NOBLE DENTON

Health and Safety Authority

Survey of workplace transport safety management

Final Report

NOBLE DENTON

Health and Safety Authority

Survey of workplace transport safety management

C1293\04\001R Rev F December 2008

DOCUMENT ISSUE RECORD						
Rev	**Issue Date**	**Doc. ID**	**Purpose**	**Author**	**Checker**	**Approver**
A	05/06/08	001R	Issue of draft information review	RJR	NAP	NAP
B	29/08/08	001R	Issue of interim report	NAP	DWJ	NAP
C	02/09/08	001R	Issue of interim report with updated accident data	NAP	DWJ	NAP
D	10/10/08	001R	Issue of Draft Final Report	NAP	RJR	NAP
E	05/12/08	001R	Issue of Final Report	NAP	RJR	NAP
F	16/12/08	001R	Second issue of Final Report	NAP	RJR	NAP

Noble Denton BOMEL Ltd, Thames Central, 90 Hatfield Road, Slough, Berkshire SL1 1QE, United Kingdom
T: +44 (0)1753 216800 F:+44 (0)1753 216801 E:info@bomelconsult.com www.bomelconsult.com

CONTENTS

EXECUTIVE SUMMARY

INTRODUCTION

One of the key areas that the Health and Safety Authority (HSA) is responsible for is Workplace Transport Safety (WTS). A range of hazardous activities are undertaken that result in accidents involving goods falling on people, people falling from vehicles and vehicles striking people across all industry sectors. HSA statistics indicate that on an annual basis 45–50% of fatal accidents involve workplace transport. HSA has recognised the significance of workplace transport accidents and in its Programme of Work 2008 has proposed 500 inspections, raising of awareness, and the development of guidance and research.

This current study was undertaken by Noble Denton BOMEL Limited (ND BOMEL) to develop a profile of the workplace transport environment that will be used to inform the development of a strategy and policies for WTS in Ireland. It should be noted that the industries agriculture, construction, docks and quarrying were outside the remit of this current study.

PROJECT METHODOLOGY

To develop the workplace transport 'evidence base' a series of data gathering activities were undertaken. The first activity involved developing a definition of WTS to ensure evidence gathered throughout the project used a consistent definition. A review of existing information and literature was then undertaken in order to identify what documentation had been published on the topic and to enable the project and the HSA to build on what is available. The review was important to identify the range and content of workplace transport information currently available to organisations.

In order to identify the key high risk areas based on existing data, HSA provided ND BOMEL with its accident data from January 1993 to April 2008 to enable extraction of accident data relevant to workplace transport. This bespoke workplace transport dataset was then analysed to highlight the key risk issues in terms of WTS. In addition to highlighting the key high risk areas, the analysis also provided baseline accident numbers against which future years can be compared in order to monitor change.

It was important that the study did not rely solely on existing information sources. Therefore, in order to understand how organisations in Ireland are currently approaching WTS management, a survey was conducted involving a range of organisations across different sectors. Over 100 organisations participated in the survey which was undertaken during July and August 2008.

Following completion of the information review, accident data analysis and industry survey, the evidence was aggregated against the following five WTS themes:

- Drivers

- Pedestrians
- Site layout and maintenance
- Management strategies and systems
- Vehicle selection and maintenance

Aggregating the evidence around each of these themes provided a consolidated workplace transport evidence base. This evidence base also constituted a baseline measure of WTS management activity in Ireland at this present time.

To complete the study, the key high risk areas identified were discussed and risk control measures for both industry and HSA were proposed. A set of future outcome indicators were also suggested for use in future evaluation studies.

KEY FINDINGS AND RECOMMENDATIONS

The key findings from the study and the proposed recommendations, against each WTS theme, were as follows:

Drivers

The accident analysis clearly indicated that the job of driver is a high risk occupational group (22% of fatal injuries involved heavy truck and lorry drivers). It also indicated that the drivers involved in accidents are probably company employees (92% of those involved were employees) and of Irish nationality. In terms of fatal accidents, all ages of employee were involved. However, in terms of all injury severities, employees that were involved (a high proportion of which are likely to be drivers) were typically middle aged. The survey of Irish organisations revealed that around a third of the sample agreed that from time-to-time you have to expect that drivers will take risks to get the job done. Several interviewees also noted how at their organisations, when people are working on or near vehicles (e.g. loading/unloading) they ‘rarely’ or ‘never’ wear Hi-Viz clothing. Several interviewees also noted how vehicles can ‘often’ or ‘sometimes’ be seen going too fast. These findings may indicate a lower risk awareness amongst some drivers in the workplace. Risk awareness can be heightened through education and awareness raising activities, as well as regular communication about risk from senior management and between drivers. Interestingly, the survey also found that although refresher training was being provided by some organisations, it was not being provided universally.

Despite the high risk nature of the role, the information review identified a clear gap in the guidance aimed directly at drivers, with most information being targeted at employers who are then required to disseminate this information to drivers.

Key recommendations for improving driver risk

- Organisations should consider investment in more refresher training for their drivers, either from outside agencies or in-house. This should be based on a thorough training needs analysis.
- HSA should consider developing more guidance aimed directly at drivers.
- During the survey undertaken organisations asked if HSA could consider undertaking more spot checks and inspections at workplaces, develop and implement legislation on carrying out mandatory drug testing and translating existing materials into other non-native languages. All of which would be very useful for managing the safety of drivers.

Pedestrians

Pedestrians include anyone who intentionally or unintentionally enters or moves around the workplace on foot, including the workforce, business visitors (e.g. contractors, deliveries etc.) and members of the public.

The survey of organisations clearly indicated that the majority had members of the public accessing their site; either for legitimate purposes or because they were lost or unaware they had even entered a 'workplace'. Furthermore, most of the organisations surveyed had their own workers or official site visitors moving around the workplace on foot.

Despite the high level of pedestrian activity, the survey results also highlighted almost half of the organisations consulted with agreed that pedestrians were not aware of the risks associated with workplace transport. Several interviewees also noted how when site visitors were near vehicles, they 'rarely' or 'never' wore the same personal protective equipment as employees. Several interviewees also noted how visitors are 'rarely' or 'never' accompanied around the site by a member of staff. Possibly the most significant finding is that the clear majority of organisations surveyed confirmed they always observed pedestrians walking across areas where vehicles operate.

The information review also identified that there was limited guidance aimed directly at the pedestrians themselves. Pedestrian movement (workers and members of the public) is therefore a risk that may need addressing through guidance.

Key recommendations for improving pedestrian risk

- HSA should consider producing guidance aimed directly at pedestrian workers.
- Organisations should review their site layout and signage in order to help members of the public (expected and unexpected) safely navigate their way around the workplace.

Site layout and maintenance

The evidence identified that factories, industrial sites and warehouses are the work environments where the largest total number of workplace transport related incidents have been reported to HSA. The industry survey found that the most common vehicles found within the workplace were cars, vans, waste carrying vehicles and HGVs. Encouragingly the information review found that both HSA and HSE (in the UK) have published guidance on site layout and maintenance. The result of having such information readily available was possibly reflected in the finding that many organisations reported having several good safety features implemented at their workplace.

However, areas where improvements could possibly be made are relating to updating the site layout, sharing sites with other organisations and certain less common site safety features.

The survey found that a considerable number of organisations had not considered the layout of their site in over 20 years. Reviewing the existing site with a view to updating it with easy to implement safety features could help reduce risk significantly.

The majority of organisations owned their own site and did not share it with anyone else, making the management of site safety within their own control. However, 32 organisations did share their workplace with other organisations. This may be an issue for consideration in terms of how companies jointly manage site safety and how they manage the interfaces between the various companies.

Despite many organisations having a range of safety features on site, features that were found to be less common included having a safe refuge for visiting drivers during loading / unloading activities, lanes for vehicles to travel in, barriers between pedestrians and vehicles and traffic lights / signals to help manage moving site traffic. The accident analysis provided some evidence that indicated accidents could involve people being trapped, crushed or hit by mobile machinery and possibly being hit by forklift trucks. If these types of site safety features were more common, it may reduce the risk of this type of incident occurring.

Finally, there were a number of organisations in the survey who did not operate their own vehicles, but experienced a reasonably high level of vehicle activity on their workplace. This activity came from suppliers, deliveries and visitors. These organisations may not have been traditionally targeted with site safety information, but do represent a real risk area and should therefore be considered.

Key recommendations for improving the risks associated with site layout and maintenance

- Organisations should consider modernising the layout of their existing workplaces using the information provided by HSA and HSE (UK) to help guide the process.

- Organisations should consider implementing a safe refuge for visiting drivers during loading / unloading activities, lanes for vehicles to travel in, barriers between pedestrians and vehicles and traffic lights / signals to help manage moving site traffic.

- HSA should consider producing management level guidance for companies that share a workplace.

- HSA should consider producing management level guidance for organisations that do not actually operate their own vehicles, but who experience a reasonably high level of vehicle activity on their workplace.

- HSA and / or organisations should also consider translating key workplace safety information into different languages.

- HSA should consider promoting awareness of the signs regulations to employers and safety representatives.

Management strategies and systems

The industry survey revealed that 94% of the participating organisations had a general safety management system in place and 60% reported having WTS management systems, policies and procedures in place. This indicated that there are still some organisations that have implemented general safety management systems, but have not yet gone as far as developing these systems in relation to WTS.

There is guidance available on safety management systems. Much of it encourages organisations to integrate WTS management activities into a wider safety management system. The business benefits of good safety management in this area are highlighted in order to demonstrate that investment is a wise move.

Key recommendations for improving the risks associated with management strategies and systems

- HSA should consider developing guidance and awareness raising materials aimed directly at employees.

- HSA should consider developing guidance for 'low hazard' companies (companies that operate in an environment where few hazards are present, resulting in low staff risk awareness, despite some risk being present from visiting vehicles (e.g. suppliers, deliveries etc.)). This guidance should include the most fundamental risk control measures that should be implemented in any workplace where there is vehicle (and pedestrian) activity.

- HSA should consider developing guidance aimed at 'medium hazard' small and medium sized businesses (companies that operate in an environment

where hazards are present and, within the larger organisations, management systems are in place to address the hazards, however, employees appear to be less aware of the hazards around workplace transport). These organisations are exposed to the risk, but may not have the same level of resource as larger companies to manage the risk.

- The survey also revealed that organisations wanted HSA to develop a 'check list' of items to review when assessing WTS management.

- Organisations that do not currently have workplace transport safety management systems in place should consider integrating this into their existing general safety management system.

Vehicle selection and maintenance

The evidence revealed that workplace vehicles are typically selected on their suitability for the task and some of the more traditional workplace transport vehicles used across industry, such as HGVs and forklift trucks, do have a range of safety features. However, more organisations should consider having CCTV fitted to their HGV fleet. A small number of organisations revealed that drivers still require access to the top of the vehicle, however, the majority were in the education sector and the vehicles included buses and vans and related to luggage storage. In general industry reported good vehicle maintenance procedures; typically using contractors to carry out maintenance work. The review of existing information revealed that there is widespread information available on selecting and maintaining vehicles.

Key recommendations for improving the risks associated with vehicle selection and maintenance

- Organisations should consider CCTV for HGVs where appropriate.

- The survey revealed organisations wanted the HSA to carry out more spot checks and inspections in general, and this would also apply to checking workplace vehicles.

CASE STUDIES

As a final output from this study, four case studies were developed around the following themes:

- Managing pedestrians in the workplace effectively (aimed at managerial positions).

- Raising pedestrian awareness of workplace transport risks (aimed at the pedestrians themselves).

- Raising awareness of a new HSA WTS checklist (aimed at 'low hazard' companies).

- Helping drivers to check their approach to workplace transport driving (aimed at the drivers themselves).

1. INTRODUCTION

1.1 BACKGROUND

One of the key areas that the Health and Safety Authority (HSA) is responsible for is Workplace Transport Safety (WTS). A range of hazardous activities are undertaken that result in accidents involving goods falling on people, people falling from vehicles and vehicles striking people across all industry sectors. HSA statistics indicate that on an annual basis 45–50% of fatal accidents involve workplace transport. HSA has recognised the significance of workplace transport accidents and in its Programme of Work 2008 has proposed 500 inspections, raising of awareness, and the development of guidance and research.

In order to develop a profile of the workplace transport environment that will be used to inform the development of a strategy and policies for workplace vehicle transport safety, the HSA commissioned Noble Denton BOMEL Limited (ND BOMEL) to conduct a survey of workplace vehicle safety management. It should be noted that the industries agriculture, construction, docks and quarrying were outside the remit of this current study.

1.2 STUDY OBJECTIVES

The primary technical objective for the project was to:

"Develop a profile of the workplace transport environment which will be used to inform the development of a strategy and policies for workplace vehicle transport safety"

More specifically, this translated into the following technical objectives:

1. Define and agree what constitutes workplace transport.

2. Review existing guidance to ascertain the information currently available to organisations in Ireland, and identify lessons that could be learnt from other countries including the UK.

3. Identify and survey a representative sample of organisations to ascertain the systems that they use to manage workplace vehicle safety.

4. Develop a robust evidence base from which HSA can develop its strategy and policies for workplace vehicle safety management.

5. Develop a baseline from which the impact of HSA's policies can be measured in the future.

1.3 SCOPE OF WORK

In order to address these objectives the following activities were undertaken:

- **Activity 1 - Project design**: involved conducting a project kick-off meeting and agreeing a definition of 'WTS'.
- **Activity 2 - Review of existing information**: involved reviewing all existing information and guidance on WTS in order to inform the rest of the study and identify any gaps.
- **Activity 3 - Workplace transport accident data analysis**: involved developing a workplace transport accident dataset and examining the dataset to identify high risk areas.
- **Activity 4 - Survey design**: involved identifying a representative sample from industry to survey and developing a workplace transport question set to use in the consultation exercise.
- **Activity 5 - Survey of workplace transport organisations**: involved interviewing over 100 organisations in Ireland about WTS.
- **Activity 6 - Analysis and aggregation of the evidence base**: involved aggregating all of the evidence under five key workplace transport themes in order to create a workplace transport evidence base and baseline measure.
- **Activity 7 - Reporting and presentation**: involved developing this current report.

1.4 SCOPE OF REPORT

The work undertaken is presented in this current report as follows:

- Section 2 presents the agreed definition of 'WTS'.
- Section 3 presents the review of existing information and guidance.
- Section 4 presents the development of a workplace transport accident dataset and examination of the key accident variables and high risk areas.
- Section 5 presents the survey of over 100 Irish organisations and includes development of the survey methodology as well as the findings from the survey.

- Section 6 presents the workplace transport evidence base against five key WTS themes. This also constitutes the baseline measure.
- Section 7 presents the key high risk areas identified and the associated recommendations for risk control.
- Section 8 presents suggestions for future outcome measures to be used in evaluation studies.
- Section 9 presents the references used in this report.
- Appendix A presents the interview question set alongside the logic underpinning the questions used.
- Appendix B presents a copy of four workplace transport safety case studies.

2. WORKPLACE TRANSPORT SAFETY: A DEFINITION

2.1 INTRODUCTION

In order that evidence gathered throughout this project used a consistent definition of what constitutes 'Workplace Transport Safety' (WTS) it was important that a definition was developed and agreed at the outset. This activity was undertaken during an initial meeting between HSA and ND BOMEL, where a definition was discussed, and subsequently drafted and agreed. This section of the report presents the agreed definition in order to set the context for the rest of the report.

2.2 'WORKPLACE TRANSPORT SAFETY' DEFINITION

The term 'workplace transport' covers all vehicles within the workplace perimeter. It specifically excludes transport on the public road (i.e. anything outside the workplace perimeter), air, rail or water transport (including transport used for work at docks). 'WTS' refers to the safety management of all people susceptible to involvement (either intentionally or unintentionally) with workplace transport.

WTS in agriculture, construction, docks and quarrying are outside the remit of this current study.

More specifically, the parameters within this definition are as follows:

- **Workplace perimeter** – all areas which fall under the ownership and / or general management of an organisation, including undercover workplaces (e.g. factory, warehouse, retail outlet etc.), outside workplaces (e.g. entrances, delivery areas, loading / unloading bays, staff and / or public car parks, trolley parks etc.) and areas shared with other organisations (e.g. industrial parks all using the same delivery / loading areas).

- **Pedestrians** – anyone who intentionally or unintentionally enters or moves around the workplace on foot, including the workforce, business visitors (e.g. contractors, deliveries etc.) and members of the public.

- **Transport / vehicles** – any transport which intentionally or unintentionally enters the workplace perimeter, including (but not limited to) bicycles, motorbikes, quad bikes, cars, vans, LGVs. HGVs, forklift trucks, waste carrying vehicles, ambulances, fire engines, mobile cranes, buses and coaches. For refuse collection vehicles and emergency service vehicles, there may be some instances where the workplace perimeter includes the public road.

- **Workplace transport activities** – any activity which involves workplace transport within the workplace perimeter, including (but not limited to) driving, riding, loading, unloading, coupling / uncoupling, maintenance, being a passenger.

3. EXISTING INFORMATION REVIEW

3.1 INTRODUCTION

3.1.1 Aim of the review

The aim of the review of workplace transport systems, strategies and guidance was to identify what documentation had been published on the topic and to enable the project and the HSA to build on what is available. The key objectives of this review were to:

- Identify and review relevant workplace transport systems and strategies used in Ireland, the UK and other relevant countries.
- Identify and review relevant workplace transport guidance published in Ireland, the UK and other relevant countries.

The review is important to identify the range and content of workplace transport information currently available to organisations.

3.1.2 Structure of the information review

In order to provide a comprehensive review of the literature, a number of different methods were used to identify relevant pieces of literature. The Health and Safety Executive (HSE) in the UK publish a very comprehensive guide to WTS[1]. This publication represents a 'must have' for those interested in managing WTS. The guidance reviewed below goes beyond what is contained in the HSE (UK) publication by referring to information from Ireland, Australia, the United States of America (USA) and the United Kingdom (UK).

The review presented in this report covers the following workplace transport themes:

- **Drivers –** operating the vehicles.
- **Pedestrians –** people undertaking their work around vehicles.
- **Site layout & maintenance –** traffic routes, pedestrian segregation, signage, loading areas, etc.
- **Management strategies and systems –** risk assessment, management systems, communication, cooperation, etc.
- **Vehicle selection & maintenance –** visibility, reversing aids, maintenance, repair, etc.

The guidance that is available for each theme is assessed according to:

- **What WTS issues are addressed by the guidance –** what is the breadth of coverage, and are the subjects those that one would expect to see.

- **How these workplace safety issues are presented –** is the information presented in a simple manner, is it prescriptive, or does it provide general pointers.

- **Who the intended audience is –** is the information aimed at drivers, employers, specialists or others.

- **Is the guidance a standalone document –** can the guidance be used on its own, or do several pieces of guidance need to obtained, and is it clear that this is the case.

- **How readily available the guidance is –** are potential users likely to know that the guidance exists, can it be readily downloaded, or does it have to be ordered and purchased.

3.2 GUIDANCE FOR DRIVERS

3.2.1 Overview

Central to any safe operating system are safe behaviours. Drivers have a central role in ensuring safe vehicle operation. This section aims to outline what specific guidance is available for workplace drivers. The majority of guidance that has been identified is aimed at forklift truck drivers. To broaden the topic, there is also a concise section looking at what lessons can be applied from road related driving to the workplace context (Section 3.2.3).

3.2.2 Forklift truck driving

Statistics indicate that forklift trucks are amongst some of most hazardous vehicle types. For example, in the UK, forklift trucks were involved in seven fatalities and 2000 reportable injuries in the year 2005/06[2] and is the second most likely vehicle to be involved in a workplace vehicle incident[3]. The HSA's accident statistics analysed and presented as part of this study also identified fork lift trucks as a key 'item associated' in workplace transport accidents (see Figure 45, Figure 46, Figure 47 and Figure 48). The actions of the driver are critical in causing, preventing an incident or mitigating its consequences. This section examines the guidance aimed at forklift truck drivers.

In Australia, the New South Wales Territory has a government organisation (funded by employers) called WorkCover that promotes workplace health and safety. WorkCover published a guide for forklift truck driving in 1998[4], the document contains the basic information that drivers need, to safely operate

a forklift truck and obtain a forklift truck driver's certificate. The document covers a wide range of areas:

- Knowledge requirements for drivers
- A brief description of the different types of forklift truck
- Safe working loads
- The hydraulic system
- The motor
- Pre-use checks
- Know your workplace
- Safe operation, including:
  - When raising a load
  - When tilting the load
  - Travelling
  - Loading trucks
  - Loading 'pantechnicons' (large vans)
  - Lifting loads with two forklift trucks
  - Parking
  - Forklift trucks and electricity
- Attachments
- Personal protective equipment (PPE)
- First aid
- Slinging and safe working loads
- Rules to follow when slinging
- Flexible steel wire rope
- Chain
- Flat webbing and round synthetic slings
- Fibre rope
- Lifting accessories

The document covers in detail the technical requirements for forklift operation, such calculations for determining load, angle factor, sling strength etc. The document contains less detail on how to drive safely with information presented in the form of facts and instruction rather than aiming to change attitudes and behaviours. The content is suitable to develop a training course on how to use a forklift truck and therefore is more suitable for use by trainers and managers.

WorkSafe Victoria in Australia publish a more detailed document that covers a wide-range of issues associated with forklift trucks in general[5], although most of the content relates to forklift truck driving and so it is reviewed here. It covers many areas:

- **Forklift stability: the facts**.
- **Forklift instability: the risks –** including findings from research into forklift accidents, covering impact of loads on stability, the effect of uneven surfaces, turning, speed and shortcomings associated with manufacturers' information.
- **Speed and stopping distances –** including data on stopping distances at various speeds and drivers' reaction time/distance.
- **Getting on and off: The safe way –** including slips trips and falls, the different surfaces and seatbelts.
- **Load and load handling –** including load weights and checking loads.
- **Know your forklift –** including a checklist for use by a driver.
- **Simple safety tips for forklift operators –** this covers a range of areas: seatbelts, speed, staying in the cab if it becomes unstable.
- **Know your workplace –** including a checklist for the workplace.
- **Traffic management planning –** including pedestrian exclusion zones and '10 tips' to develop a traffic management plan (see also Section 3.4.3 of this report)
- **Pedestrians and forklifts don't mix**.
- **Reducing risk**.
- **Policies and procedures**.

The guidance document is accessible and pragmatic, although its target audience will be safety and operations managers rather than drivers. ACT WorkCover in Australia has published a very similar guidance document[6] (its contents are based on the WorkSafe Victoria publication). The main difference is that there is a useful traffic management **risk matrix** in an appendix, titled: Traffic Management Plan Comparative Chart. The matrix relates a number of features about workplace transport in general (such as site layout) to what high, medium and low risks would look like. As an example the document indicates that traffic flow would be high risk if there are no signs relating to forklift movement and low risk if there was a detailed map showing layout, directions and speed limits etc.

An Australian study conducted in 1992 by MONASH university into forklift truck safety examined: safety levels, international legislation on forklift trucks and interaction with pedestrians [7]. The work concluded that:

- Pedestrians hit by forklift trucks make up 45% of analysed injuries
- Pedestrians should be separated from forklift truck operations

MONASH University Accident Research Centre (MUARC) commenced a programme of work on forklift truck operations following from the above report culminating in a guidebook published in 2003 titled 'A Guidebook of Industrial Traffic Management & Forklift Safety'[8]. This document contains a range of principles relating to the safe use of forklift trucks.

3.2.3 Lessons learnt from drivers on the road

Skilled vehicle control is a core part of workplace vehicle safety. This section covers some of the activities that are undertaken to improve road driver safety and assesses how suitable each is to a workplace vehicle setting.

The Irish Advanced Motorists offers courses to drivers to enhance their driving competence. Companies are also able to procure fleet training for their drivers from the Institute of Advanced Motorists. Interestingly, the skills trained during such advanced motoring courses attempt to increase drivers 'situation awareness'. Situation awareness refers to a driver's ability to:

- Notice what is going on around them
- Correctly understand what it means
- Anticipate what will happen next

Enhanced situation awareness results in better decisions and fewer errors. Whilst training may enhance situation awareness, guidance documents tend not to, despite being able to. **This is a potential area for development**. This is especially so in the context of a workplace where the environment and activities can change rapidly and drivers will need an excellent understanding of events and their surroundings.

Drivers' attitudes are core to the effectiveness of safe driving, research supports the notion that higher levels of risk awareness are associated with safe behaviours[9]. Attempts to make unsafe behaviours socially unacceptable are likely to shape drivers' attitudes. The 'Safe Driving Pledge' is an initiative where people show their commitment to safe driving by displaying a 'safe driving pledge' sticker in their car. Similarly, road safety charity 'BRAKE' in the UK has a 'Road Safety Week' where (amongst other things) various companies can show their commitment to road safety. BRAKE also promotes safe professional driving for those that drive as part of their job. The following themes have useful tips for workplace driving:

- Belt up (emphasising seat-belt use)
- Wake up (being properly rested)
- Sober up (no alcohol)

- Slow up (reduce speed)
- Look up (look out for other people)
- Sharpen up (eye testing)
- Buck up (concentrate and focus)
- Shut up (don't 'chat' or use your mobile)

The following are less relevant to workplace driving:

- Move up
- Back up
- Check up
- Wise up

These topic areas on the BRAKE website have details on practical steps that drivers can take to improve their preparedness to drive[10].

These campaigns and initiatives play an important role in raising awareness about transport safety. Guidance that aims to 'design out' risk via engineering and systems can only achieve so much. Campaigns aimed at workplace drivers that raise awareness about safe driving are likely to deliver attitudinal and behavioural improvements in driving and can lead to a 'step-change' reduction in accident levels.

3.2.4 Summary and conclusions for drivers

The messages contained in much of the guidance that is available for drivers falls into two areas:

- That aimed directly at drivers, of which there is relatively little.
- That aimed at employers to help their drivers.

Guidance documentation appears to provide accurate information relating to the factual elements of safe driving and vehicle operation. For example, information aims to enhance drivers' knowledge of the vehicle, checks, operational limitations, speed and knowledge of the workplace.

Road vehicle driving offers information that covers three main areas:

- Attitudes to driving that are influenced by social acceptability (e.g. use of seatbelts, dangers of alcohol and use of mobile phones)
- Preparedness for driving (e.g. being properly rested)
- Behaviour whilst driving (e.g. taking in more about what is going on, anticipating what could go wrong, slowing down etc)

It is possible that most workplace vehicle guidance aimed at drivers will be at a company level in the form of working instructions, rules and procedures that are not published for wider consumption.

3.3 PEDESTRIANS

3.3.1 Overview

This section considers guidance specifically aimed at workplace pedestrians or people working around vehicles. Pedestrians can be exposed to accidents by virtue of having limited protection to mitigate the consequences of, for example, a collision, slip, trip or fall. Add to this that some pedestrians will be visitors who are unfamiliar with workplace operations, this group of people need to be carefully managed.

3.3.2 Managing different types of pedestrian

An Australian based organisation called 'Forklift Action' provides information to organisations relating to a number of aspects of forklift use. An article on pedestrians has some useful practical advice that is likely to be applicable to all workplace transport environments[11]. The article maintains that there are two types of pedestrian:

- Local pedestrian
- Visiting pedestrian

Local pedestrians are those that work at the premises on a regular basis and are likely to be known to drivers and this group is likely to benefit from regular reminders about safety. The author maintains that this group is not the focus of the article. The article suggests that there are four main approaches to managing visiting pedestrians:

- **Warn them –** this includes use of universal symbols that do not require reading skill. Where written information is necessary it should be available in several languages (if required) and displayed at entrances. Messages should indicate what pedestrians should do and where they should go.

- **Control them –** this approach is about preventing visitors from entering prohibited areas. The use of barriers and segregated areas is emphasised.

- **Equip them –** providing visitors with the same Personal Protective Equipment (PPE) as employees is advisable (presuming employees have adequate protection).

- **Stay with them –** visitors should have someone with them that knows the dangerous areas and make sure that they do not venture into them.

These above steps provide a simple and practical approach for managing site visitors.

3.3.3 Pedestrian walkways and access

ND BOMEL has produced guidance for the HSE (UK) on pedestrian walkways and access. Whilst this may be more relevant to workplace design, the content is specific to pedestrian access and will be of value to most workplace vehicle transport settings. The guidance was delivered in the form of two case-studies and two posters. The case-studies are described below.

At one site delivery drivers had to walk across the main haul road to get into the site office. This exposed them to moving vehicles, a hazardous situation. The solution was to introduce segregated walkways that meant that delivery drivers walked from the workplace entrance along fenced walkways to the site office and were not exposed to other site vehicles, nor did they need to have knowledge of the workplace layout.

The second example related to needing to separate pedestrians from vehicles. This example was complicated by having several different types of pedestrian: sales people, residents for new homes built on the site and other contractors. As the layout of the site changed regularly, there was a need for 'movable' walkways. The solution was to use mobile hoop barriers (which resemble open doorways) at various locations across the workplace for pedestrians to walk through. The hoop barriers indicated appropriate walkways which were clearly visible to drivers.

3.3.4 Summary and conclusions for pedestrians

This section has identified that there are several techniques that can be used to manage pedestrian movements and reduce risk. These include: segregation, information (e.g. signs/spoken), guide them (either in person or with routes) and prevent them from entering dangerous areas. The review of literature found no device (such as an alarm or horn) for use by pedestrians that indicated to drivers that pedestrians were in the area or threatened by (vehicle warnings are addressed in Section 3.6.5).

3.4 SITE LAYOUT & MAINTENANCE

3.4.1 Overview

The design of a site where vehicles operate can have a substantial influence on accident levels. Often sites evolve over time, whether by deliberate change to layout or through excessive wear and tear. Sometimes these

changes can be rapid and extensive. With multiple operations and a number of different people working on a site, the risks are varied. This section examines the systems, strategies and guidance that are available to those that deal with site layout and maintenance.

3.4.2 General guidance

The HSA have published an information sheet titled 'WTS Management'[12]. The document, published in 2008, is aimed at those who manage workplaces where vehicle movements occur. The document asks questions across a number of key areas:

- The need to manage workplace transport risk by: identifying hazards, undertaking risk assessment and recording the results.
- Legislative requirements.
- The workplace, including layout of the place of work, suitability of traffic routes and suitability / provision of safety features.
- Vehicles, including suitability for the task, inspection and maintenance.
- Employee selection, training and supervision. This includes the need for staff to be capable of performing their work activities in a safe and responsible manner.
- Loading and unloading operations.

Another HSA information leaflet[13] published in 1997 contains similar information relating to workplace vehicle movements:

- Types of accidents.
- Legal duties.
- There is a checklist for employers to work through, with questions on the workplace, vehicles, drivers and other employees, vehicles, and specific guidance.

The HSE in the UK has developed material to help organisations with workplace design and layout, information is available on their website[14]. Messages are contained in a number of key areas. For each area a question is asked and a series of practical options are discussed.

The topic areas addressed by the HSE's (UK) website are:

- **Traffic routes –** including hazards such as bends, junctions, gates, gradient, stability on slopes, the consequences of spills and importance of traction (i.e. grip).

- **Driving surfaces –** including the need for suitable driving surfaces that are free from excessive unevenness and are well maintained, to provide adequate grip. Topics covered include the materials for surfaces; the driving activities should determine foundations, surface and drainage requirements. Repair and maintenance aspects of surfaces are also considered.

- **Vehicles and loads –** including the need to segregate vehicles from one-another and pedestrians, in addition it is important that those approaching the site know its layout and limitations. The content also addresses the relationship between vehicles and the site, covering width, height, weight, loads and unsuitable vehicles.

- **Vehicle handling –** including manoeuvrability, visibility, reversing and physical characteristics.

- **Speed –** including traffic calming, setting speed limits, enforcing speed limits and sensors.

- **Traffic management –** including location, overcrowding and activities conducted at a location - tipping, loading etc.

- **Separating pedestrians and vehicles –** including signage, barriers, bridges, paths and crossing points.

- **Signs, signals and road markings –** including use of crossings, hazards such as bends, blind corners and road works, signs, signals and road markings.

- **Protecting structures –** including weak or vulnerable structures and how a structure could be exposed.

- **Lighting –** including lit areas, light pollution, positions for lights and changes in lighting level.

- **Parking –** including controls, segregation, parking areas, enforcement and manoeuvrability.

- **Loading areas –** including position of loading areas, space around bays, height differences, visibility, preventing falls, dock shelters and electrical risk.

- **Temporary workplaces and unprepared roadways –** temporary routes tend to be less safe than normal ones, surfaces, hazards and safety banks (to prevent vehicles entering the unsuitable areas) are all described.

- **Site-based ways to stop vehicles from moving –** including chocks, restraints, signals, barriers, key safety and driver welfare.

- **General maintenance –** including cleaning and systems for reporting damage.

- **Illustrated case studies –** includes a number of case studies indicating what a dangerous site is, and how to improve it.

- **General workplace transport publications –** this has with links to other publications and resources.

The content of each area provides readers with a useful starting point to help enable effective site layout and design. The readership is most likely to be safety managers or site designers, although the content will be relevant to all managers that control workplace vehicle operations.

3.4.3 Guidance relevant to specific site types

A document produced by the Department of Transport, the National Roads Authority and Local Government Management Services Board titled 'Guidance for the Control and Management of Traffic at Roadworks' was published in October 2007[15]. The audience for the publication are local authorities that have responsibility for managing road works. Whilst the guidance is mainly for road works, there are merits in including it within this review for its workplace transport element. The document is useful as it:

- Covers road traffic management in the context of roadwork.

- Addresses vehicle movements within a workplace.

The document is one of the longer pieces of guidance (142 pages) but it has many aspects that directly relate to workplace vehicle safety management. The areas that are relevant include:

Planning and design:

- **Planning the works –** including principles of traffic management, emergency services, site information, programming, basic space considerations, detailed traffic management design and post design review.

- **Route design –** including sight lines, safety zones, signage, edge strengthening and widening, lane widths, lane delineation, safety barriers, and transition Sections (e.g. entrance/exit from site).

- **Traffic movement design theory –** including speed limits, speed and traffic management arrangements, routes for vehicles, vehicle recovery and incident management.

- **Traffic control options –** including STOP/GO boards and traffic signals.

Much of the content of the document could be translated into future guidance for workplace transport as there are many comparable issues.

3.4.4 Summary and conclusions for site layout and maintenance

Guidance relating to site layout and maintenance typically covers: a summary of legal requirements, the need to identify hazards, conduct risk assessments and implement risk control measures. Guidance indicates that employers using vehicles on workplaces need to:

- Plan vehicle movements.
- Install suitable and marked vehicle and pedestrian paths.
- Enable users to adhere to safe routes and remain segregated.
- Control vehicle speeds.
- Provide, at the destination, adequate facilities for loading/unloading and parking.
- Ensure that the physical environment minimises risks (e.g. by having level surfaces, edge protection and barriers).

3.5 MANAGEMENT STRATEGIES AND SYSTEMS

3.5.1 Overview

There is a general recognition that an organisation can most effectively and efficiently manage WTS under the umbrella of its existing safety management system. Activities in the area of management strategies and systems are the subject of this section.

3.5.2 Business case

Often safety messages have greater impact with senior managers when the content has a strong business as well as safety and moral case. In the UK, the Department for Transport (DfT) have a 'driving for work' area on their website with a section devoted to 'The Business Case'[16] for considering workplace transport. The content is aimed primarily at road related work incidents, although many of the issues/lessons are directly comparable. The following is a list of factors that 'The Business Case' website indicates that employers will have to cover, many of these are directly relevant to workplace/workplace injuries[17]:

- Loss of company reputation and contracts

- Fines and costs of prosecution
- Damage to products/ plant/ building and equipment
- Staff down time for medical appointments/attendance at court etc
- Replacement staff costs and sick pay
- Loss of production or production delays
- Increased insurance premiums and excess
- Excess on a claim
- Offenders' own legal fees
- Claims from third parties
- Accident investigation and paperwork
- Repairs to damaged equipment
- Alternative transport for repair duration
- Inconvenience
- Re-delivery
- Management and administrative time

3.5.3 General management guidance

The HSE (UK) website contains various details relating to management responsibilities for workplace transport. The content is generic in nature, i.e. it could apply to areas other than workplace transport. Nevertheless, the areas covered include the need for employers to undertake:

- **Risk assessment –** there are a number of steps presented that are central to effective risk management:
  - Step 1 – Identify the hazards
  - Step 2 – Decide who might be harmed and how
  - Step 3 – Evaluate the risks
  - Step 4 – Record your findings
  - Step 5 – Review the risk assessment regularly
- **Taking responsibility –** the information emphasises that employers should:
  - **Take overall responsibility –** this advice aimed at managers indicates the importance of being visible to employees, showing commitment to safety, going on safety tours, and talking about safety with employees.
  - **Allocate responsibilities –** include safety responsibilities in job descriptions, include safety information in communications.
  - **Display –** safety notices or bulletins.
  - **Enforcement –** people need to be accountable for their actions.
- The information emphasises that managers should **communicate**:
  - Safety policies
  - Safety responsibilities

- Working practices
- How to follow safety practices
- Where information can be obtained

- **Co-operation**

  - Employees and employers should cooperate over health and safety. Often companies put a 'near-miss' reporting scheme in place where hazards can be recorded. This helps to monitor trends in accidents, whether risks are adequately controlled, how risks can be reduced and how to engage employees in safety related decisions.
  - Employers should monitor safe working practices be offering supervision, observing staff and administering penalties for unsafe behaviours.

The above indicates what topics employers should address as part of their general workplace transport management.

In the UK, HSE published a document titled *'WTS: an employer's guide'*[18]. This 22-page document indicates that companies' established systems for managing safety should be extended to include risks posed by workplace transport. The document contains guidance for managers and operational advice. The main contents are summarised below:

- **Risk assessment –** including identification of the main activities and associated risks, such as: the vehicles themselves, the routes or roadways, driver behaviour and what other people are doing.

- **Organising for safety –** here the focus is on employers and employees responsibilities and key areas to consider here include: communication, contractors and subcontractors, visiting drivers, shared premises, deliveries and the public.

- **A safe site –** including traffic routes, temporary traffic routes, visibility, speed, pedestrians, signs signals and markings, lighting and housekeeping.

- **Safe vehicles –** including maintenance, vehicle immobilisation and privately owned vehicles.

- **Managing the risks –** including competence and training drivers.

The document goes into further detail on the following specific vehicle activities: reversing, parking, coupling and uncoupling, loading and unloading, tipping, avoiding overturns and avoiding falls.

3.5.4 Competence management system

As part of HSE's (UK) workplace transport website there is a section on 'Personnel'. Having management systems that ensure sufficient and competent staff are available is a core part of an employer's safety management system. The content of the site covers a number of areas and has a number of messages:

- **Recruitment –** employees need to understand that they have a legal duty to act safely, employers need to ensure that staff are physically and mentally competent for driving.
- **Induction –** these need to explain health and safety policies, drugs and alcohol and the penalties for unsafe acts.
- **Initial training –** staff have a duty to work responsibly and carefully and employers must train staff when exposed to new risk and ideally this needs to be tailored to the needs of the employee.
- **Refresher training –** keep skills up to date.
- **Maintaining good practice –** good practice can deteriorate, regular assessments and responding to the changing needs of individuals is essential.
- **Managing contractors –** physical and mental fitness, competence and qualifications for work.
- **Managing visitors –** their physical fitness and their understanding of what they have to do.
- **Managing lift trucks –** according to HSE (UK), 24% of workplace transport accidents involve forklift trucks and the main problem with them stems from poor supervision and a lack of training.
- **Medical fitness to drive –** regular assessments, employees should be judged according to the work and employees need to understand the impact of any medication.

In the UK, HSE operate a system where lift-truck training should be provided by an accredited training body. Training by an accredited body is not mandatory but training provided by such organisations provides a guarantee that it will be to the standard required by HSE's (UK) Approved Code Of Practice (ACOP). The reference provides additional detail of how the training relates to the ACOP[19].

3.5.5 Enforcement activities

In 1995 ACT WorkCover in Australia conducted a scheme of regulatory inspection of 69 counter-balanced forklift trucks [20]. WorkCover is an enforcement agency of the government and the inspection targeted:

- Vehicle condition
- Systems
- Maintenance
- Certificates of competency
- Training records
- Operators knowledge

The results are summarised here as an indicator of what both management and regulatory inspections can reveal and also to highlight the key problems with forklift vehicles and operation. The results indicate:

- 44% of businesses were issued with notices in relation to tyres/wheels
- 75% of businesses did not have a pre-operation checklist
- Notices were issued on recently serviced vehicles; some companies had not taken up advice of the servicing company
- 12% of businesses had operators without a certificate of competence
- 90% of businesses were issued with notices in relation to non-compliant or non-existent training logbooks
- The majority of operators could not demonstrate how to perform a pre-operational check
- 38% of prohibition notices were issued for fork tynes (the main fork part of the lift device)

These results indicate what might be discovered by a series of inspections.

