

EFFECTIVENESS OF DEFENSIVE DRIVING AMONG COMMERCIAL TRUCK
DRIVERS: A CASE STUDY AT MISC INTEGRATED LOGISTICS SDN. BHD.
(MILS)

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A dissertation submitted in partial fulfilment of the
requirements for the award of the degree of
Master of Science (Transport Planning)

Faculty of Built Environment
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JUNE 2013

Alhamdulillah. This dissertation is dedicated to both my parents, Md Mahdzir Bin Hj Zabidi and Hatun Binti Mat Arin for their love, patience, inspiration and support during all the process of completing this. Special thanks to all my beloved brothers, sisters and friends, thank you for your encouragement.

ACKNOWLEDGEMENT

First of all, thanks to Almighty God, Allah S.W.T because of His grace and His blessings given to me in completing the report on the topic of "Effectiveness of Defensive Driving Among Commercial Truck Drivers: A Case Study at MISC Integrated Logistics Sdn. Bhd. (MILS)". Secondly, I would like give my gratitude to my respected supervisor, Dr. Muhammad Zaly Shah Muhammad Hussien for his patience and assistance in providing me with such ideas and inspirations throughout the whole process in completing this report. Apart from that, I am very grateful for the support and the encouragements from both my parents. To all my brothers and sisters, in-laws, nephews and nieces, and to my late sister, you will always in my memory. Not to forget, thank you to Mr Shamsul Azren for all his helps and supports these past two years. Furthermore, thank you to all my fellow friends especially Afeefah, Talip, Aan, Deo, Khairrel, Fairuz, Asgad, Zulazhar, Jegen, Mehdi, Zulhilmi, Leha and Shira for the information and the discussion of ideas that we've share through. Special thanks to Pon, Rizal, Wak, Kodi and Angah for giving me home and shelter whenever I am at Johor Bahru. Finally, I thank everyone that has taken part in contributing their energy and thoughts into this research report.

ABSTRACT

Road accidents involving commercial vehicles in Malaysia have increased over the years. During the process of transporting goods, commercial truck drivers sometimes involve with road accident brought forth by several reasons. All those reasons could lead the commercial truck drivers prone to potentially engage with road accident. Hence, clear understanding on the factors contribute to potential accident should be identified in order to minimise the accident cases. The objectives of this study are to determine for the common causes of road accident involving commercial truck, to evaluate the application of defensive driving while transporting goods and to propose appropriate commercial driver management approach that could be implemented. This study conducted using case study method where the researcher selected a transport company in Port Klang as the population and analysing data related such as the incident investigation report based on the incident that took place in the year 2012. Findings showed that the main causes of road incident involving commercial truck drivers are behaviour and attitude of the drivers themselves, road condition, weather condition and surroundings. However, should the commercial truck driver effectively apply defensive driving method, the risk of having road incident could be minimised. Study concluded that seminar and courses, training session, and discussion and meeting with truck drivers in order educate and correct their behaviours and attitudes are all important. Should their behaviour and attitude improved, they would never driving in aggressive thus applying defensive driving method and this could help them to become more perceptive and have the ability to anticipate the situation and circumstances which on-going the moment when they are on the wheel and eventually very helpful in any situation such as raining, bad road condition or terrible surrounding.

ABSTRAK

Kemalangan jalanraya melibatkan kenderaan komersial di Malaysia meningkat saban tahun. Semasa dalam proses pengangkutan barang, pemandu trak komersial kadangkala terlibat dengan kecelakaan jalanraya yang berpunca daripada pelbagai sebab. Kesemua sebab itu boleh mendorong pemandu trak komersial untuk cenderung untuk bertembung dengan kemalangan jalanraya. Oleh sebab itu, kefahaman yang jelas mengenai factor-faktor yang membawa kepada potensi untuk kemalangan hendaklah dikenalpasti dalam usaha untuk mengurangkan jumlah kes kemalangan. Objektif dalam kajian ini adalah untuk mengenalpasti penyebab kemalangan jalanraya yang kebiasaannya berlaku melibatkan kenderaan komersial, untuk menilai penggunaan pemanduan defensif ketika membawa barangan, dan untuk mencadangkan pendekatan pengurusan pemandu komersial bersesuaian yang dapat dibangunkan. Kajian ini dijalankan menggunakan kaedah kajian kes yang mana penyelidik telah memilih sebuah syarikat pengangkutan dari Port Klang sebagai populasi and data dianalisa berkaitan seperti laporan siasatan kemalangan berdasarkan kepada kemalangan-kemalangan yang telah terjadi pada tahun 2012. Dapatan kajian menunjukkan punca utama kemalangan jalanraya adalah kerana sikap serta perangai pemandu itu sendiri, keadaan jalan, keadaan cuaca serta persekitaran. Walau bagaimanapun, jikalau pemandu trak komersial secara efektifnya mengamalkan cara pemanduan defensif, risiko untuk terlibat dengan kemalangan jalanraya boleh dikurangkan. Kajian menyimpulkan bahawa seminar dan kursus, sesi latihan, dan perbincangan serta taklimat bersama pemandu trak dalam usaha untuk memberi pendidikan serta memperbetulkan sikap dan perangai mereka adalah penting. Jika sikap serta perangai mereka dapat diperbaiki, mereka tidak akan memandu secara agresif seterusnya mengamalkan cara pemanduan defensif dan ini akan dapat membantu mereka untuk menjadi lebih perseptif dan mempunyai kebolehan untuk menjangka situasi dan kesan yang boleh berlaku ketika mereka sedang memandu yang akhirnya akan menjadi sangat berguna dalam apa jua situasi samada hujan, keadaan jalan yang teruk ataupun persekitaran yang dahsyat.

