

QUALITATIVE STUDY ON ORGANISATIONAL FACTORS CAUSING WORK-RELATED TRAFFIC ACCIDENTS

Qualitative Study on Organisational Factors Causing Work-related Traffic Accidents
Published in August 2018 by

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CONTENT

- Executive Summary** 1
- 1 Introduction**..... 6
 - 1.1 Background 6
 - 1.2 Aim 7
- 2 Methodology** 8
 - 2.1 Method 8
 - 2.2 Sample 8
 - 2.3 Ethical Considerations 8
- 3 Results** 9
 - 3.1 Recruitment, Onboarding & Training 9
 - 3.2 Work Arrangements, Employer Expectation & Employee Performance..... 10
 - 3.3 Safety Measures and Initiatives 12
 - 3.4 Vehicle Technology & Insurance 14
 - 3.5 Cost and Productivity 16
 - 3.6 Other Risks Factors for WRTA..... 17
- 4 Key Findings**..... 20
- 5 Next Step**..... 21
- 6 References** 22

EXECUTIVE SUMMARY

1 Background and Aim

Vehicular-related accident is currently the number one cause of fatal work injuries, accounting for 31% of all fatal injury cases from 2013 to 2017. 56% of these vehicular-related accidents took place in worksites and 44% on public roads. Around 41% involved heavy vehicles followed by 20% involving motorcycles.

For accidents on the road, studies conducted on heavy vehicle drivers and motorcyclists have revealed the following as possible risk factors:

- i. Organisational Factor: pay-per-trip, client/sales demands, trips/work planning
- ii. Individual factor: Recklessness, overworked/fatigue

The Workplace Safety and Health Act was amended to include Work-Related Traffic Accidents (WRTA) in 2014. Hence, to better understand how stakeholders can manage such accidents, Workplace Safety and Health (WSH) Institute together with Blackbox Research Pte Ltd, initiated a study on Work-Related Traffic Accidents (WRTA) involving heavy vehicle drivers and vocational riders.

This research also addresses the priority areas identified in WSH Institute's [National WSH Research Agenda 2018-2020](#) under vehicular safety.

The study aims to:

- i. Determine company practices and work arrangements contributing to the risk of work-related traffic accidents (WRTA);
- ii. Identify the measures taken by companies to manage risk of WRTA;
- iii. Determine the prevalence and cost of WRTA; and
- iv. Determine potential productivity losses to the company.

To best meet the research objectives, the study followed a hybrid approach that utilised both qualitative and quantitative primary research. The findings from the qualitative phase of the study will help guide the design and development of the quantitative survey.

2 Methodology

For the qualitative research stage, the researchers interviewed employers (through company representatives) and employees of companies with either heavy vehicle drivers or vocational riders. In addition, a representative from an insurance firm, as well as a representative from a technology provider were interviewed. A total of 25 in-depth interviews (IDIs) were conducted from 9 February to 30 November 2017. 13 came from companies with heavy vehicle drivers, 10 from companies with vocational riders, and one each from a technology and insurance company. Of the 25 interviews, 10 were with riders/drivers, while the rest were with company

representatives. All IDIs were held at each informant's respective office and lasted between 30 minutes to an hour.

3 Results

The interviews topics were categorised into the six themes below. The insights from the IDIs informed the questionnaire development for the on-going quantitative research phase:

i. Recruitment, Onboarding and Training

- *Recruitment:* Recruitment standards differed greatly from company to company. Generally, larger companies and companies carrying high value or dangerous goods had more stringent recruitment standards for screening the experience as well as skills of their drivers.
- *On-boarding:* Almost all respondents reported that their company had some form of on-boarding process or training. These on-boarding processes varied greatly in scope between companies. Safety induction courses were rarely conducted – only large companies arranged them. The most popular type of on-boarding was attaching recruits to an experienced driver or rider.
- *Training:* Small companies would only send their employees to safety-related training or certification if it was required by the law. The general protocol in such companies is to cover few basic instructions along with the technical training during the driver attachment programme.

ii. Work Arrangements, Employer Expectation & Employee Performance

- *Motivation:* Money was the main reason riders and drivers were in their line of work. Accordingly, incentive systems tended to be built around this motivation.
- *Salary Structure:* Many companies, especially heavy vehicle companies, used a pay-per trip salary, some without a base salary. This means that their employees' salary is fully dependent on the number of trips they make – which could lead to riskier driving behaviour to achieve company-set milestones for the next higher payment tier. Almost all the companies employing the pay-per-trip salary structure claimed that they do not set any minimum targets for their drivers / riders to hit.
- *Basis for Incentives:* Some companies also offered bonuses tied to performance (i.e. driver's productivity), but the performance indicators were not linked to any fixed targets (eg. a specific number of trips made). They were also influenced by other factors, such as good customer service, attendance, traffic records and safety records (i.e. no accidents).

iii. Safety Measures and Initiatives

- *Safety Measures:* Small rider companies tended to have few safety measures, while large heavy vehicle companies had comprehensive safety systems. Also, companies with a designated safety manager or safety team tended to have better systems in place, though only large companies seemed to have dedicated safety manager with a team under him.
- *Incentives and Penalties:* Some companies gave safety incentives (i.e. monetary rewards for good safety records) but these incentives were largely too marginal to encourage employees to be safer. Penalties (for accidents or traffic fines) tended to

be larger, though this might not serve as a deterrence, as some employees had adopted an “I won’t get caught” mentality.