3.5.6 Management led improvement initiatives

Recognising that a mature safety culture depends on several key ingredients of which management commitment and leadership are key (although not sufficient). Menzies, a UK newspaper distribution company, commenced a management lead improvement initiative following an incident. The initiative is summarised on the HSE (UK) website[21]. This is one of the few pieces of guidance that emphasises reducing the number of vehicle movements to reduce risk. Most guidance has been reviewed works on an assumption that *existing* operations should be made safer, rather than changing the operation. Additional key observations from this initiative are:

- **Control vehicle entry into a depot –** fewer delivery vehicles arriving on site at any one time reduces risk (as a result of reduced exposure) also providing vehicles with arrival times helps this
- **Keys –** yard 'banksmen' can now take vehicle keys to prevent unauthorised movement and ensure that vehicles are moved under proper control and direction
- **Cameras –** all vehicles over 7.5 tonnes now have infrared reversing cameras fitted (these operate at night)
- **Load assessment –** vehicles are assessed for load safety before being unloaded – items posing a risk can be dealt with in a safe well-lit area or can be sent back to the source depot for correct loading
- Yard layout and signage was enhanced
- More training is conducted in-house
- Reportable incidents have reduced by 16%

3.5.7 Summary and conclusions for management systems and strategies

Management systems and guidance for workplace transport tend to indicate that risks should be managed with the company's wider safety management system. This will typically incorporate the need to identify hazards, assess risk, record findings, mitigate and/or implement risk control measures and review regularly. The case study example highlights how a company can influence safety by doing more than aiming for legal compliance. The review also highlighted that guidance available from the UK relating to safety management content encompasses competence management.

3.6 VEHICLE SELECTION & MAINTENANCE

3.6.1 Overview

Ensuring that the right kind of vehicle is available for a job demonstrates the company's commitment to safety and helps to ensure that the vehicle and its use does not represent a significant risk to people. This section provides an overview of the available information relevant to vehicle selection and maintenance.

3.6.2 Information for managers

In the context of road use, cars have to meet the standard National Car Test requirements[22] which were specified following the introduction of the Road Traffic (National Car Test) Regulations, 1999 and subsequent amendments[23].

The HSE (UK) website contains details surrounding vehicle selection and maintenance. The content is aimed at managers that are responsible for purchasing or managing the people and activities that are undertaken with vehicles. The information is also relevant to those that are responsible for vehicle maintenance. The following is a summary of the information contained on the website:

- **Safe vehicles –** there are a number of questions aimed at those purchasing a workplace vehicle, the questions focus on: all-round visibility from the cab, what warning systems are available, what protection (e.g. horns and lights) are available, what safeguards are there to stop people coming into contact with dangerous components. Information also covers: access and egress from cab, protection from the environment (e.g. dirt, rain etc), rollover protection, vehicle immobilisation, vehicle conspicuity (visibility of vehicle) and visibility of surroundings for the driver.

- **Safe manoeuvring –** the information emphasises the importance of having a clear view unimpeded by visual clutter; mirrors are also identified as having an important role. Closed-circuit television is also identified as potentially useful, along with other technologies such as radar and reversing alarms.

- **Ways to stop vehicles from moving –** the information emphasises the use of four-wheel 'hand brakes', whilst stability can be increased with outriggers (a structure that takes the load away from the vehicle's wheels to the ground). Chocks are also identified as a way of stabilising a vehicle. There is detailed coverage relating to the use of emergency brakes on semi-trailers and 'tractive' units.

- **The right vehicle for the job –** there are a series of questions aimed at those involved with the purchase of vehicles, covering: dimensions of loads, securing loads, distance that will be travelled, terrain, space for the vehicle and environment.

- **Inspection, maintenance and repair –** the information emphasises the importance of daily checks and adhering to manufacturers guidelines for maintenance; paying specific attention to brakes, steering and tyres. There are also a number of factors to consider when maintaining vehicles, such as application of brakes, use of chocks, batteries, fuel and dust. The message relating to retrofitting equipment indicates that this should done following consultation with the manufacturer.

- **Securing loads –** the weight and forces exercised by loads need to be withstood by the vehicle and anchor systems should ensure that the load is stable. The load should be fixed to the chassis, or sufficiently strong structure. Where more than one fixing item (of the same type) is

replaced, all should be replaced at the same time to ensure that items have been exposed to the same level of stress.

- **Site-based access to vehicles –** recognising the need for employees to access parts of the vehicle to clean, load and unload, this section looks at the need to provide effective access to vehicles. Employees should not climb on vehicles, or on dangerous structures. The information emphasises the role and effective use of platforms, gantries, stairs, steps and ladders.

- **Vehicle-based access to vehicles –** drivers need to be able to access all parts of the vehicle that require their attention. There are a series of requirements relating to the use of ladders; rungs should slope inwards, run the full length of the climb, be level, have slip resistant surface and should not allow debris or liquid build up. Walkways, guard rails and retrofitting are all addressed.

- **Preventing falls from vehicles –** employers should prevent people from falls. There are a number of factors to take into consideration (e.g. what tasks will someone be undertaking, what are the risks and eliminate or reduce the risks). Various technical systems are described, and the benefits of personal protective equipment and adequate lighting is emphasised. The technique of a 'three-point-hold' (where three points of a climbers body are in contact with the vehicle) is emphasised as a way of minimising climbing risk.

- **Safe sites –** this area relates to the need to identify risks on the workplace that may affect the vehicle, covering: level ground, puddles/mud, winds and other structures that may impede access.

- **Safe drivers –** there is good practice information, which interestingly does not cover driving as an activity, rather it focuses on passengers, access, facing the direction you are walking, not leaning backwards when on the vehicle, do not rely on ropes to support loads and do not rest personal weight on equipment that is not intended to for such use. The information also emphasises the importance of neatness, access, footwear and fall protection.

3.6.3 Falls from vehicles

This section considers how vehicle design and equipment provision can be used to prevent falls from height. Employees are likely to have to work on vehicles from a variety of heights from time-to-time. Tasks might include loading/unloading, entering/exiting the cab, sheeting and maintenance. In Australia an organisation called WorkSafe Victoria (part of the Victoria state government) has published a document titled 'Prevention of falls – trucks'[24]. The document is most suited to safety and line managers and emphasises

the need for risk assessment and the benefits from working at ground level. Where working at height is necessary, the document emphasises:

- **Tarping/sheeting using a 'Barney Beam' –** this is a device that is attached to a forklift that has an arm which extends over the load bed of a truck, the raised arm lays a sheet over the load as the forklift proceeds along the side of the trailer. The tarp/sheet is then secured manually from ground level.

- **Passive fall protection device –** refers to something such as a guard or rail that prevents a fall from occurring. Often car transporters make use of these, but permanent fitment can lead to the vehicle exceeding its maximum legal width. In the UK certain exemptions have been provided and in Australia the document indicates that barriers can be raised when necessary.

- **Travel restraint system –** is a device that limits the extent of a fall such as a harness or fall-arrest system. The device is attached to a designated structure prior to working from a height. These devices depend on drivers being trained and actually using the restraint system in the first instance.

- **Insist that suppliers and customers provide protection –** where a company's drivers are delivering at a site the document indicates the need for suitable fall prevention systems to be present.

- **Duration of task –** prolonged working at height should be avoided and not achieved with devices such as a harness which more suitable for short-term tasks (such as opening a tank lid). Platforms, walkways, mobile platforms and scaffolding should be used for tasks of a longer duration.

- **Cabin access –** the use of long handrails and deep nonslip foot-steps are emphasised and drivers should face the cab when exiting.

- **Tray/load-bed access –** the use of retractable steps to board a load-tray is emphasised.

WorkSafe have also published a guidance note on the same topic, relating to car carrying vehicles specifically. This guidance goes into more detail relating to barrier construction, strength requirements and action relating to procurement of new vehicles[25].

In the UK, HSE's website has details of 13 case-studies indicating what companies are doing to limit falls from vehicles[26]. These case studies tend to focus on what modifications can be made to vehicles to reduce risk, measures include:

- Enabling access to load areas of vehicles with the use of built-in stairs removed the need to use a tail-lift (Warburtons)

- Providing flat surfaces on articulated vehicles to improve access (Multiserve)

- Installing refrigeration units underneath vehicles rather than on the front of the trailer's body improves access to units for maintenance (Morrisons)

- Toolbox talks, improved cab access provisions and better footwear were introduced to reduce slips trips and falls when entering/alighting a cab (Shanks Waste Management)

- Edge protected gantries were used to aid loading/unloading of vehicles. These gantries are structures that are placed alongside a vehicle for safe access. Alternatively, a driver can approach the gantry and stop alongside. The result is a level platform running the length of a vehicle trailer (Balfour Beatty and Billington)

- Installation of a series of 'jack-legs' to portable office cabins reduced the amount of working at height when loading/unloading cabins from a trailer (Sheperds Group)

- Installation of ladder to access the load area on a trailer (Milbank and Select)

- Trailer edge protection system (Bovis Lend Lease and William Hare Ltd)

- Edge protection on a tail lift and worktop (e.g. for kitchens) storage underneath the vehicle trailer (Wickes)

- Rear vehicle access platforms and improved vehicle crane access (Travis Perkins)

3.6.4 Forklift trucks

The HSA have published a comprehensive Code of Practice document relating to the training of drivers using rider-operated lift trucks[27]. The document contains information on many aspects of training and relates the content to Irish legislation, for example:

- Selection of people for training

- Training facilities

- Training types (e.g. basic training, specific job training and familiarisation training)

- Training structure/content
- Authorisation, records and certificates
- Monitoring of standards
- Instructor selection and training
- Accreditation

HSE (UK) recognise that there are specific risks associated with the appropriate use of forklift trucks. A guidance note published in 2005 explains how forklift trucks should be selected, depending on the purpose[28]. Forklift trucks were designed to lift loads and not people. The guidance goes into detail surrounding the selection of a suitable truck, its use and its design.

A 2-page publication from WorkSafe in Australia contains detail surrounding the main issues to consider when purchasing a forklift truck[29]. These issues are:

- Identification of the problem
- Solutions, including:
  - Capacity
  - Stability
  - Environment
  - Operator safety
  - Access/egress
- Maintenance, examination and testing
- Consultation

3.6.5 Vehicle emitted warnings

Vehicle movements that conflict with pedestrian activity represents a major workplace safety risk. The provision of adequate warnings to pedestrians when vehicles are moving offers a way to reduce risk. There are a number of systems that can be used to provide such warnings[30]:

- Audible warnings when the vehicle is in reverse
- Provision of reversing lights
- Provision of air horns (activated by drivers)
- Provision of motion alarms (activated by any vehicle movement)
- Provision of flashing lights

3.6.6 Summary and conclusions for vehicle selection and maintenance

Central to safe use of vehicles is having an appreciation of what task needs to be completed; this should dictate the selection of the right kind of vehicle. The task will shape what access requirements there are to the vehicle, how people should move on the vehicle, how slips, trips and falls should be prevented and mitigated.

There does appear to be a gap in guidance surrounding the selection of road-based vehicles for use on a workplace. The number of vehicles that can be used on the road for work purposes is immense; a review of new cars on the market indicates that there are 465 different kinds of car available in 2008 and this excludes vans and heavy goods vehicles. With many road-based cars being used at a workplace it is important to make sure that such vehicles are actually suitable for use at the workplace. When vehicles designed for the road are taken into a workplace that they were not intended for, there may be an increase in risk.

3.7 SUMMARY AND CONCLUSIONS

One of the main observations relating to the review of guidance and systems is that most is aimed at 'employers'. As such, the audience can range from company directors to frontline managers. This reflects that most legislation is aimed at employers and that most guidance is produced by enforcement agencies. The downside of this is 'employers' as an audience group may be too broad. The lack of guidance aimed directly at frontline staff (drivers and pedestrians) may reflect that:

- Legislation, and therefore guidance, is more focussed on employers
- Frontline staff are best targeted by employers
- Communicating directly to frontline staff is *too difficult.*

In terms of access to the guidance; there is no one-stop-shop for WTS, perhaps with the exception of the HSE (UK) website, although this has a an obvious bias to UK legislation. However, in general, despite useful information being available from many countries, it is unlikely to be sufficiently accessible, for even the committed and willing. For less receptive audiences, the likelihood of using the guidance that is available is likely to be relatively low. In addition, not all the messages and certainly the legislative content of such information is less relevant in Ireland. To improve accessibility to guidance and information relating to WTS, the following actions and ideas have been derived from the review:

- **Communications –** identify key messages, the associated audience group and then profile their desire and ability to engage with the messages; this should help guide content and method for communication materials.

- **Create a one-stop-shop –** for use by the main audience groups that contains or links to good detailed advice, examples and information needed to operate vehicles safely in a workplace.

- **Business benefits –** there appears to be value in emphasising the business benefits of enhanced workplace vehicle safety through having a more reliable system for controlling vehicle movements.

- **Use case-studies to communicate messages –** where case-study examples are used, it tends to bring the concepts alive and is likely to be a more powerful way of communicating messages.

- **Minimise the number of vehicle movements on a site –** there is very little emphasis on this area and areas such as planning, site design and layout.

- **Develop a two-step process to provide guidance relating to workplace transport –** the first step would involve establishing the essential and manageable information that audience groups would need and this would be simpler for HSA to provide. As the guidance becomes more established, it would then be possible to build on this and provide information that is more specific.

There is useful information available and the HSA can identify key issues and gaps relevant to workplaces in Ireland and then 'cherry pick' as appropriate.

Note: The HSA regularly updates its website with guidance relating to WTS. Readers are advised to go to www.hsa.ie to check for updates.

4. ACCIDENT DATA ANALYSIS

4.1 INTRODUCTION

The HSA hold data on all reported accidents occurring within the workplace in Ireland. HSA provided ND BOMEL with this accident data from January 1993 to April 2008 to enable ND BOMEL to extract accident data relevant to workplace transport. (The data for 2008 only covers the four month period from January to April 2008, as the analysis was conducted in April 2008). The bespoke workplace transport dataset was then analysed in order to highlight the key risk issues in terms of WTS. In addition to highlighting the key high risk areas, the analysis also provides baseline accident numbers against which future years can be compared in order to monitor change and evaluate the impact of different WTS initiatives. This section describes the process of developing the workplace transport accident dataset and then presents the findings from the analysis of the accident data.

Note: It is important to note that HSA recognises that the under reporting of workplace accidents is an issue, however, the full extent of this under reporting is not currently known.

4.2 WORKPLACE TRANSPORT ACCIDENT DATASET DEVELOPMENT

In order to create the workplace transport dataset, the following steps were undertaken:

- As the industries agriculture, construction, docks and quarrying were outside the remit of this current study, accidents reported within these industries were taken out of the main database at the outset (i.e. the NACE sector (Rev 1.1) codes 'Agriculture, hunting and forestry', 'Fishing', 'Mining and quarrying' and 'Construction' were extracted).

- The data fields within the HSA accident database which provide some description (e.g. occupation, accident trigger, injury reason etc.) were identified.

- All items under each of the data fields which appeared to relate to workplace transport (e.g. under occupation, there was 'drivers and mobile plant operators') were also identified.

- The initial list of relevant field items were agreed by HSA.

- Using the relevant field items, a series of Microsoft Access database queries were created to extract the relevant workplace transport accident data.

- The ‘first cut’ of the dataset contained **43,748** reported accidents.
- To ensure the 43,748 accidents contained within the ‘first cut’ of the dataset were relevant to workplace transport, a sample of the accident narratives contained within the database field “circumstances” were reviewed. These accident narratives were categorised as either being ‘relevant’ or ‘irrelevant’ to workplace transport.
- As a result of this review, some of the field items (e.g. ‘Earth moving and related plant operators’) were taken out of the workplace transport dataset because they did not have a workplace transport theme (in other words they were deemed ‘irrelevant’).
- In total, all of the following ‘irrelevant’ field items were taken out of the workplace transport dataset:
    - **Work environment**: ‘Factory, industrial site or warehouse’; ‘Office, school, shop, restaurant, hotel, theatre etc.’; and ‘Transport Related Area or Road’ (this category did not actually generate any accidents)
    - **Occupation**: ‘Earth moving and related plant operators’; ‘Labourers in mining, construction, manufacturing and transport’; ‘Metal processing plant operators’; and ‘Wood processing plant operators’.
    - **Item associated**: ‘Conveying, transport and storage systems - not specified’; ‘Other known conveying, transport and storage systems in Group 11 but not listed above’.
- Another Microsoft Access database query was created to make a ‘second cut’ of the dataset.
- The ‘second cut’ of the dataset contained **15,413** reported accidents.

Table 1 presents the field items (definitive search terms) used to define the final workplace transport dataset.

Table 1 Field items (definitive search terms) defining the final workplace transport dataset

"ISCO_OCCUPATION_DESC"	"ACCIDENT_TRIGGER"	"INJURY_REASON"	"ITEM_ASSOCIATED"
BUS AND TRAM DRIVERS	Loss of control of: Road traffic transport (excl. commuting)	Injured by a vehicle or transport: In the workplace	BUSES, COACHES: PASSENGER
CAR, TAXI AND VAN DRIVERS	Loss of control of: Other transport or handling equipment	Trapped or crushed by an object or machinery	CARS
CRANE, HOIST AND RELATED PLANT OPERATORS			CRANES, OVERHEAD TRAVELLING CRANES
DRIVERS AND MOBILE PLANT OPERATORS			FIXED CRANES, MOBILE CRANES, VEHICLE-MOUNTED CRANES, OVERHEAD TRAVELLING CRANES, HOISTING DEVICES WITH SUSPENDED LOAD
GARBAGE COLLECTORS			FORKLIFT TRUCKS
HEAVY TRUCK AND LORRY DRIVERS			LAND VEHICLES - NOT SPECIFIED
LIFTING-TRUCK OPERATORS			MACHINE COMPONENTS, VEHICLE COMPONENTS: CHASSIS, CRANKCASE, LEVERS, WHEELS, ETC.
MOTOR VEHICLE DRIVERS			MOBILE HANDLING DEVICES,

"ISCO_OCCUPATION_DESC"	"ACCIDENT_TRIGGER"	"INJURY_REASON"	"ITEM_ASSOCIATED"
			HANDLING TRUCKS (POWERED OR NOT) - BARROWS, PALLET TRUCKS, ETC.
MOTOR VEHICLE MECHANICS AND FITTERS			OTHER TRANSPORT VEHICLES - NOT SPECIFIED
MOTORCYCLE DRIVERS			OTHER KNOWN LAND VEHICLES IN GROUP 12 BUT NOT LISTED ABOVE
PRODUCTION AND OPERATIONS MANAGERS IN TRANSPORT, STORAGE AND COMMUNICATIONS			OTHER KNOWN TRANSPORT VEHICLES IN GROUP 13 BUT NOT LISTED ABOVE
TRANSPORT CONDUCTORS			VANS, TRUCKS
TRANSPORT LABOURERS AND FREIGHT HANDLERS			VEHICLES - HEAVY: LORRIES, BUSES, COACHES (PASSENGER TRANSPORT)
			VEHICLES - LIGHT: GOODS OR PASSENGERS
			VEHICLES - TWO OR THREE WHEELS, POWERED OR NOT

4.3 ANALYSIS OF KEY ACCIDENT FIELDS

4.3.1 Overview

Using the workplace transport accident dataset created, each of the key accident fields were analysed to identify high risk areas. The resulting analyses are presented in the following sections.

4.3.2 Presentation and interpretation of graphs

In order to aid interpretation of the graphs, the following points should be considered:

- **Accident data period** – the accident data presented on the following graphs shows HSA accident data from January 1993 to April 2008. It is important to be clear that the data for 2008 therefore only covers the four month period from January to April 2008 (as this analysis was conducted in April 2008) and therefore does not reflect the pattern of accidents for the whole of 2008.

- **Y axis value** - the Y axis on all of the graphs in this report are whole numbers and not percentages.

- **Unknowns** – some graphs contain data that is labelled as 'Unknown'. This is where some accident details have not been reported for a period of time and therefore no data exists, causing it to appear as 'Unknown' on the graph. For example, the age of the victim was not recorded across the whole sixteen-year period.

- **NACE** – the term 'NACE' refers to a pan-European industry classification system which groups organisations according to their business activities.

4.3.3 Contents of workplace transport dataset

The workplace transport dataset contains 15,413 reported incidents. The majority of these accidents were reported between January 1993 and April 2008. However, a few incidents were miscoded into 'erroneous' years (e.g. '1903', '1904' etc.). Table 2 highlights the total number of incidents reported in the workplace transport accident dataset by injury severity and by the year of reporting.

Table 2 Severity of workplace transport related incidents reported between January 1993 and April 2008

Year	Fatal	Non-fatal injury	Dangerous Occurrence	Unknown severity	TOTAL
Erroneous					20
1993	8	470			478
1994	9	596	5		610
1995	11	627	1		639
1996	14	548	8		570
1997	8	649	19		676
1998	4	822			826
1999	7	967			974
2000	14	1,095	4		1,113
2001	5	1,177	15		1197
2002	9	989			998
2003	10	1,028	9		1,047
2004	12	1,400	17	1	1,430
2005	14	1,380	17		1,411
2006	10	1,421	52		1,483
2007	14	1,547	55	2	1,618
To April 2008	6	315	1	1	323
TOTAL	**155**	**15,031**	**203**	**4**	**15,413**

Table 2 highlights that the severity of some incidents were also classed as 'Unknown'. As explained in Section 4.3.2, this is because the data is missing and this could be due to several reasons.

4.3.4 HSA year

4.3.4.1 All incident severities

In order to visually review the trend in workplace transport accident numbers by year, the findings were also presented in a graphical format as highlighted on Figure 1.

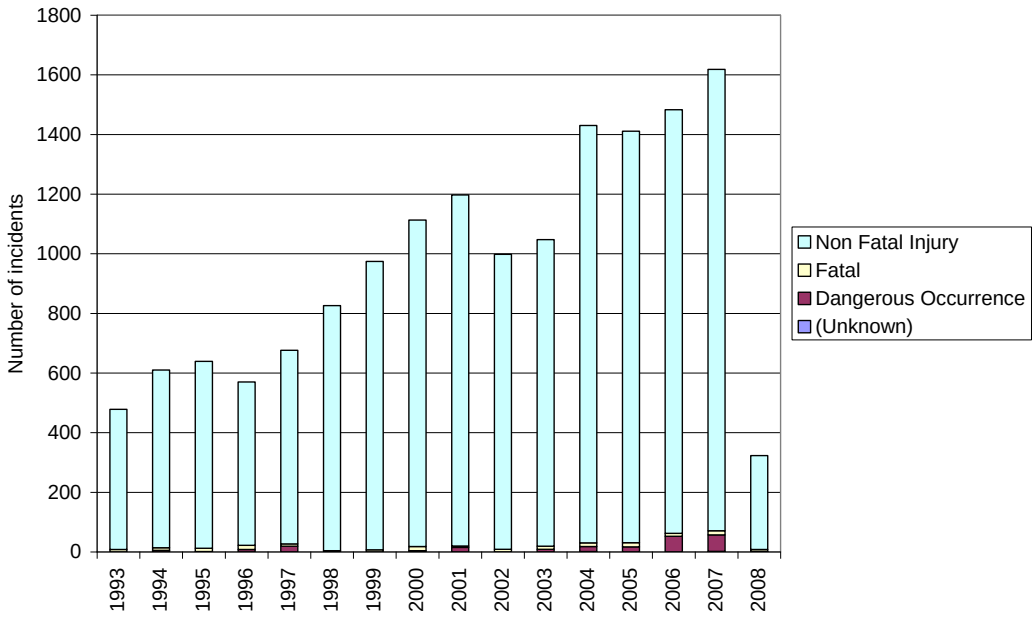


Figure 1 Number of workplace transport related fatal injuries, non-fatal injuries and dangerous occurrences reported to HSA by year

Figure 1 highlights an overall steady increase in the number of reported incidents between 1993 and 2007. However, this apparent increase may actually be caused by an increase in reporting activity, as opposed to a real increase in incident numbers.

The majority of incidents in each year are non-fatal injuries. However, there is an increase in dangerous occurrences over the last few years, peaking in 2007. The number of fatal accidents is at its highest in 1996, 2000, 2005 and 2007, when there were 14 fatal accidents.

4.3.4.2 By incident severities separately

In order to view the trend in the various accident severities separately across the sixteen-year period see Figure 2, Figure 3 and Figure 4. Figure 2 presents the number of fatal injuries reported in the workplace transport accident dataset by year.

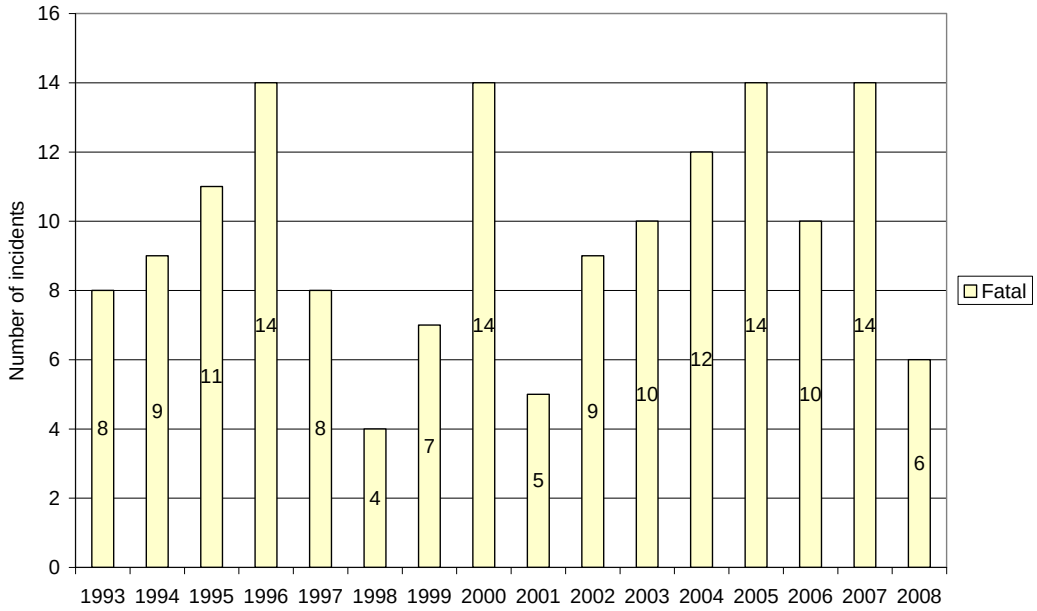


Figure 2 Number of workplace transport related fatal injuries reported to HSA by year

Figure 2 highlights that the number of fatal accidents was at its highest in 1996, 2000, 2005 and 2007, when there were 14 fatal accidents reported. In terms of the workplace transport accident dataset developed for this study, the number of fatal accidents occurring has generally been going up and down across the 16-year period. In the last seven years (between 2001 and 2007) fatal accidents appear to be gradually increasing.

Figure 3 presents the number of fatal injuries reported in the workplace transport accident dataset by year.

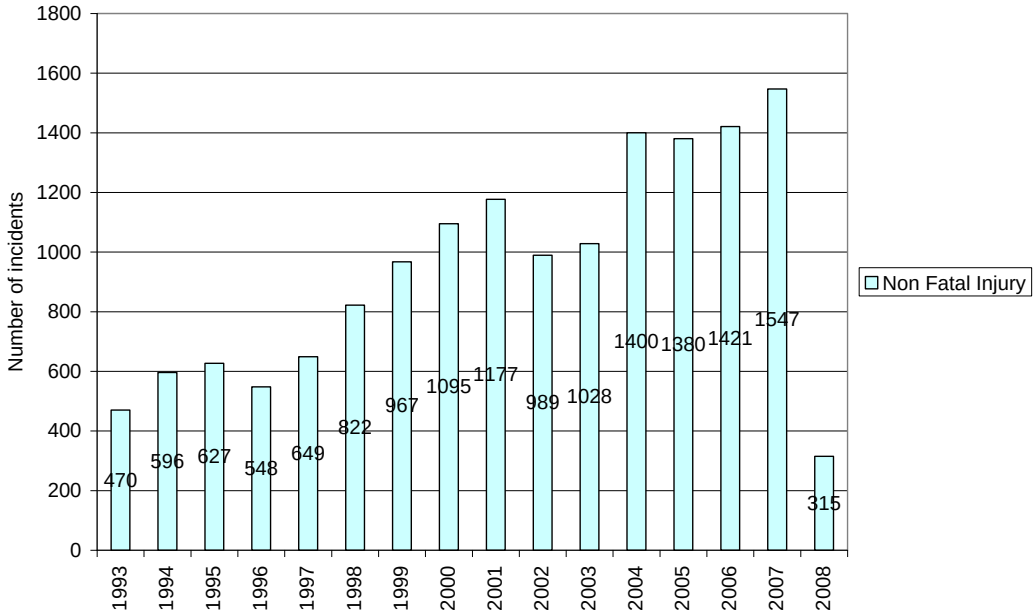


Figure 3 Number of workplace transport related non-fatal injuries reported to HSA by year

Figure 3 highlights an overall steady increase in the number of non-fatal workplace transport accidents reported by year. Figure 4 highlights the number of dangerous occurrences and 'unknowns' reported in the workplace transport accident dataset by year. It should be noted that dangerous occurrences were not reported every year across the whole 16-year period.

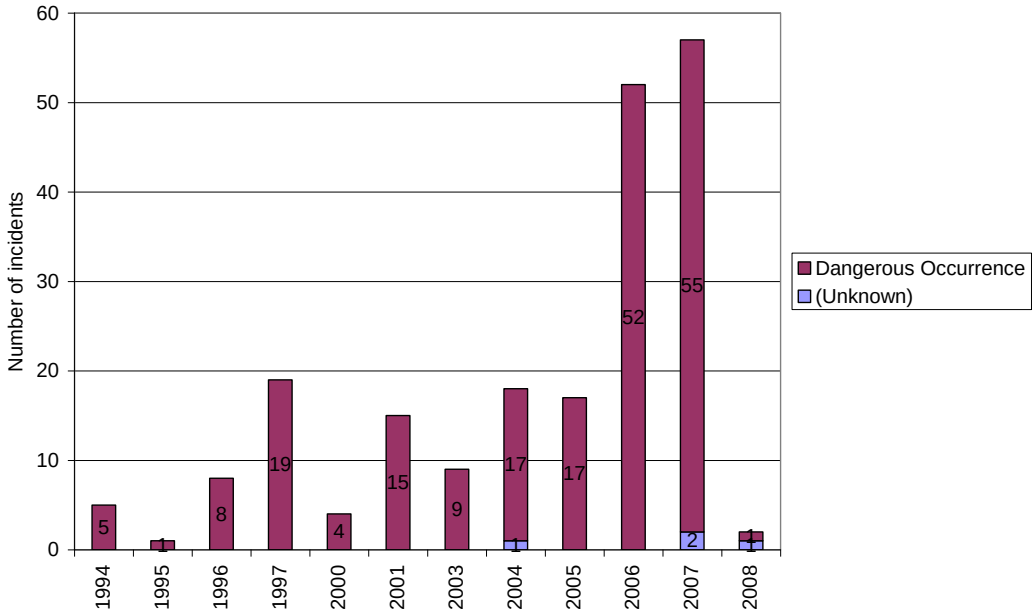


Figure 4 Number of workplace transport related dangerous occurrences (and unknowns) reported to HSA by year

4.3.5 NACE sector (Rev 1.1 classification)

4.3.5.1 All incident severities

In order to understand the key industry sectors reporting workplace transport related accidents, the dataset was analysed by NACE sector (Rev 1.1 classification). Figure 5 highlights the findings.

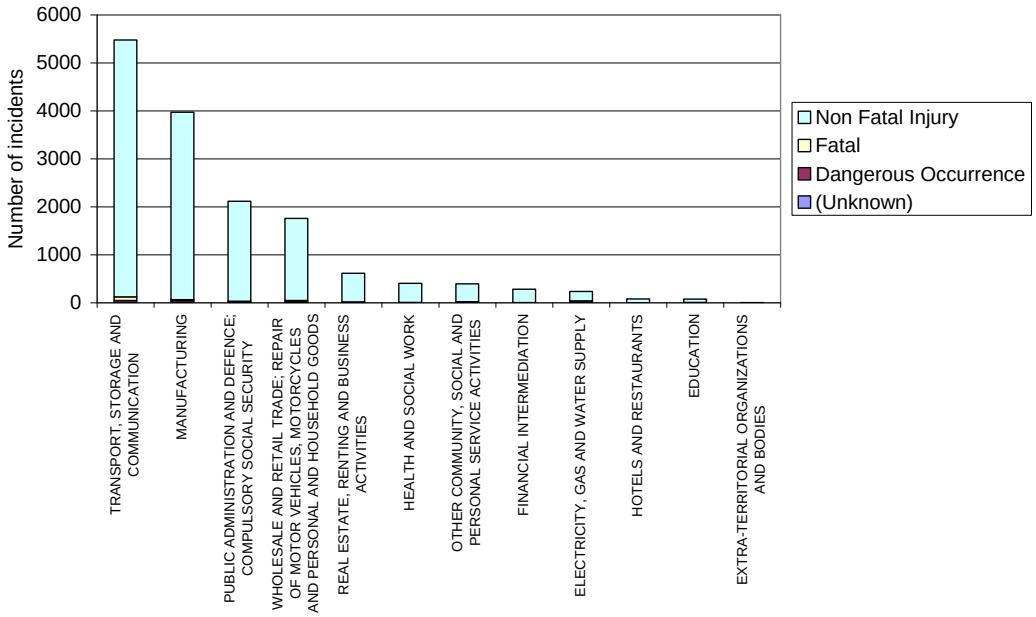


Figure 5 Number of workplace transport related fatal injuries, non-fatal injuries and dangerous occurrences reported to HSA by NACE sector (Rev 1.1 classification)

Figure 5 highlights that the sectors reporting the highest overall numbers of incidents are transport, storage and communications; manufacturing; public administration and defence (including compulsory social security); and wholesale and retail trade (including repair of motor vehicles, motorcycles and personal and household goods). However, this would be largely expected due to the transport related nature of the work undertaken in these sectors. Transport, storage and communications also report the highest number of fatalities, with a total of 76 reported between 1993 and April 2008.

4.3.5.2 By incident severities separately

In order to view the trend in the various accident severities separately by NACE sector see Figure 6, Figure 7 and Figure 8. Figure 6 presents the number of fatal injuries reported in the workplace transport accident dataset by NACE sector (Rev 1.1 classification).

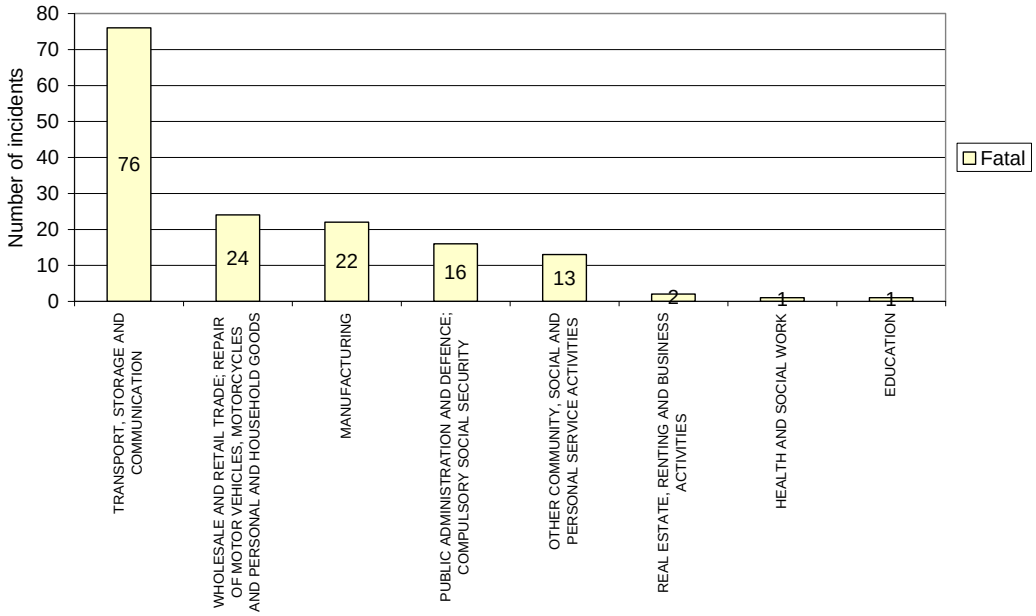


Figure 6 Number of workplace transport related fatal injuries reported to HSA by NACE sector (Rev 1.1 classification)

Figure 6 highlights that the NACE sector 'Transport, storage and communications' indicates the highest number of fatal incidents, with a total of 76 reported between 1993 and April 2008.

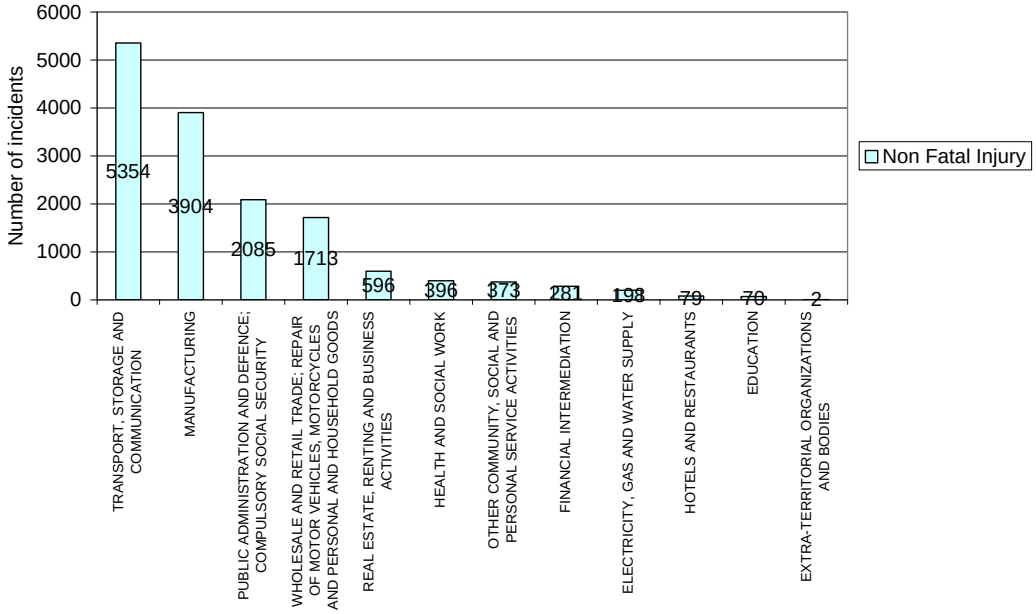


Figure 7 Number of workplace transport related non-fatal injuries reported to HSA by NACE sector (Rev 1.1 classification)

Figure 7 highlights that non-fatal accidents shows a similar trend, with the NACE sector 'Transport, storage and communications' having the highest

number of accidents. However, compared with the fatal accidents graph, this graph shows the 'manufacturing' sector as being the second most high risk in terms of non-fatal accidents.

Figure 8 highlights the number of dangerous occurrences and 'unknowns' reported in the workplace transport accident dataset by NACE sector.

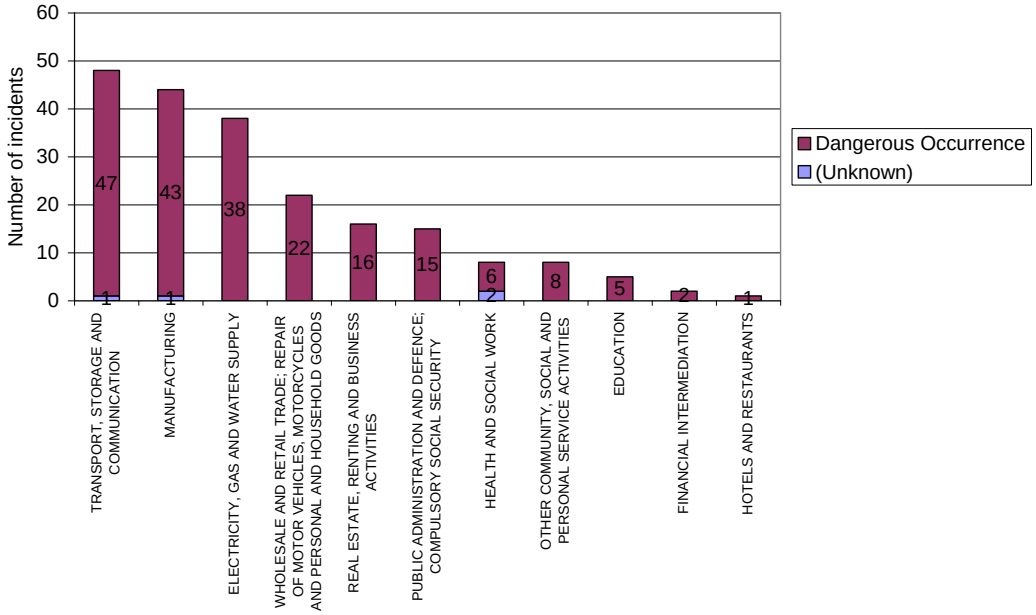


Figure 8 Number of workplace transport dangerous occurrences (and unknowns) reported to HSA by NACE sector (Rev 1.1 classification)

Figure 8 highlights that the distribution of dangerous occurrences shows a similar pattern to non-fatal accidents, however, in contrast to other incident severities a relatively larger number of dangerous occurrences were reported in the electricity, gas and water supply sector.

