortage of nearly 4,000 drivers within 3 years (by the end of 2005) and about 10,000 by 2010. This would have a major impact on the New Zealand economy.

Clearly driver training and education have a major role to play in addressing the driver shortage and the quality of the drivers in the industry. There is a real risk that pressures on drivers will increase and the standard of drivers will decrease as it becomes more and more difficult to attract new drivers. Current forms of driver training and education need to change to reflect the new environment the transport industry is entering.

4 Basic attributes required to become a truck driver

Many drivers enter the industry because they are "born" into it. They come from a farming or transport background where they are used to dealing with machinery from an early age and naturally gravitate towards this type of work. Those from other backgrounds receive little encouragement from schools or the community to take up a career in truck driving because of the poor image the industry has. This leads to a self perpetuating situation with the industry unable to attract sufficient numbers of staff of satisfactory calibre, which results in a lowering of standards and even greater difficulties in attracting people with the basic attributes required to be a good truck driver.

The minimum basic attributes that are required include:

PHYSICAL

They must be physically fit and carry no injuries that could affect their on the job performance. Of particular relevance is freedom from injuries to their back, legs, (particularly knees), and arms.

They must also be able to pass the medical fitness check as required by the Land Transport Safety Authority to obtain a heavy vehicle drivers license.
They must not engage in regular use or have a dependence on drugs and/or alcohol

MENTAL
Driving a truck is often stressful. Thus people who wish to do this must have the right attitude to the job and be able to:

- Accept the rights of others to use the road
- Display courteousness to other road users, law enforcement officers and fellow workers
- Maintain calmness when faced with an emergency or required to work under pressure
- Have the ability and desire to learn and apply the learning in a practical environment
- Sustain performance under arduous working conditions and in pressurised situations.
- Accept and apply the disciplines of working within the law and of meeting the rules and operational policies of the companies they work for or do business with.

COMMUNICATION
The ability to communicate with others is an essential part of the daily routine of a truck driver. The methods of communication used within the industry are very broad and include verbal, (face-to-face and through, for example, the phone), through written instructions, by gestures and increasingly by transmitted messages through the electronic media.

Whilst it would be nice for all people entering the industry to have well-developed communication skills, in practice this will not happen and the best that can be hoped for is an understanding by the person of basic interpersonal communication skills and the ability, and desire, to improve on this.

A person who wishes to become a truck driver must be able to:

- Understand and interpret instructions given in simple English
- Hold a verbal conversation with others in simple English

These basic physical, mental and communication attributes are common to those required in many other areas of employment including forestry, marine, building and the agriculture sectors that are also experiencing labour shortages. The attributes reflect the essential skills listed in the New Zealand Curriculum Framework (Education, 1993). That Framework identifies the knowledge, understanding, skills, and attitudes which all students must develop if they are to play a full part in the world in which they will live and work. The Ministry of Education's essential skills are:

1. **Communication skills:** including competency in listening, speaking, reading and writing and the ability to convey and receive information, instructions ideas and feelings appropriately and effectively.
2. **Numeracy Skills:** including the ability to estimate and to use calculators.
3. **Information Skills:** including the ability to identify, locate and process information, the ability to distinguish fact from opinion.
4. **Problem-solving Skills:** including being able to think critically and logically and to analyse problems from a variety of different perspectives.
5. **Self-management and Competition Skills:** including being able to manage time effectively, take responsibility for their own actions and decisions, and to have a range of practical life skills.
6. **Social and Co-operative Skills:** including being able to develop good relationships with others, take responsibility as a member of a group or organisation, and to act appropriately and responsibility in a range of social and cultural settings.
7. **Physical Skills:** including personal health and fitness, and the ability to use tools and materials efficiently and safely.
8. **Work and Study Skills:** including being able to work effectively both independently and in groups and to have the desire to continue learning throughout life.

Discussions with transport operators have highlighted the problem that exists in preparing people for the workforce. In the past under-achievers were able to work as manual physical labourers; however that type of work has now largely disappeared with the increase in mechanisation that has occurred.

It is now more important than ever for students to develop the essential skills outlined in the Ministry of Education Curriculum Framework. If they do not attain those essential skills they have a high likelihood of becoming unemployable.