- *Enforcement*: Many employers admitted upon probing that while safety measures might be in place, they were rarely enforced. The interviewed employees shared this sentiment, often confirming that only the legally necessary precautions were strictly followed.
- *Information Asymmetry*: A comparison of employer and employee IDIs showed that employees were not always aware of the safety measures implemented by their companies.
- *Safety Responsibility*: Despite the lack of (or whether perceived or not) safety measures in some companies, employees remained unconcerned due to a belief that safety on the road is a personal responsibility.

iv. Vehicle Technology & Insurance

- *Implementing Technology*: Most companies expressed their interest in implementing some form of technology in their vehicles. Yet their motivation for doing so was to enhance control and productivity, rather than for safety. In-car camera remained the most desired technology as it helped with insurance claims. Industry experts confirmed that unless the senior management team took an active interest in improving the safety culture and was prepared to invest some money, it was often not fruitful to pitch new technology solutions to these companies. The interviewed safety managers also recounted that they had to re-frame any proposal in terms of potential cost-benefit rather than enhanced safety record.
- *Unnecessity to Adopt Technology*: A small handful of companies simply viewed technology as impractical or unnecessary. They found it unnecessary in Singapore, given that the island is small and the distance travelled is not extremely long.
- *Reception to Technology*: Older drivers / riders especially tended not to be receptive to technology as they may deem it as an invasion of privacy, a lack of trust in them and their skills, or may simply not know how to utilise it. Employers even described that some heavy vehicle drivers tend to actively resist the roll-out of additional technology that could monitor their driving behaviour.
- *Insurance*: Select companies reported that implementing technology could lower insurance rates significantly; a representative from a technology distributor in Singapore confirmed the existence of preferential insurance rates. However, other employers said that the cost savings were negligible. In fact, the interviewed insurance company said that a company’s safety record is ultimately the deciding factor, not technology.

v. Cost and Productivity

- *Substantial Productivity Loss and Accident Cost*: Accidents cost companies a lot of money. They have to pay for the excess for insurance, medical bills (if needed), and replacement vehicles or employees, and suffer productivity loss from vehicle downtime. Having said that, none of the interviewed company representatives felt any significant pressure to roll out new (improved) safety measures because of the potential cost or productivity savings.

vi. Other Risk Factors for WRTA

- *Reasons for WRTA*: According to driver interviews, speeding was common among their colleagues. This, in part, is exacerbated by the pay-per-trip salary structure;

they speed so that they can make more trips and earn more income. Only few select companies had technological solutions that could remotely prevent their vehicles from speeding. Negligence and complacency *were also frequently cited factors*. Given that riders and drivers are on the road so often, many start becoming complacent and do not take the necessary care to be safe. Their negligence, in time, may cause them to experience WRTA. For delivery trucks, tight car parks and unfamiliar client locations were also important factors.

- *Construction Sites as Hotbed for Vehicular Accidents*: Employers and employees alike associated constructions sites with high risk of vehicular accidents. The worksties are littered with obstacles like beams and poles which are difficult for the driver to spot.
- *Non-reporting of Accidents*: Near-misses or minor accidents frequently went unreported to the company. It is a perceived hassle to admit minor mistakes, and some employees prefer repairing any damage in external workshops without their employer's knowledge.
- *Information Gathering*: While many respondents had heard of WSH, few reported receiving any communication or information. Even those who had received communications from WSH reported that road safety was rarely a prominent topic.
- *More Information Sharing*: Employers were looking for information on technology, best practices for safety, or any other solutions industry leaders or WSH bodies could recommend.

4 Key Findings

The 3 key findings that emerge from the IDIs are as follows:

- i. Existing Information Sharing is not Impactful Enough
 - Information sharing and outreach seem to be less than ideal. Many companies reported that they were ill-informed regarding the technologies available in the market or best practices in the industry. Some expressed a desire to do more about safety but lacked the know-how to do so. Some also touched on the lack of contact with WSH. Thus, agencies should seek to facilitate more information sharing with and between companies.
 - One promising starting point would be to build industry-specific case studies that show the progress and cost savings of specific industry players who invested in and transformed their approach to road safety. Decision-makers wanted to see concrete evidence that the proposed solutions could benefit their companies, in a quantifiable manner. The other potential area is to provide relevant material to assist companies in conducting safety induction course for their drivers and riders.
- ii. Buy-in from Senior Management is Crucial to Bolster Safety
 - From the interviews, the sense is that safety can only flow from top down. Some respondents who are safety managers expressed their frustration and challenges with trying to improve safety without the support of higher management. Agencies should seek to involve and communicate more with the key decision makers of a

company, rather than targeting safety managers who are often powerless to instil major changes.

- The qualitative interviews suggest that a safety pitch has to likely be accompanied with a cost-saving or logistics improvement pitch rather than standing alone. On its own, safety is often taken for granted and is rarely on the senior management's investment agenda.

iii. Welcomed More Safety Measures, But Only to Measures that Would Increase Productivity and Control

- Some companies also seemed to be interested in implementing more safety measures, but further probing revealed that this interest was motivated by a desire to increase productivity, performance or control; improving safety is thus either a by-product of increased efficiency, or a means to the end of increasing profits or having more control over the company vehicle fleet. Any communications efforts to promote safety should thus be pitched with a productivity and cost-savings angle in order to gain serious momentum in the industry.