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GLOSSARY OF TERMS

MILS	-	MISC Integrated Logistics Sdn. Bhd.
SPAD	-	Land, Public Transport Commission
JIT	-	Just-In Time
HSE	-	Health, Safety and Environment
ADT	-	Average Daily Traffic
RKP	-	Rakan Khidmat Penghantaran (Driver)
FMDMS	-	Fleet Management Department Management System
VTI	-	Swedish Road and Traffic Research Institute

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CHAPTER 1

INTRODUCTION

Every year, the transportation industry is a leader in work related injuries, either fatal or non- fatal. Commercial vehicles such as prime movers and other large freight carriers are a unique presence on roads that are occupied mostly by small passenger vehicles, and commercial vehicles bring dangers that are also unique. Not only do commercial trucks drivers need to be aware of the special circumstances potentially produce by the large vehicles they are driving, but other drivers on the road also need to use caution in their presence. Especially on major highways and at higher speeds, seemingly insignificant driving errors that may occur without consequence where small vehicles are concerned can result in catastrophe when a prime mover is involved.

Commercial vehicle accidents can result from a variety of factors, including the carelessness and recklessness of drivers. Some causes of commercial vehicle accidents include, but are not limited to:

1. Mechanical Defect: This can include defective electrical systems, wheels and tires, brake systems, repair and upkeep neglect, and more.
2. Human Error: Drivers are required to operate commercial vehicles with 100% of their ability at all times. Unfortunately, issues like intoxication, sleep deprivation and inadequate training often result in commercial vehicle accidents.

3. Road Condition: Road maintenance as well as upkeep and design can also be factors in a commercial vehicle accident.

1.1 Background of Problem

Road accidents involving commercial vehicles in Malaysia have increased over the years. Jacobs and Aeron-Thomas noted that Malaysia has the highest number of road accidents compared to any other countries in the world. The main causes of road accidents are road condition, traffic lights, drivers' factor, vehicle condition, speeding, road lighting and others. Despite attempts by the government in improving all the factors mentioned especially road quality and road lightings, the accident rate remain high in recent years.

Since 2007 the behaviour of commercial truck drivers has been a major issue, and continues to remain so. Commercial truck drivers play a key role in providing safe handling of the goods transported. The state of mind and health of drivers and the preparation before the journey all count. The respective management has to ensure that drivers are sent for training to equip them with knowledge to be proactive during conflict situations and emergencies during journeys. Good driver management will result in good driver behaviour and fewer summonses.



Figure 1-1 Commercial Vehicles Accident in Ayer Keroh, Melaka

Figure 1-1 taken from the TheStar newspaper report about incident occurred last December when a speeding lorry went out of control and caused a 10-vehicle accident, leaving two people dead and three seriously injured at the Jalan Gapam-MITC-Jalan Tun Abdul Razak traffic junction in Ayer Keroh. The vehicles involved in the accident were three lorries, three cars and four motorcycles. Witnesses testify that the lorry rammed into a tipper truck and a cargo lorry and seven other vehicles before it skidded and landed on the opposite side of the road.

Safety, Health and Environment Code of Practice (SHE COP) which was introduced since 2007 in view to manage and address driver, journey and vehicle problems. There was a plan to retrain commercial vehicle drivers and send them for safety courses. Commercial vehicles were supposed to be installed with GPS units to track vehicles that were over-speeding or going off-track. All these plans received so much publicity, but no meaningful results yet to be seen.

The re-registration exercise by Land, Public Transport Commission (SPAD) exposed the existence of thousands of illegal commercial vehicles which have not undergone routine roadworthiness inspections. Many of these vehicles will help to further escalate the road accident statistics in future.

