MIROS
BOOK OF ABSTRACTS 2017

MIROS
MALAYSIAN INSTITUTE OF ROAD SAFETY RESEARCH
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MIROS BOOK OF ABSTRACTS 2017

This book compiles and lists the reports published by MIROS in 2017. The reports are fundamentally the outputs of the research projects and operational exercises carried out by the research centres at MIROS. The reports are generated and produced by the respective units under each centre, and focus on their specific areas of expertise in the fields of road safety.

The reports are divided into several categories. All reports are available to the general public except those labelled restricted or confidential. The reports provide extensive insights into various issues related to road safety in general, and more specifically, road safety issues in Malaysia. Depending on the categories, the reports contain analyses, reviews and/or recommendations. Although the reports are official documents produced by MIROS, they not binding on any other parties, whether mentioned in the reports or otherwise. The inputs from the reports are to be used only as references and as sources of information. Reference herein to any specific reports does not necessarily constitute or imply its endorsement, recommendation, or favouring by MIROS, the Ministry of Transport of Malaysia, or the Malaysian Government. Interested parties may contact MIROS to obtain the full report.

MALAYSIAN INSTITUTE OF ROAD SAFETY RESEARCH

Established on 3rd January 2007, MIROS is a one-stop centre for the generation and dissemination of road safety information and dissemination of road safety information through various media and a concerted training programme. MIROS carries out studies and evaluates current procedures on road safety to generate information that will form the core of its evidence-based intervention programmes to enhance road safety. This effort is also assisted through the establishment of networks and partnerships with more experienced international members of the road safety research field.

Ever since its inception, MIROS has produced a number of research publications on road safety. These reports published in 2017 are available in this book of abstracts.

VISION

To emerge as a world leader in road safety research

MISSION

To foster the science and arts of road safety interventions

MIROS RESEARCH REPORT (MRR)

MRRs are technical reports derived from research findings. The reports address objectives, methodologies, and results that lead to recommendations and conclusions.

MRR NO. 168

A Study on Vehicle Speeds at Intersection Approached in Selangor

Authors(s): Nusayba Megat Johari, Norfaizah Mohamad Khaidir, Azzuhana Roslan, Sharifah Allyana Syed Mohamed Rahim
ISBN: 978-967-5967-76-4

This report highlights factors associated with speed control of vehicles approaching intersections by identifying their speeds. This study aimed to recommend measures to road authorities to improve intersection safety.

The Hulu Langat district was used in the case study. Selected intersections had a variety of geometries and control types. The speeds of vehicles were recorded for two hours during the daytime off-peak period (10 am–12 pm) and two hours during the night-time off-peak period (9 pm–11 pm) at all intersections. A total of 102,658 speed readings were obtained throughout this study.

Variables hypothesised as related to the driving speed at intersection approaches included vehicle type, time of day, presence of warning signs, number of lanes, area type (i.e., residential, commercial and mixed-use), intersection control type, as well as intersection geometry. Statistical analysis was conducted to test the effect of these variables on the driving speed at intersection approaches.

The area type and number of lanes per direction had a greater influence on driving speed at intersection approaches compared to the other tested variables. Residential areas recorded an average intersection approach speed higher than those for commercial and mixed-use areas. Intersection approaches with two lanes per direction had a higher mean speed compared to those with one or three-lane approaches.

Of the total speed data collection, 18.5% showed speed violations, with car drivers accounting for 70% of these. The greatest proportion of speed violations occurred on roads with a lower speed limit (i.e., 60 km/h). Speed violations were more prevalent during the daytime than the night-time.

MRR NO. 206

Parents' Knowledge and Attitudes on Child Restraint System (CRS) Usage in South Peninsular

Authors(s): Noor Faradila Paiman, Yahaya Ahmad, Aqbal Hafeez Ariffin, Azhar Hamzah, Rohayu Sarani, Akmalia Shabadin, Mohd Syazwan Solah, Mohd Rasid Osman, Wong Shaw Voon

ISBN: 978-967-2078-00-5

Children are much more likely than adults to get serious injuries in car crashes due to their softer bones, weaker neck muscle and fragile bodies. Child Restraint System (CRS) can help in reduce injury and prevent fatality in the event of a crash. This study aimed to measure parents' knowledge on CRS usage before the CRS law and regulations are implemented in Malaysia. A survey addressed parents/carers' knowledge about the "best size" ranges for restraints available in the Malaysian market, the types of restraints they were using for their children and frequency of use as well as their views on fitting restraints to vehicles. 74% out of 500 respondents cited they have had ever use CRS, and only 40% of them is currently using it with their children. 64% of them know about CRS and their function, 43% had ever heard of ISOFIX attachment system. About 70% of them choose the correct seat location, but the "best size" usage rate was found low. In conclusion, high usage rate with high incorrect usage and understanding of the CRS could promote additional injury towards the children in a car crash. Many initiatives could be introduced before the implementation of the CRS law in Malaysia such as awareness, community-based programs and CRS clinics that aim to guide parents on the correct and effective way of installing the CRS device in their car.

MRR NO. 207

Vulnerability of Pedestrians at Traffic Junction

Authors(s): Rizati Hamidun, Azzuhana Roslan, Rohayu Sarani, Akmalia Shabadin, Siti Zaharah Ishak, Wong Shaw Voon
ISBN: 978-967-2078-01-2

An accident involving pedestrian may easily result in fatal injury due to their vulnerability. As reducing fatality in road accident becomes the road safety target, effort should be taken to identify fatality is contributing factors through analysis of existing accident data. Thus, this study aims to investigate the factors associated with pedestrian fatality injury. Utilising pedestrian accident data from the year 2009–2013, the pedestrian injury a model was developed using logistic regression to identify the factors related to pedestrian fatalities at cross and T/Y junctions. The final model explained four significant factors including the age of pedestrian, part of the bodily injury, vehicle and junction type. The results show that accident involving pedestrian occurred at the T/Y junction, pedestrian hit by heavy vehicle, and experiencing head/neck injury increases the likelihood of being fatal and may increase 5.6 times when being hit by heavy vehicle compared to other types of vehicles. Traffic ban for heavy vehicles and speed control the area with a high volume of pedestrian should be considered due to the greater impact of these factors vehicles on the pedestrian fatality.

MRR NO. 210

Understanding the Use of Motorcycles among Secondary School Students Based on Protection Motivation Theory

Authors(s): Azhani Ali, Zulhaidi Mohd Jawi, Sharifah Osman @ Liew Shyuan Yei, Sharina Shariff, Low Suet Fin, Wong Shaw Voon

ISBN: 978-967-2078-02-9

Despite the high risks as reflected from the annual road traffic casualties, motorcycles remain as a popular mode of transport in Malaysia due to its economic and ease-of-use factors. The age of the secondary school students in Malaysia ranges from 13 (Form 1) to 18 (Form 6), and thus technically the students who conform to the legal age to ride a motorcycle to school must be at least from Form 4, at the age of 16. From the author's thorough review, there's no literature found that discussed license ownership among secondary school students in Malaysia's context; however, it is common to see the youths under the legal age riding motorcycles on public roads.' Therefore, the general objective of this study is to identify the behaviour towards motorcycle usage among secondary school students based on the Protection Motivation Theory (PMT). PMT is one of the few health-related theories that are commonly used to address fear and threat appeal to predict behaviour change. It is chosen in order to help in explaining the rational and irrational decision making processes among the target samples. This quantitative study has applied self-administered questionnaire for the data collection. From a total of 412 respondents, the results revealed that the students tend to agree that riding a motorcycle is riskier compared to other mode of transportations. Nevertheless, they are not willing to change to the safer mode of transport due to several factors such as peer influence, family-based decision-making and most importantly the convenience factors that motorcycle has to offer. More studies are needed in the future in both socio-economic and socio-technical perspectives with regard to commuting to school among school students.

MRR NO. 211

Understanding the Use of Motorcycles among Secondary School Students Based on Protection Motivation Theory

Editors: Fauziana Lamin, Mohd Rasid Osman, Low Suet Fin, Siti Zaharah Ishak, Wong Shaw Voon
ISBN: 978-967-2078-03-6

This report contains evaluation study of OPS Selamat 7/2015 effectiveness. The evaluation was conducted through several research projects, i.e. seatbelt wearing compliance, helmet wearing compliance, vehicle speed and CRS usage. Findings of each measured variable were presented in separate chapters. The comparative trend of road users' perception and behavioural changes between during OPS Selamat and the non-OPS period was observed. As results, it was found that OPS enforcement activities have a positive effect towards helmet wearing compliance and CRS usage for vehicles entering Klang Valley. However, seatbelt wearing rate decreases and the strategy of lowering the speed limit only increase the speeding noncompliance rate. These findings exhibit that the OPS Selamat 7/2015 affects on some elements of road users' behaviour changes towards traffic legislation compliance. In order to further improve, enforcement should be emphasising to those elements that show an alarming compliance rate. On the other hand, trend analysis for POBC among road users reveals that the level of POBC is significantly higher during OPS as compared to before and after OPS, which demonstrates that the operation is still relevant. However, the rate of POBC is still at the moderate level over eight years (2008–2015). Thus, this effort should be continued with innovative approaches to ensure continual improvement of the road users' perception towards compliance with rules and regulation.

MRR NO. 212

Risk Factors Identification and Issues Pertaining to Road Collisions Involving Pedestrian and Motorcycle

Authors(s): Aqbal Hafeez Ariffin, Azhar Hamzah, Noor Faradila Paiman, Mohd Syazwan Solah, Siti Fairos Mat Husin, Zulyahikem Zakaria, Mohd Rasid Osman, Wong Shaw Voon

ISBN: 978-967-2078-04-3

Road crash statistics from the Royal Malaysia Police (RMP) revealed that there are serious concerns over the relatively high amount of road crashes involving pedestrian-motorcycle in Malaysia. Analysis conducted on local motorcycle crash data for the 2001-2010 period showed that motorcyclists were involved in 24.8% of killed and severely injured (KSI) crashes involving a collision with a pedestrian (by type of the first collision). This warrants a study to be carried out to understand the overall accident characteristics and investigate the associated risk factors. Secondary data from RMP records (POL 27) which were retrospectively collected via MIROS Road Accident Analysis and Database System (M-ROADS), were utilised using five years (2009–2013) of related road crashes (n = 1,626). Results of logistic regression analysis shown that the following factors collectively led to a higher probability of being fatal for pedestrians; pedestrian aged more than 25 years old; suffers head injury (location of body injury); being involved in a crash with a road speed limit of more than 50 km/h; being involved in crash occurred at straight road and being involved in a crash that happens at location with dark-unlit condition. Subsequently, focus group discussions with stakeholders were also conducted to gather relevant data to identify related issues and suggestions on motorcycle safety technology with regards to collision with a pedestrian.