1 INTRODUCTION

1.1 Background

Vehicular-related accident is currently the number one cause of fatal work injuries, accounting for 31% of all fatal injury cases from 2013 to 2017. 56% of these vehicular-related accidents took place in worksites and 44% on public roads (Figure 1). Around 41% involved heavy vehicles (Figure 2) followed by 20% involving motorcycles.

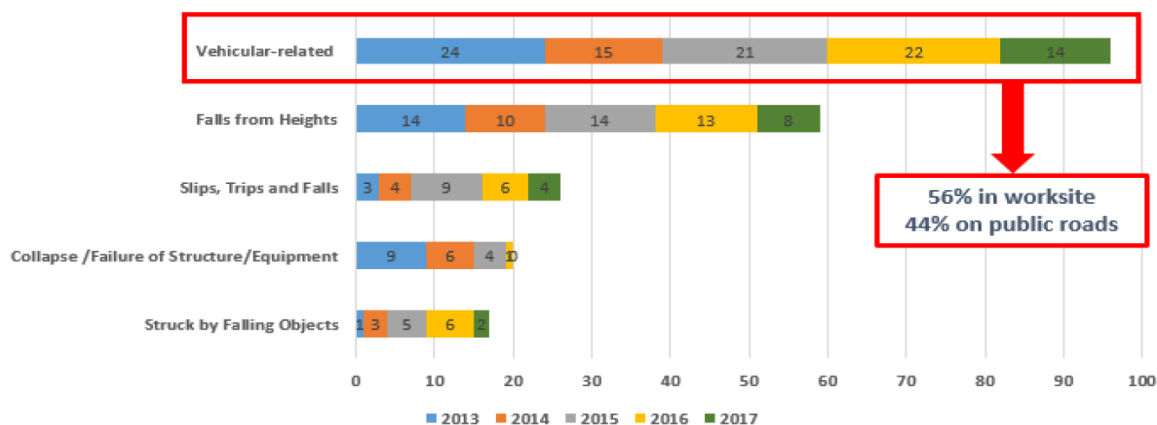


Figure 1: Top Fatal Injury Incident Types, (Year 2013 - 2017)

Source: WSH National Statistics Report 2017

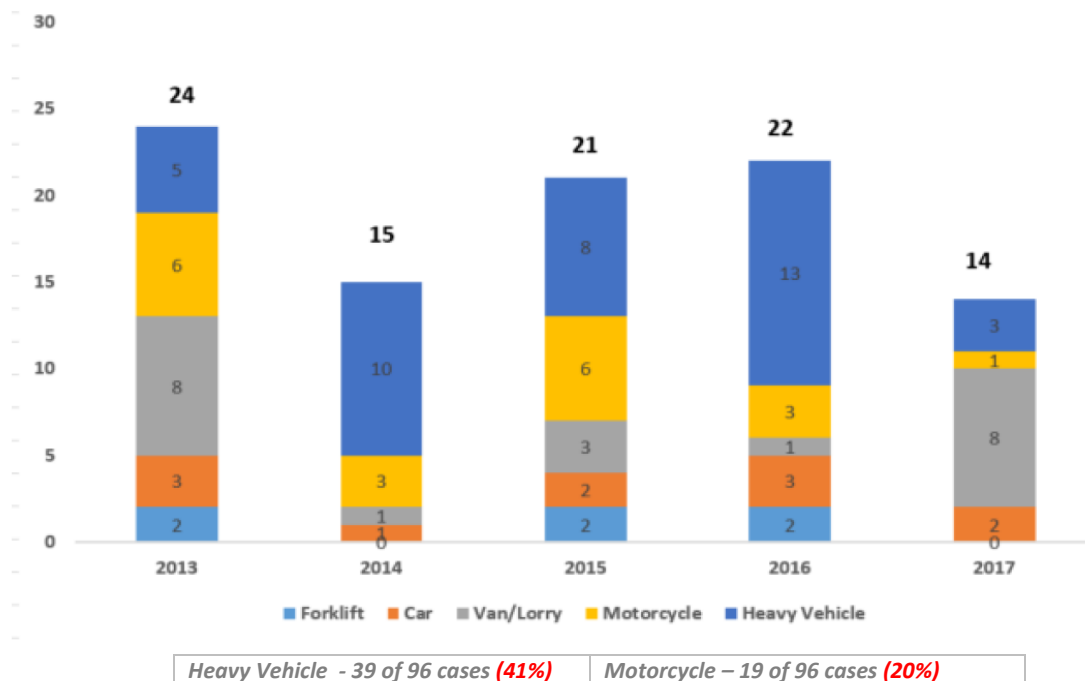


Figure 2: Breakdown of Victims by Vehicle Type, (Year 2013 - 2017)

Source: WSH National Statistics Report 2017

An emerging concern is also the growing popularity of online ordering that has in turn fueled the demand for delivery services. This demand is increasingly being met by bicycles, power-assisted bicycles (PABs), personal mobility devices (PMDs) and vans because they offer flexible and cost-effective alternatives for businesses. As riders are more vulnerable on the road, more needs to be done to find practical solutions to minimize work-related injuries of vocational riders.