Table 1-1 Total Vehicles Involved in Road Accidents, Malaysia, 2001 – 2010

Year	Total Cases	Cases Involving Trucks
2001	483,351	36,448
2002	507,846	37,794
2003	555,634	42,753
2004	602,153	54,420
2005	581,136	42,062
2006	634,182	44,767
2007	666,027	47,696
2008	671,078	48,250
2009	705,623	26,724
2010	760,433	50,438

Table 1-1, taken from Royal Malaysia Police, shows the total number of the recorded road accident in Malaysia for the past ten years, and unsurprisingly the total of trucks involved in road accidents recorded massive five-figure number of cases.

The nation Road Safety Plan 2006-2010 was yet to be achieved, which was to bring down the road fatality index from 23 per 100,000 populations in 2006, to 10 per 100,000 by the year 2010. Our fatality index has not improved at all. What has gone wrong?

1.2 Problem Statement

During the process of transporting goods, commercial truck drivers sometimes involve with road accident brought forth by several reasons. All those reasons could lead the commercial truck drivers prone to potentially engage with road accident. Hence, clear understanding on the factors contribute to potential accident should be identified in order to minimise the accident cases.

1.3 Research Question

What are the best possible solutions that could be recommended for transport operator in effort to minimise potential road accident among commercial drivers while transporting goods?

1.4 Research Objectives

1. To determine for the common causes of road accident involving commercial truck.
2. To evaluate the application of defensive driving while transporting goods.

3. To propose appropriate commercial driver management approach that could be implemented.

1.5 Scope of Research

The scope of the research defines the boundary of the study. For this research, the scopes are as follows:

1. The study will utilise incident investigation reports and data collected in 2012.
2. The study will target respondents consisting of drivers who previously involved with road accidents during work.
3. The study will be conducted in the operator premises area, which is under the administration of the haulage operator.
4. Operational data of the haulage operation will be obtained through secondary sources as provided by the operator.

1.6 Research Assumptions

In this study, several assumptions were made. Among these assumptions are:

1. There are no unrecorded accident cases.
2. All accidents have been properly investigated and no pending accident investigation ongoing.
3. The accident investigation conducted with integrity and honesty.

1.7 Limitations of Research

The limitations in this study are:

1. It will be conducted only at a MISC Integrated Logistics Sdn. Bhd. (MILS) located in Port Klang.
2. The data to be collected will only covers certain period of time and not all the data from the beginning of the company start its operation.

1.8 Expected Contributions

1. It is expected that the findings of this research will give advantages for other haulage companies in Malaysia to minimise the potential road accident. It will be used for public and private sectors to look forward in improving the performance of logistics activities.
2. From this research, it will help other researcher to study more deeply on the findings and hopefully could come out with another possible improvement.

1.9 Significance of Research

The significant of this study are:

1. The study will help haulage operation planner, drivers and management in planning their transportation activities while at the same time minimising potential road accident.
2. This study will open up for more critics and improvisation for future researcher, students and academician.

1.10 Research Design

Since this is a study to identify other factors that could lead to potential road accident among commercial truck drivers, the study will employ the qualitative methodology by using secondary data. Secondary data analysis saves time that would otherwise be spent collecting data and, particularly in the case of qualitative data, provides larger and higher-quality databases that would be unfeasible for any individual researcher to collect on their own.

Among the problems or issues that need to be explored are to identify the significant of defensive driving in preventing potential road accident. A complex detail understanding of the issues can only be obtained by thorough evaluation of the secondary data such as accident investigation report. Understanding the context or setting which participating in the study could address the problem or issue.

1.11 Thesis Outlines

This report consists of three chapters. The outlines of the chapter are as follows:

Chapter 1: The purpose of this chapter is to provide the brief introduction towards various issues such as the background of the problems, goals and objectives of the research, scope and limitations, assumptions, expected contributions and significance of the research and finally the research design.

Chapter 2: The purpose of chapter 2 is to discuss the theoretical foundations for the study to be implemented by outlining the important concepts, theories and framework that contribute to design and implementation of the research.

- Chapter 3: This chapter will discuss the methodology of this study.
- Chapter 4: This chapter will discuss on analysis, findings and result that the researcher gains from the data.
- Chapter 5: This chapter provides the recommendations and conclusions of the research.

1.12 Chapter Summary

This chapter provides the brief introduction towards various issues such as the background of the problems, goals and objectives of the research, scope and limitations, assumptions, theoretical framework of the research, expected contributions and significance of the research and finally the research design. The next chapter will give the theoretical foundations for the study to be implemented by outlining the important concepts, theories and the framework that contribute to implementation of the research.