MRR NO. 213

Assessing Retro-Reflective Markers (RRMs) Usage on Heavy Goods Vehicles

Authors(s): Mohd Amirudin Mohamad Radzi, Mohd Syazwan Solah, Ahmad Noor Syukri Zainal Abidin, Kak D-Wing, VJ Tan, Mohd Rasid Osman, Wong Shaw Voon

ISBN: 978-967-2078-05-0

Since 2011, MS 828:2011 (Malaysian Standard) has been gazetted to guide industry on the right specification to follow with regards to RRMs. The implementation of MS 828:2011 has been announced by Transport Minister of Malaysia in June 2016, and all trucks and trailers in Malaysia are compulsory to install RRMs which complied with MS 828:2011 starting on 1 July 2016.

In order for better visibility of long, heavy goods vehicles and their trailers, etc., these vehicles have to be marked with effective and complied RRMs in order to reduce the number of rear-end collision, in particular, related to conspicuity issue. However, the RRMs that are being used by the heavy and long vehicle including in the current market were not up to the standard with respect to colourimetric, photometric and dimension.

The objectives of this study are i) to identify the current status of RRMs in Malaysia, ii) to profile the photometric values of current RRMs and iii) to determine usage rate of substandard RRMs on heavy goods vehicles and the current market. This study has identified the current status of RRMs on heavy goods vehicles (trucks and lorries) and current market with regards to the compliance of MS 828:2011.

Market surveillance, samples testing and drivers' interview were conducted to determine on current RRMs usage and to analyse the photometric values of RRMs with respect to MS 828:2011. Fifty samples of RRMs were purchased randomly at hardware and accessories shops. Real world samples were collected randomly from 100 lorries who stopped at Sungai Buloh rest area. The old RRMs on the lorries were changed with the new RRMs which complied to MS 828:2011. Also, for the drivers' interview, 100 of

trucks and lorries drivers were randomly selected during the samples collected from their vehicles at Sungai Buloh rest area.

The descriptive analysis was carried out for this study. As a result, 62% of RRMs on heavy goods vehicles were still not in good condition and covered by dirt beside only 4% of the RRMs samples complied with MS 828:2011. Also, from this study, it can be concluded that the majority of the RRMs in the current market and have been used by current heavy goods vehicles are of substandard quality. From the findings, the usage of counterfeit markings or not up to standard markers may not be fully functional to reflect the light emanating from the headlights of other motorists to warn them that they are closing in on heavy vehicles. This is dangerous to the other road users who are travelling at the night time, and they are at risk to be involved with the rear end crashes especially with the lorries and trucks that are using non-compliance markers.

After taking into consideration all the findings, several recommendations are proposed for the consideration of the related authorities such as to make mandatory for all lorries and trucks to install RRMs that comply to MS 828:2011, and to implement effective enforcement towards the usage of RRMs. Also, the awareness program related to RRMs for the lorry owners and fleet operators should be implemented to give the awareness regarding the usage of RRMs. Further study also can be conducted to carry out to look the comparison percentage usage of RRMs with complied to MS 828:2011 before and after implementation.

MRR NO. 214

Establishing Baseline for the 2017 Revised Road Safety Education Module for Primary School through Context, Input, Process and Product (CIPP) Model

Authors(s): Hussain Hamid, Low Suet Fin, Law Teik Hua, Tan Kean Sheng, Ng Choy Peng, Nur Afifah Aisyah Mohmood Nor, Amelia Hazreena Abdul Ghani, Norainy Othman, Wong Shaw Voon

ISBN: 978-967-2078-07-4

Road Safety Education in Malaysia as a part of the formal curriculum has been implemented in stages since 10 years ago. In 2015, Malaysian Institute of Road Safety Research (MIROS) had conducted a study on Review of RSE Module for Primary and Secondary School. The findings of the study have initiated Road Safety Department Malaysia (RSD) to propose for an allocation to revise and redevelop the RSE Module. MIROS was given the honour to carry out the project of Review and Redevelopment of RSE Module for Primary and Secondary schools besides developing the teachers' guide on RSE for the nursery and pre-schools using the allocation given to RSD. The final manuscript of the revised RSE module for primary students was produced and used in the 24 primary schools selected for the pilot study.

A study to establish the baseline for the Revised Road Safety Education Modules for Primary School 2017 through Context, Input and Process and Product (CIPP) Model is needed to determine the level of knowledge and skill about road safety among the primary school students because RSE has been nationwide implemented since 2007. This integrated report encompasses the findings of the Context, Input, Process and Product (CIPP) study that is an improvement-oriented approach. It is to generate the baseline in terms of the readiness of school, teachers and student, road safety knowledge and behaviour among the students, and the spillover effects from students on parents for the pilot study of the revised RSE modules in the 24 selected primary schools in Malaysia.

The contextual study established the baseline, which is the status of schools' facilities, road safety clubs and activities that support the implementation of the previous RSE

modules in primary schools as of end of the year 2016 since its commencement in the year 2007. The outcome from comparing the baseline with the post-study of the pilot revised RSE program helps to assess the hypothesis that availability of the internet access and the other supporting facilities enhance the teaching delivery by teachers and learning process of students on the revised RSE modules. Currently, of the 24 pilot schools, 83% of schools have computer laboratory and 79% have internet access, 83% have LCD screen and 71% have LCD projector.

As of end of the year 2016, only 21% of the pilot schools have road safety clubs that are still active (club members are students from Year 4, 5 and 6 only). Apart from that, only 4% of schools have had road safety activities or talks, and only 4% have road safety corners that exhibit road safety materials at the notice boards. As such, the post-study will seek to measure if the availability or enhancement of road safety activities, clubs, and road safety corners create awareness and knowledge input to both teachers and students.

With regard to facilities outside the school compound, the established baseline is the availability of the School Traffic Warden Program. As of the end of the year 2016, such program is not available in all 24 schools. Taking into account that this program is important to boost student's appreciation and knowledge in road safety, a post-study will seek to identify if any of the schools have implemented the program in 2017.

In the Input-Process component study relating the initial perception of Bahasa Melayu (BM) teachers on the implementation of RSE in primary schools, it was found that 85% of them rated 9 out of 10 for their overall opinion on the need of RSE program in schools. This established baseline represents their perception from experience of teaching the previous RSE modules. The development of instruments in the post-study will objectively measure the improvement in teacher's perception of the revised RSE module by comparing to the pre-study questionnaires.

The baseline of the product component was established based on three aspects, that is, the road safety knowledge, the behaviour of the student, and the spillover effect from students to parents. As for the behaviour, the findings revealed that less than 50% of the students from pre-school, Year 1, Year 2 and Year 3 stated "always" on three out of six positive road safety behaviour item. However, the percentage of

students stated “always” in item “hold adults’ hand when crossing street” is high which is more than 60%. As for students of Year 4 and Year 5, less than 40% of the students stated “always” on four out of six positive behaviours item. All the above findings are prevalent in both urban and rural areas.

Besides that, the findings further illustrated that majority of students from pre-school until Year 5 are still not aware on the importance of wearing bright clothes to enhance their visibility and walking facing the traffic along the street. For the students of pre-school, Year 2 and Year 3, they are also not aware of the needs to wave at the drivers before crossing the street. At the same time, very few of the Year 4 and Year 5 students have used the service of lollipop man; this finding can be explained as the findings of the contextual component reported that very few schools have traffic warden programs.

The baseline on road safety knowledge from pre-school to Year 5 has been established. The different cut off score on road safety knowledge for each year was obtained and will be compared with the score in the post-stage of the study. As for the pre-school students, 57.9% of them failed to answer correctly any of the questions provided which is relatable as pre-school students has not exposed to road safety education. The cut off score for Year 1 students is at the score of 4 where only 11.7% of the students have obtained this score. For Year 2 students, the cut off score is at the score of 9 with 13.0% of them got this score. Meanwhile, the Year 3 students demonstrated a cut off score of 10 with 21% of them achieved this score. 7 is the cut off score for students of Year 4, 10.1% of them possess this score. Lastly, for students of Year 5, the cut off score are 13 and 12% of them hold this score.

Besides that, the study used Willingness to pay (WTP) as the indication for the spillover effect from students on parents. The protective category of Family Communication Pattern contributed a mean WTP of RM919.41. Whereas, consensual category reported RM1,364.25 as the mean WTP. As for Leissez-faire category, the mean WTP is RM1,541.80. The mean WTP of the pluralistic category is RM19,582.20. On the other hand, the baseline for the parent-child initiation discussion on the topic of safety equipment, road safety regulations and road safety experience/views were established. The students of pre-school until Year 5 reported the highest percentage that is more than 60% on the topic of road safety experience/views.

A positive change for the baseline for all the components is expected as the modules have been revised due to the change of curriculum from the New Primary School Curriculum (KBSR) to Standard Based Curriculum for Primary Schools (KSSR). Besides that, the modules also have been amended in a few aspects, namely the theme, contents, activities, teaching aids and parents' involvement.

MRR NO. 215

Evaluation of Commercial Aftermarket Brake Pads Performance

Authors(s): Afiqah Omar, Fauziana Lamin, Muhammad Azizirrahim Mohd Yusof, Mohd Rasid Osman, Talib Ria Jaafar, Ahmad Noor Syukri Zainal Abidin, Wong Shaw Voon

ISBN: 978-967-2078-06-7

Brake pads are one of the most important components in automobile braking system. As reported by several studies, brake pads are the results of the combination of several materials and the new formulations are mainly based on the experience of trial and error method. A composite of brake pads usually consists of structural materials, matrix, filler, abrasives and lubricants. Each component plays different roles in the performance of friction materials. The effectiveness of the brakes subjected to quality and proper composition of the brake pads.