For accidents on the road, studies conducted on heavy vehicle drivers and motorcyclists have revealed the following as possible risk factors^[1]:

- i. Organisational Factor: pay-per-trip, client/sales demands, trips/work planning; and
- ii. Individual factor: Recklessness, overworked/fatigue

The Workplace Safety and Health Act was amended to include WRTAs in 2014. However, to better understand how stakeholders can manage such accidents, this study is initiated by the WSH Institute together with Blackbox Research Pte Ltd to determine the organizational factors that contribute to the risk of WRTAs and measures taken by companies.

This research also addresses the priority areas identified in WSH Institute's [National WSH Research Agenda 2018-2020](#) under vehicular safety.

1.2 Aim

The study aims to:

- i. Determine company practices and work arrangements contributing to the risk; of work-related traffic accidents (WRTA);
- ii. Identify the measures taken by companies to manage risk of WRTA;
- iii. Determine the prevalence and cost of WRTA; and
- iv. Determine potential productivity losses to the company.

To best meet these research objectives, the study followed a hybrid approach that utilised both qualitative and quantitative primary research. This report seeks to highlight some key findings from the qualitative stage of this study. These findings from the Qualitative phase of the study will guide the design and development of the quantitative survey.

Given the exploratory nature of this topic, qualitative research enabled the gathering of depth and richness about existing work arrangements and their impact on WRTA. Through the 25 in-depth interviews (IDIs) conducted, the researchers were able to gather important insights and identify areas to be tested on a larger scale with quantitative research. The findings from the qualitative phase of the study will help inform on preliminary factors that could contribute to WRTAs and guide the design and development of the quantitative survey to provide statistical support on these factors.

2 METHODOLOGY

2.1 Method

For the qualitative research stage, the researchers interviewed employers (through company representatives) and employees of companies with either heavy vehicle drivers or vocational riders. In addition, a representative from an insurance firm, as well as a representative from a technology provider were interviewed.

All interviews were held at the informants' respective offices. A familiar environment was chosen to help respondents feel more comfortable and forthcoming in the interview. All employee interviews were also conducted separately from the employer interview to minimise any influence bias; employers were not present during the interview and hence would not know what the employees said.

A total of 25 in-depth interviews (IDI) were conducted between 9 February and 30 November 2017. Each interview lasted between 30 minutes to an hour.

2.2 Sample

Out of the 25 IDIs conducted, 13 came from companies with heavy vehicle drivers, 10 from companies with vocational riders, and one each from a technology and insurance company. The 25 IDIs were broken down into 10 IDIs with the employees (6 heavy vehicle drivers and 4 vocational riders), 13 IDIs with the employers (7 employers of heavy vehicle drivers and 6 employers of vocational riders), 1 IDI with insurance provider and 1 IDI with technology provider.

2.3 Ethical Considerations

In order to protect the identity of the respondents, the findings will not be attributed to the respondents or company and only presented in an aggregated manner.

3 RESULTS

The interview topics were categorised into six themes reflected below and quotes from respondents would be cited and elaborated to substantiate the insight highlighted.

- (i) Recruitment, Onboarding & Training;
- (ii) Work Arrangements, Employer Expectation & Employee Performance;
- (iii) Safety Measures and Initiatives;
- (iv) Vehicle Technology & Insurance;
- (v) Cost and Productivity; and
- (vi) Other Risks Factors for WRTA.

3.1 Recruitment, Onboarding & Training

3.1.1 Recruitment

Recruitment standards differed greatly from company to company. As expected, most companies preferred candidates who had prior experience as a heavy vehicle driver or vocational rider. That said, many companies simply settled for candidates who held the requisite license (eg. Class 4 for heavy vehicles, Class 2B for vocational riders), as one representative in a rider company pointed out:

“As long as candidates are agreeable to the working hours and job scope, that’s good enough” (Rider Employer)

One company even admitted that they did not care about a rider’s motoring skills. Instead, the company was only concerned about whether the candidate had another non-traffic related technical skill (i.e. maintenance experience) required for the job. Other companies preferred younger drivers.

Some companies did however have stricter recruitment standards. Generally, larger companies and companies carrying high value or dangerous goods tended to have more stringent recruitment standards for screening the experience as well as skills of their drivers.

“[We] prefer younger drivers but there’s no real cut-off age.” (Heavy Vehicle Employer)

“[We look at] safe driving record(s). SPF has a website to look at drivers’ records and license” (Heavy Vehicle Employer)

3.1.2 Onboarding

Once employed, almost all riders and drivers went through some form of on-boarding or training. Larger companies, especially heavy vehicle companies, tended to have a more structured orientation programme. Some components of the orientation programme included a briefing on standard operating procedures (SOPs) and safety, training courses (both safety and non-safety related), or issuing an employee handbook.

Most companies however, tended to only provide unstructured training with an informal on-boarding process. Attaching the new employee to an experienced rider or driver seemed to be the most popular form of on-boarding. Attachments could last from as short as a few days to as long as over 2 months, depending on company practice and the skill and experience of the new employee.

“If inexperienced driver, [he] follows experienced driver for 1 to 2 months” (Heavy Vehicle Employer)

“[There was a] three day on-job training; experienced driver follows new driver to teach how to operate truck, teach procedures” (Heavy Vehicle Driver)

Some companies did place an emphasis on safety during the on-boarding process. These companies reported having Safety Induction Trainings (SITs) for their drivers or riders. SITs might be conducted in-house or by third-party providers. Again, SITs tended to be conducted only in larger companies with a dedicated safety manager / team of safety officers overlooking the proceedings.