4.3.6 County (employer)

4.3.6.1 All incident severities

In order to understand whereabouts in Ireland the key employers reporting workplace transport related incidents are based, Figure 9 highlights reported incidents by employer region.

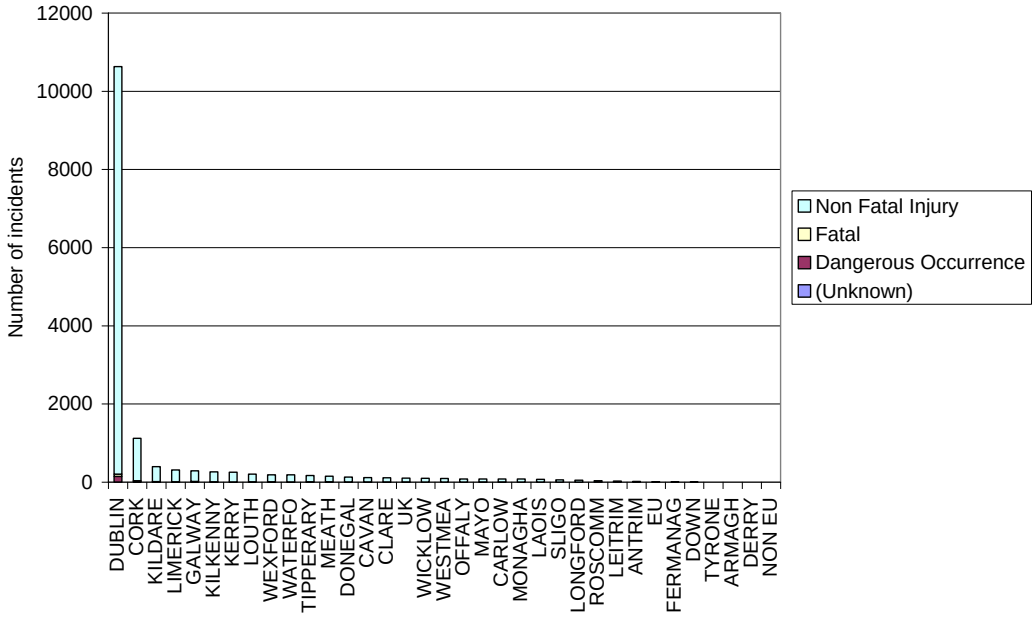


Figure 9 Number of workplace transport related fatal injuries, non-fatal injuries and dangerous occurrences reported to HSA by the county where the victim's employer is based

Figure 9 clearly highlights that the majority (69%) of workplace transport related incidents are being reported by employers based in the Irish capital city of Dublin. This would be largely anticipated due to the significant proportion of industry concentrated within the Irish capital. The counties of Cork, Kildare and Limerick also feature.

4.3.6.2 By incident severities separately

In order to view the trends in the various accident severities separately by the county where the victim's employer is based, see Figure 10, Figure 11 and Figure 12. Figure 10 highlights the number of fatal injuries reported to HSA by the county where the victim's employer is based.

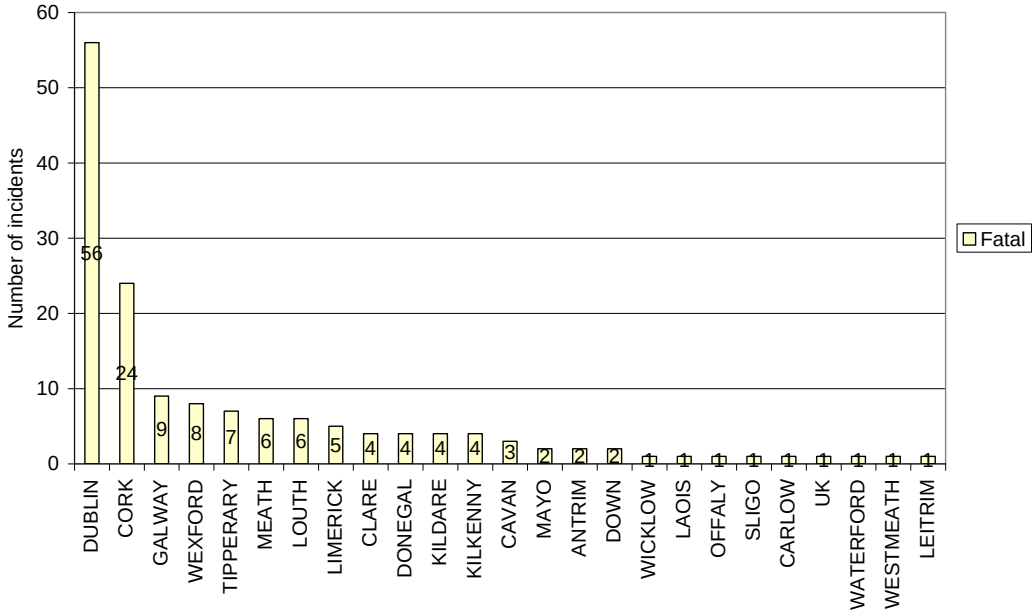


Figure 10 Number of workplace transport related fatal injuries reported to HSA by the county where the victim's employer is based

Figure 10 highlights a similar trend as seen on Figure 9, with the clear majority of employers based in Dublin, followed by the county of Cork. Figure 11 highlights the same trend for non-fatal accidents. It should be noted that Figure 11 only displays the first 20 counties with the largest number of accidents.

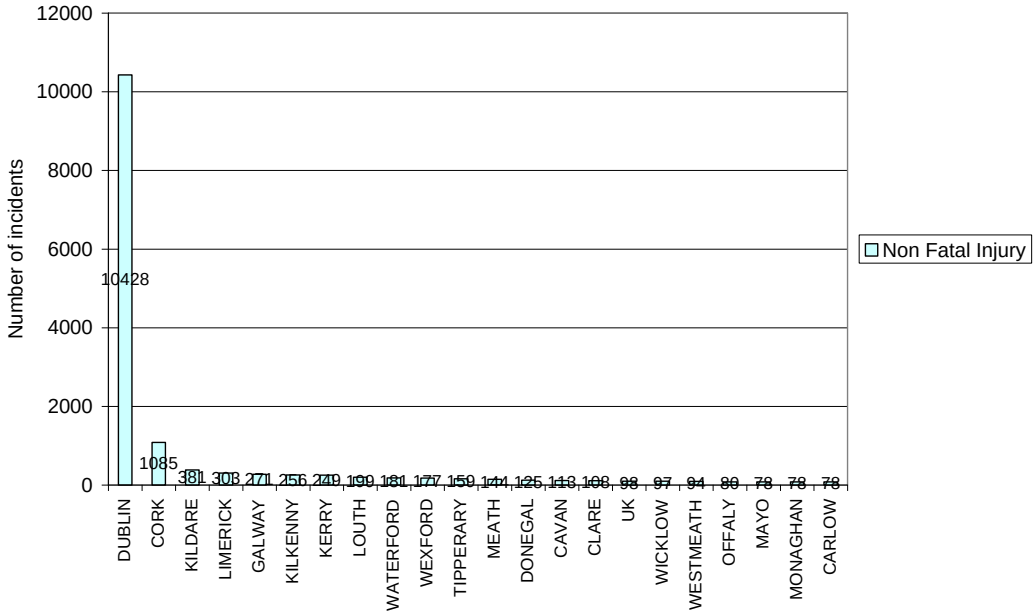


Figure 11 Number of workplace transport related non-fatal injuries reported to HSA by the county where the victim's employer is based

Figure 12 highlights the number of workplace transport related dangerous occurrences (and unknowns) by employer county.

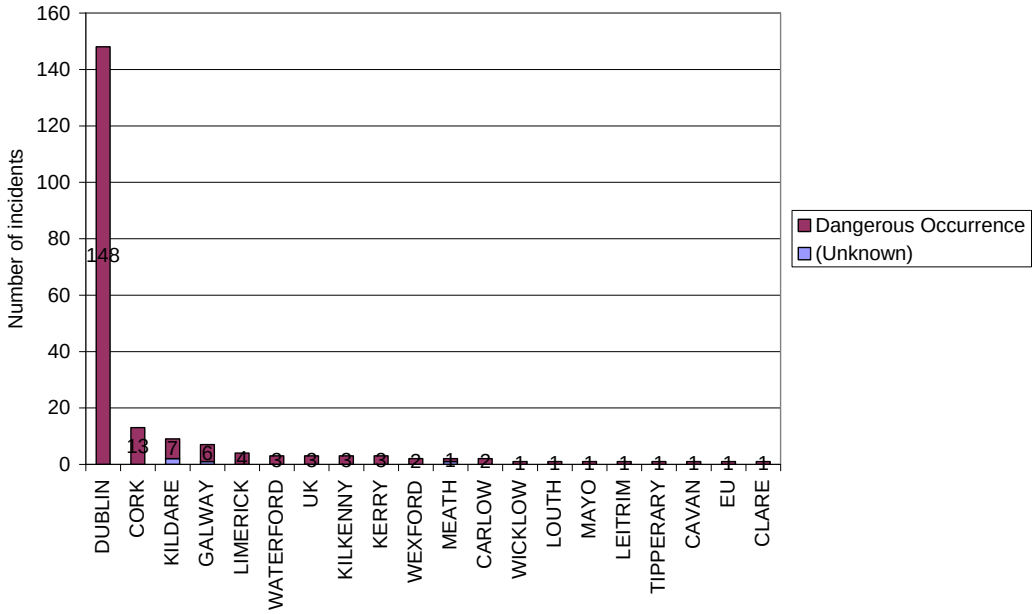


Figure 12 Number of workplace transport related dangerous occurrences (and unknowns) reported to HSA by the county where the victim's employer is based

As with the previous graphs, Figure 12 highlights Dublin as being the most significant employer region.

4.3.7 County (place of work (POW))

4.3.7.1 All incident severities

In order to build on the previous regional findings, analyses was conducted on the workplace transport dataset to explore the key counties where the victim was working at the time of the incident. These findings are presented on Figure 13.

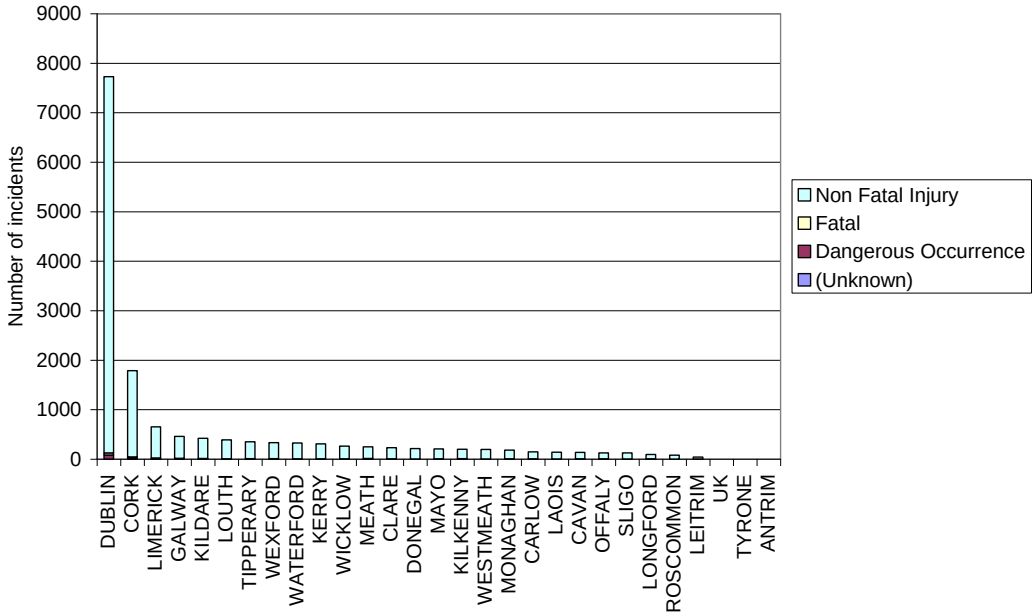


Figure 13 Number of workplace transport related fatal injuries, non-fatal injuries and dangerous occurrences reported to HSA by the county where the victim is based for work

Figure 13 highlights a similar pattern to previous regional graphs, with 50% of workplace transport related incidents being reported by workers based in the Irish capital city of Dublin. As before, this would largely be anticipated due to the significant proportion of industry concentrated in this region. The counties of Cork and Limerick also feature.

4.3.7.2 By incident severities separately

In order to view the trends in the various accident severities separately, by the county where the victim is based for work, see Figure 14, Figure 15 and Figure 16.

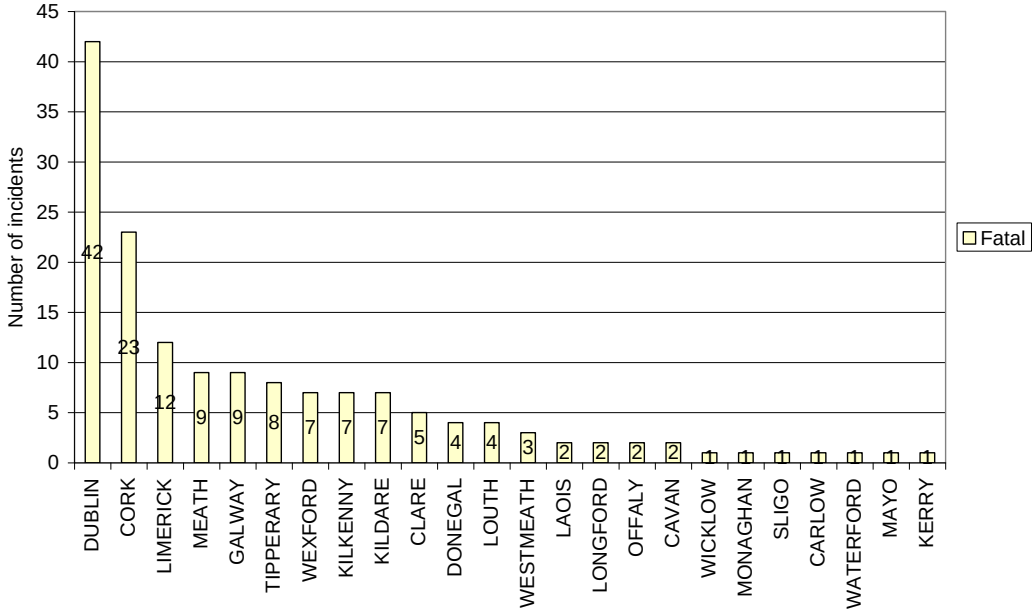


Figure 14 Number of workplace transport related fatal injuries reported to HSA by the county where the victim is based for work

Figure 14 highlights that the largest number of fatal injury accidents were occurring in the county of Dublin. Figure 15 highlights the number of non-fatals by county. It should be noted that Figure 15 only displays the first 20 counties with the largest number of accidents.

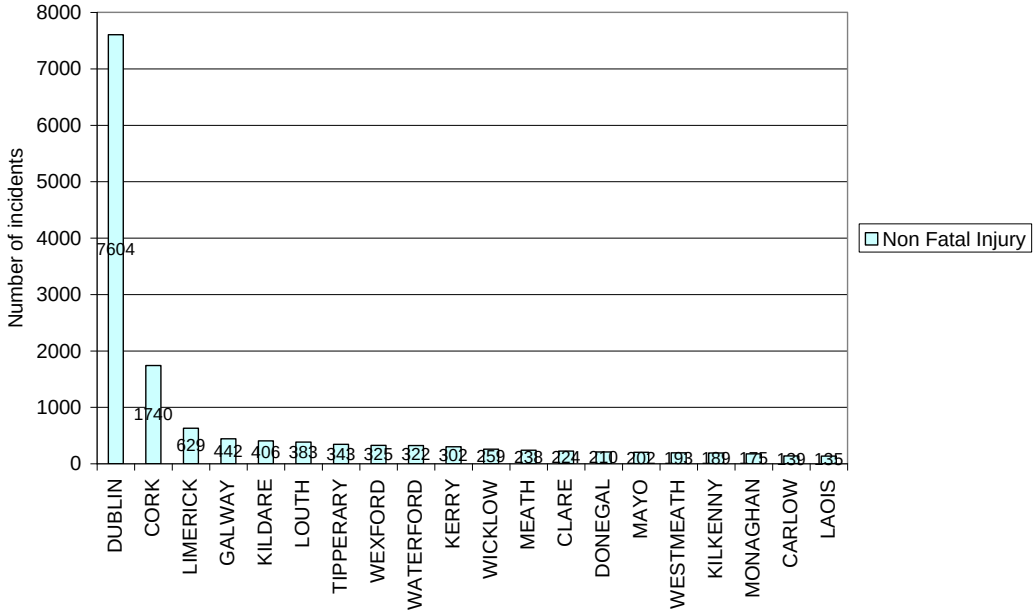


Figure 15 Number of workplace transport related non-fatal injuries reported to HSA by the county where the victim is based for work

Figure 15 highlights a similar regional trend with reported non-fatal injuries.

Figure 16 highlights the number of dangerous occurrences (and unknowns) reported to HSA, by the county where the victim is based for work.

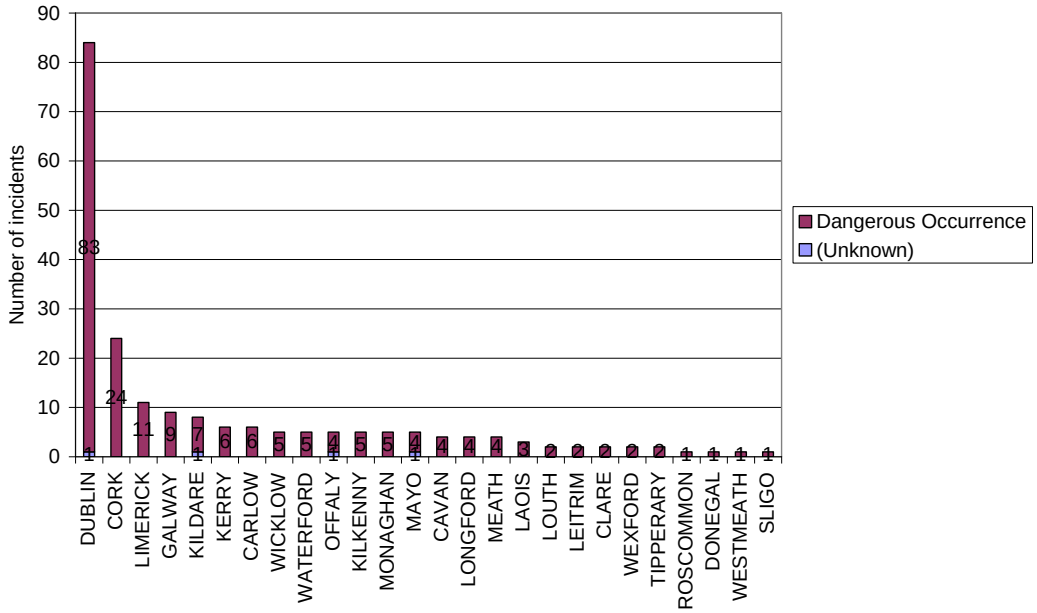


Figure 16 Number of workplace transport related dangerous occurrences (and unknowns) reported to HSA by the county where the victim is based for work

Figure 16 highlights a similar pattern, with Dublin being most significant, followed by Cork and Limerick.

4.3.8 Work environment

4.3.8.1 All incident severities

Figure 17 highlights the most frequently occurring work environment within which workplace transport related incidents have been reported. Only the 15 most frequently occurring work environments are presented on the graph. Where some incidents were reported, but the work environment was recorded as 'Unknown', these are not included on the graph because of the large number of 'Unknowns'.

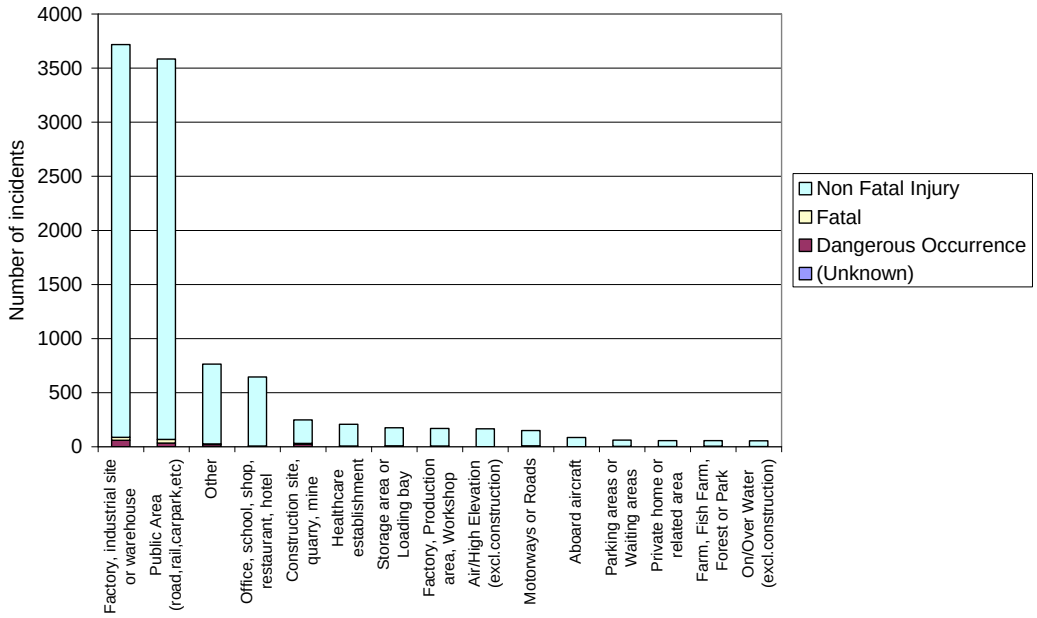


Figure 17 Number of workplace transport related fatal injuries, non-fatal injuries and dangerous occurrences reported to HSA by work environment

Figure 17 highlights that the work environments where the largest total number of workplace transport related incidents have been reported are factories, industrial sites or warehouses and public areas (including road, rail and car park).

In terms of factories, industrial sites and warehouses, this findings is likely to reflect the high number of industrial vehicles operating in these work environments, such as forklift trucks, HGVs and vans. In terms of the public areas, this is more likely to reflect incidents involving cars and two-wheeled vehicles.

It should be noted that although this study did not involve either the construction or aviation industry, related work environments do appear on Figure 17. This is because although these industries were taken out of this dataset, accidents in other industries may have been coded using these work environment terms.

4.3.8.2 By incident severities separately

In order to view the trends in the various accident severities separately, by work environment, see Figure 18, Figure 19 and Figure 20. It should be noted that only the 15 most frequently occurring work environments are presented on each of these three graphs.

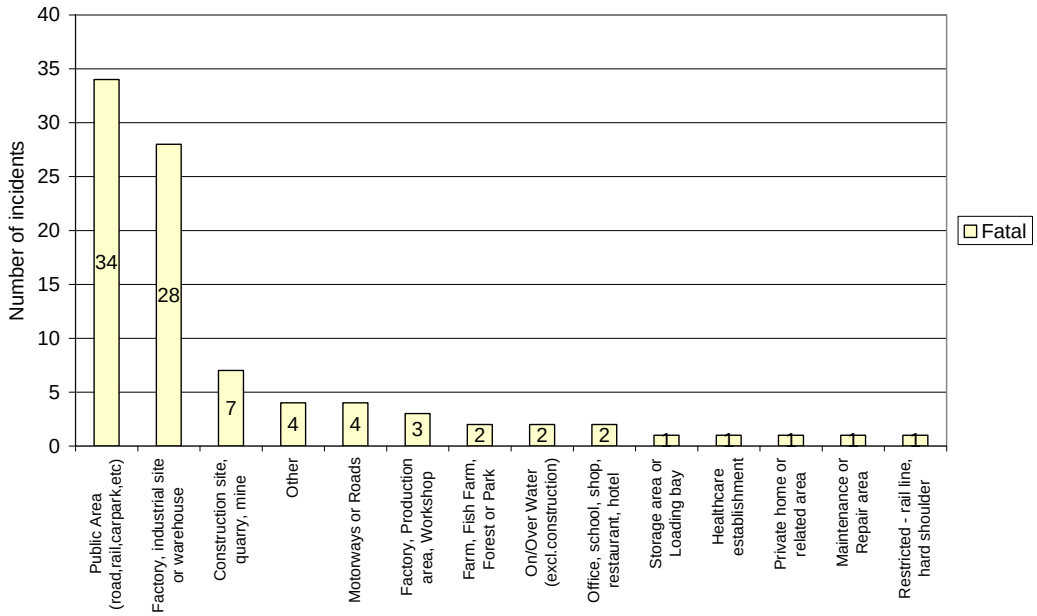


Figure 18 Number of workplace transport related fatal injuries reported to HSA by work environment

Figure 18 highlights that in terms of fatal injury workplace transport accidents, the largest number have been reported in a public area (e.g. road, rail, car park etc.). This is closely followed by factories, industrial sites or warehouses. This therefore highlights a similar trend as shown on Figure 17.

Figure 19 highlights the trend for non-fatals.

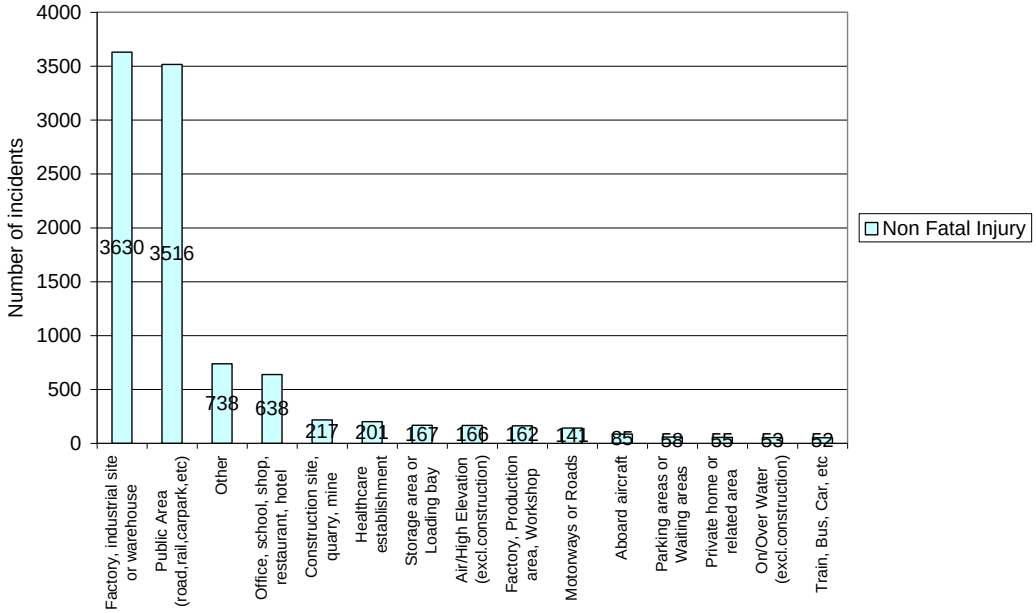


Figure 19 Number of workplace transport related non-fatal injuries reported to HSA by work environment

Figure 19 highlights the work environments where the largest total number of non-fatal injury workplace transport accidents have been reported are factories, industrial sites or warehouses, followed by public areas.

Figure 20 completes the picture by providing an indication of which work environments reported dangerous occurrences.

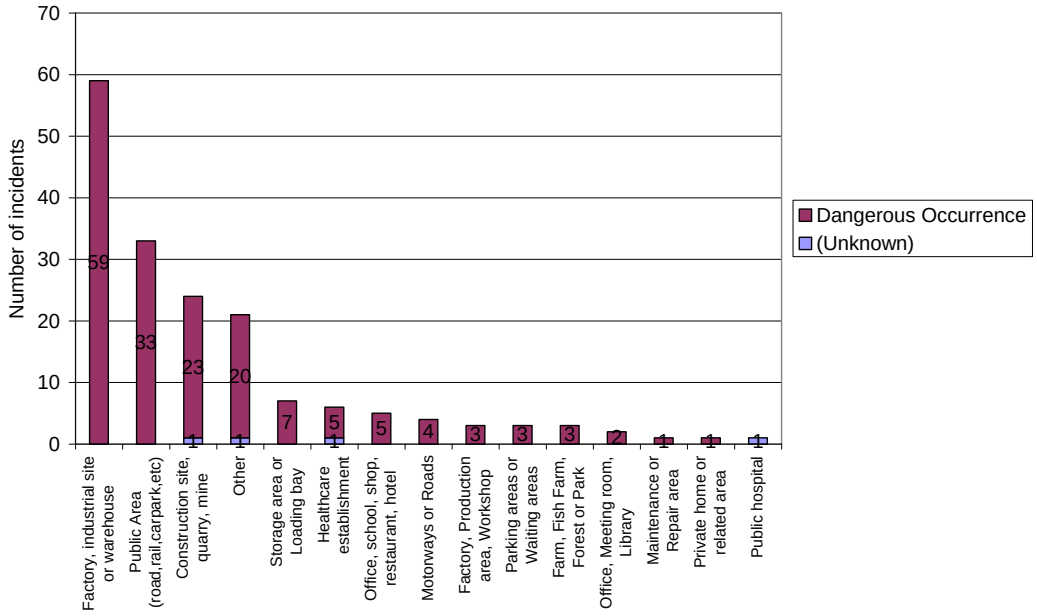


Figure 20 Number of workplace transport related dangerous occurrences (and unknowns) reported to HSA by work environment

Figure 20 highlights a similar pattern to fatal and non-fatal injuries, with the largest number of dangerous occurrences being reported in factories, industrial sites or warehouses, followed by public areas.

4.3.9 Victim age

4.3.9.1 All incident severities

Figure 21 highlights the age group of the victim involved in the workplace transport related incident. It should be noted that because there were several years when victim age was not recorded, there were many 'Unknowns' in the dataset, these are therefore not shown on the graph to aid interpretation.

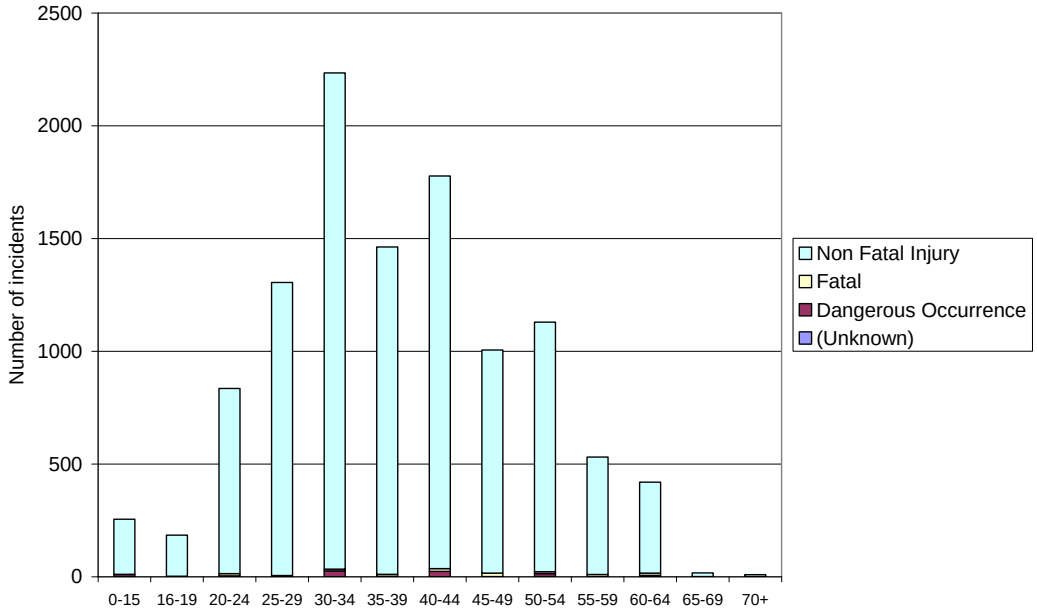


Figure 21 Number of workplace transport related fatal injuries, non-fatal injuries and dangerous occurrences reported to HSA by age group

Figure 21 highlights that the largest total number of workplace transport related incidents involved a victim aged between 30 and 34 years. Victims aged between 40 and 44 years and then 35 and 39 years followed this. This generally indicates that workplace transport related incidents involve more middle age workers, than workers in their twenties or older workers in their mid-fifties and sixties. This may reflect the fact that workers in these age groups are less likely to be operating or working around workplace transport vehicles, or possibly more risk awareness in these age groups.

4.3.9.2 By incident severities separately

In order to view the trends in the various accident severities separately, by age group, see Figure 22, Figure 23 and Figure 24. Figure 22 presents the number of fatal injuries reported in the workplace transport accident dataset by age group. As with all severities, 'Unknowns' are not displayed on the graphs.

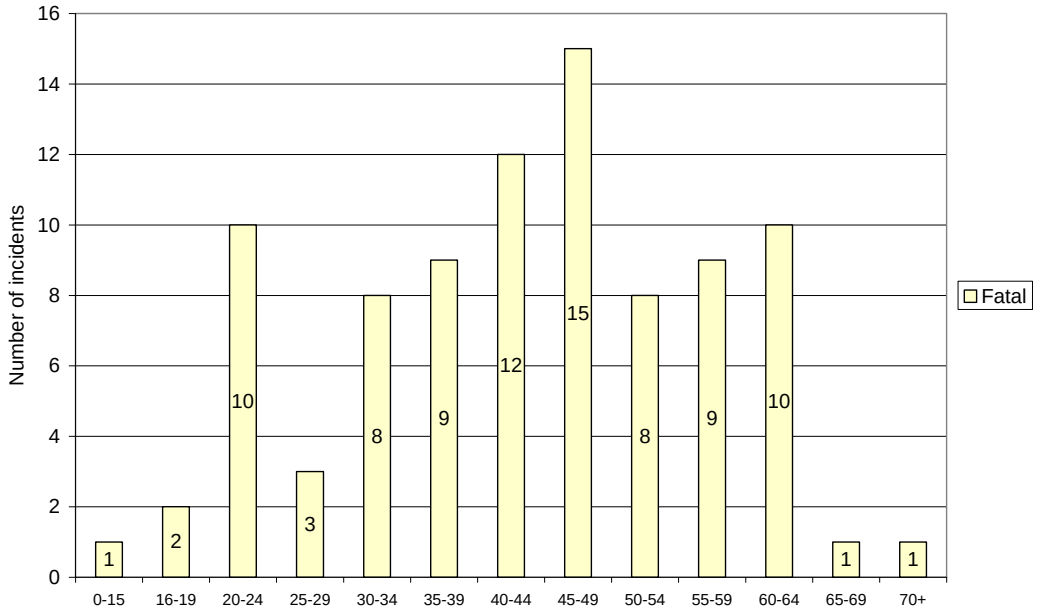


Figure 22 Number of workplace transport related fatal injuries reported to HSA by age group

Figure 22 highlights that the number of fatal workplace transport related accidents are reasonably evenly distributed throughout the age groups, with the exception of two young age groups (16 to 19 years and 25 to 29 years) and older age groups (65 years plus), who have been involved in less fatal accidents.

The largest number of fatal workplace transport related accidents involved workers in the 45 to 49 age group (accounting for 15 fatals). This is followed by workers in the 40 to 44 age group (accounting for 12 fatals) and then the 20 to 24 age group and the 60 to 64 age group (both accounting for 10 fatals).

This illustrates a different pattern compared with the analyses of age group for all accident severities (see Figure 21). Analyses of all accident severities indicated the middle age groups appear to be most at risk. However, the analyses of fatal accidents indicate fatal accidents are more evenly distributed across the ages. Figure 23 highlights how non-fatal injury accidents are distributed across the age groups.

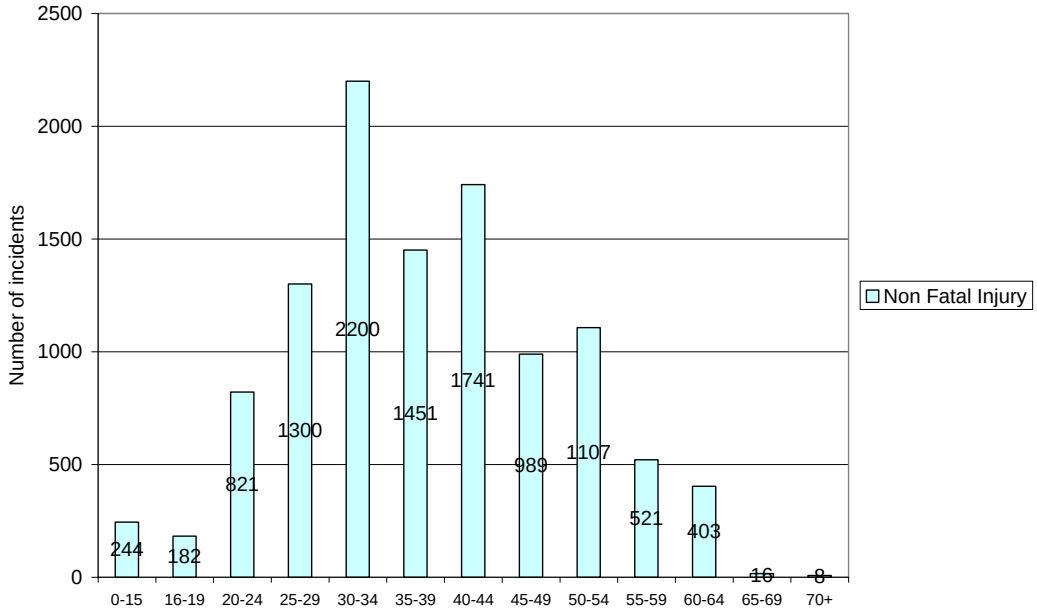


Figure 23 Number of workplace transport related non-fatal injuries reported to HSA by age group

Figure 23 highlights a similar pattern as with all severities (see Figure 21), however, this is to be expected as non-fatal injury accidents comprise such a large proportion of the overall total accident numbers.

Figure 24 highlights the number of dangerous occurrences reported by age group.

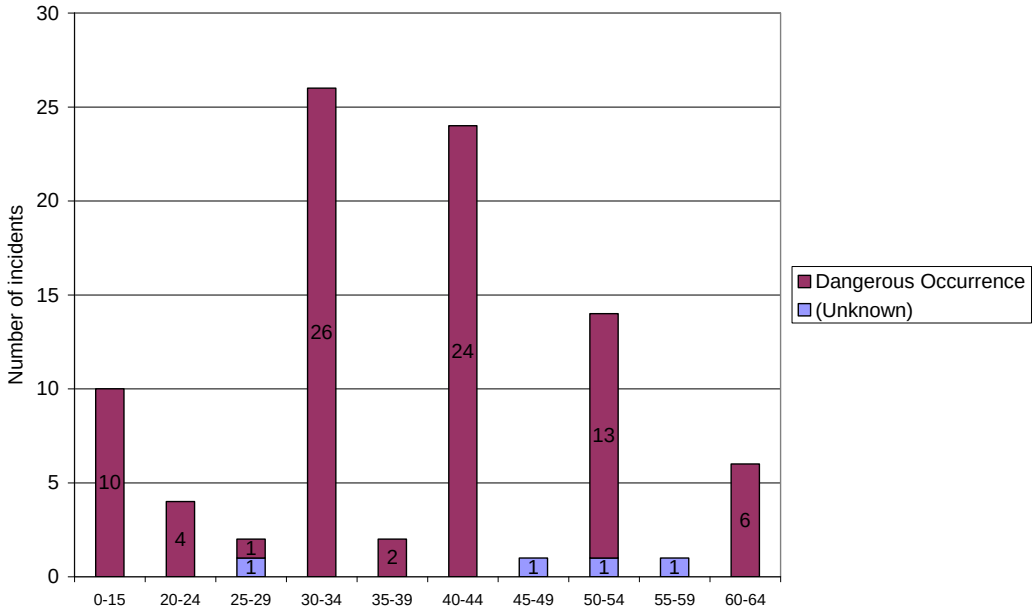


Figure 24 Number of workplace transport related dangerous occurrences (and unknowns) reported to HSA by age group

Figure 24 highlights a different pattern for dangerous occurrences, with the largest number of occurrences being reported in the 30 to 34 years and 40 to 44 years age groups.

4.3.10 Victim employment status

4.3.10.1 All incident severities

In order to understand the employment status of people involved in the incidents contained within the workplace transport dataset, Figure 25 highlights the victims' employment status. It should be noted that for some years employment status data was either not recorded (marked as 'blank' on the graph) or not known (marked as 'Unknown'). As they represent only a small number on the graph, they remain for completeness.