The designer of brake pads must consider factors such as friction stability, durability and minimisation of noise and vibration. A variety of materials is combined to maximise the performance of friction materials in all areas. Categories of brake materials include metal, semi-metallic, non-asbestos organics and ceramic. Different formulations have varying wear rates, braking properties and noise levels.

The evaluation of the performance of brake pads involves friction test and wear characteristics of friction material. Different countries practice different regulations, which set the minimum requirement for the friction materials to perform. The main procedures that are publicly available and can be referred include Federal Motor Vehicle Safety Standards (FMVSS), J Standards or Recommended Practices, International Standards (ISO) and ECE Regulations (UNECE). It should be noted that during the period of this study, the Malaysian government has already implemented United Nation Regulation 90 (UN R90) and Malaysian Standard (MS) 1164:2015 for replacement brake pads. However, the regulations are still not gazette. This report presents the performance of aftermarket brake pads without any marked proof of

certification sold in Malaysian market and suggests a direction for future developments.

An experimental investigation was conducted to evaluate the performance analysis of commercial brake pads sold in Malaysia. The brake pads selected in this study belong to a large circulation vehicle in Malaysia, which also establish a high number of sales. Convenience sampling was done in Klang Valley area to investigate the purchase price sold for this selected model. Based on the price, an original and two aftermarket brake pads were selected for on-road performance test, where the approach was made according to UN R90. Results of the performance obtained by the brake pads are evaluated and discussed in this report. It was found that both aftermarket brake pads surpassed the requirement of UN R90 with REM1 shows greater performance than REM2. However, REM1 also recorded the highest wear rate after the test, followed by REM2 and OEM. The materials properties of all tested brake pads were further evaluated for further comprehension of the friction materials.

MRR NO. 216

Safety Violations, Traffic Errors and Speeding as Contributing Factors in Road Crashes among Young Motorcyclists in Klang Valley

Authors(s): Nuur Sakinah Azman, Nuura Addina Mohamad, Ahmad Azad Ab Rashid, Sharifah Osman @ Liew Shyuan Yei, Low Suet Fin, Wong Shaw Voon

This study uses an adapted version of the Motorcycle Riding Behaviour Questionnaire (MRBQ) as the instrument to explore Safety Violations, Traffic Errors and Speeding as contributing factors in road crashes among young motorcyclists. The instrument was uploaded online using Google Forms and made accessible to anyone with the link. Purposive sampling was used along with the snowballing method to obtain participants within the 16–25-year-old age group who frequently ride motorcycles in Klang Valley. A total of 133 respondents participated in this online study. The results of this study found that the most frequently reported construct among young motorcyclists is Speeding. However, further analysis shows that the most frequently reported behaviour is crossing a junction while the traffic light is red, which falls under the Safety Violations construct, as reported by 52.6% of the young motorcyclists. Meanwhile, 42.7% of the young motorcyclists reported that they frequently exceed the speed limit on the motorway which falls under the speeding construct. Logistic regression found Traffic Errors (e.g., missing “Give Way” signs and barely avoid colliding with traffic having the right of way) to be a significant predictor of crash involvement among young motorcyclists. Thus, when Traffic Errors increase by one unit, the odds for young motorcyclists to involve in road crash increase by a factor of 1.381. Based on the findings, it is imperative that enforcement activities be redesigned to ensure that young motorcyclists will reduce their behaviour of running red lights and exceed the speed limit.

MRR NO. 217

Automotive Consumerism: A Study of Car User's Practices & Behaviour in Klang Valley, Malaysia

Authors(s): Zulhaidi Mohd Jawi, Mohd Syazwan Solah, Aqbal Hafeez Ariffin, Akmalia Shabadin, Azhani Ali, Mohd Rasid Osman, Wong Shaw Voon
ISBN: 978-967-2078-11-1

This study is conducted to identify the car user's practices and behaviour, with focus on six specific areas: car ownership profile; travel pattern and exposure; cost of vehicle ownership (CVO) – trip, legal, risk and aftermarket; knowledge and awareness in maintenance and retrofitting; perception and involvement in road crashes; and perception on End-of-Life Vehicle (ELV) initiative. As a continuation of the previous study dubbed as "the automotive ecosystem in Malaysia", this study took the Klang Valley (KV) car commuters as the representation of the above-mentioned practices and behaviour. As current data and other studies suggest that the ownership of cars in Malaysia is among the world's highest, this study is vital to explain the status quo of Malaysia's car users' ownership experience and its relationship with the effort to create a safe and sustainable road traffic system in the country. Though this study is not intended to generalize the scenario of automotive consumerism in Malaysia by using Klang Valley as a proxy, certain findings were well within expectation (e.g. ownership profile, ownership cost), some can be used as comparison with other studies (e.g. weather studies, travel pattern and exposure), or can be used as preliminary findings for future exploration (e.g. non-work and long-distance travelling, unreported accidents). As certain areas in current Malaysia's automotive ecosystem are already in the transformation phase (e.g. VTA and NCAP initiatives for safer and highly roadworthy cars) or still under the discussion and planning phase (e.g. ELV), academia and researchers should continuously provide useful findings and propose strategies in order to create a safe and sustainable automotive ecosystem in the country.

MRR NO. 218

Motorcycles Gap Acceptance at Merging Point of Egress and Ingress of Exclusive Motorcycle Lane in Malaysia

Authors(s): Norfaizah Mohamad Khaidir, Nusayba Megat Johari, Muhammad Ruhaizat Abd Ghani, Muhammad Marizwan Abdul Manan, Siti Zaharah Ishak, Alvin Poi Wai Hoong, Wong Shaw Voon
ISBN: 978-967-2078-10-4

Motorcycle accidents contribute up to 60% of the traffic fatalities in Malaysia. To increase motorcycle safety, exclusive motorcycle lanes (EMCL) has been built with the aim to segregate them from other vehicles. Egress (path of exiting) and ingress (path of entering) is one of the hazardous locations on EMCL where motorcyclists are required to make a critical decision whether to join or leave a traffic stream. One of the important factors they will need to consider is the availability of a gap between two vehicles that, in the motorcyclist's judgement, is adequate for them to merge into the traffic stream. Poor gap acceptance decisions will increase the likelihood of crash to happen. Therefore, the purpose of this study is to determine gap acceptance value for motorcyclists at the merging point of egress and ingress of EMCL.

Focusing on the merging point of egress and ingress where the geometrical design is different from the intersections, field data collection involved mainly the videotaping of rejected gaps and accepted gaps of single motorcycles in the minor stream with the oncoming vehicle types on the major stream. The study started in July 2014 and ended in March 2016. Data collection was conducted in August and September 2015. The study was conducted at six (6) egress locations and six (6) ingress locations along the main arterial road; Federal Road 2 and Shah Alam Highway (KESAS). Three (3) main types of data collected for the study are; gap acceptance time, classified vehicle speed and classified vehicle volume. These findings can be drawn from this study:

i. Motorcyclists accept minimum gaps time of zero (0) seconds at egress location due to the availability of sufficient lateral clearance between edge line and vehicle on the intended lane;

ii. The percentage of rejection gap time for motorcyclists was low (3.46%);
iii. Most motorcyclists accept gap time smaller than 2.50 seconds (54.9%);
iv. Gap acceptance was unique at each location and not correlated with the design type;
v. Motorcyclist accepts smaller gap time during peak period as compared to off-peak period;
vi. Vehicle types on the mainstream impacted the probability of accepting or rejecting the available gaps where motorcycles merging from the minor streams were found to reject smaller gaps when the oncoming vehicle on the major stream were also motorcycles; and
vii. Significant of speed reduction at merging area of egress and ingress can be observed on both EMCL and main carriageway at most locations.

It is suggested that the design of egress and ingress should consider the provision of taper lane or auxiliary lane so that entering or exiting motorcycles have sufficient time to complete proper merging behaviour as well as adjusting their speed difference to the major stream.

MRR NO. 219

Identifying the Contributing Road Engineering Factors of Crashes at Curved Road Sections in Negeri Sembilan

Authors(s): Akmalia Shabadin, Hawa Mohamed Jamil, Nusayba Megat Johari, Sharifah Allyana Syed Mohamed Rahim, Siti Zaharah Ishak, Wong Shaw Voon

Road geometric design is part of highway engineering where it deals with the positioning of the physical elements of the roadway according to standards and constraints. The fundamental objective of geometric design is to produce a smooth-flowing and safe highway facility. A curved road segment is one of the major components of road geometric design. However, due to its alignment characteristics, this area is prone to fatal traffic crashes compared to other road alignments. A study done in other countries revealed that curve roads had a greater risk of having fatal crashes as compared to straight roads. In Malaysia, fatal crashes on curved segments accounted for 16% of the total number of traffic crashes in 2015. Although many crashes were recorded at straight roads with more than 10,000 incidents in 2015, the proportion of curve fatal crashes to total curve crashes is 47% while the straight fatal crashes to total straight crashes is 43%. Thus, this study was established to investigate the contributing factors to crashes at the curved road in Malaysia. Most crashes that occur at curved road sections are at Negeri Sembilan and Perak. Therefore, Negeri Sembilan has been chosen as a case study for this research. A total of 46 sections of curved road in Negeri Sembilan were chosen as a study location. The study has been divided into two categories; accident-prone area and non-accident area. The roadway characteristics that have been investigated are the type of curve, the radius of the curve, lane width, curve length, super elevation of the curve, speed approaching curve, median type, availability of roadside barrier, road marking, and availability of lighting and signage. The findings of the study concluded that number of lanes and pavement road marking are the underlying factors to crashes at curve roads. This result is in agreement with several studies, which highlighted the importance of visibility at curve roads and the driver behaviour of changing lane and speed when there are given more space, which may lead to skidding or loss of control.