“We have company’s safety orientation. We issue our safety handbook, and have SIT (safety induction training)” (Large Heavy Vehicle Company Employer)

“My company showed me videos of safety management and also included a separate session on safety belts, safety harness, etc” (Heavy Vehicle Driver)

Small companies would only send their employees to safety-related training or certification if it was required by the law. The general protocol in such companies is to cover few basic instructions along with the technical training during the driver attachment programme.

I believe that my riders who are all family men would take their own precautions while travelling since they want to go back safely to their families” (Small Rider Company Employer)

“No not really, no training. Only thing they asked me is how long I been riding.” (Rider of Small Company)

3.2 Work Arrangements, Employer Expectation & Employee Performance

3.2.1 Motivation

Money remained the primary form of motivation for all drivers and riders interviewed. Accordingly, incentive systems tended to be built around this. One respondent disclosed that he quit his sales job, which paid around \$2,500 a month to become a heavy vehicle driver, because

it paid more. He could take home around \$5,000 a month on a good month, because of the incentive system. Another driver also said the following:

“[I joined] just purely for pay, purely for money. For drivers, normally our education level is lower than others. For our low education, we can earn much more money. That’s why we join to be a driver” (Heavy Vehicle Driver)

“[drivers] they don’t care about safety, just money” (Heavy Vehicle Employer)

3.2.2 Salary & Basis for Incentives

The salary structure of employees tended to differ based on the industry the company is in. Companies that do deliveries – whether container delivery, delivery of dangerous goods such as chemicals, or even food delivery – favoured a pay-per-trip salary structure; drivers and riders were paid a specified amount for each trip they made. Some of these companies offered a base salary on top of the per-trip incentives. For those without base salary, their earnings were fully dependent on the number of trips made. This could lead to riskier driving behaviour, in order to achieve company-set targets or milestones for the next higher payment tier.

“Incentives are very important. Let’s be honest, drivers only work for money.” (Heavy Vehicle Employer)

When quizzed on why they adopted a pay-per-trip salary structure, most of the delivery companies cited productivity as the primary factor. Respondents said that offering a fixed salary had in the past led to foot-dragging or skiving among employees; drivers and riders would take longer breaks and take their time to move from one location to the next. Since the nature of a delivery business is time sensitive (i.e. their business model is reliant on drivers and riders making fast deliveries, inefficient workers would have a significant negative effect on the employer’s profit margin. A pay-per-trip model was thus believed to be the only way to incentivise and motivate employees to work efficiently.

Almost all the companies employing the pay-per-trip salary structure claimed that they do not set any minimum targets for their drivers / riders to hit.

“We record performance but the driver has no quota to meet” (Heavy Vehicle Employer)

“If I’m tired, I’ll tell the controller I need to rest. They will release me [to go home and rest]” (Heavy Vehicle Driver)

“My employer is quite flexible but we try to finish more trips as there is more money in it” (Rider)

Non-delivery companies, in contrast, generally offered their riders and drivers a fixed salary. Dispatch riders, technicians (who make regular trips to provide other services), and lorry drivers

(who ferry workers) mostly fell in this category. Given the small volume of trips made, these companies expressed that a per-trip salary structure would be impractical for them.

Companies sometimes offered additional monetary incentives in the form of monthly, half-yearly or annual bonuses. These bonuses considered performance (i.e. driver's productivity), but rarely were performance indicators tied to any fixed targets (eg. a specific number of trips made). They were also influenced by other factors, such as good customer service, attendance, traffic records and safety records (i.e. no accidents).

“we give half year bonus.... [some criteria are] no customer complaints. if attendance is okay – not too many MCs and leave, no traffic violations, no accidents” (Heavy Vehicle Employer)

3.3 Safety Measures and Initiatives

3.3.1 Safety Measures

Safety measures also varied greatly from company to company and industry to industry. For example, small rider companies had almost no safety measures, while large heavy vehicle companies had comprehensive safety systems in place. Companies with a designated safety manager or safety team also had better systems in place.

Two factors seemed to determine the comprehensiveness of a company's safety measures: need and means.

Companies that transport dangerous goods and valuable goods were observed to have extremely comprehensive safety measures. While some of the measures implemented were required by law (eg. putting speed limiters on vehicles carrying dangerous goods), these companies also implementing additional measures, over and above the legal requirements. One possible reason could be that company reputation is more crucial to a company carrying dangerous/valuable goods than a company carrying regular items. Since the consequences of a mishap are significantly higher for those carrying dangerous/valuable goods, clients would take into account a transport company's safety record and safety system. With such stakes in play, there is a greater need for companies carrying such goods to invest in safety; safety is directly related to business development and profits.

Larger companies generally also had more comprehensive safety measures. This is largely because bigger companies have the means and the scale to roll out more safety measures. For one, larger companies are able to afford hiring a dedicated safety manager with a team under him to oversee safety and implement new technology or measures. They are also better able to afford new technology and offer incentives for safety. Smaller companies, however, are struggling to stay afloat or do not have the scale to be able to afford such measures.