5 Truck driver tasks

Truck drivers are required to undertake a wide variety of tasks beyond just driving the truck. A number of these tasks are safety related. Typical driver tasks include:

- Entering their log book and completing any required paperwork throughout the day.
- Ensuring their vehicle is fuelled and roadworthy. This should include a pre-trip walk-around inspection and the reporting of any faults that develop during the trip. This includes problems with the brakes, steering, tyres, engines transmissions and other equipment
- Understanding and acting on dispatch instructions.
- Loading or supervising the loading of the vehicle.
- Ensuring all of the required paperwork has been completed.
- Ensuring the Dimension and Mass Rule is complied with, including axle and gross mass, dimension limits and SRT.
- Securing the load to the requirements of the Truck Loading Code.

- Identifying the best route, taking into account any roading restrictions and possible congestion points.
- Starting the truck, checking for faults and allowing time for brake pressures to build up.
- Manoeuvring out into the traffic.
- Driving safely in accordance to the traffic regulations.
- Driving courteously and defensively.
- Driving in a manner that minimises fuel consumption and wear on the vehicle.
- At the destination communicating courteously and effectively with the goods depot to arrange the unloading arrangements and the paperwork.
- Communicating with dispatch regarding the next load or task.
- Taking the required rest breaks.
- Preparing the truck ready for the next day.
- Completing work within the driving hours requirements.
- Attending to home related activities and obligations
- Obtaining a minimum of 6 hours sleep with un-interrupted sleep at least once a week.

There are other duties as well, depending on the nature of the operation. Interviews with drivers and operators have highlighted the complications that occur every day that the driver has to be able to cope with.

6 Three stages of truck driver education

Figure 2 illustrates the three primary stages of truck driver education.

Stage 1: Developing the essential skills

As mentioned above, there are some minimum attributes a person needs to have to become a good truck drivers. These attributes correspond very closely to the Essential Skills in the New Zealand Curriculum Framework (Education, 1993). Achieving these skills is clearly the role of the school system. The Road Transport Forum is now working closely with the secondary schools and their career councillors with the view to encouraging more students to consider a career in the transport industry. Students need to be reminded that in order to become good truck drivers they need the essential skills. Unfortunately only a very small proportion of people who come forward during driver recruitment campaigns aimed at the unemployed have the essential skills that are required.

Stage 2: Recruitment

Interviews with drivers and other stakeholders during the driver retention and recruitment project noted that would-be drivers face a number of obstacles in becoming a truck driver. These included the length of time it takes to progress through the different licence classes and the cost of obtaining a licence, especially the cost of the training required. It

can be difficult for trainees to obtain student loans and other forms of support during their training. A concern is that, by the time they have progressed through all of the steps, they may have found work in other sectors. These issues are being discussed with the relevant government agencies.

While some of the skills required to be a truck driver can be taught in the formal driver training schools, there are many facets of the job that need to be learnt on the job and through experience. This includes communicating effectively with dispatch, clients, other staff and the Police. It also includes being able to operate trucks in the more difficult conditions such as in congested traffic and off-highway. A number of operators and drivers commented on the difficulty in employing what they called "poly boys", drivers with the required book learning and qualifications but no experience.