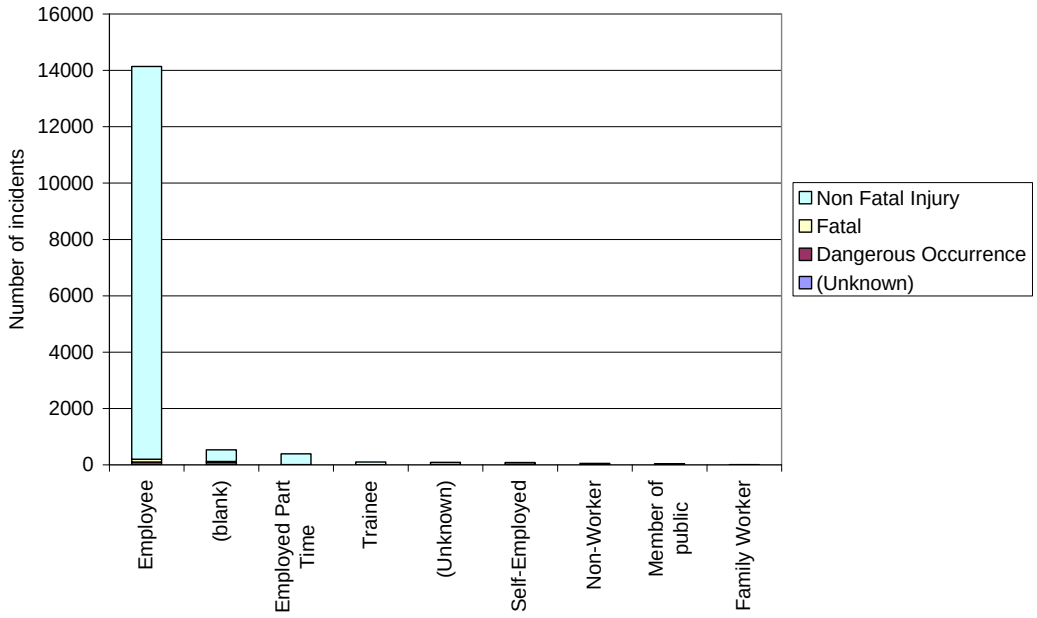


Figure 25 Number of workplace transport related fatal injuries, non-fatal injuries and dangerous occurrences reported to HSA by employment status

Figure 25 highlights how the clear majority (92%) of the workplace transport related incidents in this dataset involve employees. There are a small number of people employed part-time, some trainees and some self-employed workers. There are also a very small number of members of the public. These may reflect those incidents in retail outlet car parks. However, overall Figure 25 highlights that the clear majority of incidents in the workplace transport dataset involve victims who were employees.

4.3.10.2 By incident severities separately

In order to view the trends in the various accident severities separately, by the victim's employment status, see Figure 26, Figure 27 and Figure 28.

Figure 26 presents the number of fatal injuries reported in the workplace transport accident dataset by victim employment status.

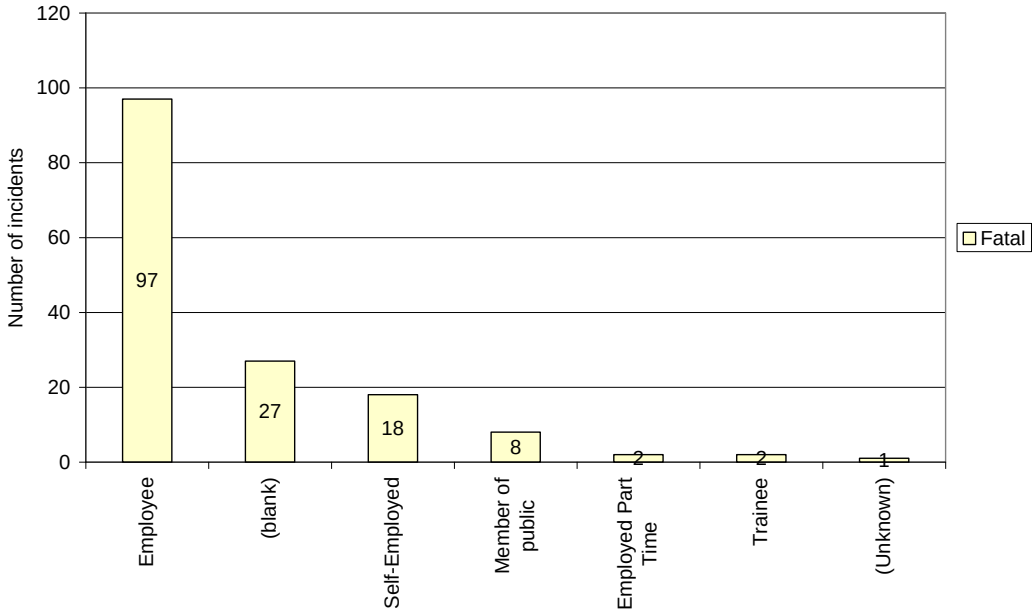


Figure 26 Number of workplace transport related fatal injuries reported to HSA by employment status

Figure 26 highlights that the clear majority of fatal workplace transport related accidents occurring between 1993 and April 2008 have involved employees (accounting for 97 fatal accidents, which equates to 63%). Self-employed workers have accounted for 18 fatal accidents and members of the public have accounted for eight fatal accidents.

Figure 27 highlights non-fatal injury accidents by employment status.

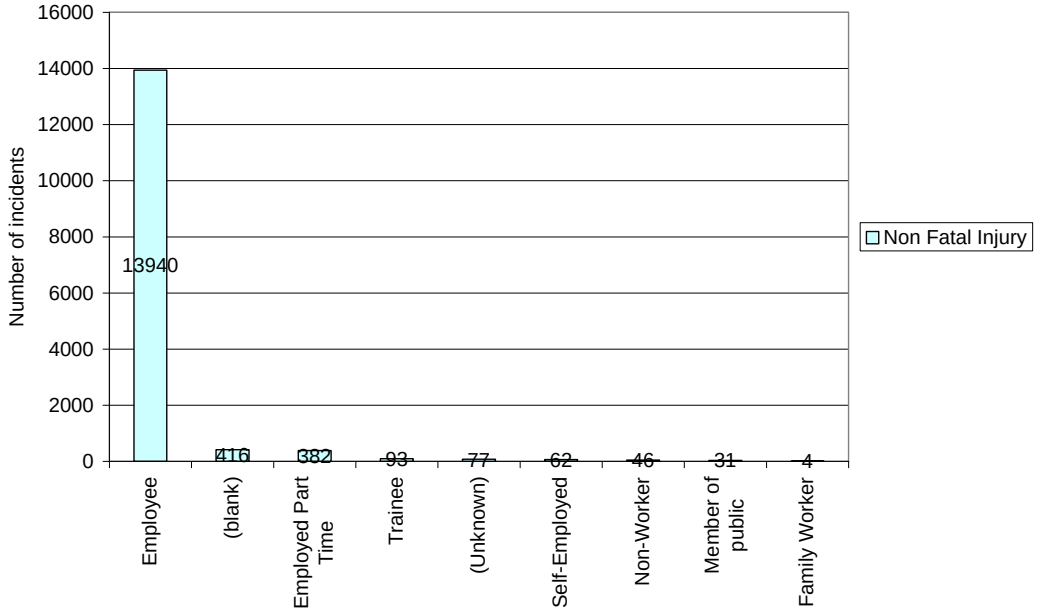


Figure 27 Number of workplace transport related non-fatal injuries reported to HSA by employment status

Figure 27 highlights a similar pattern as before, with the largest number of non-fatal workplace transport accidents occurring with employees.

Figure 28 highlights dangerous occurrences by employment status.

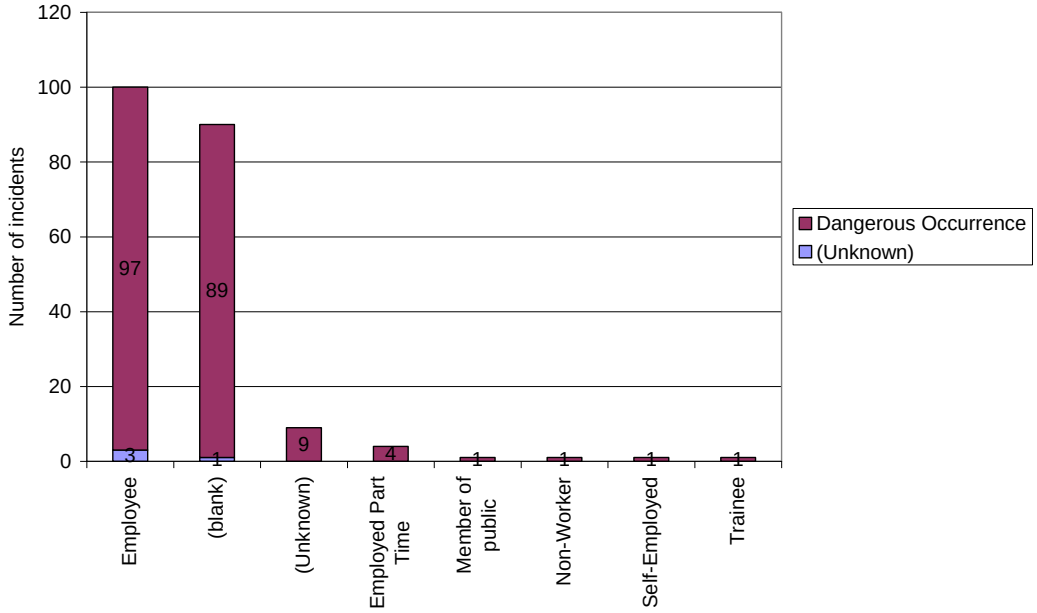


Figure 28 Number of workplace transport related dangerous occurrences (and unknowns) reported to HSA by employment status

Figure 28 supports the emerging pattern with the largest number of dangerous occurrences involving employees.

4.3.11 Victim nationality

4.3.11.1 All incident severities

To understand more about the victim involved in the workplace transport related incident, the victims' nationality is presented on Figure 29. It should be noted that for some years victim nationality data was either not recorded (marked as 'blank' on the graph) on not known (marked as 'Unknown'). As they represent only a small number on the graph, they remain for completeness.

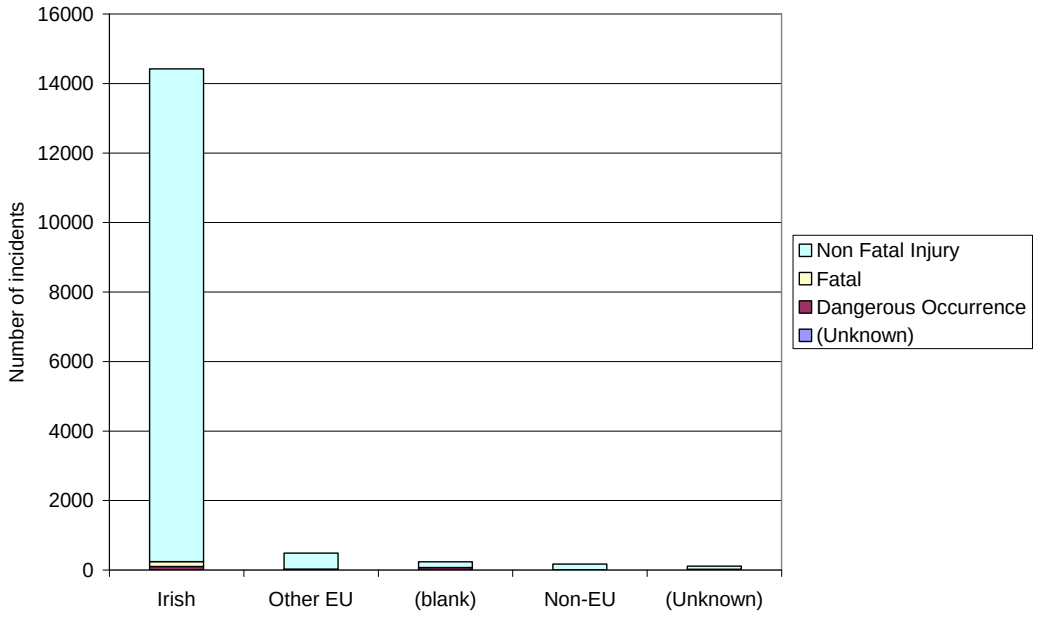


Figure 29 Number of workplace transport related fatal injuries, non-fatal injuries and dangerous occurrences reported to HSA by victims' nationality

Figure 29 highlights that the clear majority of workplace transport related incidents involve a victim that is of Irish nationality. This is largely expected considering the dataset contains incidents reported within the workplace in Ireland. However, there are a small number of incidents involving victims of other European Union (EU) nationality. This may reflect the increasing employment of workers from Eastern Europe.

4.3.11.2 By incident severities separately

In order to view the trends in the various accident severities separately, by the victims' nationality, see Figure 30, Figure 31 and Figure 32.

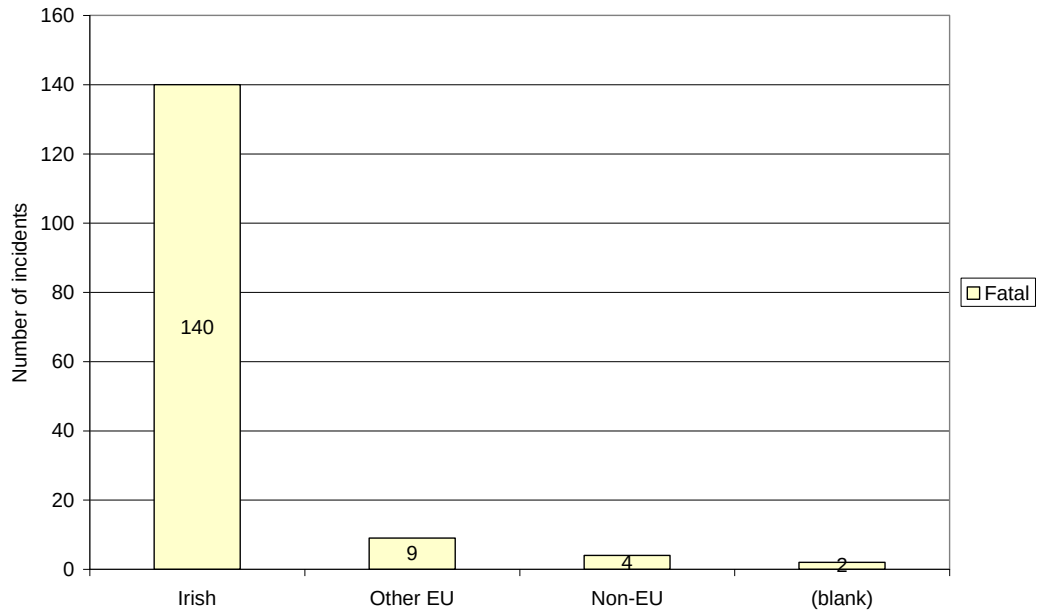


Figure 30 Number of workplace transport related fatal injuries reported to HSA by victims' nationality

Figure 30 highlights that the clear majority of workplace transport related fatal injury accidents involve a victim that is of Irish nationality.

Figure 31 highlights the number of non-fatal injuries by victim nationality.

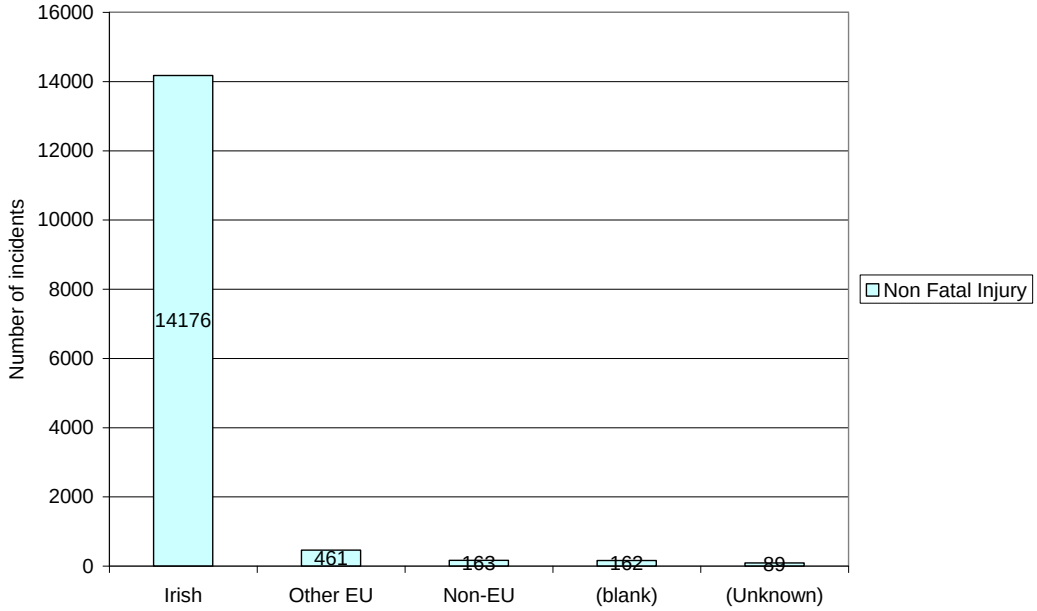


Figure 31 Number of workplace transport related non-fatal injuries reported to HSA by victims' nationality

Figure 31 reflects a similar pattern, with the majority of workplace transport related non-fatal injury accidents involving an Irish victim.

Figure 32 highlights the number of dangerous occurrences by victims' nationality.

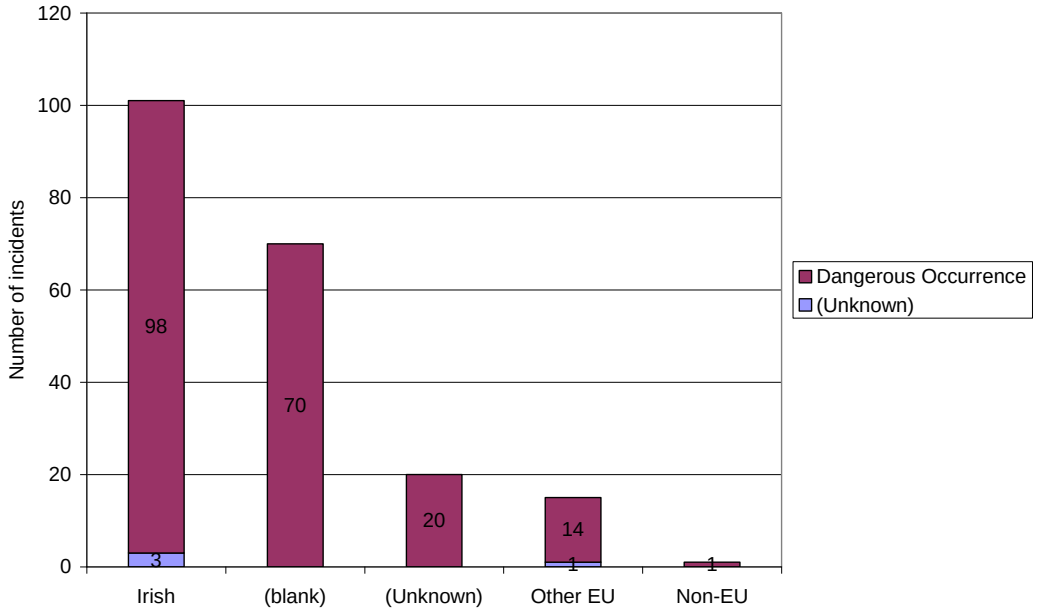


Figure 32 Number of workplace transport related dangerous occurrences (and unknowns) reported to HSA by victims' nationality

Figure 32 reflects the same pattern as previous nationality graphs, with the clear majority of dangerous occurrences involving victims of Irish nationality.

4.3.12 Occupation

4.3.12.1 All incident severities

To further develop our understanding of the victim of the workplace transport incident, Figure 33 highlights the occupations most frequently occurring within the workplace transport dataset. (The graph only displays the first 20 most frequently occurring occupations).

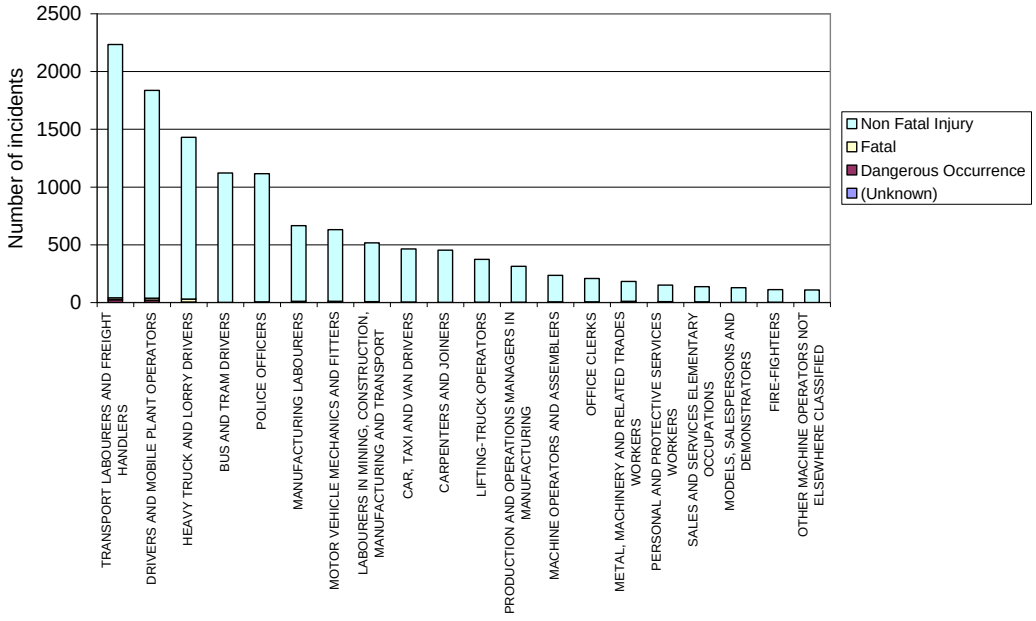


Figure 33 Number of workplace transport related fatal injuries, non-fatal injuries and dangerous occurrences reported to HSA by occupation

Figure 33 highlights that the most frequently occurring occupation in the workplace transport dataset is 'transport labourers and freight handlers'. This occupation is followed by a series of driver occupations: drivers and mobile plant operators; heavy truck and lorry drivers; and bus and tram drivers. Interestingly, police officers also feature reasonably frequently. This may reflect their high usage of police cars and other law enforcement vehicles. As expected in a dataset of this nature, lifting truck operators are also on the graph.

Occupations that also feature (although less frequently) are office clerks and sales related jobs. These are likely to reflect those people that are required to regularly drive as part of their job, but the driving is not the main focus of their role, it is an incidental part of it. Incidents involving these types of victim are of interest to this study in relation to incidents occurring in or around vehicles at the workplace.

4.3.12.2 By incident severities separately

In order to view the trends in the various accident severities separately, by occupation, see Figure 34, Figure 35 and Figure 36.

Figure 34 presents the 15 most frequently occurring occupations involved in fatal accidents within the workplace transport accident dataset.

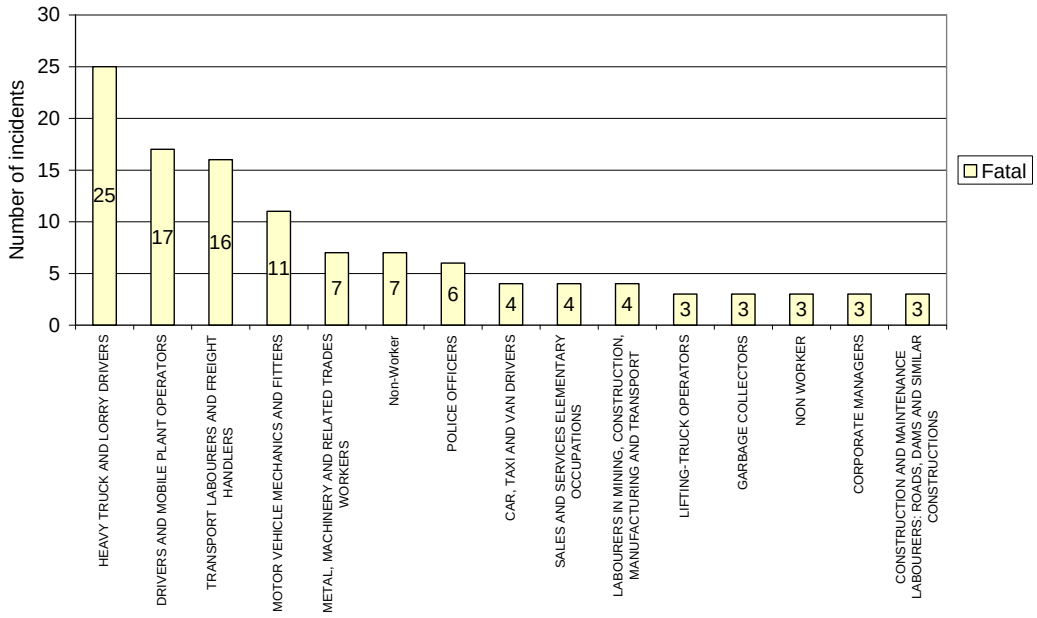


Figure 34 Number of workplace transport related fatal injuries reported to HSA by occupation

Figure 34 highlights that the occupation 'heavy truck and lorry drivers' have been most frequently involved in the fatal accidents in the workplace transport dataset. Heavy truck and lorry drivers account for 22% of the fatal injuries. In total, 25 of this type of driver have been involved in fatal accidents between 1993 and April 2008. Furthermore, drivers and mobile plant operators have been involved in 17 accidents during the same period. This suggests drivers is a high risk group.

Transport labourers and freight handlers are also at risk, accounting for 16 fatals during 1993 to April 2008. These are workers likely to be working near the vehicles and possibly handling and moving the vehicle goods.

Figure 35 presents the 15 most frequently occurring occupations involved in non-fatal accidents within the workplace transport accident dataset.

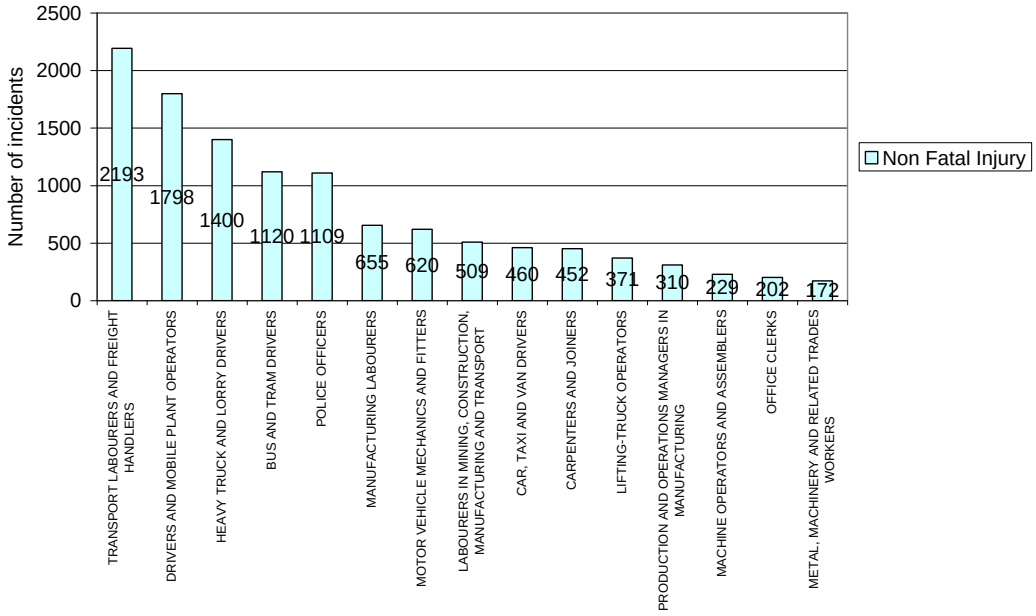


Figure 35 Number of workplace transport related non-fatal injuries reported to HSA by occupation

Figure 35 highlights a similar trend to that shown on Figure 33 (highlighting all accident severities), which is expected considering non-fatals contribute to such a high proportion of the total number of accidents.

Figure 36 highlights the number of dangerous occurrences by occupation.

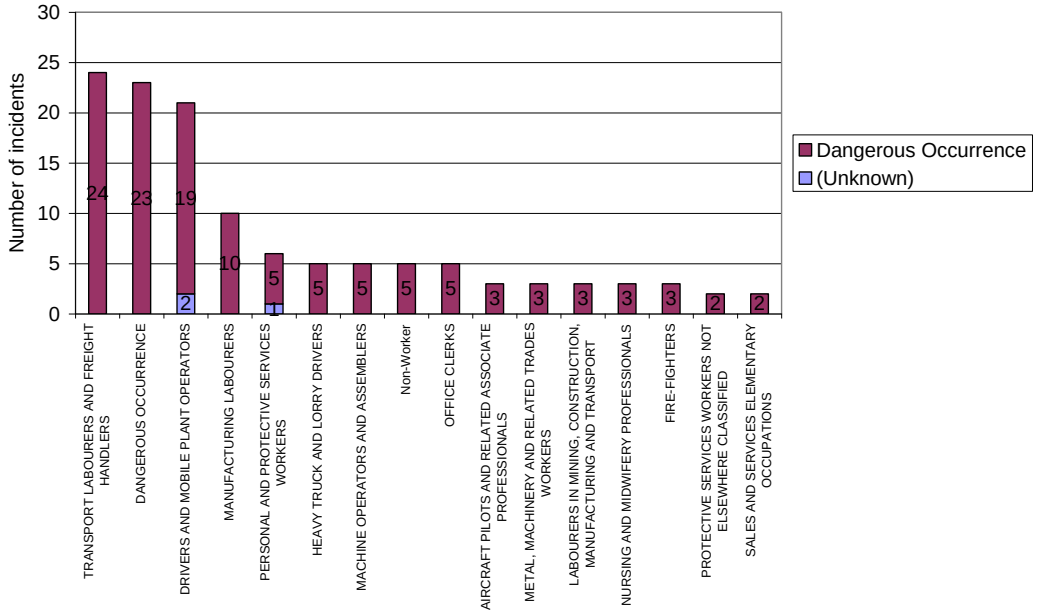


Figure 36 Number of workplace transport related dangerous occurrences (and unknowns) reported to HSA by occupation

Figure 36 highlights the most frequently occurring occupation in the workplace transport dataset is ‘transport labourers and freight handlers’. Interestingly, there is a category called ‘Dangerous Occurrences’ within the occupation field which closely follows the most significant category. This is likely to be an HSA accident coding anomaly.

4.3.13 Accident trigger

4.3.13.1 All incident severities

To understand more about the underlying causes of workplace transport related incidents, the 15 most frequently reported 'accident triggers' within the workplace transport dataset are presented on Figure 37.

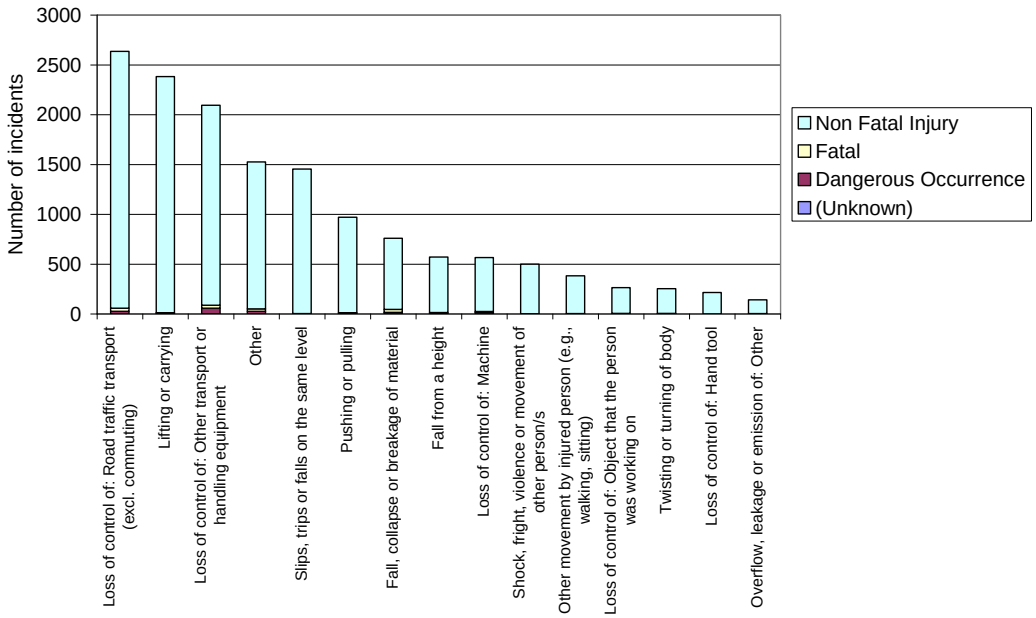


Figure 37 Number of workplace transport related fatal injuries, non-fatal injuries and dangerous occurrences reported to HSA by accident trigger

Figure 37 highlights that the largest number of workplace transport related incidents in the dataset have been reported to be triggered by a loss of control of road traffic transport (excluding commuting related incidents). The second largest number have been triggered by lifting or carrying activities and the third largest are also related to loss of control, but this time loss of control of other transport or handling equipment. It would therefore appear that a significant proportion of workplace transport related incidents are being caused by loss of control of vehicles and also handling or lifting/carrying activities (possibly loading and unloading in and around the vehicles).

Other accident triggers frequently occurring in the dataset support this notion, for example, 'pushing or pulling', 'fall, collapse or breakage of material' and 'twisting or turning of body' could all indicate incidents occurring during vehicle loading and unloading procedures.

4.3.13.2 By incident severities separately

In order to view the trends in the various accident severities separately, by accident trigger, see Figure 38, Figure 39 and Figure 40. Figure 38 highlights fatal injuries by accident trigger.

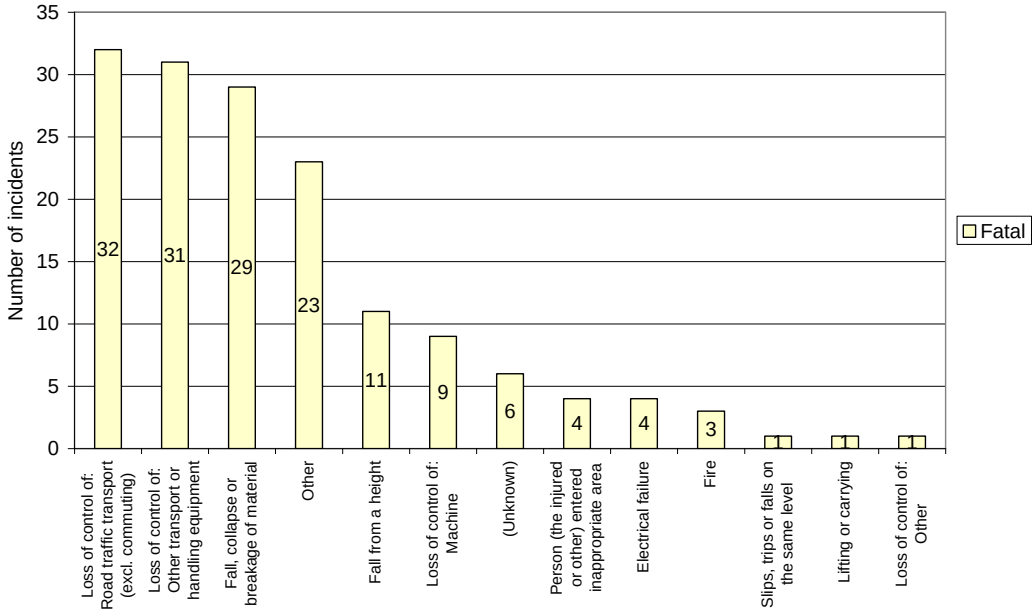


Figure 38 Number of workplace transport related fatal injuries reported to HSA by accident trigger

Figure 38 highlights the largest number of fatal injury accidents have been reported to be triggered by a loss of control of road traffic transport (excluding commuting related incidents). The second largest number have been triggered by the loss of control of other transport or handling equipment. The fall, collapse or breakage of material was the third most significant accident trigger. All of these accident triggers have clear links with workplace transport.

Figure 39 highlights the 15 most frequently reported non-fatal accident triggers.

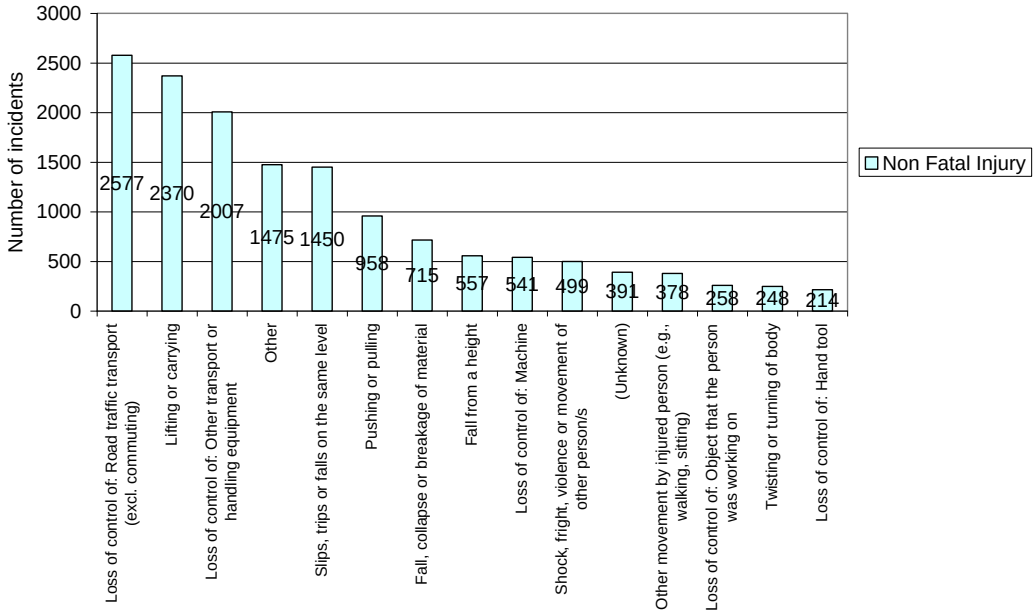


Figure 39 Number of workplace transport related non-fatal injuries reported to HSA by accident trigger

Figure 39 highlights a similar pattern as that seen with all accident severities (see Figure 37), which is expected because non-fatal accidents comprise such a high proportion of the overall total number of accidents.

Figure 40 highlights the number of dangerous occurrences reported by accident trigger.

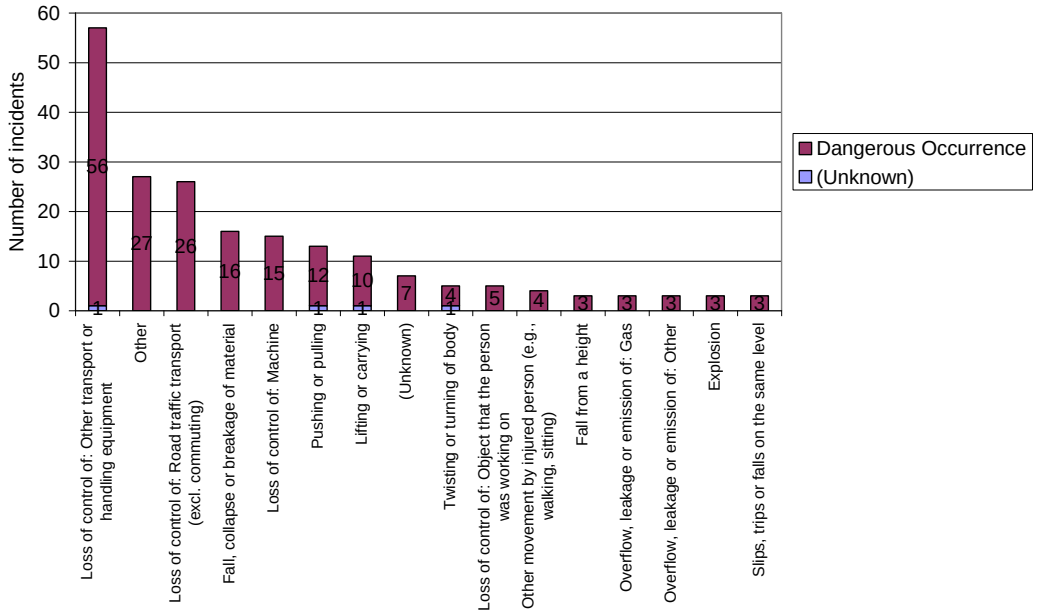


Figure 40 Number of workplace transport related dangerous occurrences (and unknowns) reported to HSA by accident trigger

Figure 40 highlights that the largest number of dangerous occurrences have been reported to be triggered by the loss of control of other transport or handling equipment. This is followed by the category 'Other', which is closely followed by the accident trigger loss of control of road traffic transport (excluding commuting related incidents).

4.3.14 Injury reason

4.3.14.1 All incident severities

Building further upon our understanding of the underlying incident causes, Figure 41 highlights the 15 most frequently occurring injury reasons in the workplace transport dataset.