3.3.2 Safety Incentives & Penalties

Some companies gave safety incentives such as monetary rewards for good safety records, or awards like Annual Driver Award for model employees. However, these incentives were often too marginal to motivate employees to be safer; employees would probably be able to make more money doing more trips than by earning the safety incentives

“we have a monthly incentive of \$80 for no incidents or damage to vehicles” (Heavy Vehicle Employer)

Penalties for accidents or traffic fines however, tended to be larger. Companies where employees used company owned-vehicles required their employees to pay for a part of the damage, should they meet with an accident. Other companies deducted a portion of the employee’s salary or bonus, or even took away the bonus altogether. For traffic fines, many employers made their employees pay for the fines in full.

“they fine \$500 [if we get into an accident... drivers have to pay excess – up to 25% of damage” (Heavy Vehicle Employee)

Other penalties included the issuance of a warning letter, suspension of the employee, sending them for counselling, re-training, or even terminating them. While penalties can get rather severe, drivers and riders reported that they have colleagues who remain undeterred. These colleagues adopt a “I won’t get caught” or “it won’t happen to me” mentality.

3.3.3 Lack of Enforcement

Regardless of size and industry, many companies, upon probing, admitted that they did not strictly enforce their safety measures. Only a handful of companies actively conducted spot checks and ensured that their employees were compliant. Most companies admitted to only giving verbal or text reminders. The interviewed employees shared this sentiment, often confirming that only the legally necessary precautions were strictly followed. For example, pre-deployment checks (brief inspection of vehicle before taking off) are something that most companies reported having. But employers and employees alike say that no one ensures that the checks are done.

“I want them to make it a habit to check before they make every trip, but I don’t think you’ll do it.... Honestly there is no one doing a check” (Heavy Vehicle Employer)

3.3.4 Information Asymmetry

A comparison of employer and employee IDIs showed that employees were not always aware of the safety measures implemented by their companies. This suggested a lack of proper communication between employers and employees, where information on initiatives had not cascaded down to the employees. Below is one such example.

“Company owns a workshop, so riders may go in at any time for free maintenance or checks” (Rider Company Employer)

“As far as mandatory maintenance, no, they don’t provide. We maintain ourselves.” (Rider from Same Company)

3.3.4 Safety: A Personal Responsibility

Despite the lack of (whether perceived or not) safety measures in some companies, employees remain unconcerned. Most share the belief that safety is a personal responsibility, and that it is up to them to be safe, not the company.

“Safety is the concern of the rider. Company already provide insurance. [We] riders should ride slower and safer” (Rider)

3.4 **Vehicle Technology & Insurance**

3.4.1 Implementing Technology

Apart from some large companies in the logistics sector, the implementation of technology was modest at best. Among the heavy vehicle companies, the smaller companies did not have any technology installed, save for a Global Positioning System (GPS) navigation device, which was usually the employee’s mobile phone. On the other end of the spectrum, some companies – usually larger ones – had company-issued tablets with elaborate software that showed them their job assignments and routes, in-car cameras, GPS trackers in their vehicles, fatigue management systems and/or fleet management systems.

Regardless of size, industry or company, almost all employers expressed their interest in implementing additional technology in their vehicles. The most desired technology among employers and drivers was an in-car camera that records and stores video footage. Drivers and employers seemed to like this form of technology not because it helps to improve safety on the road, but because it could help in insurance claims, should they be involved in accidents.

“Technology more for insurance claims. To make sure premiums don’t rise...to win accident claims” (Heavy Vehicle Employer)

This profit-oriented motivation held true not just for in-car cameras, but for all forms of technology. From the employer’s perspective, motivation to implement technology stemmed from the desire to increase productivity and control, and decrease cost. From the employee’s perspective, technology was only desired if it can help them make (or save) more money. Safety is almost never the motivating factor.

Industry experts confirmed that unless the senior management team took an active interest in improving the safety culture and was prepared to invest some money, it was often not fruitful to

pitch new technology solutions to these companies. The interviewed safety managers also recounted that they have to re-frame any proposal in terms of potential cost-benefit rather than enhanced safety record.

“Selling the concept is difficult – as it is not just about hardware but a combination of technology + management of driver/rider + risk management” (Technology Provider)

The largest barrier to implementing technology, not surprisingly, was cost. Most employer respondents balked at the thought of having to lay out a substantial investment initially. This was not helped by the fact that the cost savings from implementing technology are often hidden, indirect or gradual.

“When we decide on technology, its 80% function and 20% budget. We need to ask if it’s necessary in the Singapore landscape” (Heavy Vehicle Employer)

There also seemed to be a lack of information regarding government grants and subsidies that may actually reduce the cost of implementing even the most state-of-the-art technology. From our interview with a technology provider – who sells sensors, cameras, fleet management and fatigue management systems – a Small and Medium Enterprise (SME) for example, may be entitled to nearly 90% of subsidies by using various government grants. This means that technology is not always out of reach – cost is not always the barrier, lack of information may at times be the reason for the slow take-up rate of technology.

That said, a small handful of companies simply viewed technology as impractical or unnecessary. A large company even shared that while they did have the resources to implement technologies like a fatigue management system, they found it unnecessary in Singapore, given that the island is small and the distance travelled is not extremely long (their benchmark was cross-state routes in the US and Europe).