MRR NO. 220

Awareness and Prevalence of Vehicle Blind Spot Issues among Lorry Drivers

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All vehicles have blind spots which include the front, rear and both sides of the vehicle. However, as for larger vehicles such as lorries, trailers and buses, the blind spot areas or zones are much larger. Accidents that can be related to blind spot areas are based on the collision type angular/side, side swipe and squeezed. This study was conducted to determine the prevalence of blind spot issues among rigid and small lorry drivers in Malaysia. In order to answer the objectives of this study, several types of data collection were conducted, which consisted of survey, on-site measurements and field experiment. The findings of this study showed that lorry drivers perceived that they drive more cautiously when a motorcyclist was riding nearby the lorry. However, in terms of the location of blind spots, most drivers perceived that the rear is the blind spot area of a lorry without knowing that the front and both sides of a lorry are also blind spots. Based on the description of the previous crashes, there was a prevalence of blind spot related crashes among surveyed lorry drivers and motorcyclists. Insufficient coverage of view angle and the overall field of vision were discovered, suggesting the need for additional mirrors to cover the blind spot zones. In addition, the results of the computer-based test indicate that there is an effect of the side from which motorcyclists are overtaking the lorries on the response times, which could suggest the effect of blind spot areas on the ability to detect the smaller vehicle. The findings of this study can be a benchmark for future studies involving other classes of heavy vehicle.

MRR NO. 221

Risk of Motorcycle Crashes at Federal Road

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Each year, the number of registered motorcycles continues to grow rapidly, and each year at least 1% of them get involved in road accidents. Out of the 1% of a motorcycle involved in road accidents, more than 10,000 riders and pillions are injured and killed every year. Recent statistics (2013) indicate the number of casualties is at least 8,000 including fatal cases in Malaysia. A motorcyclist is more at risk of being killed or injured in a road crashes than any other type of vehicle used. The risk depends on factors such as the rider's age, sex, type of road, characteristic of the motorcycle and experience. When detailed out to a fatal crash involving motorcycle by road category, crash occurrence highest on State Road (34%) and Federal Road denoted only by 29%. However, this research needs to be conducted since Federal Road was the longest road in Malaysia.

The aim of this study was to determine the risk of motorcycle crashes occurrences at selected federal roads. In addition, this study was an extension of the past study which aims to determine the vehicle speed approaching posted speed sign on the federal road in Negeri Sembilan. Therefore, this study was conducted at Negeri Sembilan which identified from Buku Daftar Jalan, Jabatan Kerja Raya as among state which the sixth largest federal road after Pahang, Johor, Perak, Sabah and Sarawak. Thus the distribution of motorcycle fatalities along study was being plotted using ArcGIS based on road crash location information (i.e., road kilometre number or coordinate), which obtained from police road crashes form known as POL 27. While road attribute such as area and roadway categories were identified and segmentized manually during on-site data collection.

Based on crashes recorded by RPM, even the motorcyclist casualties show lower in Negeri Sembilan but the number of crashes shows increasing year by year. A total

465.94 km federal road network was covered in this study. Crash data related to road category was computed using crash data provided by Royal Malaysian Police (RMP). Based on data obtained from RMP, from the year 2009 to 2013 totals 5,665 road crashes occur at study area (including damage only). Out of this number 1,727 cases were involved motorcycle. In terms of the motorcyclist (rider and pillion) involved in the road crash, result show 2,084 with 137 deaths. Even though the number contribute 1% of a total motorcycle crash in Malaysia, this study needed due to police reported over 50% of motorcycle death occur at the federal and municipal road and also in the rural area (RMP, 2013). Highest fatalities (74%) also reported at the road with two-way traffic system and the dual carriageway denoted only by 6%. Two-way traffic system has a closed relation with speeding and overtaking road offence.

Furthermore, the risk of motorcycle fatal crashes was computed by using a formula as stated. To calculate the risk, each federal road was divided into a few section based on area and roadway type. Each section gave the different value of risk whereas also gave small crash risk. The risk of motorcycle fatal crashes has calculated per million vehicles. The results show the risk of a motorcycle fatal crashes per million vehicles approaching single carriageway (433.97 km) were 1.74 times higher than crashes on dual carriageway (29.34 km). Meanwhile, the risk of motorcycle fatal crashes per million vehicles approaching the rural area (377.54.2 km) is 3.57 times higher than crashes in the suburban area (35.12 km). These differences were found significant. In term of age and gender, age group 11 to 30 and male was a higher group involved in motorcycle crashes.

MRR NO. 222

Vehicle Kilometre Travelled Validation Study

Authors(s): Akmalia Shabadin, Rizati Hamidun, Sharifah Allyana Syed Mohamed Rahim, Azzuhana Roslan, Nur Zarifah Harun, Rohayu Sarani, Siti Zaharah Ishak, Wong Shaw Voon

ISBN: 978-967-2078-12-8

Motorcyclist and car occupants contributed about 83% of overall road traffic deaths in this country. Hence, the government of Malaysia is determined to lower down this figure. In 2006, the first Road Safety Plan of Malaysia 2006–2010 had listed three (3) goals to be achieved. The goals are using the common indicator to evaluate or assess the safety performance of each country. One of the indicators is road deaths per billion vehicle kilometre travelled. Thus, there is a need to ensure the vehicle kilometre travelled value is accurate, reliable and represents Malaysia. This study aims to validate the Vehicle Kilometre Travelled (VKT) value for private vehicles. Questionnaire survey using a face-to-face interview or self-completion survey has been chosen as the method of data collection. This study used convenient sampling as a method of data sampling. This study involves only private vehicles (Motorcycle, car, MPV, SUV and van) users. This study also covers Peninsular Malaysia only. The findings of this study show that there are differences in travelled distance for a motorcycle and car. The Average Annual Kilometre Travelled (AAKT) for a motorcycle is 21,495 kilometres while for the car is 28,184 kilometres. As regards to demographic groups, different groups travel differently. On the validation part, the results show that both methods (survey and secondary data) indicate that the Relative Standard Error (RSE) value is less than 25% which means that the data is considered reliable to use.

MRR NO. 223

Vehicle Speed Approaching Zebra Crossing on Federal Roads

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ISBN: 978-967-2078-13-5

Federal roads in Malaysia are one of the most travelled routes after expressways. However, unlike expressways, these main arterial roads acting as connectors between cities and towns are often built alongside residential areas thus generating pedestrian activities. The presence of at-grade unsignalised pedestrian crossings on roads with drastic changes in traffic patterns or upgraded roadways is a concern that requires attention to. In the light of the above statements, there is a need to study the Malaysian scenario on speed at unsignalised pedestrian crossings.

Marked crossings generally only improve safety where there is sufficient pedestrian and traffic flow to result in significant numbers of pedestrians making risky crossings when the marked crossing is absent. For example, Ward, 1992, (quoted in Ogden, 1996) suggests on the basis of British data that installation of refuges near pedestrian generators can reduce pedestrian accidents by as much as 60%, but where they are introduced at uncontrolled intersections, even for safety reasons, accidents are only reduced by 10%; if no safety reasons exist, accidents can increase. But risk at marked crossings is also very dependent on drivers respecting the need to stop for pedestrians, which should match the operating speed of the environment.

This study covers all of the four unsignalised pedestrian crossings on a primary arterial road, Federal route F005. Findings show that there are significant differences of vehicle speeds at the four unsignalised crossings. Mean speeds of vehicles were found to be lower in urban areas (60 km/h) as compared to rural areas (77 km/h), incidentally also school areas. In comparing the number of lanes, average speed differs significantly between two lanes and four lanes, where speeds were recorded to be lower at crossings on two lanes roads (65 km/h versus 73 km/h). For vehicle class, mean speed of passenger vehicles was found to be significantly higher (more than 70 km/h at three

of the locations) than other vehicles (below 70 km/h) at all locations. In terms of presence of pedestrians, both urban and rural areas recorded higher mean speeds during presence of pedestrians, the figure is being significant for urban areas ($p<0.001$). Mean speeds for both areas in both situations of presence and non-presence of pedestrians, however, were within the gazette speed limit.

Analysis of speed limit violations revealed that at all four locations; speed limit violations were less in the presence of pedestrians. In the presence of pedestrians, speed limit violations were also significantly lower on both sites with two lanes carriageway (11% compared to 47%%), and in comparing area type, the percentage of speed limit violations were higher in urban areas (51%) compared to rural areas (19%), possibly due to the lower speed limit set in these areas.

In conclusion, the overall findings of speed of vehicles approaching zebra crossing on federal road reveals that although majority of the vehicles were traveling within the posted speed limit, speed of vehicles at all crossing approaches, as well as on crossing were nowhere near the safe speed for pedestrians of 30 km/h or even 50 km/h (Pasanen, 1992). Similar findings are expected to be seen on roads designed for high-speed traffic (i.e. primary roads that are non-residential roads). In this, the review of speed patterns on roads is pertinent in the placement of type of pedestrian crossings. This is reflective of the instances when roads are upgraded or receive heavier traffic, necessary changes are required for the provision of pedestrian facilities. In consideration that only four unsignalised crossings were recorded along F005 in Selangor, it is, therefore advisable that these crossings are considered for upgrades to signalised crossings, or in cases where pedestrian volume is low and almost non-existent, these locations may instead use the uncontrolled crossing.

MRR NO. 225

Roadworthiness of Malaysian Taxi with Periodical Technical Inspection

Authors(s): Zarir Hafiz Zulkipli, Ahmad Noor Syukri Zainal Abidin, Rohayu Sarani, Mohd Syazwan Solah, Mohd Rasid Osman, Tan Choon Yeap, Wong Shaw Voon

This study reviews the current situation of taxis roadworthiness inspection resulting from the Periodic Technical Inspection (PTI) conducted by PUSPAKOM. This is in pursuant to a directive from Ministry of Transport on taxi issues, which proposed the possibility of reducing the frequencies for periodical inspection at Periodical Technical Inspection (PTI) for taxis. The objectives of this study are to analyse the current situation of PTI focusing only on taxis, to explore the potential to reduce the inspection term for taxis and finally to recommend the best solution.

The data was obtained from PUSPAKOM and the dataset only involved taxis which had been sent to PUSPAKOM for roadworthiness inspection which includes initial inspection and periodic inspection. The majority of the taxis are EA type (Perkhidmatan Awam Teksi) with about 60% of the overall of the taxi population.