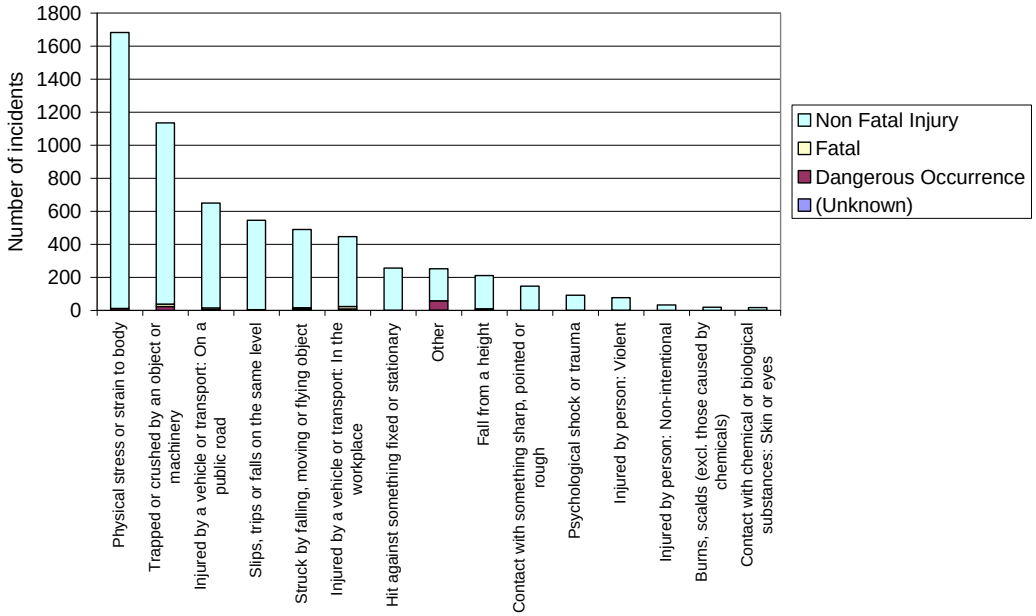


Figure 41 Number of workplace transport related fatal injuries, non-fatal injuries and dangerous occurrences reported to HSA by injury reason

Figure 41 highlights the largest number of workplace transport related injuries are due to physical stress or strain to the body. This is closely followed by being trapped or crushed by an object or machinery. These are both consistent with incidents that may have occurred during loading and unloading activities.

Being injured by a vehicle or transport on a public road is the third most frequently occurring incident, but is of less relevance to this study as it is primarily focusing on incidents occurring within the perimeter of the workplace.

4.3.14.2 By incident severities separately

In order to view the trends in the various accident severities separately, by injury reason, see Figure 42, Figure 43 and Figure 44. Figure 42 highlights the number of fatal injury accidents reported by injury reason.

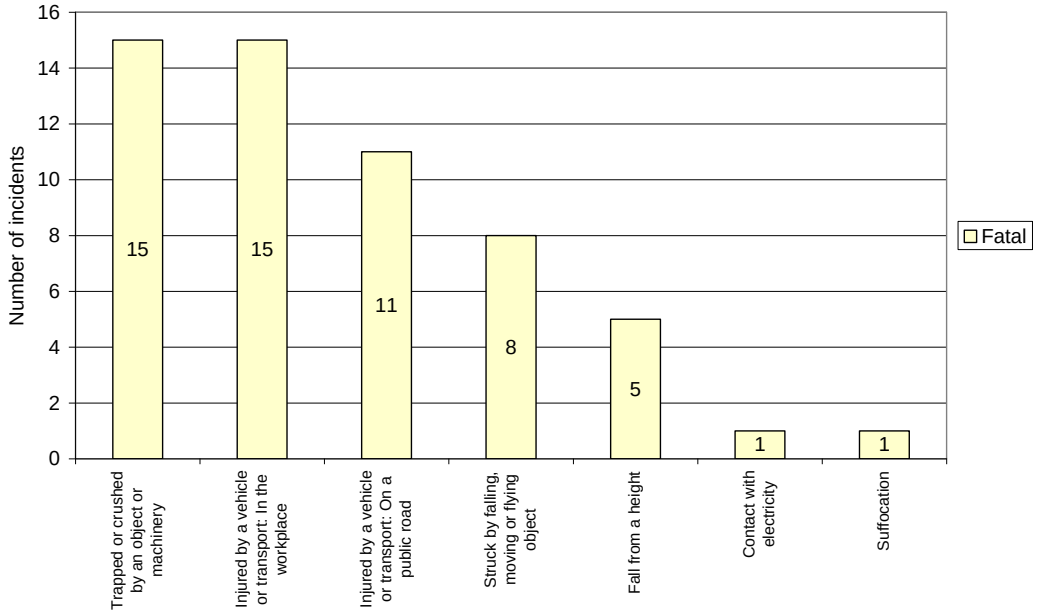


Figure 42 Number of workplace transport related fatal injuries reported to HSA by injury reason

Figure 42 highlights the two most significant 'injury reasons' reported for fatal accidents is being trapped or crushed by an object or machinery and being injured by a vehicle or transport in the workplace. Being injured by a vehicle or transport on a public road and then being struck by a falling, moving or flying object follow this.

Figure 43 highlights the non-fatal accident injury reasons, but only highlights the 15 most frequently occurring categories.

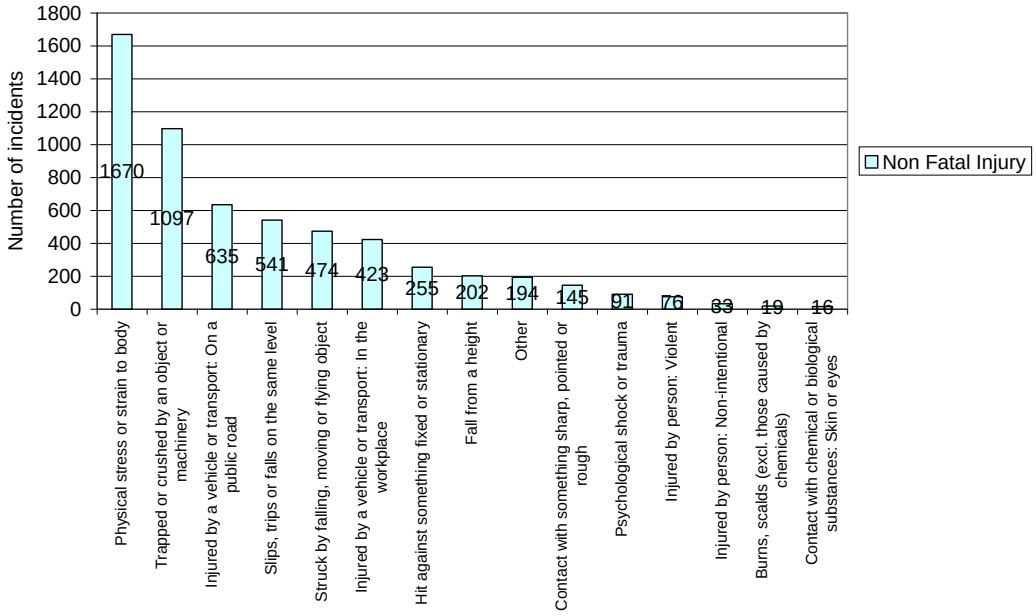


Figure 43 Number of workplace transport related non-fatal injuries reported to HSA by injury reason

Figure 43 highlights a similar pattern as that seen with all accident severities (see Figure 41), which is expected because non-fatal accidents comprise such a high proportion of the overall total number of accidents.

Figure 44 highlights dangerous occurrences by injury reason.

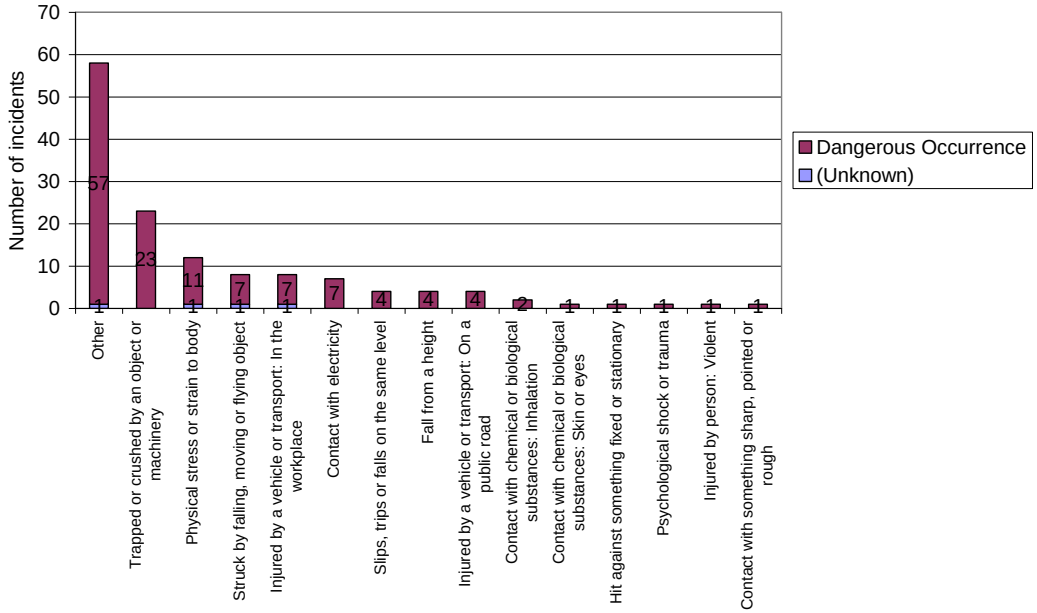


Figure 44 Number of workplace transport related dangerous occurrences (and unknowns) reported to HSA by injury reason

Figure 44 highlights the largest number of dangerous occurrences were classified as ‘Other’. However, this was closely followed by being trapped or crushed by an object or machinery.

4.3.15 Item associated

4.3.15.1 All incident severities

Figure 45 highlights the item directly associated with the workplace transport related incident. The graph only presents the 10 most frequently occurring items in the workplace transport dataset.

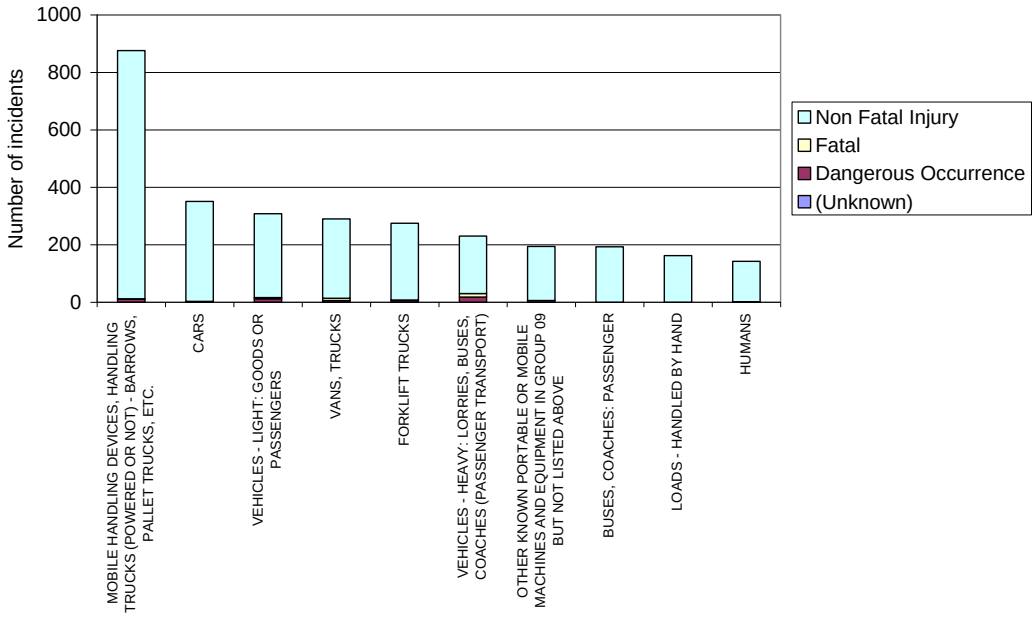


Figure 45 Number of workplace transport related fatal injuries, non-fatal injuries and dangerous occurrences reported to HSA by item associated

Figure 45 highlights that the most frequently occurring items associated with workplace transport related incidents are mobile handling devices, handling trucks (powered or not), barrows, pallet trucks, etc. These would all be consistent with incidents occurring during loading and unloading procedures.

The next most frequently occurring items associated with workplace transport related incidents are cars, followed by other light vehicles (transporting passengers or goods), vans and trucks and forklift trucks.

4.3.15.2 By incident severities separately

In order to view the trends in the various accident severities separately, by item associated, see Figure 46, Figure 47 and Figure 48. Figure 46 highlights the number of workplace transport related fatal injuries by item associated (the graph only presents the 10 most frequently occurring items).

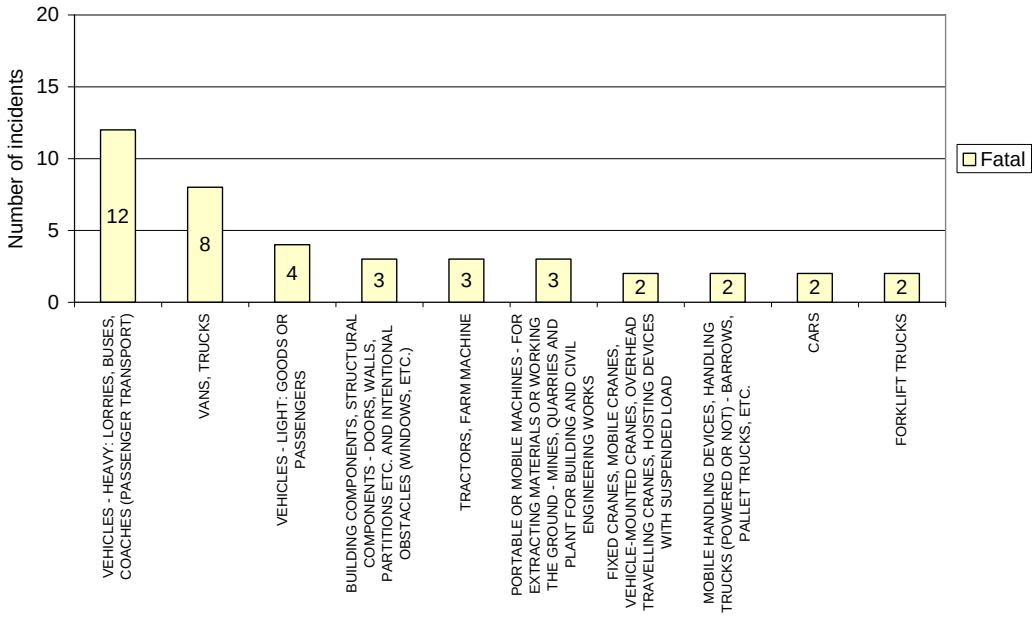


Figure 46 Number of workplace transport related fatal injuries reported to HSA by item associated

Figure 46 highlights that the largest number of items associated with fatal injury accidents are heavy vehicles (e.g. lorries, buses, coaches etc.). This is followed by vans and trucks.

Figure 47 highlights items associated with non-fatal injuries (the graph only presents the 10 most frequently occurring items).

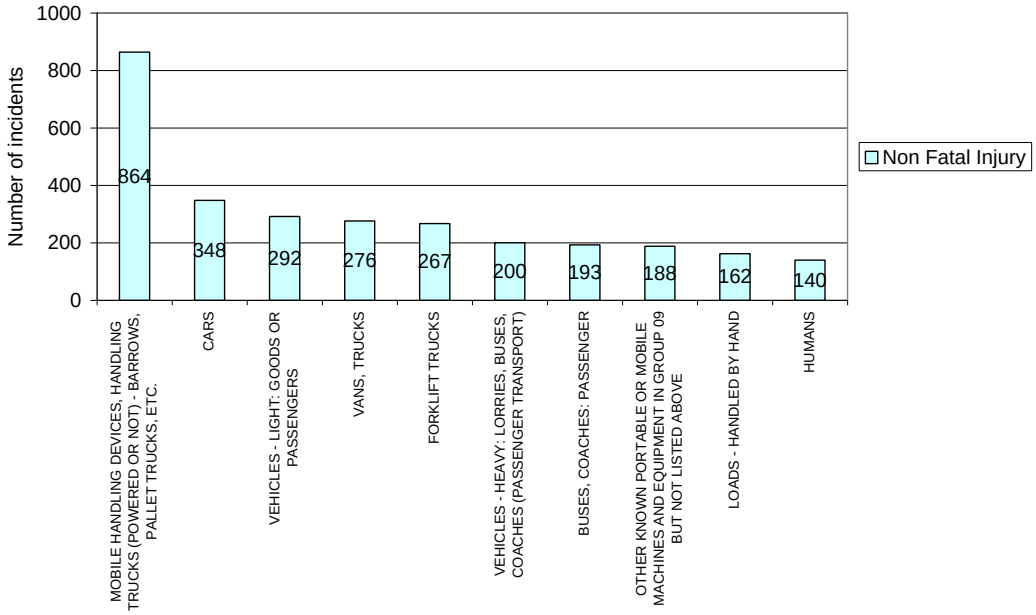


Figure 47 Number of workplace transport related non-fatal injuries reported to HSA by item associated

Figure 47 highlights a similar pattern as that seen with all accident severities (see Figure 45), which is expected because non-fatal accidents comprise such a high proportion of the overall total number of accidents.

Figure 48 highlights the number of dangerous occurrences by item associated.

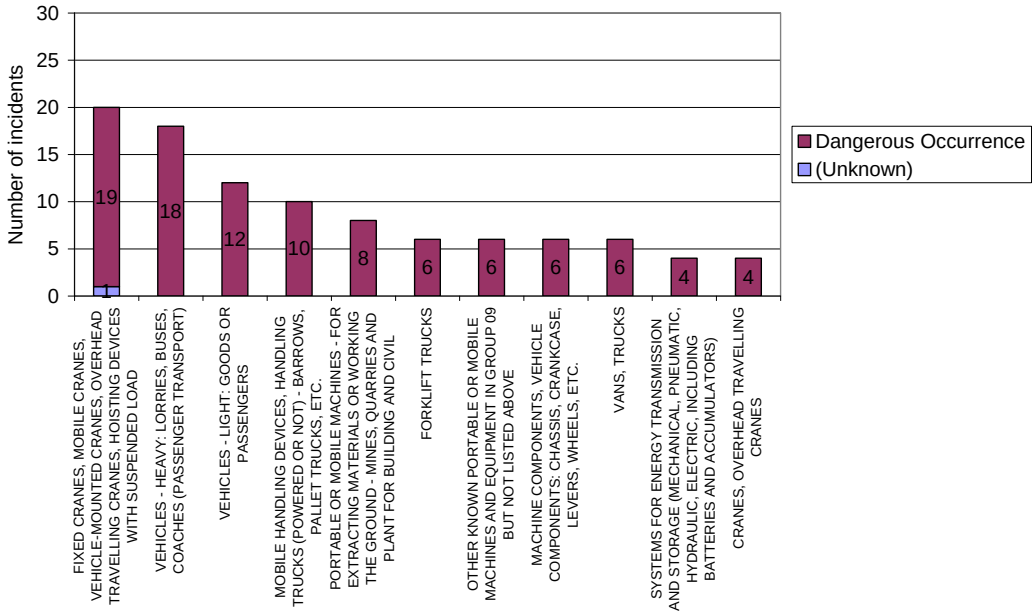


Figure 48 Number of workplace transport related dangerous occurrences (and unknowns) reported to HSA by item associated

Figure 48 highlights the largest number of dangerous occurrences were related to various different types of crane, this was followed by heavy vehicles and then light vehicles.

4.3.16 Underlying accident causes

In reviewing the key accident fields associated with the workplace transport dataset, a picture is emerging relating to the underlying causes and situational factors influencing accident occurrence. In terms of underlying causes, the most frequently occurring 'accident triggers', 'injury reasons' and 'items associated' in the workplace transport dataset all appear to be consistent with vehicle loading and unloading activities.

In order to test this hypotheses and gather further information on underlying causes, a sample of available accident narratives (accident field termed 'circumstances') were reviewed for each of the following accident triggers:

- **Loss of control of road traffic transport (excluding commuting related incidents)** – the majority of the available accident narratives in this category were related to police and bus drivers. Many were road traffic accidents, which although not the focus of this study, do present a unique situation where an individual's permanent workplace is location independent.

- **Lifting or carrying activities** – many accidents were caused by people overstretching to reach something or people getting their fingers/arms/legs trapped, caught or lacerated.

- **Loss of control of other transport or handling equipment** – of the accident narratives that were available, many referred to people being hit or run over by forklift trucks (typically whilst the forklift was reversing) because the driver did not see the pedestrian.

It should be noted that in general the accident narratives were very brief, often not providing more than a few words to explain the circumstances. It would therefore not be sensible to place too much emphasis on these accounts, in terms of assessing the underlying causes of reported workplace transport related accidents. Due to these data limitations, we also cannot present definitive percentages for these underlying causes.

4.4 SUMMARY AND CONCLUSIONS

4.4.1 High risk areas across all accident severities

- There is an overall steady increase in the number of workplace transport related incidents being reported between 1993 and 2007. However, this could be caused by an increase in reporting activity, as opposed to a real increase in the number of incidents occurring.

- NACE (Rev 1.1 classification) sectors reporting the highest overall numbers of incidents are transport, storage and communications; manufacturing; public administration and defence (including compulsory social security); and wholesale and retail trade (including repair of motor vehicles, motorcycles and personal and household goods).

- The majority of workplace transport related incidents are being reported in the Irish capital city of Dublin. This is in terms of where the victims' employers are based and in terms of the victims' place of work. This is expected due to the significant proportion of industry concentrated in the capital city.

- The work environments where the largest total number of workplace transport related incidents have been reported are factories, industrial sites or warehouses and public areas (including road, rail and car park).

- The largest total number of workplace transport related incidents involved a victim aged between 30 and 34 years. Victims aged between 40 and 44 years and then 35 and 39 years followed this. This generally indicates that workplace transport related incidents involve more middle age workers.

- The clear majority of incidents in the workplace transport dataset involve victims who were classified as employees.

- The clear majority of workplace transport related incidents contained within the dataset involve a victim that is of Irish nationality.

- The most frequently occurring occupation in the workplace transport dataset is 'transport labourers and freight handlers'. This occupation is followed by a series of driver occupations: drivers and mobile plant operators; heavy truck and lorry drivers; and bus and tram drivers.

- The largest number of workplace transport related incidents in the dataset have been reported to be triggered by a loss of control of road traffic transport (excluding commuting related incidents). The second largest number have been triggered by lifting or carrying activities and

the third largest are also related to loss of control, but this time loss of control of other transport or handling equipment.

- The largest number of workplace transport related injuries are due to physical stress or strain to the body. This is closely followed by being trapped or crushed by an object or machinery.

- The most frequently occurring items associated with workplace transport related incidents are mobile handling devices, handling trucks (powered or not), barrows, pallet trucks, etc.

- In terms of underlying causes, the most frequently occurring 'accident triggers', 'injury reasons' and 'items associated' in the workplace transport dataset all appear to be consistent with vehicle loading and unloading activities.

- A sample of the accident field 'circumstances' was also reviewed in order to see if more detail could be obtained on the accident's underlying causes. Very little information was available, however, some narratives indicated accidents were being caused by people overstretching or fork lift truck drivers not seeing pedestrians.

4.4.2 High risk areas for fatal accidents only

- The number of fatal accidents is at its highest in 1996, 2000, 2005 and 2007, when there were 14 fatal accidents.

- NACE sector 'Transport, storage and communications' report the highest number of fatal incidents, with a total of 76 reported between 1993 and April 2008.

- The occupation 'heavy truck and lorry drivers' have been most frequently involved in fatal accidents in the workplace transport dataset (accounting for 25 fatal accidents between 1993 and April 2008). 'Drivers and mobile plant operators' are also at risk having been involved in 17 accidents during the same period. This suggests drivers are a high risk occupational group.

- The clear majority of fatal workplace transport related accidents occurring between 1993 and April 2008 have involved employees (accounting for 97 fatal accidents)

- The number of fatal workplace transport related accidents are reasonably evenly distributed throughout the age groups, with the exception of two young age groups (16 to 19 years and 25 to 29 years) and older age groups (65 years plus), who have been involved with less fatal accidents.

- The work environments where the largest total number of fatal workplace transport related incidents have been reported are factories, industrial sites or warehouses and public areas (including road, rail and car park).

4.4.3 Improvements to the reporting and recording of workplace accidents

- As part of the data analysis process a number of observations were made which, if addressed, may improve the quality of accident data collected in the future. These observations are as follows:

    - It would be useful if the field accident 'circumstances' provided more data in general and also referred to the possible underlying accident causation. Although this may not be an accurate interpretation of the cause, it would help provide more evidence in this area.

    - Many of the fields did not contain complete data, hence the appearance of 'blanks' and 'unknowns' on some graphs. Improving standardisation of reporting in the future should help reduce this.

    - The category 'age group' was created by ND BOMEL to analyse the existing age data. Currently when age is recorded, the exact age is entered leading to numerous data entries. In the future, it would aid interpretation if the victims' age was recorded in an age group.

5. SURVEY OF ORGANISATIONS

5.1 INTRODUCTION

In order to understand how organisations in Ireland are currently approaching WTS management, a survey was conducted involving a range of organisations across different sectors. A total of 111 organisations participated in the survey which was undertaken during July and August 2008. The following section describes the survey methodology and findings.

5.2 SURVEY METHODOLOGY

5.2.1 Sampling strategy

In order to ensure the survey was representative of organisations in Ireland, employment data was taken from the Central Statistics Office (CSO) (www.cso.ie). In order to see the overall distribution of workers in each industry, the following employment table was downloaded from the CSO website:

"12. Persons, males and females aged 15 years and over at work in each Regional Authority Area, classified by broad industrial group, 2006"[31]

The "broad industrial group'" referred to in this table was the top level NACE sector classification Version 1.1 (not NACE Rev 2 as CSO advised that employment data will not be available for this revised sector classification until end of 2008). More specifically, the table included data, by region in Ireland, on the following broad industrial groups:

- D Manufacturing industries
- E Electricity, gas and water supply
- G Wholesale and retail trade
- H Hotels and restaurants
- I Transport, storage and communications
- J Banking and financial services
- K Real estate, renting and business activities
- L Public administration and defence
- M Education
- N Health and social work
- O Other community, social and personal service activities

Certain industries were not to be addressed as part of this study (as specified in the definition of workplace transport in Section 2.2). Therefore, the following broad industrial groups were taken out of the employment dataset:

- A – Agriculture, hunting and forestry
- B – Fishing
- C – Mining and quarrying
- F – Construction

The National Audit Office (NAO) *Sampling Guide* indicates that a sample size of between 50 and 100 should ensure results are sufficiently reliable for the majority of purposes. The target sample size for this survey was therefore agreed to be 100. The response rate is likely to be around 20%, therefore requiring a contacts list of approximately 500 organisations.

The percentage of people working in each industrial group was calculated. This gave an indication of the representation of each industrial group across Ireland. The percentage of workers in each industrial group is highlighted in Table 3. This also provided a target number of interviews required per each industrial group, in order to ensure the 100 interviews were representative of industry in Ireland.

Table 3 Target sample based on number of persons employed by broad industrial group in 2006

Broad Industrial Group (NACE Rev 1.1. classification)	Total workers	Target sample	Regional Authority Area							
			Border	Dublin	Mid-East	Midland	Mid - West	South-East	South-West	West
Manufacturing industries	243,182	**15**	26983	49481	29668	15291	27324	29999	39247	25189
Electricity, gas and water supply	11,290	**1**	1071	3375	1150	690	1226	894	1924	960
Wholesale and retail trade	257,309	**16**	27132	74873	31651	14896	20358	27687	37843	22869
Hotels and restaurants	100,731	**6**	10727	27997	9607	4986	8447	11317	16456	11194
Transport, storage and communications	105,705	**7**	8730	41262	12655	5261	9409	7986	13225	7177
Banking and financial services	85,413	**5**	5936	44461	10692	2794	4095	5499	7197	4739
Real estate, renting and business activities	180,973	**11**	11909	82071	21014	6385	11783	12285	23127	12399
Public administration and defence	101,264	**6**	10628	34089	13134	6820	7592	8753	11851	8397
Education	127,476	**8**	13528	36634	14021	6831	11525	13100	18417	13420
Health and social work	191,219	**12**	22882	55203	19635	11187	14773	19781	27748	20010
Other community, social and personal service activities	80,358	**5**	7252	27439	10766	3828	5813	8311	9918	7031
Industry not stated	132,910	**8**	11100	50923	14400	8209	9365	10985	17817	10111
All industries	1,617,830	**100(%)**	157878	527808	188393	87178	131710	156597	224770	143496

A representative sample of 500 contacts was initially gathered from the Golden Pages (www.goldenpages.ie). These contacts were agreed by HSA. HSA also provided a list of contacts. As the survey progressed, it was necessary to gather more contacts in order to achieve 100 interviews. Almost 1,000 contacts were eventually gathered in order to achieve the target sample.

5.2.2 Development of telephone interview question set

The question set content was developed based on the findings from the information review and consisted of the following sections:

- Introductory script
- Background questions (Section 1)
- Vehicles at workplace (Section 2)
- Vehicle selection & maintenance (Section 3)
- Site layout & maintenance (Section 4)
- Attitudes and safe behaviours (Section 5)
- Drivers (Section 6)
- Management practices (Section 7)

The sections in the question set also covered the five main workplace transport areas (i.e. Drivers, Pedestrians, Site layout & maintenance, Management strategies and systems and Vehicle selection & maintenance). The following sections provide a brief overview of each of the seven sections of the question set. The final question set and the logic underpinning the inclusion of each question can be found in Appendix A.

5.2.2.1 Introductory script

The introductory script was designed to introduce the project, define the area and to secure participation. Data protection issues, consent, right to withdraw, and clarifications were also addressed. If respondents had queries relating to the legitimacy of the study that could not be addressed over the phone, they were invited to check the HSA's website to assure themselves that the interview was bona-fide. Respondents were also offered ND BOMEL's contact details for future reference, if needed.

5.2.2.2 Background questions (Section 1)

In order to provide the necessary context to the interview and to obtain demographic information, Section 1 comprised a number of background questions. Included in this was the main industrial sector the organisation

operated in (using the NACE Rev 1.1 sector classification), the size of the operation and the role of the respondent.

5.2.2.3 Vehicles at workplace (Section 2)

Questions relating to the type of vehicle in use were addressed as part of Section 2. This section also addressed whether suppliers and members of the public entered the site and how vehicles are loaded/unloaded.

5.2.2.4 Vehicle selection & maintenance (Section 3)

Section 3 of the question set considered the factors that affect the organisations' vehicle procurement processes. The review of information identified that Lift Trucks, HGVs and company vehicles were important in the context of WTS, and so a number of questions considered the safety features on each. Maintenance practices were also addressed.

5.2.2.5 Site layout & maintenance (Section 4)

Questions relating to the layout of the site are addressed in Section 4 of the question set and this included details of the features that may be present on the site, such as one-way systems for vehicles.

5.2.2.6 Attitudes and safe behaviours (Section 5)

A set of attitude statements relating to site safety were developed in order to assess people's attitudes and the prevailing culture around WTS. In addition, a number of workplace transport behavioural questions were included to record the prevalence of safety related behaviours.

5.2.2.7 Drivers (Section 6)

The competence management systems for drivers were considered in Section 6, by exploring the methods used to select applicants for the role of driver and by considering the subsequent training provided.

5.2.2.8 Management practices (Section 7)

Safety management systems were addressed in Section 7 of the question set. This included details relating to safety management activities such as safety tours, near-miss reporting and inspections. This section also covered details relating to the information sources that companies refer to, such as HSA's website.

5.2.3 Pilot study of question set

Once the question set had been prepared it was reviewed by HSA and updated for use in a pilot study to determine the suitability of the:

- Instructions and introductory text
- Question language
- Response options

- Recording options and space
- Length of time to complete the interview

The pilot addressed the above points to check that the question set would secure reliable and valid responses. Following the pilot study some amendments were made to the content to ensure that the questions could be addressed within the timescales and to clarify question meaning. HSA then approved the final version for use in the telephone interviews. A copy of the final question set and the logic underpinning the inclusion of each question can be found in Appendix A.

5.2.4 Development of the face-to-face interview question set

The question set used to guide the face-to-face interviews was largely the same as that used for the telephone interviews (see Appendix A). This was to ensure consistency in the information collected, analysed and reported. However, as the interviews were longer, it provided an opportunity to go into detail in the following areas:

- Workplace signage
- Workplace layout and design
- Presence of other companies operating on the site
- Greater detail on driver selection and training

5.2.5 Survey methodology

The survey comprised of the following two elements:

- **Face-to-face interviews** – face-to-face interviews were conducted at the organisations premises with the main health and safety representative and / or transport managers. These interviews were organised in advance and undertaken by two interviewers to avoid any interviewer biases.
- **Telephone interviews** – telephone interviews were conducted from ND BOMEL's main offices. Again, a range of interviewers were used to reduce interviewer biases. Some organisations were willing to complete the interview without the need to re-schedule and some organisations preferred to schedule an interview time.

5.2.6 Collation of interview data

All of the interview findings were inputted into electronic Word forms. These Word forms were then imported into the ND BOMEL Response Analysis Tool. The tool allows analysts to review all interview feedback side-by-side and generate illustrative graphs for inclusion in the draft final report.

5.3 SURVEY FINDINGS

5.3.1 Overview

The following sections outline the findings from the interviews conducted with organisations across Ireland during July and August 2008.

5.3.2 Survey sample

5.3.2.1 NACE Sector (Rev 1.1)

Table 4 provides a breakdown of the interviews conducted with organisations across Ireland by NACE Sector (Rev 1.1.). This is also compared to the target number of interviews (as detailed in Table 3).

Table 4 Interview targets and interviews achieved by NACE Sector (Rev 1.1)

NACE Sector (Rev 1.1)	OVERALL INTERVIEW TARGET	INTERVIEWS ACHIEVED
Manufacturing industries	15	20
Electricity, gas and water supply	1	2
Wholesale and retail trade	16	23
Hotels and restaurants	6	7
Transport, storage and communications	7	14
Banking and financial services	5	0
Real estate, renting and business activities	11	6
Public administration and defence	6	2
Education	8	12
Health and social work	12	8
Other community, social and personal service activities	5	8
Other	8	9
TOTAL	100	**111**

Table 4 highlights that in total 111 interviews were conducted and these were divided across the target range of NACE Sectors. In most sectors the target number of interviews were achieved or surpassed. The only industries where it was not possible to meet the target were:

- Banking and financial services
- Real estate, renting and business activities

- Public administration and defence
- Health and social work

The main reason why it was not possible to meet the target for these industries was because they were typically office based and therefore did not operate workplace vehicles or even have them visiting their workplace. It was therefore more appropriate for the interviews to focus on the industries where more workplace vehicle activity occurred, such as 'transport, storage and communications' and the manufacturing industries.

5.3.2.2 Region in Ireland

Figure 49 highlights the distribution of all 111 interviews by region.

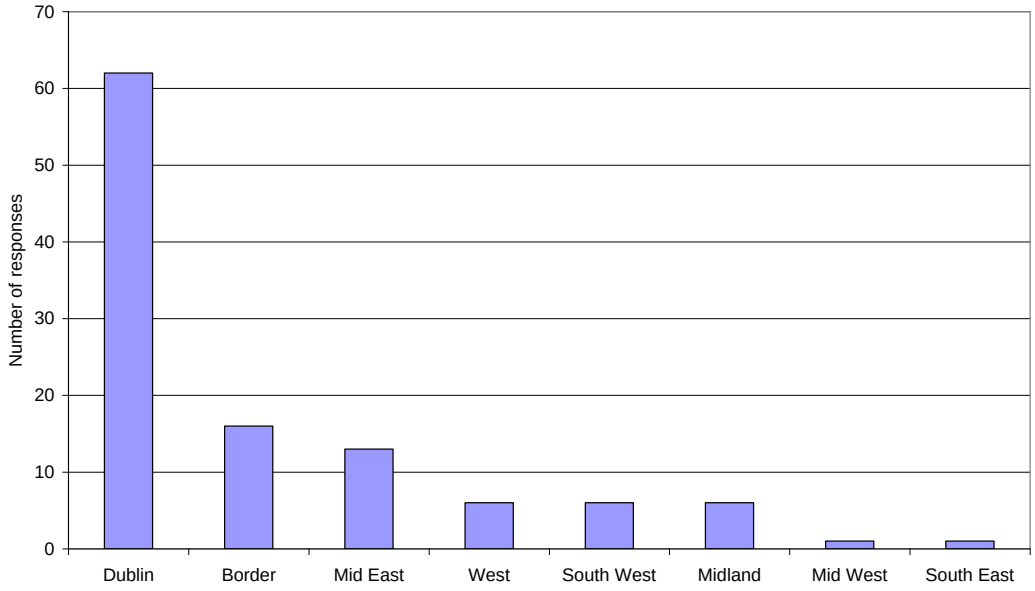


Figure 49 Interviews achieved by region in Ireland

Figure 49 highlights that the clear majority of interviews achieved were with organisations based mainly in Dublin. This reflects the significant level of industrial activity in the country's capital city. However, the overall distribution of interviews across Ireland reflects a good representation of views.

5.3.3 Organisational and interviewee background details

5.3.3.1 Number of workers at the organisation

Figure 50 presents the number of workers at the interviewee's organisation.

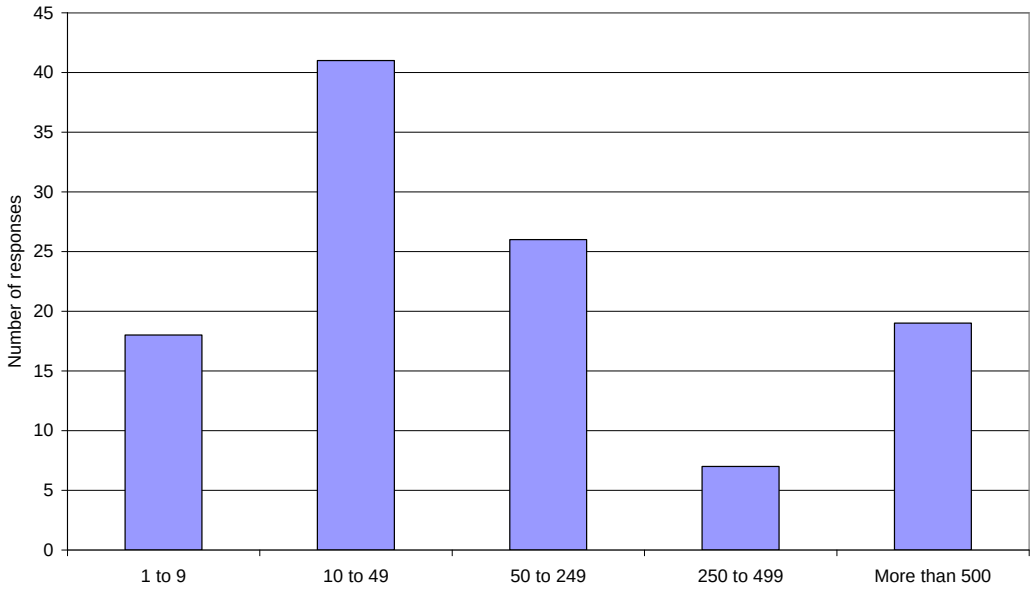


Figure 50 Number of workers at the organisation

Figure 50 highlights that the largest number of participating organisations worked for companies that employed between 10 to 49 workers. There were also a representative number of organisations of other sizes.

Interviewees were also asked how many sites their organisation had in Ireland. Figure 51 highlights the range of findings.

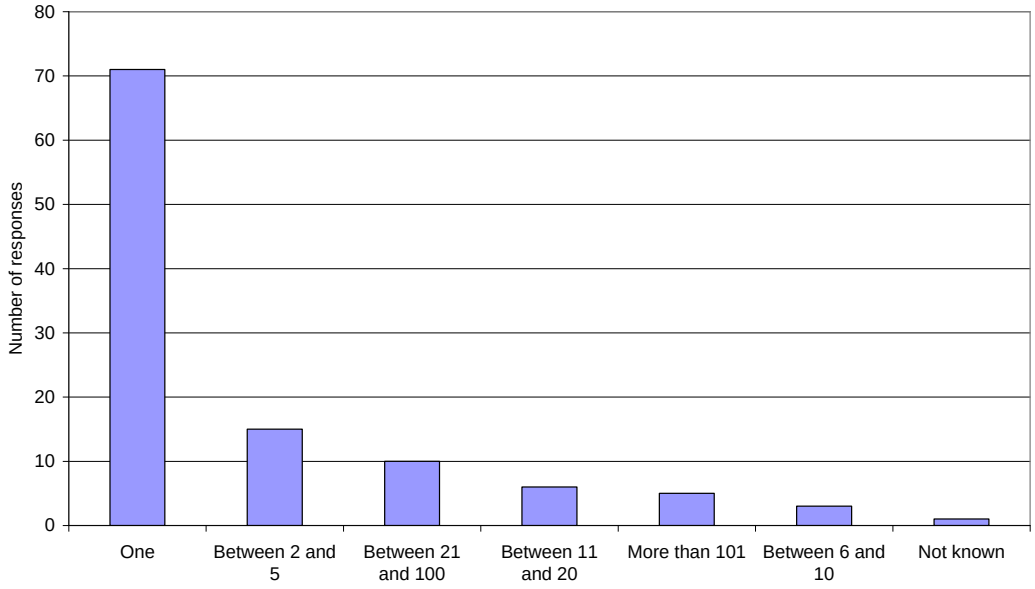


Figure 51 Approximate number of sites

Figure 51 highlights that the majority of organisations interviewed only had one site in Ireland. A total of 15 organisations had between two and five sites and 10 organisations had between 21 and 100. This graph therefore indicates that a large number of the organisations experiencing some form of workplace transport activity, only have one site to consider with regard to managing WTS.