“Given my fixed customers and the small land area of Singapore, no point spending on technology that tracks my drivers. Can always call them and ask their location – I trust them” (Rider Company Employer)

3.4.2 Reception to Technology

On receptivity to technology, employees were generally accepting of technology. They did however suggest that their colleagues – the older generation in particular – might not be as receptive, viewing technology as an invasion of their privacy, a lack of trust in them and their skills, or simply because they do not know how to utilise it. Employers even described that heavy vehicle drivers tended to actively resist the roll-out of additional technology that could monitor their driving behaviour.

“I don’t like [the GPS tracker], but I won’t mess around with it” – Heavy Vehicle Driver

“People around my age [30s] can accept technology... its people who are older that don’t like it” (Heavy Vehicle Driver)

3.4.3 Insurance

According to the employers interviewed and representatives from an insurance company, the insurance premium represented a significant proportion of a company’s cost. Companies are thus always looking out for lower insurance rates, either by seeking discounts from their insurance providers or changing insurance providers altogether.

One of the ways a handful of companies tried to lower their insurance premiums was by installing technology. They claimed that by installing technology and then reporting their implementation to the insurance company, they were able to convince their insurance provider to lower their insurance premiums rather substantially. An interview with a representative from the technology provider confirmed that preferential insurance rates exist. The respondent claimed that installing certain technology can lower insurance premiums directly and indirectly. Insurance providers may offer better premiums simply because of the implementation of the technology. If not, the technology may indeed help to improve safety records, which would then naturally cause insurance premiums to fall.

That said, other employers claimed that technology can only help to lower premiums marginally at best. Speaking to an insurance company, while technology can help lower insurance premiums by a small margin, safety records are ultimately still the deciding factor in determining the cost of insurance premiums

“claims experience, claims history, that is the most important factor. We want the past three years, whether from current or previous insurer” (Insurer)

“Technology costs a lost of money to the company. The insurance market works on incident records to lower the premiums and technology figures very low on the list” (Insurer)

“Insurance doesn’t care about technology. [They] only care about safety record of the company” (Heavy Vehicle Employer)

Given the contradiction between IDIs, this was an area that we are keenly seeking to test in the quantitative phase to see if technology can indeed help to keep premiums on the low.

3.5 **Cost and Productivity**

3.5.1 Substantial Productivity Loss and Accident Cost

Accidents cost companies a significant amount of money – there are direct and indirect costs involved. Direct costs included damage to the vehicle, and possible damage to other vehicles or properties. There were also medical fees, insurance excess, and other hidden costs.

“repair of trucks, write-offs, hospital bills, MCs, all cost money” (Heavy Vehicle Employer)

The indirect costs included loss in output from losing a worker, productivity loss from vehicle downtime, and an increase in insurance premiums.

“about \$2,000 on sales, productivity loss, if truck cannot run for one day” (Heavy Vehicle Employer)

Having said that, none of the interviewed company representatives felt any significant pressure to roll out new (improved) safety measures because of the potential cost or productivity savings.

3.6 Other Risks Factors for WRTA

3.6.1 Common Reasons for WRTA

The main reason for accidents was identified to be speeding.

“my whole vehicle topple ah...but I admit, I also admit to TP, it’s my own fault...I fast, then when turning – I mounted heavy container – I brake, the thing [container] drop”
(Heavy Vehicle Driver)

According to driver interviews, speeding was common among their colleagues. This, in part, is exacerbated by the pay-per-trip salary structure. Drivers and riders speed so that they can make more trips and earn more income for themselves. Only few select companies have technological solutions which can remotely prevent their vehicles from speeding.

“[Some] drivers are rushing more. [They] want to make the most of their time” (Heavy Vehicle Driver)

Other reasons cited by employees for causing WRTA were negligence and complacency. Given that riders and drivers are on the road so often, many start becoming complacent and do not take the necessary care to be safe. Their negligence, in time, may cause them to experience WRTA.

For delivery trucks, tight car parks and unfamiliar client locations were also important factors.

Employers and employees from construction or logistics companies also associated constructions sites with having high risk of vehicular accidents. For one, these worksites are littered with obstacles like beams and poles which are difficult for the driver to spot.

“construction sites difficult to work with...there are a lot of obstacles in the way, like beams or pipes” (Heavy Vehicle Employer)

Also, the long waiting time in construction sites frustrates drivers. In their impatience and frustration, these drivers then become more aggressive and reckless. To make matters worse, miscommunication (language barrier) at construction sites between foremen and drivers also occur from time to time and had led to confrontation. One company even had to ban all their drivers from dismounting from their vehicle until they seek permission from their supervisor over the radio.

3.6.2 Non-Reporting of Accidents

Near-misses or minor accidents frequently went unreported to the company. The hassle of reporting and the higher cost of repair (some companies make employees pay for part of the damage) mean that employees prefer not to report minor accidents to the company. Informants, both heavy vehicle drivers and vocational riders alike, said they might repair it in external workshops where the cost is lower.

“my bike [had] superficial [damage], my headlight dented... it’s a small matter. Why would I want to make a report for \$50-\$60 dollars?” (Vocational Rider)

“minor [accident] ah?... won’t report... they [colleagues] will do back [repair] themselves... company workshop, we need to pay more. I go outside one [workshop] cheaper” (Heavy Vehicle Driver)

Many companies, however, remain under the illusion that their employees will always report accidents to them – including near-misses or minor accidents. They also seem unaware that drivers go to the extent of repairing the vehicles themselves.