Using logistic regression analysis, the probability of failure of PTI by the taxi was developed. The results indicate that with the existing periodic technical inspection for roadworthiness, the probability of an EA type taxi to have failed the periodic inspection (PTI) reaches 50% after Year-2 before Year-3. Moreover, for a well-maintained EA type taxi which had never failed before, the probability of it to fail in the coming inspection would reach 50% in Year-5.

Based on the analysis result and from the statistical probability model developed, the following recommendations are proposed:

i. To maintain the existing practice for the first two years with annual periodic technical inspection;
ii. Subsequent PTI depends on how well the roadworthiness condition of the vehicle with a possibility of extending the annual PTI up to five years;

iii. PTI for after Year-5 will be twice a year (every six months);

If a vehicle has failed in any of the first two years or subsequent annual inspections, then the subsequent PTI after Year-2 will be every six months.

MRR NO. 227

Surrogate Measure of Estimating Real-Time Traffic Volume

Authors(s): Hawa Mohamed Jamil, Alvin Poi Wai Hoong, Akmalia Shabadin, Hizal Hanis Hashim, Muhammad Marizwan Abd Manan, Siti Zaharah Ishak, Wong Shaw Voon

ISBN: 978-967-2078-16-6

The study aims to estimate real-time traffic volume on road networks by utilising Google Traffic Data. Section 1.0 elaborates on the current state of traffic monitoring in Malaysia. The existing method of traffic monitoring in Malaysia mostly involves traffic count and classify the vehicle manually by enumerators or video camera. With the aim to ease the data collection of traffic volume, the objective of this study is to estimate real-time traffic volume on road network by utilising Google Traffic Data. This study will also come in handy where traffic volume study is hard to be conducted at the site, e.g., site with limited space, or site constraint as long as there is Google Traffic Data present at the location.

There are six methods of conduction traffic volume study mentioned. The first one is through toll plaza ticketing. As every vehicle that passes through the toll plaza will have to pay, the number of vehicles can be known by segregating in according to its class. Secondly is by registration offices and in Malaysia is carried out by the Road Transport Department (RTD). Next is by statistical approach whereby only applicable when there are records from the past maintained effectively and efficiently. The fourth method is by interviewing. However, this method is not easily managing because many of the transporters will not stop for an interview even a second. The fifth method is by check posts and the last method is by Global Positioning System (GPS).

According to the methodology flowchart, the project will start with desk study followed by site selection, data collection, data analysis/modelling and lastly report writing.

Analyses done are the general analysis, speed pattern by location and also independent sample T-test. Under general analysis, there is descriptive analysis and also correlation analysis. As for speed pattern by location, graphs indication speed pattern of Google Traffic Data and space mean speed were compared differentiating the site and hourly factor. Lastly in Section 5.0 conclusion and recommendation of the study were discussed.

MRR NO. 228

Evaluation of Midblock Crossing: Effect on Pedestrian and Vehicular Traffic

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ISBN: 978-967-2078-18-0

Signalised midblock crossings provide safe crossing duration to a pedestrian on a straight road. However, they are still exposed to danger when both pedestrians and vehicles violate the red signal indication and crosswalk. In this study, the violation behaviour of pedestrian and vehicular traffic was examined at six signalised midblock crossings using manual and video observations. Results indicate that the temporal violation of pedestrians is high at midblock with a high volume of pedestrians. High utilisation of midblock can be expected when vegetation fence installed on the median. Comparing different type of vehicles, motorcyclist constitutes the highest percentage of blocking crosswalk and running a red light at midblock crossings.

MRR NO. 229

Vehicles Speed Characteristics Approaching Road Work Zones in Urban Expressway

Authors(s): Mohd Firdaus Ismail, Muhammad Marizwan Abdul Manan, Alvin Poi Wai Hoong, Siti Zaharah Ishak, Wong Shaw Voon
ISBN: 978-967-2078-17-3

Work zone is the area that involved with a construction activity on or within the working traffic. During this activity, a careful design work zone control by a certified traffic consultant is compulsory. It is important to remember that whenever work is done on or near the roadway, drivers are faced with unexpected traffic conditions. Work zone on the highway system interrupt regular traffic flows and create safety problems. These changes may be hazardous for drivers, workers, and pedestrians. The study objectives are to examined speed characteristics and driver compliance with the temporary posted speed limit approaching work zones at the expressway. Speed for passenger car, motorcycles and heavy vehicles were collected at different traffic control zone which are divided into Advance Warning Area 1 (AWA 1), Advance Warning Area 2 (AWA 2) and Work Area (WA). Statistical analysis using t-test and chi-square test to determine the relationship of compliance to the speed limit with respect to factors such as location, traffic control zone and displayed temporary posted speed limit were performed. Higher mean and 85th percentile speeds compared to the temporary posted speed limit are observed at all study locations. The different of mean speed is statistically significant which more than 60% of road user travelled higher than the speed limit, especially at the AWA 2 and WA. Passenger cars and motorcycles recorded the highest non-compliance rate compared to the heavy vehicle that need to slow down due to their large dimension in order to merge with other traffic thus contribute to the high speed compliancy rate especially at that AWA 2. By displaying temporary speed limit lower than 60 km/h, it will exhibit a higher percentage of incompliance. It reflects that the speed management through the use of static speed limit sign is less effective to slow down vehicles. Thus, the implementation of alternative methods such as Variable Advisory Speed Limit, Dynamic Message Signs, Speed Monitor Display, Emergency Flasher Traffic Control Device and other available

technology can be considered as research have proved it have significant effect to reduce speed at works zones.

MRR NO. 232

An Evaluation of Motorcycle Facilities: Utilisation and User Satisfaction on EMCL and NEMCL in Malaysia

Authors(s): Siti Zaharah Ishak, Alvin Poi Wai Hoong, Akmalia Shabadin, Norfaizah Mohamad Khaidir, Rizati Hamidun, Muhammad Marizwan Abdul Manan, Syed Tajul Malik Syed Tajul Arif, Muhammad Ruhaizat Abd Ghani, Wong Shaw Voon

ISBN: 978-967-2078-19-7

The highest fatality involved motorcycle accident in Malaysia which encompasses to 60% of the overall numbers. Various initiatives were taken to decrease the numbers to 50% by the year 2020. The initiatives include the road engineering programme — the provision of Exclusive Motorcycle Lane (EMCL) and Non-Exclusive Motorcycle Lane (NEMCL). These programmes have started in the early seventies and were claimed as the first type of facilities introduced in the world. The utilisation issues can be part of the challenges in providing these facilities besides motorists' satisfaction and the availability of data that can support further research involving motorcyclists, especially at motorcycle lane facilities. Therefore the aim of this study is to develop a systematic database for motorcycle facility by providing information such as public utilisation, satisfaction and Level of Safety (LOS) on the existing motorcycle facilities provided in Malaysia. To achieve the aim, the following objectives are designed a) To identify the rate of MCL facilities utilisation and misuse b) To determine the motorcycle speed apply at motorcycle lanes and main carriageway c) To assess the current road engineering and environmental safety concern using MeTRA d) To determine motorcyclist satisfaction index for EMCL & NEMCL and e) To identify the determinants of influencing motorcyclist choice in using EMCL & NEMCL. Engineering studies were conducted, and a questionnaire related to satisfaction was distributed via face-to-face interview and an online survey. Motorist Satisfaction Index (MSI) was rated using a Likert scale for seven (7) attributes including the provision of signage, lighting, guardrail, paved lane, accessibility, security and cleanliness. The same attributes were also assessed during Road Safety Assessment. The findings were provided at the end of

this report that will be very useful to road authorities in Malaysia and lesson learned to other countries.

MRR NO. 233

Development of Electronic Guidebook for Traffic and Road Safety Audit e-MeTRA

Authors(s): Hawa Mohamed Jamil, Muhammad Ruhaizat Abdul Ghani, Norfaizah Mohamad Khaidir, Alvin Poi Wai Hoong, Ho Jen Sim, Muhammad Marizwan Abdul Manan, Siti Zaharah Ishak

ISBN: 978-967-2078-20-3

This report highlights the development of the Project "Development of Electronic Guidebook for Traffic & Road Safety Audit (e-MeTRA)". Section 1.0 explains the introduction and Standard Operating Procedure (SOP) of Road Safety Assessment (RSA) carried out in MIROS. Due to the difficulties and constraint faces at site, researchers have embarked on developing a system aim to facilitate Road Safety Assessment Operations by development of an electronic system for data collection and analysis, to store, manage, and analyse road safety assessment data collected by road safety assessment team and also to create an electronic tool for RSA data collection on-site. A literature review regarding various database of RSA from other countries is explained in Section 2.0. The countries are New Zealand, Australia, United Kingdom and the United States. In New Zealand, formal assessment of the safety of existing road corridors has been developed by the Safety Audits of Existing Roads (SAER). The monitoring system is developed using the Microsoft Access 97 database. As for Australia, Road Safety Engineering Toolkit is used to assist road safety practitioners to carry out road safety audits. It guides users through the Australian Road Safety process (feasibility, preliminary design, detail design, pre-opening stage, road work traffic and existing roads). In the United Kingdom, the County Surveyors Society and Highways Agency (MOLASSES) owned a database that stores information on safety schemes installed on local and trunk roads across Great Britain. Lastly, in the United States, a tracking consists of information on each audit, which includes the RSA Project, Observation, Intersection, Section, Suggestion, Agency Response, Contact, Completion Date, Checklist, Detailed Observation, Short Terms Suggestion and Long Term Suggestion has been developing. Section 3.0 elaborates on the methodology/development of the system. The development comprises of User

Requirement Study, User Interface (UI) Design, Database Design, On-Site Entry Module, Data Analysis Module and also Google Map Module. A case study as reported in Section 4.0. The application of the system is in a selected study, i.e. KM330 Jalan Raub–Lipis. The case study was 'A Road Safety Assessment Operation Carried Out On-Site' by Road Engineering and Environmental Research Assessment Team. For the purpose of this report, only on general information and road surface were discussed. Finally, Section 5.0 contains the conclusion of the study. The study will aid in the formulation of effective road safety research and interventions thus providing a more promising result in reducing both road accidents, and fatalities should include the system able to provide evidence on common deficiencies and type of crash associated with it.