5.3.3.2 Interviewees role in the organisation

Figure 52 highlights interviewees' job role. There are a total of 117 entries on the graph; six more than the total number of interviews (111). This is because interviewees were able to select more than one job role (where it was the case they held two or more job roles or responsibilities). As the number is only marginally higher than the total number of interviews, we can be confident that Figure 52 provides a good representation of the different types of jobs role participating in the interviews.

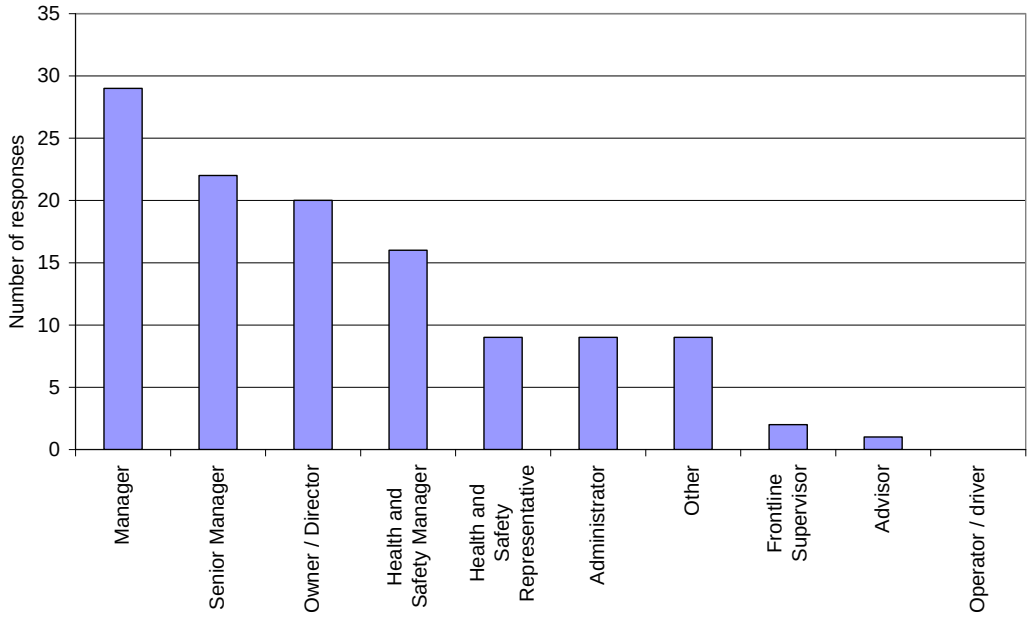


Figure 52 Interviewees role in the organisation

Figure 52 highlights that the largest number of interviewees classed themselves as 'Managers' and this was closely followed by 'Senior Managers' and 'Owners / Directors'.

When organisations were approached to participate in an interview, the health and safety manager or representative was initially asked for. A total of 16 people classed themselves as 'Health and Safety Managers' and 9 classed themselves as 'Health and Safety Representatives'. This therefore equates to only 23% of organisations (25 out of 111) having a dedicated health and safety position within their company.

This may reflect the fact that most organisations in the survey operated from one site and employed between 10 and 49 staff. It may be that many felt they did not require a dedicated health and safety person or did not have sufficient resource for one.

In direct support of this finding, a large international transportation company explained how it had only had a dedicated safety manager in the last five years. The Health and Safety manager that participated in the face-to-face interview had only been at the organisation in that role for two years. He explained: *"One of my biggest challenges is the ingrained safety culture amongst employees, they just do not perceive their work as involving risk, despite working in or around workplace vehicles and machinery on a daily basis".*

The appointment of a dedicated Health and Safety Manager at this organisation should help to underline the importance of safety in the

workplace and more specifically, around workplace vehicles, and gradually help to build a more positive safety culture.

5.3.4 Vehicles at the workplace

5.3.4.1 Types of vehicle found within the workplace

Figure 53 highlights the types of vehicles that participating organisations found within the perimeter of their workplace. These included both vehicles being operated by the company (owned and / or leased), as well as vehicles that may be used by members of the public, suppliers or other visitors to the workplace.

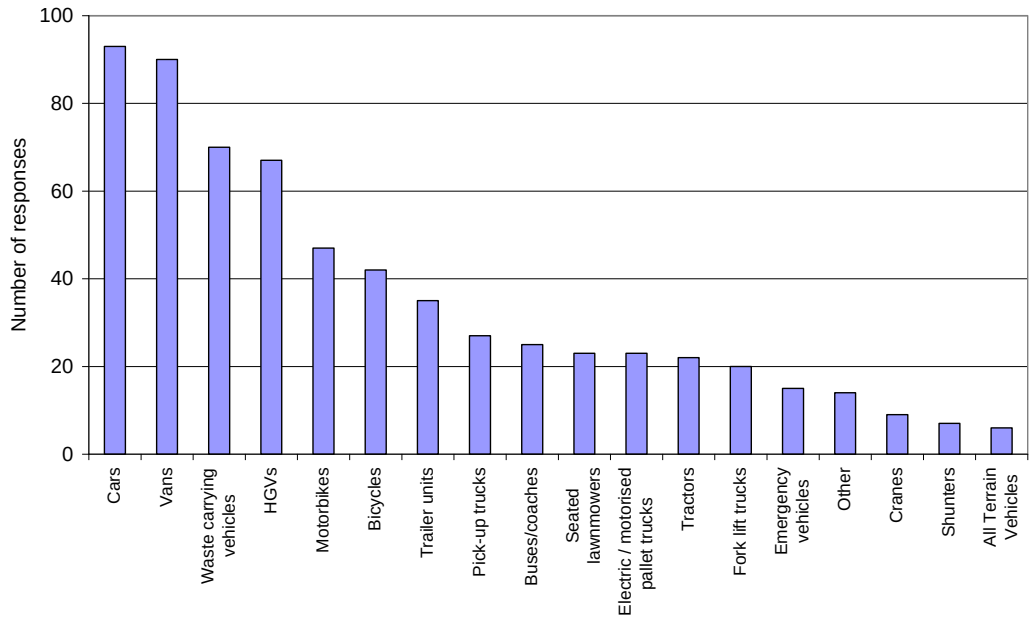


Figure 53 Types of vehicle found within the perimeter of the organisational workplace

Figure 53 highlights that the most common vehicles found within the workplaces were cars, vans, waste carrying vehicles and HGVs. There were also a significant number of motorbikes and bicycles observed. More industrial vehicles such as trailer units, pick-up trucks, electric / motorised pallet trucks and fork lift trucks were also present but in less significant numbers.

These figures reflect how almost all of the organisations had, as a minimum, vehicle activity with either staff and / or site visitors who would typically enter the site by HGV, van or car. Furthermore, most workplaces would have a regular visit from a waste carrying vehicle. The high number of motorbikes and bicycles are likely to reflect staff, couriers, visitors and / or members of the public. The industrial vehicles were observed more in manufacturing and transport related organisations.

One organisation that participated in a face-to-face interview was predominantly an administrative site for a large national organisation and despite not operating its own workplace transport, it did have a significant amount of vehicle activity at its workplace, for example deliveries, contractors and visitors. It was an example of an organisation that despite not operating is own vehicles, still requires some level of risk management measures, but these measures need to be commensurate with the level of risk at the workplace.

5.3.4.2 Site visitors

In terms of visitors to the workplace, 74 out of 111 (67%) organisations had members of the public visiting their sites. Members of the public would typically enter the site either on foot or by car. Almost all of the organisations interviewed (109), with the exception of two, had suppliers visiting their site. Suppliers would typically enter the site by HGV, van or sometimes on foot (e.g. postal deliveries).

5.3.4.3 Unloading on site

Not all of the organisations interviewed undertook unloading operations on their site. Some organisations had unloading occurring on their site, but it was not within their control (i.e. it involved visitors such as suppliers delivering office equipment, food delivery, carrying out waste disposal etc.). All organisations that either undertook unloading operations with their own vehicles or observed it occurring on their site, were asked which methods were adopted to carry out the unloading operation. Figure 54 highlights the range of methods used to unload vehicles.

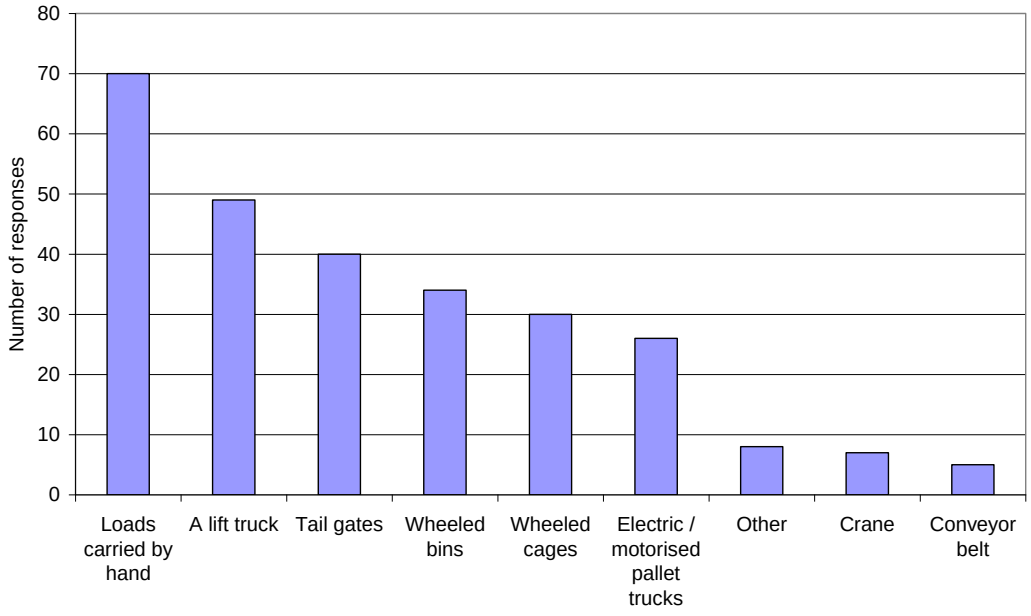


Figure 54 Methods used to unload vehicles

Figure 54 highlights that the most common method of unloading vehicles on site was by hand. This was closely followed by lift trucks and tail gates. Wheeled bins and cages and electric / motorised pallet trucks were also used. Cranes and conveyor belts were less common.

5.3.5 Vehicle selection and maintenance

5.3.5.1 Criteria for vehicle selection

Organisations that operated vehicles on their workplace (either owned or leased) were asked how they selected vehicles for the job. Figure 55 highlights the criteria upon which vehicle selection was based. Organisations were asked to pick as many criteria as were relevant.

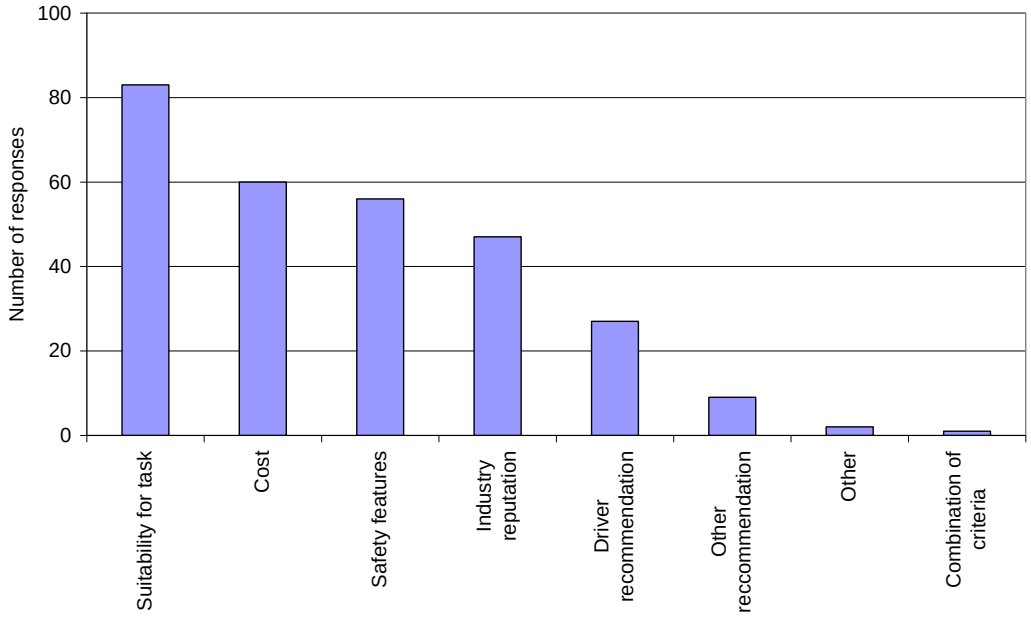


Figure 55 Criteria upon which vehicle selection is based

Figure 55 highlights that the most common criteria applied when selecting vehicles was suitability for the task. This was followed by cost and safety features. Industry reputation was also important. Driver recommendations did not feature as prominently, however, when organisations were asked if drivers were consulted when purchasing new vehicles, 63 out of 111 (57%) said that drivers were consulted. Consultation typically involved an informal interview or discussion with the driver.

5.3.5.2 Lift truck features

A total of 50 organisations indicated having forklift trucks at their workplace, typically those that they operated themselves (i.e. not used by site visitors). Interviewees from organisations that operated lift trucks were asked to indicate all of the safety features that were available on the lift trucks. The clear majority of all lift trucks operated in the workplace did have the following safety features:

- Handles to aid access to the vehicle – 90%
- Mirrors - 86%
- Seatbelts – 80%
- Reverse alarm – 100%
- Horn – 92%
- Roll-over protection – 92%
- Lights – 94%
- Falling object protection – 86%
- Attachments – 22%

In terms of lift truck attachments, only 11 out of 50 organisations confirmed they used attachments. The following attachments were used:

- Integrated work platform – 6 out of 11
- Non-integrated work platform – 4 out of 11
- Rotator – 2 out of 11
- Paper clamp – 4 out of 11
- Drum clamp – 5 out of 11
- Crane – 4 out of 11
- Hopper – 3 out of 11
- Boom – 4 out of 11

5.3.5.3 Heavy goods vehicle features

Up to 67 organisations confirmed having heavy goods vehicles (HGVs) at their workplace, either those they operated themselves, or those that suppliers used. These 67 interviewees were asked what safety features the HGVs had and the findings are presented on Figure 56.

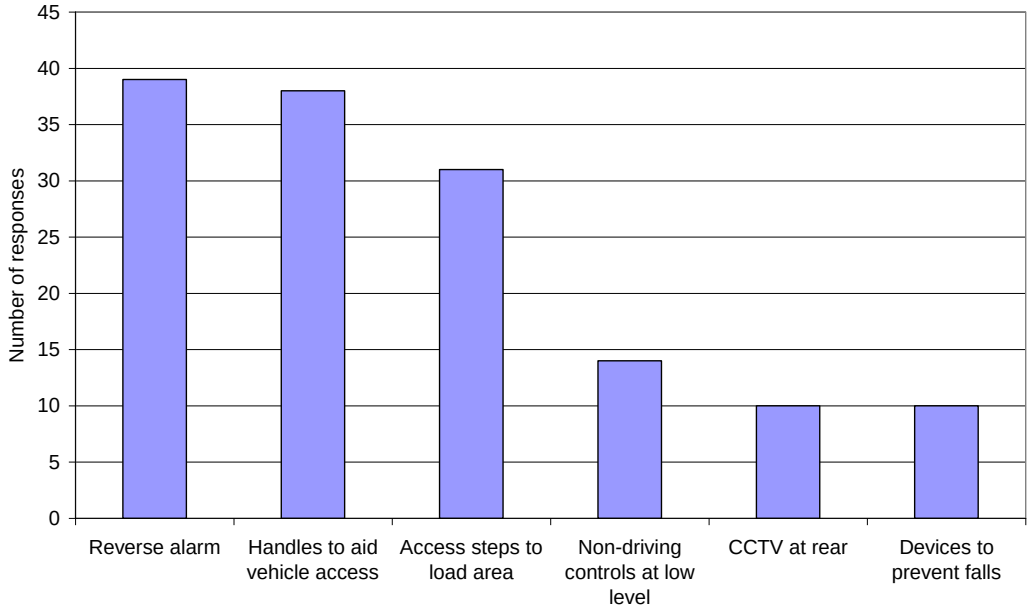


Figure 56 Safety features available on heavy goods vehicles (HGVs)

Figure 56 indicates that the majority of HGVs had reversing alarms, handles to aid access to the vehicle and access steps to the loading area. Some HGVs also had non-driving controls at low levels (to aid coupling / de-coupling manoeuvres), CCTV at the rear of the vehicle and devices to help prevent falls. This therefore indicates that there is still room for improvement in terms of ensuring all HGVs in operation are suitably equipped with the most appropriate safety features.

Furthering the discussion related to HGVs, interviewees were also asked if their drivers were required to access the top of the vehicle. Only 13 organisations said their drivers were required to access the top of the vehicle. These 13 organisations included a transport company, a courier company, an oil company and interestingly several schools and colleges. On further analysis of the evidence, schools and colleges required access to the tops of vehicles for loading luggage on to school buses and vans etc.

5.3.5.4 Maintenance procedures

Organisations that operated vehicles were asked if the vehicles were maintained. Out of the 111 organisations interviewed, 101 organisations said they did maintain their vehicles, only one said they did not, one interviewee said they did not know and eight declined to comment because they did not

operate vehicles. Of the 101 organisations that said they did maintain their vehicles, 96 confirmed maintenance records were also kept.

Interviewees were also asked to explain who maintains their vehicles and Figure 57 highlights the findings.

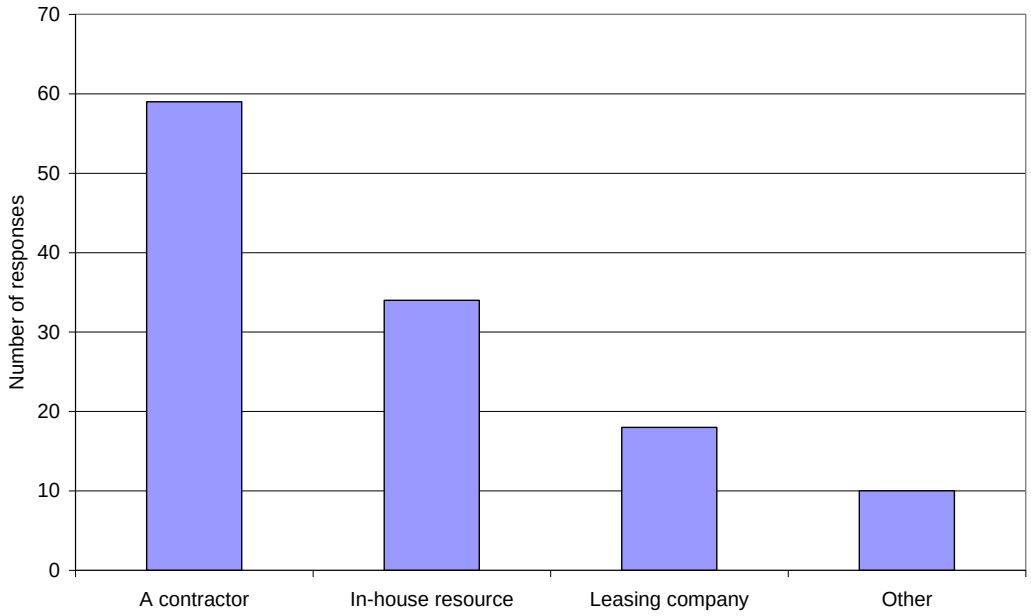


Figure 57 Method used to maintain vehicles

Figure 57 highlights that the majority of organisations used a contractor to carry out maintenance on their vehicles (59 out of 101 – 58%). A significant number used their own in-house resource. A smaller number of organisations went through the vehicle leasing company. A minority of organisations said they used a contractor as well as the leasing company, depending on whether it was routine maintenance (where they would use the leasing company) or a one-off maintenance issue (where a contractor would be used).

Finally, interviewees were also asked if drivers carried out safety checks before using a vehicle. Out of the 111 organisations interviewed, the same eight declined to comment (because they did not operate vehicles), but a clear majority of 88 organisations confirmed drivers did carry out safety checks prior to using a vehicle.

5.3.6 Site layout

5.3.6.1 Age of site layout and ownership

Each organisation was asked to indicate how old the layout of their site was. This was to gauge whether or not organisations had recently modernised the layout, taking into consideration the appropriate safety features, or whether the site had been organised in the same way for years previous.

The largest number of organisations had either updated their site layout less than one year ago (9 organisations) or had updated it in the last one to five years (32 organisations). A further 21 organisations had updated their site layout in the last six to 10 years. This equated to 62 out of 111 organisations (56%) who had a site layout that was less than 10 years old. However, 30 organisations had kept their site layout the same for over 20 years and a further 17 organisations had kept theirs the same for between 11 and 20 years. (Two organisations did not know the age of the site layout). This suggests there are still a significant number of organisations who may benefit from re-considering the way their site is organised and which safety features could be most appropriate.

One large national organisation had just completed updating the layout of one of their key workplaces when they were interviewed for the survey. They had put considerable thought into vehicle entrances and exits, a one-way system, loading bays and signage to guide drivers and pedestrians around the site. Its next objective was to roll out this updated layout across the rest of its workplaces.

The majority of organisations did not share their site with another company (71% - 79 out of 111). However, the remaining 32 (29%) did share their site. In terms of ownership of the workplace, 62% (69 out of 111) organisations did own their workplace (i.e. it was not a leased site). A further 35% (39 out of 111) confirmed they did not own the workplace and three interviewees did not know.

5.3.6.2 Key features present at the workplace

Each organisation interviewed was also asked to indicate the key features present at their workplace. Organisations were asked to indicate all of the features that were present and the findings are presented on Figure 58.

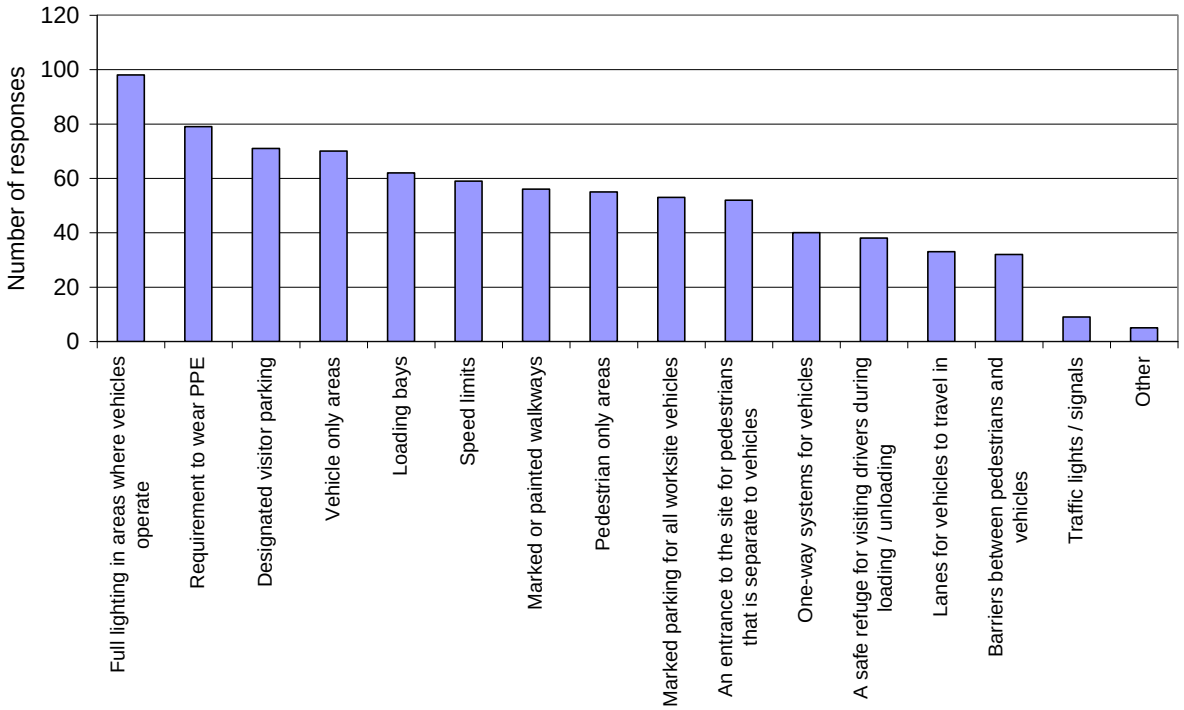


Figure 58 Key features present at the workplace

Figure 58 highlights the key features present at the workplaces of the 111 organisations interviewed. The most common feature was full lighting in areas where vehicles operate (88% - 98 out of 111). This was followed by a requirement to wear PPE, designated visitor parking and vehicle only areas. Features that were found to be less common on workplaces were as follows:

- A safe refuge for visiting drivers during loading / unloading - 34%
- Lanes for vehicles to travel in - 30%
- Barriers between pedestrians and vehicles - 29%
- Traffic lights / signals - 8%

In terms of reversing on site, 81% of interviewees (90 out of 111) confirmed that reversing was carried out at their workplace.

5.3.7 Attitudes and safe behaviours

5.3.7.1 Attitudes

Interviewees from each of the participating organisations were asked for their level of agreement on a series of statements designed to gather their attitudes, values and beliefs about WTS at their organisation. Table 5 presents the findings (numbers out of 111 are presented).

Table 5 Level of agreement with attitudinal statements on WTS

Attitudinal statement	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know	No comment
"I think that drivers look out for pedestrians that are on site"	0	3	2	50	55	0	1
"I believe that this organisation has got WTS under control"	2	8	5	50	46	0	0
"I believe that management do not take WTS seriously enough"	53	42	7	8	1	0	0
"I believe that pedestrians are not aware of the risks associated with workplace transport"	14	35	10	41	9	0	2
"I think that some of our vehicles are not quite up to the job"	44	45	4	5	1	0	12
"I think that the way the workplace is laid out makes it very safe to get from one part of the site to another"	2	10	15	52	30	1	1
"I think that from time-to-time you have to expect that drivers will take risks to get the job done"	19	33	14	34	3	1	7

Note: Shaded cells denote highest proportion of answers

Table 5 highlights that the majority of organisations answered positively; agreeing with positive attitudinal statements and disagreeing with negative. However, two areas that may require further investigation are pedestrian risk awareness and the likelihood of drivers taking risks.

The results highlight how a total of 50 out of 111 (45%) interviewees agreed that pedestrians were not aware of the risks associated with workplace transport. Furthermore, 37 out of 111 (33%) interviewees agreed that from time-to-time you have to expect that drivers will take risks to get the job done.

5.3.7.2 Behaviours

Interviewees from each of the participating organisations were asked how often they believed certain behaviours related to WTS were occurring at their organisation. Table 6 presents the findings.

Table 6 Perceived frequency of behaviours

Behaviours	Always	Often	Sometimes	Rarely	Never	Don't know	No comment
When people are working on or near vehicles (e.g. loading/unloading) how often do they wear Hi-Viz clothing?	56	8	7	13	14	1	12
When site visitors are near vehicles, how often do they wear the same personal protective equipment as employees?	34	7	3	14	25	0	28
How often do people walk across areas where vehicles operate?	11	47	14	26	8	1	4
How often do drivers leave their vehicles in designated parking areas?	60	28	6	5	4	0	8
How often can vehicles be seen going too fast?	1	12	15	46	33	2	2
How often is getting the right equipment for loading / unloading a vehicle, a problem?	0	3	2	25	50	2	29
How often are restraints used to protect people from falls from vehicles?	17	6	5	5	8	2	68
How often are visitors accompanied around the site by a member of staff?	51	20	12	14	7	3	4

Note: Shaded cells denote highest proportion of answers

Table 6 highlights that generally safe behaviours are being observed by the majority of the interviewees in relation to WTS at their organisations. However, there were several areas where improvements could still be made. Several interviewees noted how at their organisations, when people are working on or near vehicles (e.g. loading/unloading) they 'rarely' or 'never' wear Hi-Viz clothing. Several interviewees also noted how when site visitors were near vehicles, they 'rarely' or 'never' wore the same personal protective equipment as employees. Several interviewees also noted how vehicles can 'often' or 'sometimes' be seen going too fast and how visitors are 'rarely' or 'never' accompanied around the site by a member of staff.

Possibly the most significant finding is that 72 out of the 111 organisations interviewed said people 'always' (11 out of 111), 'often' (47 out of 111) or 'sometimes' (14 out of 111) walk across areas where vehicles operate. This is therefore a risk that may need addressing through guidance or targeted inspection. This also supports the need for more measures that segregate pedestrians from vehicles.

5.3.8 Drivers

5.3.8.1 Driver selection methods

Interviewees were asked to indicate which methods they used to select applicants for the driving role. Figure 59 presents the findings.

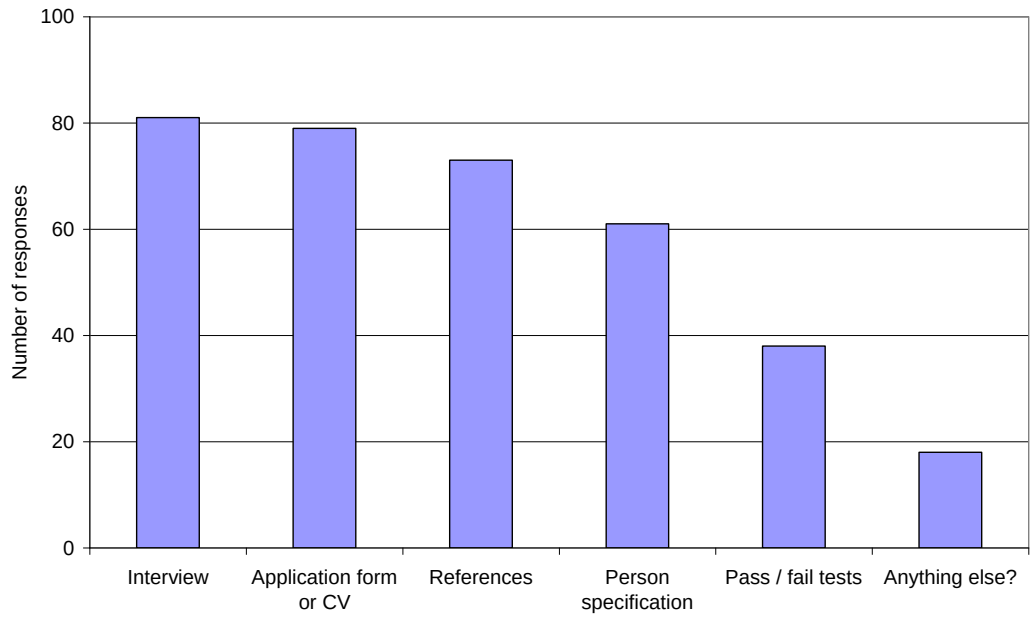


Figure 59 Methods used to select applicants for the driving role

Figure 59 highlights that the majority of organisations interviewed used most of the available selection methods to select suitable drivers. A less common method was the use of 'pass / fail' tests. Some organisations indicated that they used other methods not suggested in the interview script, these included

medical screenings and a check of existing driving certificates and driving licences.

5.3.8.2 Driver training

In addition to any legal requirements for training drivers (i.e. training provided to new drivers to assist them in gaining a valid driving license) organisations were also asked to indicate what other training provision is in place and this is highlighted on Figure 60.

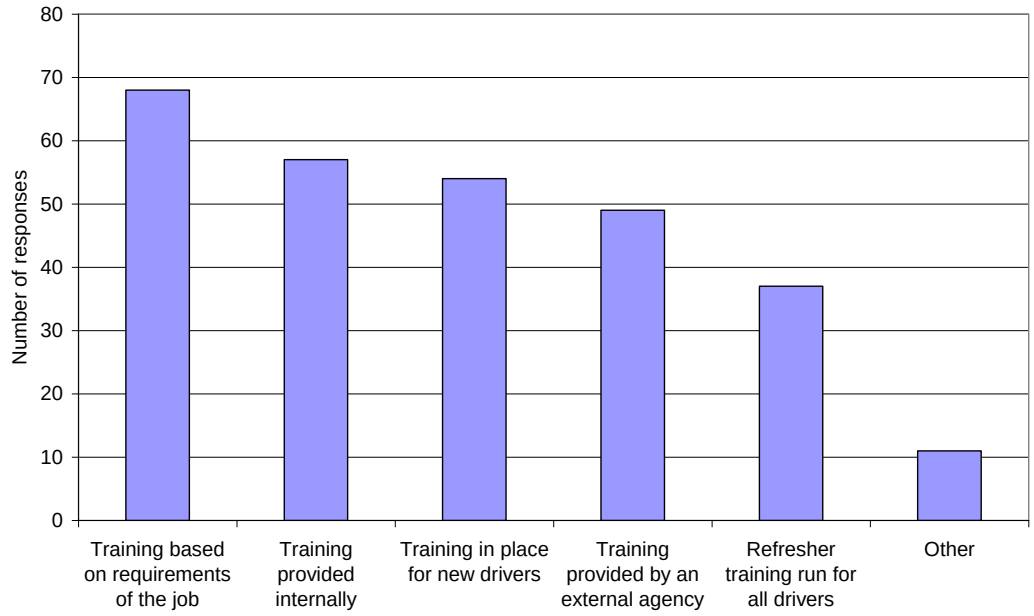


Figure 60 Training provided for company drivers

Figure 60 highlights that 68 organisations provided training that is based on the requirements of the job; 57 provided in-house training; 54 organisations provided training for new company drivers; 49 provided training using an external agency; and 37 organisations provided refresher training for all of their drivers. This demonstrates that companies are providing drivers with various forms of training, however, it would appear that more could be provided in terms of refresher training.

Refresher training is a critical element of overall training provision as people can naturally slip into bad habits if their skills are not updated, new legislation and driving standards may be introduced which drivers need to be made aware of and it also provides an opportunity to remind drivers of the risks involved in working with vehicles at work.

In terms of the frequency of refresher training, the HSA's Code of Practice document relating to the training of drivers operating rider-operated lift trucks does not include a set frequency for refresher training[27]. However, the Code of Practice does advise that employers should continuously monitor the

performance of lift truck operators to ascertain whether they might need refresher training (indicators that refresher training could be required might be the occurrence of near misses, accidents or simply regular unsafe working practices). The HSE (UK) also remind employers that although they are free to set refresher training intervals, they should not then ignore operators for the period in between.

5.3.9 Management practices

5.3.9.1 Safety management systems

All interviewees were asked if their organisation had a general safety management system in place. A total of 104 out of 111 (94%) confirmed they did have a general safety management system in place. When participants were asked if they had a workplace transport management system, policies and procedures in place, a total of 67 out of 111 (60%) said they did.

Although 60% does represent a majority of organisations, this still illustrates that despite 104 organisations having a general safety management system in place, not all of these have integrated aspects of WTS management into this. This may be due to the fact that not all organisations in the survey operated their own vehicles, in which case there would not be the same level of need for a WTS management system, however, all of the participating organisations had some form of vehicle activity within the perimeter of their workplace. This is therefore an area that all organisations may want to consider in the future, specifically in terms of what needs to be included in a safety management system that is commensurate with their level of WTS risk.

5.3.9.2 Workplace transport management activities undertaken

In order to further understand the types of WTS management activities that organisations are currently undertaking, interviewees were asked to indicate which activities they carried out. Figure 61 highlights the findings.

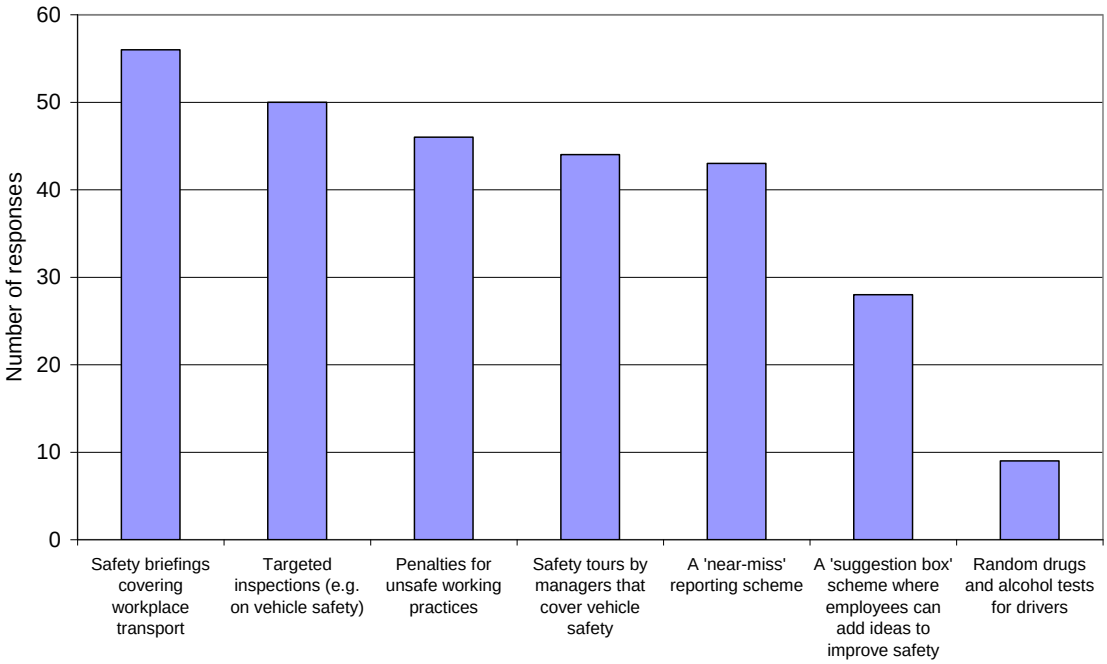


Figure 61 Workplace transport management activities undertaken

Figure 61 highlights that almost half of the overall survey sample said they undertook safety briefings with employees that covered workplace transport, carried out targeted inspections on vehicle safety, awarded penalties for unsafe working practices related to workplace transport, undertook safety tours by managers that covered vehicle safety and had a 'near-miss' reporting scheme in place. However, this still means that a reasonably high proportion of organisations are not carrying out these activities. Far fewer organisations had a 'suggestion box' for employees to make recommendations about WTS and even less (only nine organisations) carried out random drugs and alcohol tests.

5.3.9.3 Guidance used by organisations

The survey also provided an opportunity to explore what guidance organisations used to help them understand more about, and manage, WTS. Figure 62 highlights the key information sources used by organisations (interviewees were provided with a list of sources to choose from).

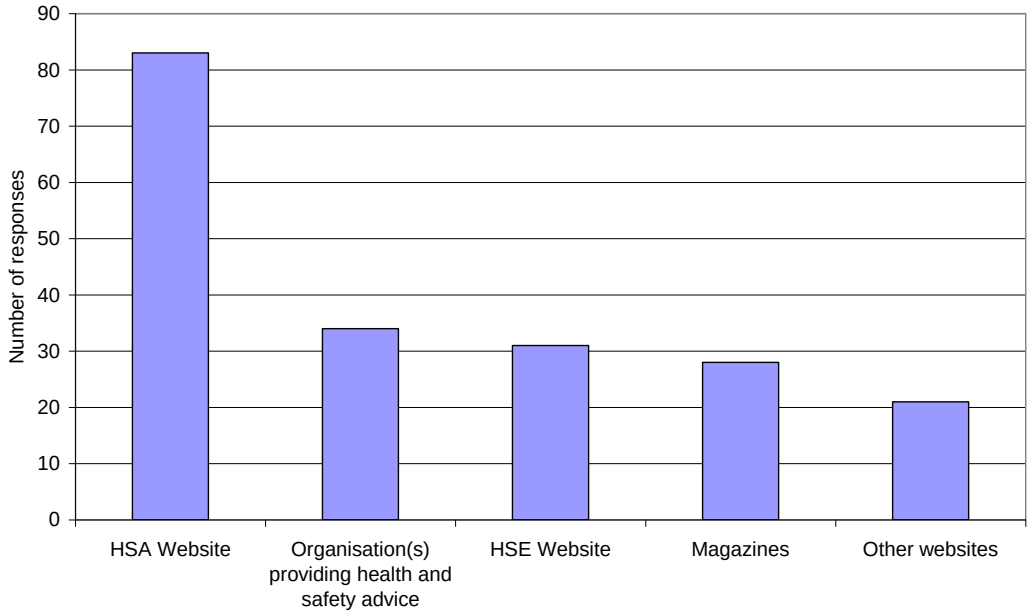


Figure 62 Sources of guidance used by organisations

Figure 62 highlights that the clear majority of organisations (75% - 83 out of 111) said that they used the HSA website to gather information on WTS. A further 34 interviewees said they consulted with organisations that provided health and safety advice, 31 organisations used the UK's HSE website, 28 organisations used various magazines for information and 21 organisations used other websites.

In order to find out more about the other organisations, magazines and websites used by organisations, interviewees were asked to specify exactly which information sources they consulted.