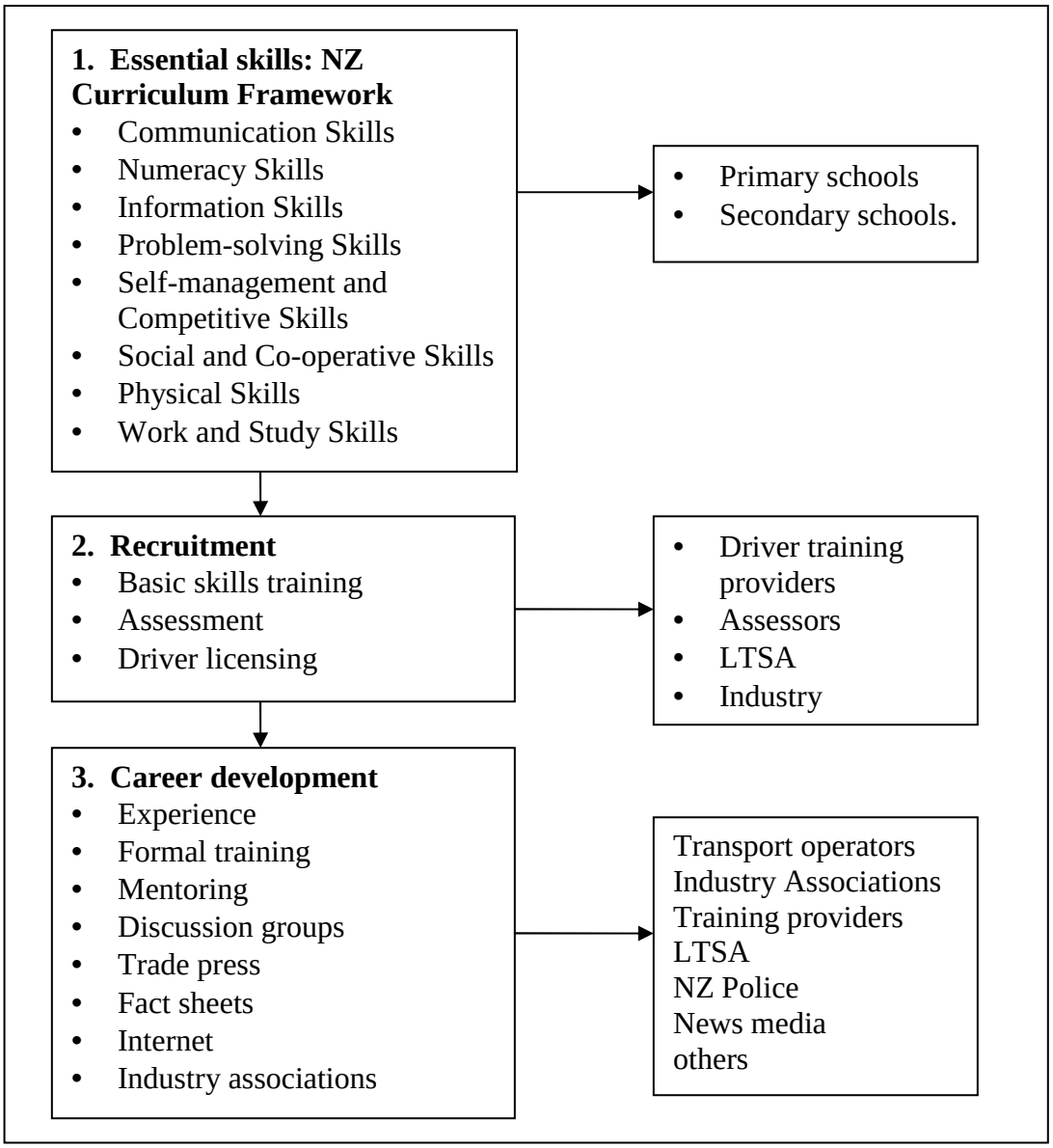

Figure 2: The three stages of driver development

Stage 3: In-service career development within learning organisations

It has been clearly demonstrated that investing in the development of the people in an organisation will result in major benefits if that investment is undertaken in a structured manner that reflects the aims and objectives of that organisation. In the UK the British Government is encouraging the adoption of this approach through their $100 million "Investors in People" programme.

For transport operations, on-going investment in the development of drivers and other staff is critical for the improvement of safety and profitability. A learning organisation approach needs to take into account not just formal training but a culture that encourages drivers to seek new information, knowledge and experience on the job over their whole career as a driver.

An important part of being a driver is in understanding the rules and regulations that go with sharing the road with other motorists. There are also health and safety requirements to meet, including the management of stress and fatigue. These requirements keep changing and it is important that drivers keep up to date with those changes. Education through fines and penalties is not a good way to learn. Information needs to be readily available through multiple sources and different media so that it is easily accessible. Drivers need to learn how to access this information and to see it as part of their responsibility to keep up to date.

Organisations such as LTSA, NZ Police, OSH and the industry associations would contribute to their own aims and objectives if they were to more actively support transport companies with driver development. Increased emphasis on driver and industry education would result in increased compliance, reduced frustration on the road-side when stopped by CVIU, greater acceptance of Rule changes, and generally a more professional and safety aware industry

Options that can be used to support driver development include:

- Formal training towards the achievement of a truck driving related National Certificate
- Driver mentoring to assist drivers gain experience in, for example, off-highway forestry applications
- Driver discussion groups within companies and within regions aimed at raising driver awareness
- The use of the trade press as a means of conveying information to drivers
- The internet
- Fact sheets, newsletters and pamphlets
- Trade fairs and conferences
- Radio, audio tapes, videos, CR ROMs and Television

It is recommended that a driver education and development strategy be developed jointly by government and industry to address some of the issues raised in this paper.

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