MRR NO. 237

Hazard Profiling of Courier Riders' Delivery Route

Authors(s): Mohd Khairul Alhapiz Ibrahim, Ahmad Azad Ab. Rashid, Mohd Firdaus Mohd Siam, Low Suet Fin, Wong Shaw Voon

ISBN: 978-967-2078-23-4

Courier and postal delivery workers are among the high-risk group on Malaysian roads due to their higher on-road exposure. The past decade has seen an increasing trend in number of road crashes involving courier and postal delivery workers. The fact that majority of these workers use a motorcycle for delivery purposes compounds the risk of crash involvement. This study aimed to determine types of hazards facing courier riders on the road by recording the riding scenarios on their actual delivery route. Researchers used a digital camera and a hands-free camera harness to hold the camera at the chest level to record the riding scenarios. This study has found that road users including the participants themselves were the most dangerous category of hazards facing courier riders on their delivery route. Considering both road user and non-road user related hazards, the five most prevalent categories of hazards were attributed to other motorists, participants' riding behaviours, behaviours of pedestrians or cyclists, road surface issues and obstruction of view. The findings also show that encroachment of participants' riding path, participants' unsafe lane filtering and jaywalking pedestrians are the most frequent cause of critical incidents that resulted in near misses. The classification of hazards and risk assessment presented in this study can be beneficial for operation management and rider training consideration.

MRR NO. 238

Kajian Analisis Soalan Ujian Memandu Calon: Ujian Bahagian 1 bagi Kurikulum Pendidikan Pemandu (KPP) Baharu [RESTRICTED]

Authors(s): Low Suet Fin, Noradrenalina Isa, Nor Fadhilah Mohd Soid, Wong Shaw Voon

Salah satu cabaran yang dihadapi oleh negara kita ialah kadar kemalangan yang masih tinggi walaupun pelbagai usaha telah dilakukan oleh pihak-pihak yang berwajib. Oleh itu, golongan pengguna jalan raya yang berumur antara 16-25 tahun yang merupakan pemegang lesen memandu motokar atau motosikal baru, seharusnya diberikan tumpuan dan perhatian yang sewajarnya. Hal ini kerana berdasarkan Statistik Laporan Perangkaan Kemalangan Jalan Raya Polis Diraja Malaysia 2014, jumlah golongan tersebut yang terlibat dalam kemalangan jalan raya amat membimbangkan. Objektif kajian ini ialah untuk menganalisis soalan-soalan ujian memandu Bahagian 1 yang diduduki oleh calon-calon yang ingin mendapatkan lesen memandu. Kajian ini penting kerana calon-calon perlu lulus dalam ujian ini bagi membolehkan mereka menduduki ujian dan seterusnya memperolehi lesen yang sah. Soalan-soalan telah dianalisis berdasarkan taksonomi Bloom serta hasil pembelajaran yang telah digariskan dalam Kurikulum Pendidikan Pemandu (KPP) yang baharu. Kajian ini dilaksanakan dengan menganalisis tiga set soalan yang telah dibekalkan oleh pihak JPJ. Hasil kajian mendapati bahawa kebanyakan soalan tertumpu kepada hasil pembelajaran 1 iaitu tanda isyarat lalu lintas dan hasil pembelajaran 2 iaitu pemanduan berhemah. Apabila soalan-soalan dianalisis berdasarkan domain kognitif taksonomi Bloom pula, didapati kebanyakan soalan merupakan soalan jenis pengetahuan dan pemahaman. Analisis soalan-soalan berdasarkan domain afektif dalam taksonomi Bloom pula menunjukkan bahawa kebanyakan soalan merupakan soalan jenis penerimaan dan tanggapan sahaja. Berdasarkan hasil kajian ini, adalah dicadangkan agar pihak JPJ membuat penstrukturan semula soalan-soalan ujian memandu Bahagian 1 supaya calon-calon dapat menguasai semua pengetahuan serta kemahiran yang perlu. Hal ini bagi membolehkan calon-calon mengaplikasikannya dalam tingkah laku pemanduan semasa berada di jalan raya untuk keselamatan diri mereka dan para pengguna jalan raya yang lain.

MRR NO. 239

MIROS Crash Investigation and Reconstruction Annual Statistical Report 2011–2013

Authors(s): Siti Atiqah Mohd Faudzi, Ahmad Noor Syukri Zainal Abidin, Mohd Amirudin Mohamad Radzi, Zarir Hafiz Zulkipli, Kak D-Wing, Muhammad Azizirrahim Mohd Yusoff, Fauziana Lamin, Afiqah Omar, Mohd Rasid Osman, Wong Shaw Voon

ISBN: 978-967-2078-22-7

This report highlights the statistical analysis of MIROS's in-depth crash investigation cases throughout the year of 2011–2013. The main objective of this report is to provide the result of the descriptive analysis, inferential analysis and indexes on casualties of crash investigation cases of the said year. From 2011 until 2013, MIROS' crash investigation team investigated 167 cases regarding the crash that meets the MIROS's specific requirements. The number of investigated cases for each year of 2011, 2012 and 2013 is 68 cases, 44 cases and 55 cases respectively. For each year more than 50% of the crash cases involved two vehicles. The proportion of crash involving passenger car which included car, four wheel drive, van and MPV is significantly higher compared to another vehicle type. In terms of crash configuration, head-on collision recorded the highest proportion compared to others. A high number of investigated cases tend to occur on the midblock road compared to the other types of intersection.

The inferential analysis shows some parameters have significant relationships with other variables. This includes horizontal and vertical alignment, road type and crash configuration, the number of vehicles and crash configuration. On a vertical slope road, the likelihood for an accident to happen in the horizontal bend road is 7.381 higher than in horizontal straight road. The analysis showed that KSI Index is high on Wednesday, the time between 1401 to 1600, the month of August, Sarawak, vicinity of construction, a night without street light, during light rain, in private road, crossroad intersection, straight and slope road alignment, single carriageway, cases involved rollover and single vehicle. Fatality index has also shown that the highest number of

the parameters listed above except for staggered intersection instead of a crossroad. Risky driving and speeding are found to be the most identified crash occurrence factors in the investigated cases year 2011–2013. Meanwhile for injury occurrence factors, crash compatibility was found to be more prominent in each variable analysed.

MRR NO. 240

Compilation Study Conducted during OPS Hari Raya Aidilfitri Period 2016

Editors: Low Suet Fin, Maslina Musa, Wong Shaw Voon
ISBN: 978-967-2078-21-0

The OPS Hari Raya Aidilfitri 2016 conducted is an annual integrated event to increase awareness and enhance compliance with traffic regulations among road users. The interventions include increased enforcement, speed reduction on certain roads, banning of heavy vehicles and increase the dosage of road safety information.

The dosage of road safety information shows an increasing the percent of information on road safety during the OPS period compared to before OPS. Road users were also more exposed towards news and information on road safety during OPS compared to before OPS. Social media shows the top source of information compared to traditional media (television, radio and newspaper).

In relation towards enforcement, several studies are conducted which includes compliance to helmet wearing among motorcyclist, compliance to seatbelt wearing among drivers and vehicle passengers, perception towards enforcement and usage of child restraint system in travelling vehicles. From the observation conducted to measure the compliance rate of helmet wearing, it shows that more riders wear a helmet during the enforcement period. Proper wearing rate (proper strapping when using a helmet) is also seen during the OPS period.

As for compliance to seatbelt wearing, the study shows that front passengers and rear passengers are respectively 0.930 and 0.641 times less likely to wear a seatbelt during OPS than after OPS. As an overall, seatbelt wearing rate for all type of occupants increased after OPS compared to during OPS. The comparison of wearing rate between these OPS with the previous OPS revealed that the wearing rate among drivers and front passengers increased while the rear passengers' wearing rate decreased for these OPS.

The perception study towards enforcement is a continuation of previous studies on perception towards traffic enforcement conducted before and during Hari Raya Aidilfitri 2016. The results revealed that more people perceived that they were likely to get summoned for committing most of the traffic offences during OPS compared to before OPS. Visibility of enforcement activity was also higher in the period during OPS than before.

Although Malaysia has not regulated any law on the use of child restraint system (CRS) in travelling vehicles, the study is conducted to determine CRS usage among children 0 to 12 years old while travelling in vehicles before and during OPS Hari Raya 2016. The overall use of CRS is extremely low before and during the period of OPS.

Another strategy conducted is to manage the speed of road users along the federal and state roads throughout Malaysia by a 10 km/h reduction of the posted speed limit. However, operating speeds at 85th percentile revealed and overall speed of more than 90 km/h during OPS despite recording a reduction in the 85th percentile speed. In contrast, the speed limit compliance is higher before OPS than during OPS, which can be contributed to the lowering of the speed limit by 10 km/h during OPS period.

In terms of traffic volume on the road, trip origin home is higher on Saturday and Monday before Hari Raya Aidilfitri whereas trip origin from hometown was high on Friday, Saturday and Sunday after Hari Raya Aidilfitri. Although banning of heavy vehicles is enforced during the OPS period, the traffic volume is still present.

MRR NO. 241

Effectiveness of OPS Selamat 8/2016: An Evaluation Study

Editors: Fauziana Lamin, Mohd Rasid Osman, Low Suet Fin, Siti Zaharah Ishak, Wong Shaw Voon
ISBN: 978-967-2078-26-5

This report contains evaluation study of OPS Selamat 8/2016 effectiveness. The evaluation was conducted through several research projects. These projects support two main indicators of the OPS Selamat effectiveness, i.e. road users' perception on enforcement and advocacy and road users' behavioural changes. Among the measured variables are road safety information dosage, seat belt wearing, helmet wearing, child restraint system usage, traffic volume and vehicle speed. Findings of each measured variable, according to the predetermined indicators, were presented in separate chapters. The comparative trend of road users' perception and behavioural changes between and during OPS Selamat and baseline period was observed. As a result, it was found that there is an increase of road users' perception on enforcement during OPS Selamat period. However, due to a lacking in advocacy activity during the OPS Selamat 8/2016, no strong associations between self-reported behaviour towards traffic regulation compliance and road safety messages can be observed. In addition, a positive change of road users' behaviour including seat belt wearing, helmet wearing, heavy vehicle movement compliance can be perceived during the period. These findings reveal that the OPS Selamat 8/2016 has an effect on road users but it can be further improved in order to reach a satisfactory road safety benchmark. Accordingly, some recommendations are proposed to improve the effectiveness of the OPS Selamat, especially on the variables that indicate an alarming percentage of compliance.