The magazines organisations used included the following key publications:

- Health and Safety Review (Irish version)
- Safety Focus
- Safety and Health Practitioner (SHP)
- Irish Health and Safety Association bulletin
- Industry specific trade magazines (e.g. for the oil industry 'Downstream User' and 'Fuel News' and for the building manufacturing industries 'Irish Building Services News')

The organisations that interviewees consulted with included:

- National Institute for Occupational Safety and Health (NIOSH)

- Institute of Occupational Safety & Health (IOSH)
- National Information Standards Organization (NISO)
- Small Firms Association (SFA)
- Irish Small and Medium Enterprise Association (ISME)
- Irish Business and Employers Confederation (IBEC)
- Irish Statute Book
- Chartered Institute of Environmental Health (CIEH)
- Irish Haulage Association (IHA)
- NIFAST (Irish safety training)
- Irish Petroleum Industry Association (IPIA)

This list illustrates a range of organisations that are used for their health and safety guidance, including health and safety specific organisations, business-related organisations, legislative bodies and industry specific bodies.

The websites organisations used included the following key sites:

- Barbour index
- Road Safety Authority
- Department of Transport
- Australian and New Zealand health and safety websites

5.3.10 Making improvements to WTS

5.3.10.1 Most helpful items

In order to understand the key things that would be most helpful to organisations in terms of improving their management of WTS, interviewees were asked to indicate out of a list of six items, which one would be most helpful. The findings are presented on Figure 63.

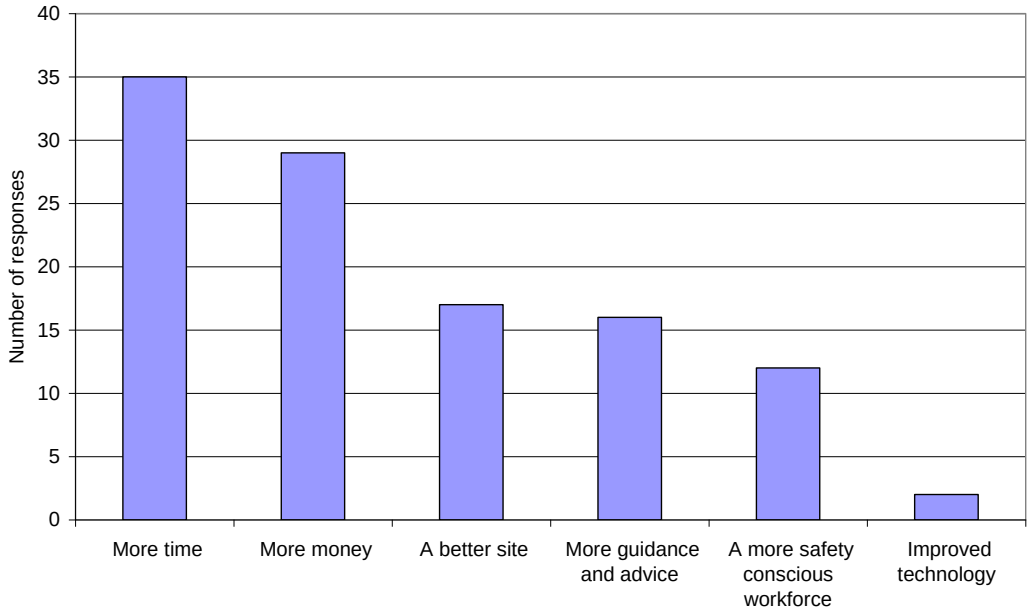


Figure 63 Resources organisations believed would be ***most*** helpful in improving WTS

Figure 63 highlights that the highest number of organisations would like ***more time*** to enable them to organise WTS. This was followed closely by ***more money*** in order to resource various initiatives.

Items that some organisations indicated wanting to have were a better workplace, more advice and guidance and a more safety conscious workforce. HSA would have more influence in these areas, for example, in terms of providing guidance designed to help organisations improve the workplace and ways they can help to improve safety awareness amongst their workforce.

Improved technology was only requested by two organisations.

5.3.10.2 Recommendations for the Health and Safety Authority

To conclude the interview, interviewees were asked what they would like from the HSA to help them improve WTS. A range of responses were provided, including:

- More training on workplace transport legislation
- More information briefings on site for managers
- More spot checks and inspections
- More guidance and advice

- A set checklist of things to look for when reviewing WTS
- Implementation of a regulation on drug testing
- Simpler advice and concise information to support smaller businesses
- Translation of materials into other languages for non-native employees
- Recommendations for the layout of workplaces, especially with regard to pedestrian access

5.4 SUMMARY AND CONCLUSIONS

5.4.1 Background to participating organisations

- In total 111 interviews were conducted with organisations of varying sizes, across Ireland, from a range of industry sectors.
- The majority of interviews conducted were with organisations based in Dublin, reflecting the concentrated level of industry in this region.
- A significant proportion of participating organisations worked for companies that employed between 10 to 49 workers.
- The majority of organisations interviewed only had one site in Ireland.
- A significant proportion of interviewees classed themselves as 'Managers' closely followed by 'Senior Managers' and 'Owners / Directors'.
- Only 23% of organisations (25 out of 111) appeared to have a dedicated health and safety person within their company.

5.4.2 Vehicles at the workplace

- The most common vehicles found within the workplaces were cars, vans, waste carrying vehicles and HGVs. There were also a significant number of motorbikes and bicycles observed. More industrial vehicles such as trailer units, pick-up trucks, electric / motorised pallet trucks and fork lift trucks were also present but in less significant numbers.
- The survey illustrated how almost all of the organisations had, as a minimum, vehicle activity with either staff and / or site visitors who would typically enter the site by HGV, van or car.
- Of those organisations that either undertook their own loading / unloading operations or observed suppliers loading / unloading, the

most common method used was by hand. This was closely followed by lift trucks and tail gates. Wheeled bins and cages and electric / motorised pallet trucks were also used.

5.4.3 Vehicle selection and maintenance

- The most common criteria applied by organisations when selecting vehicles was suitability for the task. This was followed by cost and safety features. Industry reputation was also important.

- Driver recommendation did not feature prominently in the criteria used to select new vehicles, however, when organisations were asked if drivers were consulted when purchasing new vehicles, 63 out of 111 (57%) agreed that drivers were consulted. Consultation typically involved an informal interview or discussion with the driver.

- The clear majority of all lift trucks operated in the workplace had the following safety features: handles to aid access to the vehicle - 90%; mirrors - 86%; seatbelts - 80%; reversing alarms - 100%; a horn - 92%; roll-over protection - 92%; lights - 94%; and falling object protection - 86%. Only 22% had attachments.

- The majority of HGVs had reversing alarms, handles to aid access to the vehicle and access steps to the loading area. Some HGVs also had non-driving controls at low levels, CCTV at the rear of the vehicle and devices to help prevent falls. It appears that there is still some room for improvement in terms of ensuring all HGVs in operation are suitably equipped with the most appropriate safety features.

- Only 13 organisations said their drivers were required to access the top of the vehicle. These 13 organisations included a transport company, a courier company, an oil company and interestingly several schools and colleges. On further analyses of the evidence, schools and colleges required access to the tops of vehicles for loading luggage on to school buses and vans etc.

- Out of the 111 organisations interviewed, 91% (101) of organisations said they did maintain their vehicles; 86% (96) of these confirmed maintenance records were also kept.

- The majority of organisations (58%) used a contractor to carry out maintenance on their vehicles, whilst a significant number used their own in-house resource. Vehicles operated through a leasing company typically used the leasing company for maintenance and a small number maintained vehicles using both a contractor (for one-off maintenance needs) and the leasing company (for a long-term maintenance agreement).

- Out of the 111 organisations interviewed, the clear majority of organisations (88) confirmed drivers did carry out safety checks prior to using a vehicle.

5.4.4 Site layout

- A total of 62 out of 111 organisations (56%) had a site layout that was less than 10 years old; this included 9 organisations that had a site layout less than one year old and 32 organisations that had updated their sites in the last one to five years.

- Conversely, 30 organisations had kept their site layout the same for over 20 years and a further 17 organisations had kept theirs the same for between 11 and 20 years. This suggests there are still a significant number of organisations who may benefit from re-considering the way their site is organised and which safety features could be most appropriate to reduce risk.

- The majority of organisations owned their own site and did not share it with anyone else, making the management of site safety within their own company control. However, 32 organisations did share their workplace with other organisations. This may be an issue for consideration in terms of how companies best share the management of site safety and the interfaces between the various companies.

- The participating organisations had a range of workplace safety features. The most common feature was full lighting in areas where vehicles operate (88% - 98 out of 111). This was followed by a requirement to wear personal protective equipment (PPE) on site, designated visitor parking and vehicle only areas.

- Despite many organisations having a range of safety features on site, features that were found to be less common included having a safe refuge for visiting drivers during loading / unloading activities (34%), lanes for vehicles to travel in (30%), barriers between pedestrians and vehicles (29%) and traffic lights / signals (8%) to help manage moving site traffic. The accident analysis provided some evidence that indicated accidents could involve people being trapped, crushed or hit by mobile machinery and possibly being hit by forklift trucks. If these types of site safety features were more common, it may reduce the risk of this type of incident occurring.

- The majority of organisations (81%) confirmed reversing was carried out at their workplace.

5.4.5 Attitudes and behaviours

- The majority of organisations answered a range of attitudinal statements related to WTS in a positive way.

- Two areas that were felt to possibly require further investigation were ***pedestrian risk awareness*** and the ***likelihood of drivers taking risks***.

- The results highlight how a total of 50 out of 111 (45%) interviewees agreed that pedestrians were not aware of the risks associated with workplace transport. Furthermore, 37 out of 111 (33%) interviewees agreed that from time-to-time you have to expect that drivers will take risks to get the job done.

- In general, safe behaviours in relation to workplace transport were felt to be occurring at workplaces.

- However, there were several areas where improvements could still be made. Several interviewees noted how at their organisations, when people are working on or near vehicles (e.g. loading/unloading) they ***'rarely'*** or ***'never'*** wear Hi-Viz clothing. Several interviewees also noted how when site visitors were near vehicles, they ***'rarely'*** or ***'never'*** wore the same personal protective equipment as employees.

- Several interviewees also noted how vehicles can ***'often'*** or ***'sometimes'*** be seen going too fast and how visitors are ***'rarely'*** or ***'never'*** accompanied around the site by a member of staff.

- Possibly the most significant finding is that 72 out of the 111 organisations interviewed said people ***'always'*** (11 out of 111), ***'often'*** (47 out of 111) or ***'sometimes'*** (14 out of 111) walk across areas where vehicles operate. This is therefore a risk that may need addressing through guidance or targeted inspection. This also supports the need for more measures that segregate pedestrians from vehicles.

5.4.6 Drivers

- The majority of organisations used driver interviews, application forms, curriculum vitaes (CVs), previous employer references and person specifications to help select suitable drivers.

- A less common method used was 'pass / fail' tests. Some organisations indicated that they used medical screenings and a check of existing driving certificates and licences.

- It was found that 68 organisations provided training that was based on the requirements of the job; 57 provided in-house training; 54 organisations provided training for new company drivers; 49 provided

training using an external agency; and 37 organisations provided refresher training for all of their drivers.

- It was suggested that although refresher training is being provided by some organisations, it should be in place across a larger number of organisations to ensure drivers keep their skills up to date and remain aware of the risks associated with workplace transport.

5.4.7 Management practices

- Up to 94% of organisations confirmed they had a general safety management system in place. Furthermore, 60% said they also had a WTS management system, policies and procedures in place.

- This illustrated that despite 90% of participating organisations having a general safety management system in place, not all of these have integrated aspects of WTS management into this. This is therefore an area that all organisations may want to consider in the future, specifically in terms of what needs to be included in a safety management system that is commensurate with their level of WTS risk.

- Almost half of the overall survey sample said they undertook safety briefings with employees that covered workplace transport, carried out targeted inspections on vehicle safety, awarded penalties for unsafe working practices related to workplace transport, undertook safety tours by managers that covered vehicle safety and had a 'near-miss' reporting scheme in place.

- However, this still means that a reasonably high proportion of organisations are not carrying out these activities. Far fewer organisations had a 'suggestion box' for employees to make recommendations about WTS and even less (only nine organisations) carried out random drugs and alcohol tests.

- The clear majority of organisations said that they used the HSA website to gather information on WTS. Interviewees also confirmed consulting with organisations that provided health and safety advice (e.g. NIOSH, IOSH, IBEC), the UK's HSE website, various magazines (e.g. Health and Safety Review Ireland, Safety and Health Practitioner) and other websites (e.g. the Barbour index).

5.4.8 Improving WTS

- The highest number of organisations would like more time to enable them to organise WTS. This was followed closely by more money in order to resource various initiatives.

- Some organisations also indicated wanting a better workplace, more advice and guidance and a more safety conscious workforce. HSA would have more influence in these areas, for example, in terms of providing guidance designed to help organisations improve the workplace and ways they can help to improve safety awareness amongst their workforce.

- Organisations suggested a range of ways the HSA could help them to improve their own WTS, which included, more spot checks and HSA inspections, developing a check list of WTS items, introducing a regulation on drug testing, translation of materials into other languages, simpler advice for small businesses and recommendations for the layout of workplaces.

6. WORKPLACE TRANSPORT EVIDENCE BASE

6.1 INTRODUCTION

The previous sections have outlined evidence gathered about WTS in Ireland from a review of the available information, an analysis of the HSA's accident data (1993 to 2007/08) and a survey of 111 Irish organisations during July and August 2008. The evidence has been collected against the following key WTS themes:

- Drivers
- Pedestrians
- Site layout and maintenance
- Management strategies and systems
- Vehicle selection and maintenance

This current section aggregates the evidence collected around each of these five workplace transport themes in order to build a consolidated workplace transport evidence base. This evidence base therefore also constitutes a baseline measure of WTS management activity in Ireland at this present time.

6.2 EVIDENCE AGGREGATION

6.2.1 Drivers

Table 7 presents the key evidence collected on ***workplace transport drivers*** that has been gathered from the information review, accident data analysis and survey of Irish organisations.

Table 7 Aggregated evidence on drivers

Evidence source	Aggregated evidence on drivers
Existing information and guidance	• ***Sources: Irish Advanced Motorists, HSE(UK), BRAKE(UK), Safe driving pledge, National Roads Authority.*** • Increasing drivers' 'situational awareness' will have a positive effect on workplace vehicle safety. • There is some driver information available relating to forklift trucks, though it is part aimed at drivers and part aimed at their employers. • Attempts to enhance drivers' safety related attitudes will also have positive effects on workplace vehicle safety. • It is likely that guidance aimed directly at drivers of workplace vehicles is not publically available; such messages are likely to be communicated internally, within a company. • Most guidance relating to driving is aimed at the employer who then (presumably) acts on the information, relaying it to their drivers.
HSA accident data	**Driver occupations** • The occupation 'heavy truck and lorry drivers' have been most frequently involved in fatal accidents contained within the workplace transport accident dataset (accounting for 25 fatal accidents between 1993 and April 2008 – equating to 22% of the total number). 'Drivers and mobile plant operators' are also at risk having been involved in 17 accidents during the same period. This evidence suggests drivers are a high risk occupational group and should be focused upon. • In terms of all injury severities, driver occupations are still significant, with drivers and mobile plant operators, heavy truck and lorry drivers, and bus and tram drivers all being involved in a large number of reported accidents. **Driver employment status** • The clear majority (92%) of incidents in the workplace transport accident dataset involved victims who were classified as 'employees'. It is therefore likely that the drivers highlighted as being involved in workplace transport accidents are also likely to be company employees, as opposed to self-employed workers or members of the public. **Driver nationality** • The clear majority of workplace transport related incidents contained within the dataset involved a victim that is of Irish nationality, therefore, the drivers at risk are likely to be of Irish nationality.

Evidence source	Aggregated evidence on drivers
	Driver age • In terms of the age of drivers, reported fatal accidents are reasonably evenly distributed throughout the age groups. However, the largest total number of workplace transport related incidents (i.e. all injury severities) involved a victim aged between 30 and 34 years. Victims aged between 40 and 44 years and then 35 and 39 years followed this. This generally indicates that workplace transport related incidents involve more middle age workers and therefore possibly middle aged drivers.
Cross-industry survey	**Driver selection** • The majority of organisations used driver interviews, application forms, curriculum vitaes (CVs), previous employer references and person specifications to help select suitable drivers. • A less common method used was 'pass / fail' tests. Some organisations indicated that they used medical screenings and a check of existing driving certificates and licences. **Driver training** • It was found that 68 organisations provided training that was based on the requirements of the job; 57 provided in-house training; 54 organisations provided training for new company drivers; 49 provided training using an external agency; and 37 organisations provided refresher training for all of their drivers. • It was suggested that although refresher training is being provided by some organisations, it should be in place across a larger number of organisations to ensure drivers keep their skills up to date and remain aware of the risks associated with workplace transport. **Driver behaviours** • 37 out of 111 (33%) interviewees agreed that from time-to-time you have to expect that drivers will take risks to get the job done. • Several interviewees noted how at their organisations, when people (often drivers) are working on or near vehicles (e.g. loading/unloading) they 'rarely' or 'never' wear Hi-Viz clothing • Several interviewees also noted how vehicles can 'often' or 'sometimes' be seen going too fast. **Driver-related vehicle issues** • Only 13 organisations said their drivers were required to access the top of the HGV. Although not a significant number out of the 67 companies who had HGV activity on their site, this still represents a combined risk from workplace transport and working at height.

Evidence source	Aggregated evidence on drivers
	• Out of the 111 organisations interviewed, the clear majority of organisations (88) confirmed drivers did carry out safety checks prior to using a vehicle.

6.2.1 Pedestrians

Table 8 presents the key evidence collected on ***pedestrians*** that has been gathered from the information review, accident data analysis and survey of Irish organisations.

Table 8 Aggregated evidence on pedestrians

Evidence source	Aggregated evidence on pedestrians
Existing information and guidance	• ***Sources: HSE (UK), ND BOMEL.*** • There is limited guidance aimed at workplace pedestrians themselves. • Most guidance is linked to site layout and maintenance and managing visitors.
HSA accident data	• There was no evidence specifically on pedestrians within the workplace transport accident dataset.
Cross-industry survey	**Pedestrian site visitors** • In terms of visitors to the workplace, 74 out of 111 (67%) organisations had members of the public visiting their sites, typically by foot or by car. Almost all of the organisations interviewed (109), with the exception of two, had suppliers visiting their site, typically by HGV and van. • Several interviewees also noted how visitors are 'rarely' or 'never' accompanied around the site by a member of staff. Possibly the most significant finding is that 72 out of the 111 organisations interviewed said people 'always' (11 out of 111), 'often' (47 out of 111) or 'sometimes' (14 out of 111) walk across areas where vehicles operate. This is therefore a risk that may need addressing through guidance or targeted inspection. This also supports the need for more measures that segregate pedestrians from vehicles. **Pedestrian risk awareness** • A total of 50 out of 111 (45%) interviewees agreed that pedestrians were not aware of the risks associated with workplace transport. • Several interviewees also noted how when site visitors were near vehicles, they 'rarely' or 'never' wore the same personal protective equipment as employees.

6.2.1 Site layout and maintenance

Table 9 presents the key evidence collected on ***site layout and maintenance*** that has been gathered from the information review, accident data analysis and survey of Irish organisations.

Table 9 Aggregated evidence on site layout and maintenance

Evidence source	Aggregated evidence on site layout and maintenance
Existing information and guidance	• ***Sources: HSA, HSE(UK), and National Roads Authority.*** • HSA and HSE (UK) have published guidance on site layout and maintenance. • This information tends to emphasise the need to plan vehicle movements, install pedestrian paths/walkways, enable users to adhere to routes and remain segregated from different forms of transport, control vehicle speed, provide adequate facilities for loading/unloading and ensure that the environment minimises risks (e.g. level surfaces, edge protection and barriers). • This information is available, though perhaps too generic in nature; case-study examples tend to help bring alive and demonstrate how to apply the concepts.
HSA accident data	• The work environments where the largest total number of workplace transport related incidents have been reported are factories, industrial sites or warehouses and public areas (including road, rail and car park). This was also the same for fatal accidents only. • Factories, industrial sites and warehouses present working environments that can be influenced by effective WTS management systems, if these are adopted by management and employees alike. Public areas would be hard for organisations to influence.
Cross-industry survey	**Vehicles at the workplace** • The most common vehicles found within the workplaces were cars, vans, waste carrying vehicles and HGVs. There were also a significant number of motorbikes and bicycles observed. More industrial vehicles such as trailer units, pick-up trucks, electric / motorised pallet trucks and fork lift trucks were also present but in less significant numbers. • Almost all of the organisations had, as a minimum, vehicle activity with either staff and / or site visitors who would typically enter the site by HGV, van or car. Furthermore, most workplaces would have a regular visit from a waste carrying vehicle. The high number of motorbikes and bicycles are likely to reflect staff, couriers, visitors and / or members of the public. The industrial vehicles were observed more in manufacturing and transport related organisations. • The majority of organisations confirmed reversing was carried out on their workplace. **Site visitors** • In terms of visitors to the workplace, 74 out of 111 (67%) organisations had members of the public visiting their sites, typically by foot or by car. Almost all of the organisations interviewed (109), with the exception of two, had suppliers visiting their site,

Evidence source	Aggregated evidence on site layout and maintenance
	typically by HGV and van. **Age of site layout and site ownership** • A total of 62 out of 111 organisations (56%) had a site layout that was less than 10 years old; this included 9 organisations that had a site layout less than one year old and 32 organisations that had updated their sites in the last one to five years. • Conversely, 30 organisations had kept their site layout the same for over 20 years and a further 17 organisations had kept theirs the same for between 11 and 20 years. This suggests there are still a significant number of organisations who may benefit from re-considering the way their site is organised and which safety features could be most appropriate to reduce risk. • The majority of organisations owned their own site and did not share it with anyone else, making the management of site safety within their own company control. However, 32 organisations did share their workplace with other organisations. This may be an issue for consideration in terms of how companies best share the management of site safety and the interfaces between the various companies. **Site safety features** • The participating organisations had a range of workplace safety features. The most common feature was full lighting in areas where vehicles operate (88% - 98 out of 111). This was followed by a requirement to wear personal protective equipment (PPE) on site, designated visitor parking and vehicle only areas. • Despite many organisations having a range of safety features on site, features that were found to be less common included having a safe refuge for visiting drivers during loading / unloading activities, lanes for vehicles to travel in, barriers between pedestrians and vehicles and traffic lights / signals to help manage moving site traffic. The accident analysis provided some evidence that indicated accidents could involve people being trapped, crushed or hit by mobile machinery and possibly being hit by forklift trucks. If these types of site safety features were more common, it may reduce the risk of this type of incident occurring.

6.2.1 Management strategies and systems

Table 10 presents the key evidence collected on ***workplace transport management strategies and systems*** that has been gathered from the information review, accident data analysis and survey of Irish organisations.

Table 10 Aggregated evidence on management strategies and systems

Evidence source	Aggregated evidence on management strategies and systems
Existing information and guidance	• ***Sources: Department for Transport (UK) and HSE (UK).*** • There is 'business case' information that is intended to help demonstrate that investing in WTS is a wise move. • Nearly all guidance that addresses management systems and strategies focuses on the need to integrate workplace vehicle transport risk management within the organisations' wider safety management system. • Well developed competence management systems are important for ensuring skilled employees. • Very little evidence was found advising employers of the benefits of improved planning **to reduce the number of vehicle movements.**
HSA accident data	• The second largest number of workplace transport related incidents were triggered by lifting or carrying activities and the third largest number were related to a loss of control of other transport or handling equipment. • The largest number of workplace transport related injuries were caused by physical stress or strain to the body. This was closely followed by being trapped or crushed by an object or machinery. • These types of issues could be managed more effectively if strong WTS management systems were put in place and adopted by companies.
Cross-industry survey	**Safety management systems** • Up to 94% of organisations confirmed they had a general safety management system in place. Furthermore, 60% said they also had a WTS management system, policies and procedures in place. • This illustrated that despite 90% of participating organisations having a general safety management system in place, not all of these have integrated aspects of WTS management into this. This is therefore an area that all organisations may want to consider in the future, specifically in terms of what needs to be included in a safety management system that is commensurate with their level of WTS risk. **Safety management activities** • Almost half of the overall survey sample said they undertook safety briefings with employees that covered workplace transport, carried out targeted inspections on vehicle safety, awarded penalties for unsafe working practices related to workplace transport, undertook safety tours by managers that covered vehicle safety and had a 'near-miss' reporting scheme in place.

Evidence source	Aggregated evidence on management strategies and systems
	• However, this still means that a reasonably high proportion of organisations are not carrying out these activities. Far fewer organisations had a 'suggestion box' for employees to make recommendations about WTS and even less (only nine organisations) carried out random drugs and alcohol tests. **Management information and guidance** • The clear majority of organisations said that they used the HSA website to gather information on WTS. Interviewees also confirmed consulting with organisations that provided health and safety advice (e.g. NIOSH, IOSH, IBEC), the UK's HSE website, various magazines (e.g. Health and Safety Review Ireland, Safety and Health Practitioner) and other websites (e.g. the Barbour index).

6.2.1 Vehicle selection and maintenance

Table 11 presents the key evidence collected on ***workplace vehicle selection and maintenance*** that has been gathered from the information review, accident data analysis and survey of Irish organisations.

Table 11 Aggregated evidence on workplace vehicle selection and maintenance

Evidence source	Aggregated evidence on workplace vehicle selection and maintenance
Existing information and guidance	• ***Sources: HSE(UK).*** • Guidance aimed at helping employers select and maintain vehicles is one of the more widespread elements of workplace vehicle safety. • The task that needs to be completed should dictate the method and vehicle used to move equipment; not the other way around. • When road-based vehicles are brought into a workplace, there may be an increase in risk as the vehicle was not designed for the environment. • Vehicle's should offer adequate protection from falls, slips and trips. • Case-study examples indicate practical steps to take to improve vehicle safety. • Modifications and regular maintenance should be conducted according to the manufacturers advice and guidelines.
HSA accident data	• The most frequently occurring items associated with workplace transport related incidents were mobile handling devices, handling trucks (powered or not), barrows, pallet trucks, etc. • This indicates the influence and importance of the vehicles themselves in managing WTS.
Cross-industry survey	**Vehicle selection** • The most common criteria applied by organisations when selecting vehicles was suitability for the task. This was followed by cost and safety features. Industry reputation was also important. • Driver recommendation did not feature prominently in the criteria used to select new vehicles, however, when organisations were asked if drivers were consulted when purchasing new vehicles, 63 out of 111 (57%) agreed that drivers were consulted. Consultation typically involved an informal interview or discussion with the driver. **Vehicle safety features** • The clear majority of all lift trucks operated in the workplace had the following safety features: handles to aid access to the vehicle; mirrors; seatbelts; reversing alarms; a horn; roll-over protection; lights; and falling object protection. • The majority of HGVs had reversing alarms, handles to aid access to the vehicle and access steps to the loading area. Some HGVs also had non-driving controls at low levels, CCTV at the rear of the vehicle and devices to help prevent falls. It appears

Evidence source	Aggregated evidence on workplace vehicle selection and maintenance
	that there is still some room for improvement in terms of ensuring all HGVs in operation are suitably equipped with the most appropriate safety features. • Only 13 organisations said their drivers were required to access the top of the HGV. Although not a significant number out of the 67 companies who had HGV activity on their site, this still represents a combined risk from workplace transport and working at height. **Vehicle maintenance** • Out of the 111 organisations interviewed, 101 organisations said they did maintain their vehicles; 96 of these confirmed maintenance records were also kept. • The majority of organisations used a contractor to carry out maintenance on their vehicles, whilst a significant number used their own in-house resource. Vehicles operated through a leasing company typically used the leasing company for maintenance and a small number maintained vehicles using both a contractor (for one-off maintenance needs) and the leasing company (for a long-term maintenance agreement).

6.3 BASELINE MEASURE

The previous tables have provided an overview of the evidence gathered during this study, in relation to the five key WTS themes. These tables provide a measure of the 'state of play' in terms of WTS management activity occurring at this present time in Ireland. Therefore, these tables constitute a baseline measure. Furthermore, the rest of this report (see Section 3, Section 4 and Section 5 particularly) provide more detailed evidence to support the baseline measure.

Future measures can be compared against this baseline and examined to assess progress in the five key WTS areas. More specifically, workplace transport initiatives can be evaluated against this baseline. (Please see Section 8 for more detail on future evaluation.)

7. KEY RISK AREAS AND RECOMMENDATIONS

7.1 INTRODUCTION

The previous sections have outlined all of the evidence against five key WTS themes. In doing this the key risk areas have also been outlined in detail throughout this report (see Section 3, Section 4 and Section 5). The objective of this section is not to replicate the detail of these findings but, instead, to provide a brief synopsis of the evidence, identify some of the key high risk themes and identify risk control measures that should be considered by HSA and industry.

7.2 KEY RISK AREAS

7.2.1 Drivers

7.2.1.1 Key risk areas for drivers

The key risk areas identified for drivers were as follows:

- The accident analysis clearly indicated that the job of driver is a high risk occupational group. It also indicated that the drivers involved in accidents are probably company employees and of Irish nationality.

- In terms of fatal accidents, all ages of employee were involved. However, in terms of all injury severities, employees that were involved (a high proportion of which are likely to be drivers) were typically middle aged.

- The survey of Irish organisations revealed that around a third of the sample agreed that from time-to-time you have to expect that drivers will take risks to get the job done.

- Several survey interviewees also noted how at their organisations, when people are working on or near vehicles (e.g. loading/unloading), they ***'rarely'*** or ***'never'*** wear Hi-Viz clothing.

- Several survey interviewees also noted how vehicles can ***'often'*** or ***'sometimes'*** be seen going too fast. These findings may indicate a lower risk awareness amongst some drivers in the workplace. Risk awareness can be heightened through education and awareness raising activities, as well as regular communication about risk from senior management and between drivers.

- The survey also found that although refresher training was being provided by some organisations, it was not being provided universally.

- Despite the high risk nature of the role, the information review identified a clear gap in the guidance aimed directly at drivers, with most information being targeted at employers who are then required to disseminate this information to drivers.

In conclusion, the evidence has identified the role of driver as being a high risk area, yet there is currently an absence of guidance aimed directly at drivers and a need for more refresher training across industry. Guidance and refresher training are both excellent ways of maintaining risk awareness levels high and are therefore areas which should be considered for improvement.

7.2.1.2 Key recommendations for improving driver risk

The following table presents risk control measures for consideration by both HSA and industry.

Recommendations for HSA
• HSA should consider developing more guidance aimed directly at drivers; written in their language and making the issues relevant and interesting for them. • During the survey undertaken organisations asked if HSA could consider undertaking more spot checks and inspections at workplaces, develop and implement legislation on carrying out mandatory drug testing and translating existing materials into other non-native languages. All of these interventions would be very useful for managing the safety of drivers.
Recommendations for industry
• Organisations should consider investment in more refresher training for their drivers, either from outside agencies or in-house. This could be as simple as a 'tool box talk' conducted at the workplace to remind drivers of the risks involved in driving and working with vehicles. This should be based on a thorough training needs analysis.

7.2.2 Pedestrians

7.2.2.1 Key risk areas for pedestrians

Pedestrians include anyone who intentionally or unintentionally enters or moves around the workplace on foot, including the workforce, business visitors (e.g. contractors, deliveries etc.) and members of the public. The key risk areas identified for pedestrians were as follows:

- The survey clearly indicated that the majority of organisations had members of the public accessing their site; either for legitimate purposes or because they were lost or unaware they had even entered

a ‘workplace’. Furthermore, most of the organisations surveyed had their own workers or official site visitors moving around the workplace on foot.

- Despite the high level of pedestrian activity, the survey results also highlighted almost half of the organisations consulted with agreed that pedestrians were not aware of the risks associated with workplace transport.

- Several survey interviewees also noted how when site visitors were near vehicles, they ***‘rarely’*** or ***‘never’*** wore the same personal protective equipment as employees.

- Several survey interviewees also noted how visitors are ***‘rarely’*** or ***‘never’*** accompanied around the site by a member of staff.

- Possibly the most significant finding is that the clear majority of organisations surveyed confirmed they ***‘always’*** observed pedestrians walking across areas where vehicles operate.

- The information review also identified that there was limited guidance aimed directly at the pedestrians themselves. Pedestrian movement (workers and members of the public) is therefore a risk that may need addressing through guidance.

7.2.2.2 Key recommendations for improving pedestrian risk

The following table presents risk control measures for consideration by both HSA and industry.

Recommendations for HSA
• HSA should consider producing guidance aimed directly at pedestrian workers. This would be aimed at workers who need to regularly move around the workplace to help with deliveries, vehicle and equipment maintenance etc. It should also include information for workers that infrequently go on site.
Recommendations for industry
• Organisations should review their site layout and signage in order to help members of the public (expected and unexpected) safely navigate their way around the workplace (see Section 7.2.3 for more on site layout). More measures for segregating pedestrians from vehicles could perhaps be considered.

7.2.3 Site layout and maintenance

7.2.3.1 Key risk areas for site layout and maintenance

The key risk areas identified for site layout and maintenance were as follows:

- The evidence identified that factories, industrial sites and warehouses are the work environments where the largest total number of workplace transport related incidents have been reported to HSA.

- The industry survey found that the most common vehicles found within the workplace were cars, vans, waste carrying vehicles and HGVs.

- Encouragingly the information review found that both HSA and HSE (in the UK) have published guidance on site layout and maintenance. The result of having such information readily available was possibly reflected in the finding that many organisations reported having several good safety features implemented at their workplace.

- Areas where improvements could possibly be made related to updating the site layout, sharing sites with other organisations and certain less common site safety features.

- The survey found that a considerable number of organisations had not considered the layout of their site in over 20 years. Reviewing the existing site with a view to updating it with easy to implement safety features could help reduce risk significantly.

- The majority of organisations owned their own site and did not share it with anyone else, making the management of site safety within their own control. However, 32 organisations did share their workplace with other organisations. This may be an issue for consideration in terms of how companies jointly manage site safety and how they manage the interfaces between the various companies.

- Despite many organisations having a range of safety features on site, features that were found to be less common included having a safe refuge for visiting drivers during loading / unloading activities, lanes for vehicles to travel in, barriers between pedestrians and vehicles and traffic lights / signals to help manage moving site traffic.

- The accident analysis provided some evidence that indicated accidents could involve people being trapped, crushed or hit by mobile machinery and possibly being hit by forklift trucks. If the types of site safety features referred to above were more common, it may reduce the risk of this type of incident occurring.

- There were a number of organisations in the survey who did not operate their own vehicles, but experienced a reasonably high level of

vehicle activity at their workplace. This vehicle activity came from suppliers, deliveries and visitors. These organisations may not have been traditionally targeted with workplace transport site safety information, but do represent a real risk area and should therefore be considered.

7.2.3.2 Key recommendations for improving the risks associated with site layout and maintenance

The following table presents risk control measures for consideration by both HSA and industry.

Recommendations for HSA
• HSA should consider producing management level guidance for companies that share a workplace. This would provide guidance on how to manage the interface between various companies on site in terms of the rules and regulations to adhere to, agreeing a common set of standards / practices and how to communicate effectively at both a management level and at the 'shop floor' level (particularly in the event of a site emergency). • HSA should consider producing management level guidance for organisations that do not actually operate their own vehicles, but who experience a reasonably high level of vehicle activity on their workplace. This guidance should include the most fundamental risk control measures that should be implemented in any workplace where there is vehicle (and pedestrian) activity. • HSA and / or organisations should also consider translating key workplace safety information into different languages. • HSA should consider promoting awareness of the signs regulations to employers and safety representatives.
Recommendations for industry
• Organisations should consider modernising the layout of their existing workplaces using the information provided by HSA and HSE (UK) to help guide the process. • Organisations should consider implementing a safe refuge for visiting drivers during loading / unloading activities, lanes for vehicles to travel in, barriers between pedestrians and vehicles and traffic lights / signals to help manage moving site traffic.

7.2.4 Management strategies and systems

7.2.4.1 Key risk areas for management strategies and systems

The key issues identified for management strategies and systems were as follows:

- The industry survey revealed that 94% of the participating organisations had a general safety management system in place and 60% reported having WTS management systems, policies and procedures in place.

- This finding indicated that there are still some organisations that have implemented general safety management systems, but have not yet gone as far as developing these systems in relation to WTS.

- There is guidance available on safety management systems. Much of it encourages organisations to integrate WTS management activities into a wider safety management system. The business benefits of good safety management in this area are highlighted in order to demonstrate that investment is a wise move.

In addition to the key risk areas identified through the field work, the less 'formalised' findings from the industry survey revealed that organisations almost fell within three broad categories:

- **Category 1 - High hazard industries** – companies that fall into this group are used to operating in a highly regulated industry that is commensurate with the level of potential risk, for example large oil companies. Management and employees alike understand risk and the importance of managing it effectively. Naturally, as a consequence, there are also good safety management systems in place for all risk areas (including workplace transport) and these are supported by a positive safety culture.

- **Category 2 - Medium hazard industries** – companies that fall into this group operate in an environment where hazards are present (such as workplace transport) and, within the larger organisations, management systems are in place to address the hazards. Examples from the survey included transportation companies, retail / wholesale companies and manufacturing companies. However, despite management being aware of the risk, employees appear to be less aware of the hazards around workplace transport. Furthermore, some organisational management expressed frustration with communicating this risk to employees.

- **Category 3 – Low hazard industries** – companies that fall into this group operate in a low hazard environment (e.g. predominantly desk-based work environments) and few hazards are present. This has resulted in a low risk awareness amongst staff in general. However, for

these organisations there is still some risk present from visiting ancillary vehicles (e.g. post, waste, couriers etc.). In these types of organisation, management and employees alike need to be educated on the best ways to manage the risk (albeit small) from workplace transport.

7.2.4.2 Key recommendations for improving the risks associated with management strategies and systems

The following table presents risk control measures for consideration by both HSA and industry.

Recommendations for HSA
• HSA should consider developing guidance and awareness raising materials aimed directly at employees. This will help management communicate the risks of workplace transport to their employees. (*This also links to the recommendation to develop guidance for drivers*). • HSA should consider developing guidance for 'low hazard' companies. This guidance should include the most fundamental risk control measures that should be implemented in any workplace where there is vehicle (and pedestrian) activity. (*This also links to the recommendation to develop guidance for site layout and maintenance*). • HSA should consider developing guidance aimed at 'medium hazard' small and medium sized businesses. These organisations are exposed to the risk, but may not have the same level of resource as larger companies to manage the risk. The survey also revealed a direct request for simple and concise information to support smaller businesses. • The survey also revealed that organisations wanted HSA to develop a 'check list' of items to review when assessing WTS management.
Recommendations for industry
• Organisations that do not currently have workplace transport safety management systems in place should consider integrating this into their existing general safety management system.

7.2.5 Vehicle selection and maintenance

7.2.5.1 Key risk areas for vehicle selection and maintenance

The key issues identified for vehicle selection and maintenance were as follows:

- The evidence revealed that workplace vehicles are typically selected on their suitability for the task and some of the more traditional workplace transport vehicles used across industry, such as HGVs and forklift

trucks, do have a range of safety features. However, more organisations should consider having CCTV fitted to their HGV fleet, where appropriate.

- A small number of organisations revealed that drivers still require access to the top of the vehicle, however, the majority were in the education sector and the vehicles included buses and vans and related to luggage storage.

- In general, industry reported good vehicle maintenance procedures; typically using contractors to carry out maintenance work.

- The review of existing information revealed that there is widespread information available on selecting and maintaining vehicles.

7.2.5.2 Key recommendations for improving the risks associated with vehicle selection and maintenance

The following table presents risk control measures for consideration by both HSA and industry.

Recommendations for HSA
• The survey revealed organisations would like the HSA to carry out more spot checks and inspections in general, and this would also apply to checking workplace vehicles.
Recommendations for industry
• Organisations should consider CCTV for HGVs where appropriate.

7.3 CASE STUDIES

Based on the evidence collected highlighting the key risk areas and associated recommendations for HSA and industry, four workplace transport case studies were developed, as follows:

- Managing pedestrians in the workplace effectively (aimed at managerial positions).
- Raising pedestrian awareness of workplace transport risks (aimed at the pedestrians themselves).
- Raising awareness of a new HSA WTS checklist (aimed at 'low hazard' companies).
- Helping drivers to check their approach to workplace transport driving (aimed at the drivers themselves).

A copy of these case studies can be found in Appendix B.

8. FUTURE OUTCOME MEASURES

8.1 INTRODUCTION

The current project has developed a workplace transport evidence base around five key WTS themes. This essentially constitutes a baseline measure of the 'state of play' in Ireland at this current point in time. This baseline measure can be used to assess progress in coming years, as well as evaluate the impact of specific WTS initiatives. In order to help the HSA evaluate future interventions in the area of workplace transport this section identifies a list of suggested outcome measures.

8.2 THE INTERVENTION IMPACT CHAIN

Rarely is there a direct link between the introduction of a new safety intervention (e.g. a policy, procedure, piece of legislation or guidance document) and the immediate realisation of a reduction in workplace transport related accidents. In between the introduction of the initiative and the benefits realisation, there are a number of key stages that need to completed. Figure 64 illustrates these key stages in the intervention impact chain.