“Drivers can’t hide accidents – we check vehicles every week” (Heavy Vehicle Employer)

3.6.3 Information Gathering and Sharing

While many employers have heard of WSH, few reported receiving any communication or information. Some had to actively look for safety information, while others who had received communications from WSH reported that road safety was rarely a prominent topic.

“Personally, I’ve never received [any information from WSH]” (Heavy Vehicle Employer)

“Not much information from WSH for drivers – more safety in the workplace” (Rider Employer)

For employees, the awareness and reach of WSH is even poorer. It was mostly associated to compulsory safety courses required in some industries. Other employees had never heard of WSH before.

The desire for greater information sharing on safety within their respective industry ranked as one of the top suggestions by employers. One suggestion was for WSH bodies to come up with a monthly safety slide deck that could be used in their toolbox meeting. Other employers were looking for good deals on technology, advice on implementing safety measures or suggestions on customised solutions for their company size and set up.

“industries should work with government to disseminate information on new technology”
(Heavy Vehicle Employer)

“will be good if WSH can provide slides for my toolbox meeting” (Heavy Vehicle Employer)

4 KEY FINDINGS

4.1 Existing Information Sharing Is Not Impactful Enough

Information sharing and outreach seem to be less than ideal. Many companies reported that they were ill-informed regarding the technologies available in the market or best practices in the industry. Some expressed a desire to do more about safety but lacked the know-how to do so. Some also touched on the lack of contact with WSH. Thus agencies should seek to facilitate more information sharing with and between companies.

One promising starting point would be to build industry-specific case studies that show the progress (and cost savings) of specific industry players who invested in and transformed their approach to road safety. Decision-makers wanted to see concrete evidence that the proposed solutions could benefit their companies, in a quantifiable manner. The other potential area is to provide relevant material to assist companies in conducting safety induction course for their drivers and riders.

4.2 Buy-in from Senior Management is Crucial to Bolster Safety

From the interviews, the sense is that safety can only flow from top down. Some respondents (who are safety managers) expressed their frustration and challenges with trying to improve safety without the support of higher management. Agencies should seek to involve and communicate more with the key decision makers of a company, rather than targeting safety managers who are often powerless to instil major changes.

The qualitative interviews suggest that a safety pitch has to likely be accompanied with a cost-saving or logistics improvement pitch rather than standing alone. On its own, safety is often taken for granted and is rarely on the senior management's investment agenda.

4.3 Welcomed More Safety Measures, But Only to Measures that Would Increase Productivity and Control

Some companies also seemed to be interested in implementing more safety measures, but further probing revealed that this interest was motivated by a desire to increase productivity, performance or control; improving safety is thus either a by-product of increased efficiency, or a means to the end of increasing profits or having more control over the company vehicle fleet. Any communications efforts to promote safety should thus be pitched with a productivity and cost-savings angle in order to gain serious momentum in the industry.

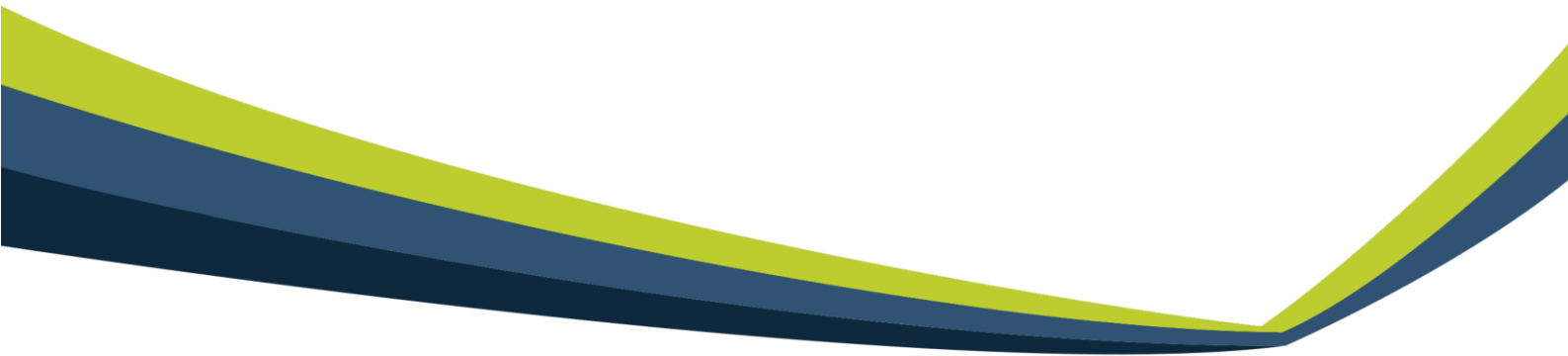
5 NEXT STEP

The findings from the qualitative phase of the study will help inform on preliminary factors that could contribute to WRTAs and guide the design and development of the quantitative survey to provide statistical support on these factors.

The quantitative survey is currently in progress and results from this part is expected to be completed towards the end of 2018. More information on the findings from the quantitative survey would be available on the WSH Institute website in early 2019.

6 REFERENCES

1. Workplace Safety and Health Institute. 2016. *Preventing Work-Related Traffic Accidents Involving Heavy Vehicles*. [Online].
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