MRR NO. 242

The Pattern of Wearing High Visibility Windbreaker among Motorcyclists Using the Awareness Approach

Authors(s): Sharifah Liew, Nor Fadilah Mohd Soid, Nuur Sakinah Azman, Low Suet Fin, Wong Shaw Voon

ISBN: 978-967-2078-24-1

The main aim of this study is to compare the pattern of wearing rate of High Visibility Windbreakers (HVWB) among motorcyclists by using the awareness approach, which is an intervention program designed specifically for motorcyclists. Two organisations were selected and given two types of approach – Approach 1 consisted of the intervention program and the distribution of HVWB whereas Approach 2 consisted of the distribution of HVWB only. Baseline observation was conducted prior to the implementation of both approaches to collect baseline data on the pattern of wearing HVWB among the motorcyclists at both organisations. The observation was again conducted after the implementation of both approaches and the results found that there was a significant increase in wearing rate of HVWB among motorcyclists who received road safety intervention compared to the motorcyclists who did not receive any road safety intervention. Result also found that motorcyclists who exposed to the road safety intervention programme wore HVWB, 5.71 times more than motorcyclists who do not expose to any mod of intervention programme.

MRR NO. 243

A Study on Commercial Vehicle Speed and its Operational Characteristics

Authors(s): Ho Jen Sim, Muhammad Marizwan Hj. Abdul Manan, Mohd Firdaus Ismail, Muhammad Ruhaizat Abd Ghani, Siti Zaharah Ishak, Alvin Poi Wai Hoong
ISBN: 978-967-2078-25-8

A commercial vehicle is the backbone of the logistics industry which drives a vibrant economy of a country. Nevertheless, commercial or heavy vehicle-related accident is drawing serious attention. In 2014 alone, a total of 57,430 road accidents involving lorry, bus, and taxi was recorded (Kementerian Pengangkutan Malaysia, 2014). The height, weight and width dimension of the commercial vehicles reduce the visibility of other drivers and thereby increase the risk of an accident. Furthermore, due to the evolution of technology, larger trucks are now equipped with higher horsepower where a lot of speeding-related accidents were reported.

This study is set to evaluate the speed profile for different types of commercial vehicles at different road hierarchy. The speed profiles are very useful in assisting the authority in road and infrastructure design. For instance, appropriate traffic calming measures can be deployed based on the speed profiles on the specific roads.

A total of 7168 commercial vehicles were observed on the four types of roads. Nearly 50% of them were collected on primary roads. About one-third of the samples were light lorry with two axles while two axles heavy lorry constituted 16%. The results indicate that in general most of the heavy vehicles (4.39%–98.61%) travelled fast and did not comply with the speed limits posted on different types of road hierarchy. The lower the posted speed limit, the higher the percentage of non-compliance rates which means that the compliance increase as the speed limit increase. Majority of the commercial vehicles (28%–57%) occupied the middle lanes and those smaller sizes of vehicles (as compared to other sizes of commercial vehicles) had more tendencies to travel on the fast lane.

MIROS INQUIRY REPORT (MIR)

MIRs are reports on selected accidents/cases that are considered high profile and of national interesting nature. It starts off as a briefs report for internal evaluation, which is the expended into full reports as required. These reports are “RESTRICTED” and intended for internal use only. They are not available to the general public.

MIR NO. 209

MIROS Inquiry Report: Single Vehicle Fatal Crash at KM137.1 North-South Expressway near Pagoh [CONFIDENTIAL]

Authors(s): Wong Shaw Voon, Kak D-Wing, Zarir Hafiz Zulkipli, Iskandar Abd Hamid, Ahmad Noor Syukri Zainal Abidin, Mohamad Suffian Ahmad, Aziemah Azhar, Alvin Poi Wai Hoong, Syed Tajul Malik Syed Tajul Arif, Mohd Rasid Osman

On 24 December 2016, an express bus with registration number AJC 6633, ran off the road and plunged into a ravine near KM137.1 North-South Expressway (northbound). This tragic road crash caused 14 deaths including the driver. The bus was travelling from Larkin Bus Terminal to Terminal Bersepadu Selatan (TBS), carrying 30 passengers (including drivers) when the crash occurred at approximately 3.30 a.m.

The incident was widely reported through the electronic and printed media and has become one of the most attentive issues to the public recently. The Ministry of Transport (MOT) entrusted the Malaysian Institute of Road Safety Research (MIROS) to conduct an in-depth crash analysis and investigation into the case. The expected outcome of the investigation is to address gaps in the safety transportation system and to propose effective countermeasures to minimise the injury outcome and in preventing a similar crash from reoccurring in the future.

The interim report of the investigation was submitted to MOT within two weeks after the crash. MIROS has presented the investigation findings and results from crash reconstruction based on physical evidence obtained at the crash site and inspection on the damaged bus to MOT on 9 January 2016.

The subsequent in-depth, comprehensive analysis of the crash concluded that the crash was contributed by a combination of factors mainly the driver, the vehicle and the road environment.

Specifically, the contributing factors of the crash are as follows:

- The bus was travelling at a speed higher than the permissible speed;
- The driver of the bus was driving for long hours with minimum rest, 13 hours 50 minutes on the road with a total of 1 hour 37 minutes stop over, which would very likely lead to driver fatigue;
- Poor road design and road safety facilities are not effective in preventing run off road event.

Analysis from the marks left at the Crash Scene has shown that the bus was weaving in and out of the unpaved road shoulder gradually for a distance of 49.7 m. After a short distance of 11.4 m on the paved road, the bus ran off road again for the second time and had travelled for 115.1 m to the edge of the ravine. The bus fell off the edge, went airborne and hit with the concrete wall of an underpass. Subsequent to the impact, the bus slid along the concrete wall of the underpass, leaving scratch marks on the wall before it reached its final rest position.

The trajectory of the bus after falling off the edge of the ravine was determined based on the law of physics and physical evidence found at the crash site. The kinematics and the dynamics of the bus at the material time were confidently derived after extensively analysing the gathered physical evidence, considering a range of possible drag factor values and possible braking effort made by the driver. The bus could have travelled with a speed as high as 122.9 km/h. However, by giving the best possible benefit to the driver, the possible minimum speed was 102.7 km/h. Finally, by determining the drag factor value of the grass surface at the crash site, the probable speed of the bus was 115.5 km/h. By giving the best benefit to the driver, the possible minimum speed of 102.7km/h is already significantly higher than the permissible speed of 90 km/h.

Assessment of road design and environment of the crash site revealed that the road where the crash occurred was rated with 2 stars according to the iRAP rating system, which indicated that the safety features of the road were not adequate. For example, the installed semi-rigid W-beam barrier was a sub-standard crash barrier, in which the length and end treatment specifications of the crash barrier were improper and insufficient to prevent run-off-road collisions such as this crash. Besides that, the investigation also found that the speed of operation traffic was higher than the

permissible speed on average, where 85th percentile of passenger cars and bus were found travelling at 127 km/h and 103 km/h respectively. Thus, proper speed management system, such as installing Automated Enforcement System (AES) has to be implemented to reduce the average speed of operating traffic.

The investigation also looked into the safe operation of the bus. It was claimed that the bus was operated by an individual, and the investigation found that the ticket was sold by Billionstar Express Sdn. Bhd. and the rightful owner on paper was Goldstar Express Sdn. Bhd. (based on PUSPAKOM's record) which was also the permit holder. Thus, the owner of the bus was not managing the operation of the bus and failed to comply with the OSHA ICOP SHE 2010 requirements for the transport sector. In addition to that, the bus has been operating on an unapproved route for a year. The finding revealed that the current monitoring system not only failed to detect the unsafe operation practices but also unable to discover the misuse of the approved permit issued by SPAD. All of these findings have exposed the weakness of the current monitoring and enforcement system. The relevant authorities shall take immediate and stern action to assess and revamp the monitoring and implementation system to mitigate the said issues.

Furthermore, the bus was claimed to have complied with UN R66 (Strength of Superstructure) as stated in its Vehicle Type Approval (VTA) technical report. However, the coachbuilder of the bus failed to present the UN R66 technical report when it was requested by the investigation team. Without proper documentation, compliance to the said regulation is questionable. In addition, the coachbuilder could not provide any UN R80 (Strength of seat anchorage) technical report for their new bus models starting 1 January 2014. Besides that, no evidence or supporting documents can be presented which confirm that the design and specification of the seat anchorage for the current bus model that complies with the UN R80. These findings show that a thorough review and assessment of current VTA approval procedures are required to identify any loopholes in the existing system according to WP 29's framework. The approval of any vehicle model under VTA shall be set to a maximum period. In addition, the relevant authority should expedite the mandatory implementation of speed limiter on all heavy commercial vehicles.

The analysis has also concluded that similar to many other crashes, this particular crash and the injury outcome could be minimised if not prevented, and it just needed to get

one of the many other influencing factors right. The analysis also further proved that should the bus was on its maximum permissible speed, 90 km/h, and there were shoulder rumble stripes, which would alert the driver before ran off road, the bus could be brought to a stop before went down to ravine by just applying hard braking. This again proved that for road safety, everyone could play a significant role to make a difference.

Recommendations have been formulated in order to avoid and/or minimise the injury risk of a similar crash. The recommendations comprise actions to be taken to improve and enhance the vehicle certification and approval process; to assess and review the road design and environment including speed management strategy along expressways; to intensify the implementation and assessment of safe operation practices in transport industry which includes conducting a comprehensive audit in enhancing the existing permit approval and monitoring mechanism; and, to improvise the monitoring mechanism of bus operation and revise the enforcement mechanism on the road.