REFERENCES

- Christie, R. & Fabre, J. (1999). *Potential for fast-tracking heavy vehicle drivers*. Melbourne: National Road Transport Commission (NRTC).
- Christie, R. (1991). *Driver Training/Education: The Wrong Place to Start in Safe Fleet Management?*, Paper presented to Australian Fleet Magazine's Fleet Management Conference. Melbourne and Sydney, September.
- Christie, R. (1996). *Driver training - What have we learned?* NRMA Today, Edition 12, 20-24.
- Christie, R. (2000). *Off-road facilities for traffic safety education and novice driver training- A cautionary tale*. In Proceedings of the Saferoads, Local Government Road Safety Conference, Melbourne, Australia, 20-21 July.
- Creswell, J.W. (2007). *Qualitative inquiry and research design: Choosing among five approaches (2nd ed.)*. Thousand Oaks, CA: Sage.
- Dewar, R.E. (1991). *The Driver: Improving performance to improve safety*. ITE Journal, July, 33-37.
- ERSO – European Road Safety Observatory (2007), *Work-related road safety*, 2007
- European Agency for Safety and Health at Work (EU-OSHA) (2001), *Preventing Road Accidents involving Heavy Goods Vehicles*, Factsheet 18, 2001.
- European Agency for Safety and Health at Work (EU-OSHA) (2010), *OSH in figures – OSH in the transport sector – an overview*, 2010

- European Foundation for the Improvement of Living and Working Conditions (2004), *EU road freight transport sector: Work and employment conditions*, 2004.
- Haworth, N., Kowaldo, N. & Tingvall, C. (2000). *Evaluation of pre-driver education program*. Report No. 167. Clayton, Victoria : Monash University Accident Research Centre.
- Haworth, N., Tingvall, C. & Kowaldo, N. (2000). *Review of best practice road safety initiatives in the corporate and/or business environment*. Report No. 166. Clayton, Victoria.: Monash University Accident Research Centre.
- Keller, J.J. Online driver training course information. Retrieved from <http://www.jjkeller.com>
- Law, T.H., Wong, S.V. and Radin Umar, R.S (2004). *The Malaysian Government's Road Accident Death Reduction Target for Year 2010*. Universiti Putra Malaysia, 2004.
- Lord, P. (2000). *Advanced blindness: Advanced driver training produces safer drivers, right? Maybe, maybe not, say the experts*. Wheels Magazine, 21-23.
- Manders, S.A. (1986). *Fleet management techniques. An investigation of the effectiveness of various techniques on vehicle collision prevention*. Report GR 86/17. Hawthorn, Victoria: Road Traffic Authority.
- Radin Umar R.S. (1998). *Critical Review of Road Safety in Malaysia*. Volume 7, No 1, The Proceeding of The Chartered Institute of Transport in the UK. March 1998.
- Radin Umar, R.S. *Update of Road Safety Status in Malaysia*. Universiti Putra Malaysia, 2005.

- Reason, J., Manstead, A., Stradling, S., Baxter, J., & Campbell, K. (1990). *Errors and violations on the road: A real distinction?* *Ergonomics*, 33, pp. 1315–1332.
- Rimmo, P.A. (2002). *Aberrant Driving Behavior: Homogeneity of a Four-Factor Structure in Samples Differing in Age and Gender.* *Ergonomics*, 45(8), pp. 569–582.
- Smith System Defensive Driving. Retrieved from <http://www.smith-system.com>
- Stake, R. (1995). *The art of case study research.* Thousand Oaks, CA: Sage.
- Statistical Report Road Accident, Road Traffic Branch, Royal Malaysia Police Bukit Aman. 2001-2010. Website of Royal Malaysia Police Bukit at <http://www.rmp.gov.my/>
- Treat, J.R. (1977), *Tri-level study of the causes of traffic accidents: An overview of final results.* Proceedings - 21st Conference, American Association for Automotive Medicine, Vancouver, Canada.
- Treat, JR., Tumbas, N.S., McDonald, S.T., Shinar, D., Hume, RD., Mayer, RE., Stansifer, RL., and Catellan, N.J. (1979). *Tri-Level Study of the Causes of Traffic Accidents: Volume I: Causal Factor Tabulations and Assessment* (Document No. DOT HS-805 085). Washington, DC: National Highway Traffic Safety Administration, USDOT.
- VTI - Swedish Road and Traffic Research Institute (1990). *Traffic safety in the Telecommunications Administration*, in VTI Annual Report 1989/90. Linkoping, Sweden.
- Watson, B. (1994). *Driver education and training: An overview of the evidence and the implications for young drivers.* Brisbane. Queensland Transport.

- Watson, B. (1997). *When common sense just won't do: misconceptions about changing the behaviour of road users*. In Bullen & Troutbeck (Eds). *The Second International Conference on Accident Investigation, Reconstruction, Interpretation & the Law: Proceedings, 20-23 October 1997* (pp347-359): Brisbane.
- Watson, B., Fresta, J., Whan. H., McDonald, J., Dray, R., Beuermann, C., & Churchward, R. (1996). *Enhancing driver management in Queensland*. Brisbane: Land transport & Safety Division, Queensland Transport.
- Yin, R. K. (2003). *Case study research: Design and methods (3rd ed.)*. Thousand Oaks, CA: Sage.