MIR NO. 234

MIROS Inquiry Report: Juru Crash Investigation KM147 North-South Expressway (Northbound) [CONFIDENTIAL]

Authors(s): Siti Atiqah Mohd Faudzi, Ahmad Noor Syukri Zainal Abidin, Mohd Amirudin Mohamad Radzi, Syed Tajul Malik Syed Tajul Arif, Nusayba Megat Johari, Mohd Rasid Osman, Siti Zaharah Ishak

On 24 October 2017, two (2) employee buses with registration number PBD6650 (Bus A) and JGX6099 (Bus B) were involved in a fatal crash at KM147 North-South Expressway (Northbound) near to Juru Toll Plaza, Pulau Pinang. The fatal crash reported occurring just before 6.00 a.m. and the weather during that time was reported to be fine. The crash occurred when Bus A was believed to park near to the road shoulder at the road site was hit from rear by the oncoming Bus B. Due to the impact, Bus A moved towards the road shoulder and impacted the barrier. After the impact, both of the buses skidded towards the median crash barrier and ended at the median crash barrier as final rest position. A total of eight (8) passengers were killed in the crash.

The road is an expressway and was constructed as a four (4)-lane, dual-carriageway with two (2) directions respectively with a relatively flat vertical alignment. It is classified as a rural expressway with speed limit of 110 km/h. It was observed that there no street lighting post was installed along the stretch. The road pavement at the crash site was in good condition – no potholes or surface bleeding was visible. The crash had caused major damages to the rear structure of the Bus A. The rear offside of the bus A was severely damaged, caused by the rear impact of Bus B. Thorough inspection of Bus B found the major damages on the frontal nearside structure of the bus was caused by the impact of the rear structure of Bus A. The minimum impact speed obtained from the kinematic analysis and trip-based analysis of Bus A and B, the most probable time of crash was estimated between 5.55 a.m. and 5.56 a.m. while the minimum average travelling speed of both buses was calculated to be 75 km/h–105.6 km/h for Bus A and 105.6 km/h for Bus B. Three (3) main issues highlighted are related to conspicuity, structural integrity of the involved vehicle and handling of emergency situation i.e. vehicle breakdown by the said driver.

MIR NO. 235

MIROS Inquiry Report: Kampar Multi Vehicle Fatal Crash KM45 Jalan Ipoh-Teluk Intan [CONFIDENTIAL]

Authors(s): Kak D-Wing, Afiqah Omar, Nurulhuda Jamaluddin, Hawa Mohamed Jamil, Mohd Rasid Osman, Siti Zaharah Ishak

A multiple vehicle crashes involving a truck, a van and a passenger car occurred on 28 October 2017, at KM45 Jalan Ipoh-Teluk Intan, Perak. The crash occurred in the early morning around 6.30 a.m., and the weather was reported to be fine at the material time. The incident caused nine (9) deaths, which involved the driver and all of the occupants of the van. The driver of the truck was slightly injured and sent to Ipoh Hospital for further treatment while the passenger car driver escaped unhurt.

A team from MIROS was dispatched to the crash site to carry out an in-depth crash investigation and thorough analysis of the crash. Besides focusing on the environmental factor and vehicle damage, this report also highlights the possible findings from the crash reconstruction. From the evidence gathered, it was identified that the truck collided with the passenger car first, before entering the opposite lane and crashing into the oncoming van. As a result of the impact, both truck and van moved in the same direction towards the unpaved road shoulder where the final rest positions of both vehicles are located 16.5 m away from the initial point of impact. Abrasive marks were found on the seatbelt for both driver and front passenger of the van, which signified that both the driver and the front passenger did wear the seatbelt during the crash event. For rear passenger compartment, it was found that all of the rear passenger seats were detached and no seatbelt was installed at the rear passenger seats.

The crash was initiated by the risky driving behaviour of the passenger car that initially hit the truck while the passenger car encroached into the travelling lane of the truck. The collision resulted in the truck to lose control and moving towards the opposite lane before hitting the van. Through comprehensive speed analysis, the travelling speed of the truck at the point of impact with the van was 73.9 km/h, which was higher than the

posted speed limit (70 km/h). Thus, it is recommended to improve speed enforcement activities at the crash area and it will increase the perception of being caught among road users.

Another issue related to this case is the noncompliance of aged vehicles with UNECE R14 (safety belt anchorage) requirement, which highlights the importance of seats and seat belt anchorage. The survival rate of the rear passengers can be increased if their seats were still intact after the crash and all of them were restraint. Thus, it is recommended to review current end of life policy considering the weakness of safety features on aged vehicles.

MIROS CODE OF PRACTICE (MCP)

MCPs are reports that promote good practice on road safety and produced in the form of technical and practical guidelines. They lead to activities that required participation from other parties, and also be used as reference for standard operating procedures (SOPs).

MCP NO. 193

Crash Investigation and Reconstruction Training Module

Authors(s): Mohd Amirudin Mohamad Radzi, Ahmad Noor Syukri Zainal Abidin, Kak D-Wing, Siti Atiqah Mohd Faudzi, Zarir Hafiz Zulkipli, Norlen Mohamed
ISBN: 978-967-2078-27-2

The Malaysian Institute of Road Safety Research (MIROS) is the leading agency in Malaysia conducting crash investigation and reconstruction. As the leading crash investigation agency in the country, MIROS plays an important role in developing and implementing training programs to expand and share its knowledge in the field to both local and international stakeholders. This document provides the framework for MIROS's Crash Investigation and Reconstruction Training Module. This module contains three different training levels, namely, basic, intermediate and advanced. The levels include both theoretical and practical perspectives to suit the requirements of the participants.

MCP NO. 226

Guideline of Safe Driver and Rider Performance Evaluation: Focusing on Cognitive and Psychomotor Components

Authors(s): Mohd Firdaus Mohd Siam, Ahmad Azad Ab Rashid, Mohd Khairul Alhapiz Ibrahim, Nurulhana Borhan, Sharina Shariff, Low Suet Fin, Wong Shaw Voon

ISBN: 978-967-2078-15-9

The objective of the guideline is to provide a method that evaluates driver and rider performance that focuses on the safety and time efficiency elements. Safety element focuses on aiming for accident-free trips which on the other words reflecting what a defensive driving or riding is. The scopes of this guideline are converging on two measurable components which are cognitive and psychomotor. It intends to evaluate the driver and rider in which at the end aims to produce good drivers and riders who would be able to properly balance between safety and time efficiency elements without compromising each other. In this guideline, seven attributes will be assessed which are a distraction, safe gap acceptance, motorcyclist conspicuity, speed management, hazard perception, crash avoidance motor skill and time efficiency and vehicle inspection. The guideline covers two evaluation stages that shall be completed by each driver or rider including preliminary screening evaluation and actual evaluation. The evaluation locations are specifically designed in the MIROS driving simulator lab, controlled driving track and actual driving road. The guideline is suitable to be implemented by any government agency, public and commercial transport fleet operator to assess the performance of their drivers and riders and to continually improve their drivers' and rider's competency level and services.

MIROS CRASH ANALYSIS REPORT (MCAR)

MCARs are reports produced on selected cases of accidents, usually originating from MIRs. These reports are “RESTRICTED” and are not available to the general public.

MCAR NO. 208

Cheneh Crash Investigation KM273.9 Lebuhraya Pantai Timur 2 [RESTRICTED]

Authors(s): Fauziana Lamin, Afiqah Omar, Ahmad Noor Syukri Zainal Abidin, Mohd Rasid Osman, Wong Shaw Voon

This report contains a comprehensive investigation into a crash involving a passenger vehicle, which was occupied by four adults. The crash occurred on 17 October 2015 at KM273.9 Pantai Timur Phase 2 Expressway (LPT2) around 11.40 pm. The weather was reported to be fine during that time. The incident claimed two fatalities, one severe injury and one slight injury. A team from MIROS was dispatched to the crash site to carry out an in-depth crash investigation and thorough analysis of the crash. Besides focusing on the environmental factor and vehicle damage, this report also highlights the issue(s) correspond to the incident based on the crash reconstruction. The central cause of the crash causation is most probably due to the inattentive driver, which caused a delay in driver's manoeuvre towards the exit ramp. Meanwhile, the insufficient safety level of the guardrail end terminal has led to the injury severity causality. It is recommended that the safety of the end terminal at gore area on the expressway be enhanced. This is crucial in order to prevent the similar occurrence in the future and subsequently minimise injuries and fatalities due to road crashes in Malaysia.

MIROS ROAD SAFETY ASSESSMENT (MRSA)

MRSAs are audit reports on roads in Malaysia. It is generally produced by the Road Safety Engineering and Environment Research Centre. They can be used as a reference and guidelines which can lead to other activities that promote road safety. Unless stated otherwise, these reports are “RESTRICTED” and not available to the general public.

MRSA NO. 230

Road Safety Assessment: Jalan Temiang & SMJK Chan Wa, Seremban, Negeri Sembilan [RESTRICTED]

Authors(s): Mohd Firdaus Ismail, Nor Aznirahani Mhd Yunin, Alvin Poi Wai Hoong, Siti Zaharah Ishak, Wong Shaw Voon

Road Safety Engineering and Environment Research Centre (REER), MIROS received a letter from Yang Berhormat Ng Chin Tsai (Adun Temiang, Negeri Sembilan) on 25th May 2016 regarding the complaints of 4-legged unsignalised intersection at Jalan Temiang and main road of SMJK Chan Wa, Seremban, Negeri Sembilan.

Among the issues raised are the traffic congestion especially during the weekends and lack of signboard thus contributes to minor road crashes. At the school area, occurrence of several accidents involving students has triggered the report.

To assess the problems based on the complaints, a team from the Highway and Traffic Engineering Unit, REER performed an observation at the site on 27th July 2016. Relevance data regarding the traffic and road characteristics were collected during the visit. The findings in regards to road and traffic engineering design were divided into six sub-sections namely traffic volume analysis, speed analysis, cross section, illegal parking, road marking and signage.

The deficiencies identified are then followed by relevant recommendations in which the recommended countermeasures will act as a guide for road authority and relevant agencies as information and further action. By addressing these issues and implementing the right countermeasures, it is possible to enhance the Level of Service (LOS) and in turn increase safety for road users.

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