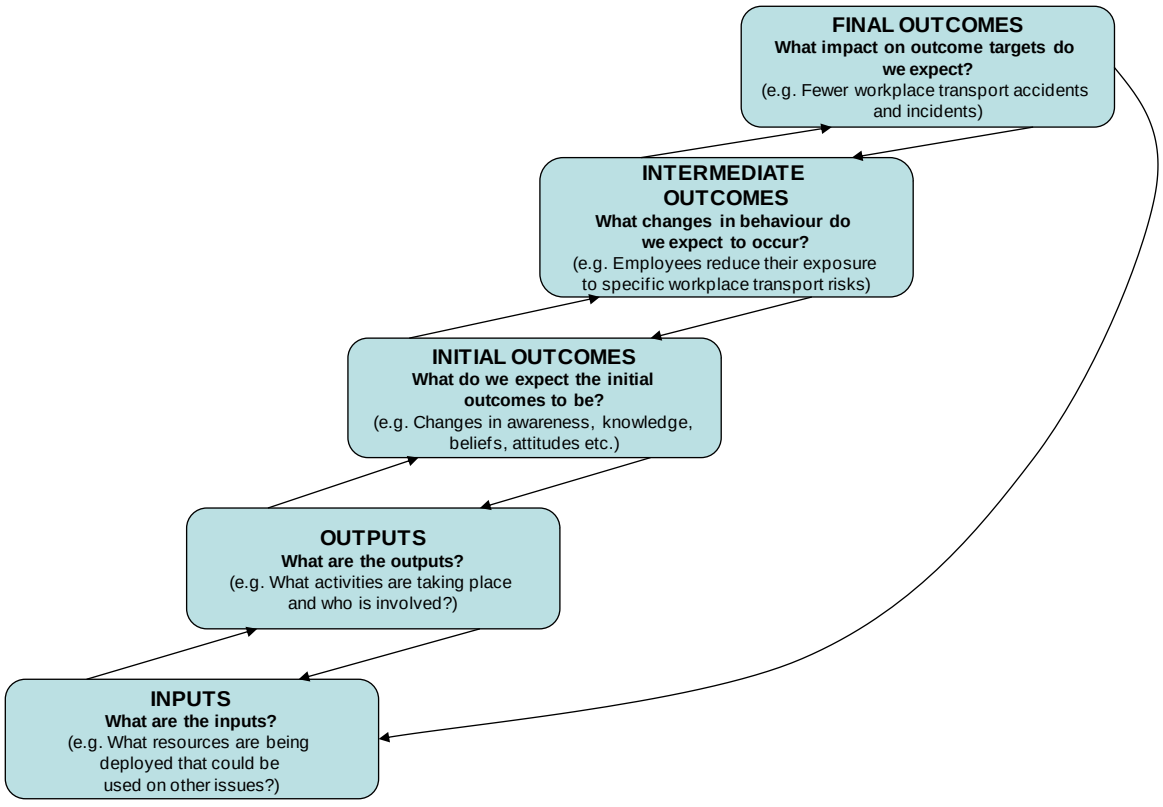


Figure 64 Stages in the intervention impact chain

Figure 64 illustrates how when a new safety intervention is launched there are certain project inputs and project outputs, and then several stages that must be attained before arriving at the final outcome measure, a reduction in accidents. The key aspect of Figure 64 in relation to this current project report is the identification of outcome measures that should be collected by HSA in the future in order to ensure that progress can be measured against the baseline. Figure 64 highlights that before final outcomes can be realised, there needs to be a change in attitudes and awareness (initial outcomes) and then a change in behaviour (intermediate outcomes). Following these changes, it is anticipated a reduction in accidents will follow.

8.3 FUTURE OUTCOME MEASURES

In order that HSA can trace progress in WTS and evaluate future interventions, it is important to have a framework of outcome measures in place: initial, intermediate and final. Table 12 therefore presents a series of suggested outcome measures that also link to the baseline measure presented in this report.

Table 12 Suggested future outcome measures

Outcome measures		
Initial (e.g. awareness, attitudes)	**Intermediate (e.g. behaviours, practices)**	**Final (e.g. incident reductions)**
Employee (including drivers) knowledge, awareness and attitudes about workplace transport risk in general Non-worker awareness about the risks of workplace transport Management and employee (including drivers) knowledge, awareness and attitudes about workplace layout and design Management knowledge of WTS policies, procedures and systems	Driver behaviour in relation to speeding Driver behaviour in relation to wearing hi-viz protection Pedestrian behaviour around the workplace Changes made to the workplace layout Introduction of WTS management policies, procedures and systems Integration of WTS management systems with general safety management systems Introduction of appropriate reversing aids on vehicles to reduce risks associated with reversing	Number of fatal and non-fatal workplace transport related accidents Number of workplace transport related dangerous occurrences Number of incidents occurring to drivers Number of incidents involving non-workers Number of incidents occurring at factories, industrial sites or warehouses and public areas

Table 12 presents a range of suggested future outcome measures, that, if collected over the course of time HSA will be able to use to directly compare against the baseline measure in order to assess the extent and nature of any observed changes / improvements. It is not intended that this list is exhaustive, but it does provide a framework for the outcome measures and some initial suggestions.

9. REFERENCES

[1] Health and Safety Executive. 2005. Workplace Transport Safety, An Employers Guide.

[2] http://www.hse.gov.uk/press/2007/gnnne22307.htm

[3] http://www.hse.gov.uk/research/hsl_pdf/2007/hsl0739.pdf

[4] http://www.workcover.nsw.gov.au/NR/rdonlyres/22258511-918B-468B-843C-BE8739AD1DD2/0/fork_lift_truck_drivers_guide_0007.pdf

[5] http://www.worksafe.vic.gov.au/wps/wcm/resources/file/ebcad2435c446c8/forklift_safety.pdf

[6] http://www.workcover.act.gov.au/pdfs/guides_cop/Forklift_Safety_Booklet.pdf

[7] http://www.monash.edu.au/muarc/reports/muarc030c.pdf

[8] http://www.monash.edu.au/muarc/reports/Other/Guidebook%20forklifts%2003.pdf

[9] http://www.orsa.org.uk/guidance/pdfs/dft_safetyculture.pdf

[10] http://www.rospa.com/roadsafety/resources/employers.htm

[11] http://www.forkliftaction.com/news/newsdisplay.aspx?nwid=5234

[12] http://hsa-store.ptools.com/index.asp?locID=35&docID=271

[13] http://publications.hsa.ie/index.asp?locID=18&docID=157

[14] http://www.hse.gov.uk/workplacetransport/sitelayout.htm

[15] http://www.nra.ie/Publications/DownloadableDocumentation/LGMSBDocument-GuidancefortheControlandManagementofTrafficatRoadWorks/file,10784,en.pdf

[16] http://www.dft.gov.uk/drivingforwork/content/overview.asp?pid=2

[17] http://www.dft.gov.uk/drivingforwork/content/overview.asp?pid=2

[18] http://www.hse.gov.uk/pubns/indg199.pdf

[19] http://www.hse.gov.uk/lau/lacs/32-7.htm

[20] http://www.workcover.act.gov.au/pdfs/work_reports/Report-ForkliftSafety.pdf

[21] http://www.hse.gov.uk/workplacetransport/menzies.htm

[22] http://www.ncts.ie/test.html

[23] S.I. No. 368/2000 — Road Traffic (National Car Test) Regulations, 2000.

[24] http://www.worksafe.vic.gov.au/wps/wcm/resources/file/ebcde6435dd11c4/prevention_falls_trucks.pdf

[25] http://www.worksafe.vic.gov.au/wps/wcm/connect/WorkSafe/Home/Forms+and+Publications/Guidance+Notes/import_Car+carrying+vehicles+-+preventing+falls

[26] http://www.hse.gov.uk/fallsfromvehicles/casestudies.htm

[27] http://publications.hsa.ie/getFile.asp?FC_ID=378&docID=114

[28] http://www.hse.gov.uk/workplacetransport/pm28.pdf

[29] http://www.worksafe.vic.gov.au/wps/wcm/resources/file/eb737d466f7218b/HSS0018%20-%20Purchasing%20or%20hiring%20a%20safe%20and%20efficient%20forklift%20Industrial%20Lift%20Truck.pdf

[30] http://www.worksafe.vic.gov.au/wps/wcm/connect/WorkSafe/Home/Forms+and+Publications/Alerts/import_Trucks+without+warning+devices+for+reversing+are+a+hazard

[31] http://www.cso.ie/census/Census2006_Volume7.htm

APPENDIX A – COPY OF FINAL QUESTION SET AND LOGIC UNDERPINNING QUESTION INCLUSION

Workplace transport survey

Developed by
BOMEL Limited

For the Health and Safety Authority

SUGGESTED INTRODUCTORY SCRIPT

- ***Hello, my name is…(INSERT NAME)…and I work for an independent research organisation called BOMEL and we are conducting a short survey on behalf of the Health and Safety Authority. The survey lasts about 15 minutes and is about workplace transport. Workplace transport refers to all vehicles that come inside the workplace perimeter such as forklift trucks, cars and heavy goods vehicles. This project is not looking at road safety.***

- ***The Health and Safety Authority is keen to learn how organisations are approaching the issue and we would really appreciate your insight which will ultimately help to improve safety in the area.***

- ***If you would be happy to take part, everything that you say will be treated in the strictest of confidence. We will not share individuals' details or answers with the Health and Safety Authority or any other parties and the results of the survey will be combined to explore overall trends.***

- ***Would you like to take part?***

- ***(IF INDIVIDUAL SAYS 'NO' AT THIS POINT, THANK THEM FOR THEIR TIME AND THEN POLITELY END THE CALL)***

NOTE: if interviewee is concerned about the legitimacy of the study, you can tell them that there is a description of the study on the HSA's website: http://www.hsa.ie/eng/Statistics/Updates/

- ***Great, thanks!***

- ***Please stop me at any time if you have any questions or do not wish to continue. You have the right to withdraw at any time without giving a reason. Before we begin, do you have any questions?***

- ***By continuing with this interview, I will take it as your full consent to participate.***

- ***Would you like our contact details in case you have any queries about this survey following participation? please contact us on_____***

INTERVIEWER NOTE: IF A RESPONDENT ASKS WHAT IS A 'WORKPLACE VEHICLE?' It includes: forklift trucks, bicycles, cars, Heavy Goods Vehicles and mobile cranes...

... and excludes: trolleys, wheeled bins and wheeled platforms.

SECTION 1 - BACKGROUND QUESTIONS

INTRODUCTION TO SECTION 1: To start with there are a few background questions about yourself and the organisation you work for

1. As a starting question, could you describe what your organisation does?		
2. What industry sector would you say (INSERT COMPANY NAME)	**Sector**	**Tick**
	Sector	Manufacturing in
If *Other* please specify:		
3. Approximately what size is your organisation (not including contractors)?	Size	1 to 9
4. What is your role?	Owner/Director	☐
	Senior manager	☐
	Manager	☐
	Health and Safety Manager	☐
	Health and Safety Representative	☐
	Frontline manager / Supervisor	☐
	Advisor	☐
	Administrator	☐
	Operator/driver	☐
	Other	☐
If *Other* please specify:		
5. Approximately how many sites do you have in Ireland?		
6. What size is your site? (e.g. either by approximate acres or by number of cars / HGVs etc.)		

SECTION 2 – VEHICLES AT WORKPLACE

INTRODUCTION TO SECTION 2: I have some questions about the vehicles that used on your site

7.	I am going to read out a list of vehicle types, please could you indicate which you might expect to see in use on your site(s)? Also: include any that may be used by the public, suppliers or visitors.	**Tick all that apply**	On a **TYPICAL** day at your largest site, how many do you think might be in use at any one time?
	Lift trucks:	☐	
	Fork lift	☐	
	Reach truck	☐	
	Rough terrain truck	☐	
	Telescopic truck	☐	
	Side-loading lift truck	☐	
	Heavy Goods Vehicles	☐	
	Trailer units	☐	
	Electric / motorised pallet trucks	☐	
	Shunters	☐	
	Tractors	☐	
	Vans	☐	
	Cars	☐	
	Pick-up trucks	☐	
	Bicycles	☐	
	Motorbikes	☐	
	All Terrain Vehicles (e.g. Quad bikes)	☐	
	Waste carrying vehicles (for refuse collection)	☐	
	Emergency vehicles	☐	
	Cranes	☐	
	Buses/coaches	☐	
	Seated lawnmowers	☐	
	Other	☐	
	If *Other* please specify:		

8.	Do members of the public access your site(s)?	Yes / No	Yes
9.	If *Yes*: Can they enter the site(s) (by)...	On foot?	☐
		Road vehicle (including cars, vans, bikes & motorbikes etc)?	☐
		Bus?	☐
		Other?	☐
	If *Other*, please specify:		
10.	Do suppliers (e.g. delivery drivers) access your site(s)?	Yes / No	Yes
11.	If *Yes*: Can they enter the site(s) (by)... (tick all that apply)	On foot?	☐
		Car/van?	☐
		Heavy Goods Vehicle?	☐
		Other?	☐
	If *Other*, please specify:		
12.	Are any of the following used to unload vehicles?	**Method**	**Tick all that apply**
		A lift truck	☐
		Wheeled cages (containing products)	☐
		Wheeled bins	☐
		Loads carried by hand	☐
		Crane	☐
		Tail gates	☐
		Electric / motorised pallet truck	☐
		Conveyor belt	☐
		Other	☐
	If *Other*, please specify:		

SECTION 3 - VEHICLE SELECTION AND MAINTENANCE

INTRODUCTION TO SECTION 3: I now have a few specific questions about the vehicles that you own or lease and are in use on your site(s)

13. How do you select vehicles? Please indicate which of the following criteria vehicle selection is based on:	**Criteria**	**Tick all that apply**
	Suitability for the task	☐
	Safety features	☐
	Cost	☐
	Industry reputation	☐
	Driver recommendation	☐
	Other recommendation	☐
	Combination of the above	☐
	Other	☐
If *Other*, please specify:		

14. Are drivers consulted when purchasing new vehicles?	Yes / No	Yes
15. If *Yes* to Question 14 can you describe how they are consulted?		

LIFT TRUCK FEATURES

16. Considering the **LIFT TRUCKS** that are in use, please indicate which of the following are available:	**Feature**	**Tick all that apply**	**Don't know**
	Handles to aid access to vehicle	☐	☐
	Mirrors	☐	☐
	Seatbelts	☐	☐
	Reverse alarm	☐	☐
	Horn	☐	☐
	Roll-over protection (e.g. a cage / basket or enclosed cab)	☐	☐
	Lights	☐	☐
	Falling Object Protection	☐	☐
	Attachments (please indicate):	☐	☐
	Integrated work platform (lifting people)	☐	☐
	Non-integrated work platform (lifting people)	☐	☐
	Rotator (to rotate loads)	☐	☐

	Paper clamp (for large reels of paper)	☐	☐
	Drum clamp (e.g. to lift oil drum)	☐	☐
	Crane (to lift materials with rope/crane)	☐	☐
	Hopper (e.g. to carry rubble)	☐	☐
	Boom (to carry carpet, or other cylindrical load)	☐	☐
	Other	☐	☐
If *Other*, please specify:			

HEAVY GOODS VEHICLES FEATURES

17. Considering the **HEAVY GOODS VEHICLES** that are in use, please indicate which of the following are available:	**Feature**	**Tick all that apply**	**Don't know**
	Handles to aid access to vehicle (cab/load area...)	☐	☐
	Reverse alarm	☐	☐
	CCTV (at rear of vehicle)	☐	☐
	Access steps to load area	☐	☐
	Non-driving controls at a low level (e.g. coupling or refrigeration controls)	☐	☐
	Devices to prevent falls (please indicate):	☐	☐
	Barriers/guards on tail gates	☐	☐
	Barriers/guards on load area	☐	☐
	Vehicle fitted fall protection harness	☐	☐
	Workplace fitted fall protection harness	☐	☐
	Automated sheeting/tarping	☐	☐
	Other	☐	☐
If *Other*, please specify:			

18. Do drivers need to access the top of the vehicle?	Yes / No	Yes

ALL COMPANY VEHICLES

19.	Do drivers carry out safety checks before using a vehicle?	Yes / No	Yes
20.	Are your vehicles maintained?	Yes / No	Yes
21.	If *Yes* to Question 20, do you use...	In-house resource?	☐
		The leasing company?	☐
		A contractor?	☐
		Other	☐
	If *Other*, please specify:		
	If a combination is used, please describe who does what?		
22.	Are records kept relating to a vehicle's maintenance history?	Yes / No	Yes

SECTION 4 - SITE LAYOUT AND MAINTENANCE

INTRODUCTION TO SECTION 4: I now have a few questions about worksite(s) design

23.	Approximately how old is the layout of the (largest) site? (as opposed to how old the site is)	Age of layout	Less than 1 year
24.	Is the site shared with another company?		Yes
25.	Does your organisation own the site?		Yes

26. Thinking about your worksite, which of the following are present?

Feature	Tick all that apply	Don't know
Vehicle only areas	☐	☐
Pedestrian only areas	☐	☐
Designated visitor parking	☐	☐
One-way systems for vehicles	☐	☐
Speed limits	☐	☐
An entrance to the site for pedestrians that is separate to vehicles	☐	☐
Marked or painted walkways	☐	☐
Barriers between pedestrians and vehicles	☐	☐
Marked parking for all worksite vehicles	☐	☐
Loading bays	☐	☐
Full lighting in areas where vehicles operate	☐	☐
Traffic lights/signals	☐	☐
Lanes for vehicles to travel in	☐	☐
A safe refuge for visiting drivers during loading / unloading	☐	☐
Requirement to wear PPE	☐	☐
Other	☐	☐

If *Other*, please specify:

27.	Is reversing carried out on site?	Yes

SECTION 5 – ATTITUDES AND SAFE BEHAVIOURS

INTRODUCTION TO SECTION 5: I now have some general statements about workplace transport safety which I would like you to indicate your level of agreement with; from 'Strongly Disagree' to 'Strongly Agree'

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
28. I think that drivers look out for pedestrians that are on site	Strongly disagree				
29. I believe that this organisation has got workplace transport safety under control	Strongly disagree				
30. I believe that management do **not** take workplace transport safety seriously enough	Strongly disagree				
31. I believe that pedestrians are **not** aware of the risks associated with workplace transport	Strongly disagree				
32. I think that some of our vehicles are **not** quite up to the job	Strongly disagree				
33. I think that the way the worksite is laid out makes it very safe to get from one part of the site to another	Strongly disagree				
34. I think that from time-to-time you have to expect that drivers will take risks to get the job done	Strongly disagree				
I have now got a series of similar statements, but this time I would like you to indicate how frequently the following occur. The scale runs from 'Always', 'Often', 'Sometimes', 'Rarely' to 'Never'.	**Always**	**Often**	**Sometimes**	**Rarely**	**Never**
35. When people are working on or near vehicles (e.g. loading/unloading) how often do they wear Hi-Viz clothing?	Always				
36. When site visitors are near vehicles, how often do they wear the same personal protective equipment as employees?	Always				
37. How often do people walk across areas where vehicles operate?	Always				
38. How often do drivers leave their vehicles in designated parking areas?	Always				
39. How often can vehicles be seen going too fast?	Always				
40. How often is getting the right equipment for loading / unloading a vehicle, a problem?	Always				
41. How often are restraints used to protect people from falls from vehicles?	Always				
42. How often are visitors accompanied around the site by a member of staff?	Always				

SECTION 6 - DRIVERS

INTRODUCTION TO SECTION 5: This section is about your employees that drive on your premises.

43. I am going to read a list of items that you may or may not use to select applicants for a driving role, please indicate which are used:

Method	Tick all that apply	Don't know
Person specification (a description of the skills and abilities required for the role)	☐	☐
Application form or CV	☐	☐
Interview	☐	☐
Pass/fail tests	☐	☐
References	☐	☐
Anything else?	☐	☐

If *Anything else*, please specify:

44. In addition to any legal requirements for training drivers, please indicate which of the following are true:

Feature	Tick all that apply	Don't know
Training is in place for NEW drivers	☐	☐
Training is based on the requirements of the job	☐	☐
Training is provided internally	☐	☐
Training is provided by an external agency	☐	☐
Refresher training courses are run for all drivers	☐	☐
Anything else?	☐	☐

If *Anything else*, please specify:

SECTION 7 - MANAGEMENT PRACTICES

INTRODUCTION TO SECTION 7: This last section is about management practices.

			Yes / **No**	**Don't know**
45.	Do you have a general safety management system in place?		**Yes**	
46.	Do you have a workplace transport management system, policies and procedures in place?		**Yes**	
			Tick all that apply	**Don't know**
47.	I have a list of safety-related management activities that your organisation may employ **in relation to workplace transport**; please indicate if you use any of the following?	Random drugs and alcohol tests for drivers	☐	☐
		Safety tours by managers that cover vehicle safety	☐	☐
		Safety briefings that cover workplace transport	☐	☐
		Targeted inspections (e.g. on vehicle safety)	☐	☐
		Penalties for unsafe working practices	☐	☐
		A 'near-miss' reporting scheme	☐	☐
		A 'suggestion box' scheme where employees can add ideas to improve safety	☐	☐
48.	Does your organisation refer to any of the following when it comes to workplace transport safety?	**Material**	**Tick all that apply**	**Don't know**
		Health and Safety Authority Website	☐	☐
		UK's Health and Safety Executive Website	☐	☐
		Other websites	☐	☐
		Please specify which:		
		Magazines	☐	☐
		Please specify which:		
		Are you a member of an organisation that provides advice relating to workplace transport safety?	☐	☐
		Please specify which:		

49.	I am going to read a list of 6 things that could improve workplace transport safety. What would be most and least helpful to you?		**Most and least**
		MOST HELPFUL 1	More time
		MOST HELPFUL 2	More time
		LEAST HELPFUL 1	More time
		LEAST HELPFUL 2	More time
50.	If you could recommend one thing for the Health and Safety Authority to do to help you improve workplace transport safety, what would it be?		

"Thank you, again, for your valuable help and assistance in this important study. Do you have any questions? Would you like my contact details in case you have any queries at a later date?"

Interviewees name (if obtained):	**Company name:**	**Contact number:**

Question 51. COMPANY MAIN REGION No comment

TELEPHONE QUESTIONNAIRE RATIONALE

Question	Rationale
1	Essential to work out organisation's operation, a core requirement.
2	NACE sector categories – necessary to determine representation of survey and issues by sector. Construction, Quarrying, Agriculture, Extra-territorial and Householders as employers have been omitted.
3	Key requirement of the study.
4	Perspectives and knowledge of interviewee are likely to vary according to seniority and role.
5	The number of places of work indicates the size and geographic extent of the organisation.
6	The size of the present site that the respondent works in provides insight into the size of the operation.
7	To work out which vehicles are in use and how many are in use. The number in use at any one point provides an indication about how busy and intensive operations are.
8	Members of the public are likely to be inexperienced users of a site and require different management strategies to employees.
9	Understanding how members of the public access a site will highlight what the type of risks are likely to be.
10	Suppliers that bring vehicles onto a site require different management strategies to employees as they may be inexperienced, be familiar with different procedures and unaware of site specific risks.
11	Understanding how suppliers access a site will highlight what the type of risks are likely to be.
12	The type of equipment (agent) that is in used when loading/unloading is important to understand as risks vary.
13	Identifies what companies see as important when it comes to vehicle selection.
14	Driver consultation in vehicle procurement helps to ensure that vehicles are fir for purpose.

Question	Rationale
15	Mechanisms for consultation indicate whether consultation is 'lip-service' or sufficiently detailed.
16	Lift trucks have been identified as representing a key risk in workplaces. The features listed can all help to reduce and mitigate that risk. The extent of their presence can be used to target efforts.
17	Goods Vehicles represent a key risk in workplaces. The features listed can all help to reduce and mitigate that risk. The extent of their presence can be used to target efforts.
18	Working at height is a key theme from the information review.
19	Relating to company vehicles, drivers' responsibility to ensure that their vehicle is safe before using it is addressed here. Vehicle problems are more likely to be detected with regular pre-use checks.
20	Vehicles need to be maintained to be safe.
21	Methods of vehicle maintenance provide a clue about how well vehicles are maintained and whether maintenance is initiated by the respondent or the owner (if leased)
22	The presence of records relating to vehicle maintenance provides insight on the level of vehicle safety. Knowing a vehicles service history is central to preventative maintenance techniques.
23	Evidence from the rail industry indicates that depots with a design that has not changed for many years are associated with increased accident rates. This is often due to increased demand that has not been met by an increased capacity/re-design.
24	Managing safety across interfaces is generally more difficult.
25	Site ownership will make it easier to make modifications.
26	All the features listed here have been recommended in guidance (from the literature review).
27	Reversing has been identified as a high-risk activity.
28	Attitudes to driver perception of pedestrians as vulnerable users.
29	Attitude to effectiveness of company's approach to WPT.
30	Attitude to management's commitment to WPT.

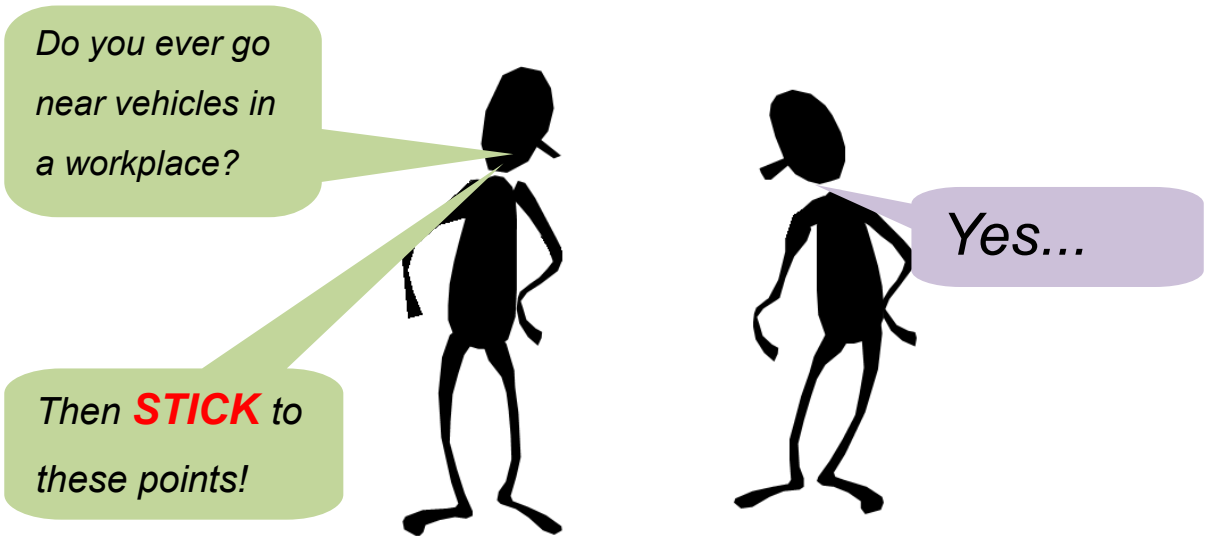
Question	Rationale
31	Attitude to pedestrians' risk awareness.
32	Attitude to the standard of vehicle safety.
33	Attitude to suitability of site layout.
34	Attitude to risk taking and rule compliance in relation to drivers.
35	Being able to see colleagues will help reduce likelihood of collision.
36	Guidance indicated that employees and pedestrian visitors should wear the same PPE.
37	High levels of pedestrian and vehicle 'co-habitation' means that pedestrians are at risk from vehicle collisions. Pedestrian-vehicle segregation is key.
38	Correctly parked vehicles help those working around them (e.g. loading and unloading), indicates how well managed the workplace is and helps a driver leave the area in a safe manner.
39	Excessive speed is associated with increased collision likelihood.
40	Not having the right equipment for loading can encourage people to take risks.
41	Falls from vehicles are a key risk and protection measures are an important mitigation.
42	Visitors are likely to be unfamiliar with the workplace – if they have someone with them to guide them, this can be a good risk reduction measure.
43	Multi-method approaches for driver selection that are based on valid competencies can help ensure that appropriate applicants are selected for the role of driver.
44	Training is central to any competence management system. The items included are indicative of the different aspects of training.
45	The cornerstone of management practice.
46	The cornerstone of management practice in relation to vehicle management.
47	The steps that are included are recognised as being associated with safer organisations.
48	Key requirement of the study.

Question	Rationale
49	Most topics were identified in the ITT as possible constraints; the question has been designed to assess which is the most desirable to change.
50	Occasionally novel and innovative ideas may follow on from the discussion; this is a useful opportunity to capture these.

APPENDIX B – COPY OF WORKPLACE TRANSPORT SAFETY CASE STUDIES

HEALTH AND SAFETY AUTHORITY

PEDESTRIAN SAFETY A STICKY ISSUE



STICK to the rules

Rules are there to protect

STICK to walking

It's not a training ground

STICK to the pedestrian walkway

It's what it's there for

STICK to crossing points

Drivers will be looking out for you

STICK on a High Visibility Jacket

Be seen, be safe

STICK with your guide

If you're visiting, ask someone to take you around

STICK your eyes and ears out

Look and listen, remember some vehicles are very quiet

STICK up for yourself and others

Report unsafe acts or defects to the person in charge

WORKPLACE TRANSPORT CASE STUDY: PEDESTRIAN SAFETY

HEALTH AND SAFETY AUTHORITY

ARE YOU A PROFESSIONAL DRIVER?

WORKPLACE TRANSPORT CASE STUDY: DRIVER CHECKLIST

The challenge

Recent research carried out on behalf of the Health and Safety Authority (HSA) identified that in 2007 there were over 1,500 injuries and 14 fatalities[1] in Ireland relating to workplace transport safety; a large number of these involved drivers. Many of these injuries could be prevented if drivers took a few sensible precautions.

"But I'm a good driver already..."

"...then try the professional workplace driver challenge."

The professional workplace driver challenge	Yes	No
Part 1 – YOURSELF		
1. Do you arrive at work refreshed and well rested? *Why? Driving when you are tired can be as dangerous as driving when you are over the drink drive limit.*	✓	x
2. Do you always wear your Personal Protective Equipment (PPE) such as your High Visibility jacket? *Why? PPE is there to protect you and let people know you are there.*	✓	x
3. Do you always travel at a safe speed and keep to speed limits? *Why? Speed is a factor in many incidents. Speed limits are there to protect yourself and others.*	✓	x
4. Do you stick to the workplace rules? *Why? Rules are there to protect you and others, highlight the ones that are difficult to apply to your boss.*	✓	x
5. Do you report unsafe behaviours, near-misses and accidents? *Why? Management need to know if people are behaving unsafely and if there are near-misses or accidents, it could be you that suffers.*	✓	x

[1] These injury and fatality figures exclude the following industry classifications: 'Agriculture, Hunting and Forestry', 'Fishing', 'Mining and Quarrying' and 'Construction'.

The professional workplace driver challenge	Yes	No
Part 2 – YOUR SCHEDULE		
6. Do you turn up for work giving yourself a chance to prepare for the shift? *Why? Being punctual gives you a chance to make sure everything is in place before you drive.*	✓	X
7. Do you check for any last minute alterations to your schedule? *Why? Picking up on changes to orders and other arrangements can save wasted journeys and help you do the job.*	✓	X
8. Are you sure you always know what the task requires before you operate your vehicle? *Why? If you know what you're doing, you will pay more attention to your surroundings when you are driving.*	✓	X
Part 3 – YOUR VEHICLE		
9. Do you know what to do if you have unsafe or insecure loads? *Why? Unsafe or insecure loads are clearly a hazard, you need to be clear what to do to stop the situation getting worse.*	✓	X
10. Do you walk round and check your vehicle and loads, using a checklist? *Why? Checking your vehicle ensures that you and others are protected.*	✓	X
Part 4 – YOUR WORKPLACE		
11. Do you always explain to others in the area what you are doing? *Why? Explaining to others what you are doing gives then a chance to get to a position of safety.*	✓	X
12. Are you actively thinking about what you see and hear? *Why? Understanding your surroundings helps you make better decisions and anticipate others correctly.*	✓	X
13. Do you try to anticipate pedestrian and other vehicle movements as well as changing road conditions? *Why? Don't assume that someone will see you, expect the worst.*	✓	X
14. Do you use your voice, where possible to alert others? *Why? Your voice is a good way to grab attention and others will appreciate your communication.*	✓	X
15. Do you always stick to marked road/routes? *Why? Not using appropriate routes increases the chances of an accident with pedestrians.*	✓	X
16. Do you give pedestrians priority in the workplace? *Why? Giving pedestrians priority cuts the chances of you hitting them.*	✓	X

If you answered 'yes' to all questions, well done!

If there were some questions where you answered 'no', what do you need to do to make the difference?

"Professional workplace driving helps keep you, your colleagues, customers and the public safe"

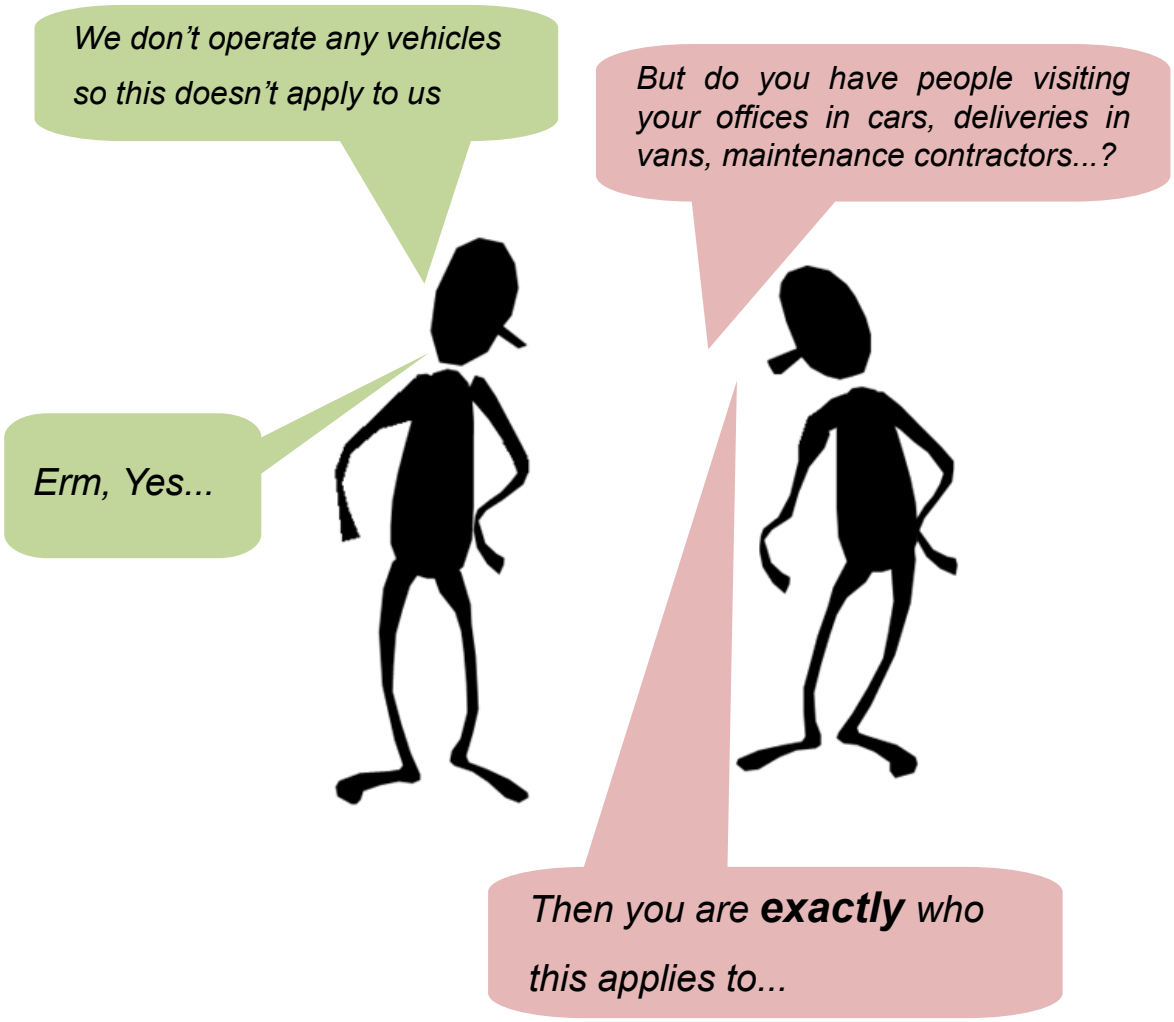
HEALTH AND SAFETY AUTHORITY

WORKPLACE TRANSPORT SAFETY… THAT MEANS YOU!

WORKPLACE TRANSPORT CASE STUDY: ASSESS THE RISK

The challenge

Many organisations wouldn't normally associate themselves with workplace transport safety risks. But these organisations are just as much at risk because they haven't assessed the hazards and risks properly.



The solution

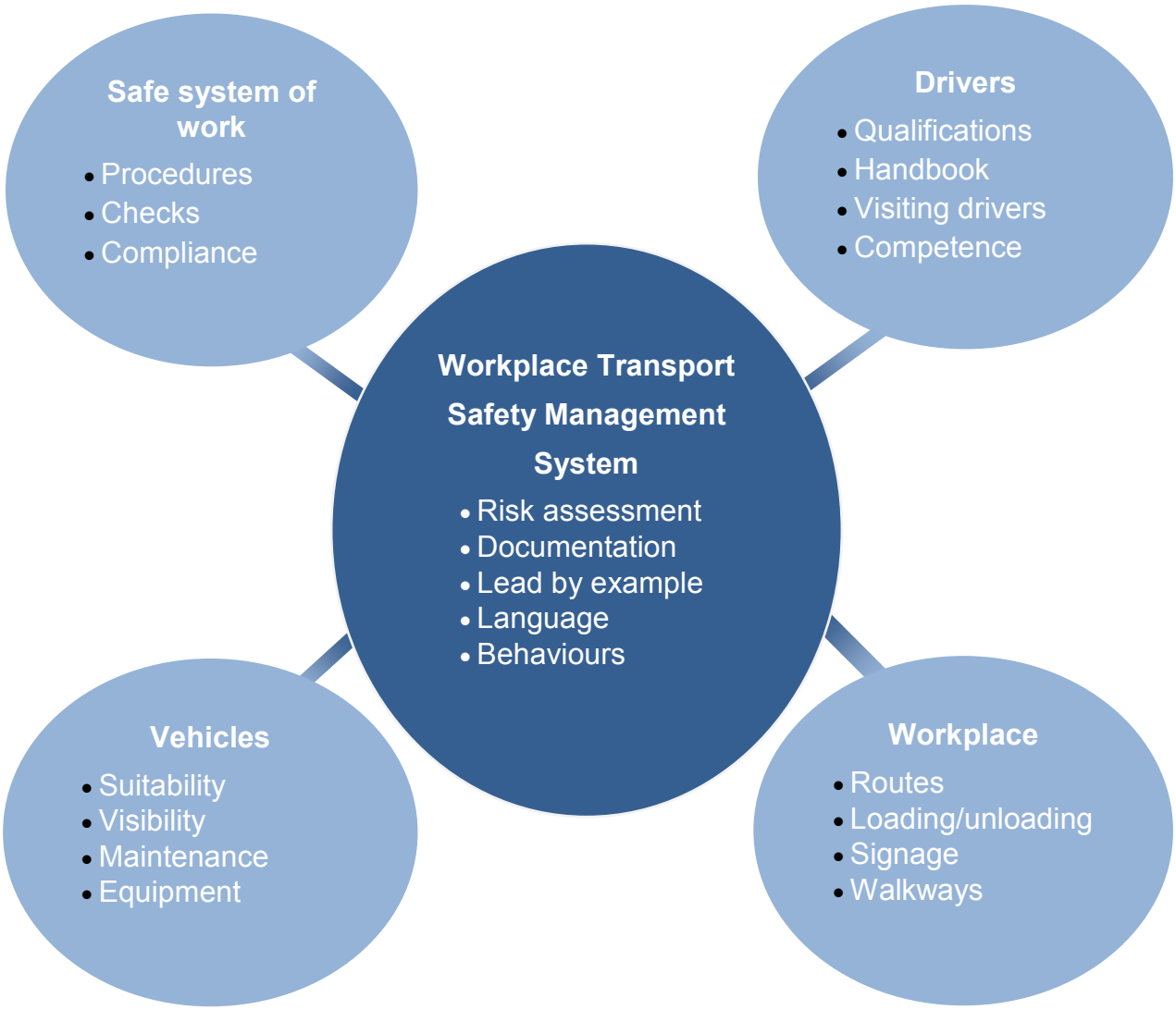
To help employers carry out an assessment of their premises, the Health and Safety Authority (HSA) have developed an easy-to-use checklist. The checklist is an aid to employers in assessing and controlling workplace transport hazards. Read it, take it out, circulate it to key staff and act on it...

HEALTH AND SAFETY AUTHORITY

WORKPLACE TRANSPORT SAFETY… THAT MEANS YOU!

WORKPLACE TRANSPORT CASE STUDY: ASSESS THE RISK

Example checklist areas



The benefits

Safer pedestrians - Use of the checklist will help you protect pedestrians from injury.

Smoother operations - Smoother operations will result from well-controlled risks. This will help ensure a smooth flow of deliveries and visitors.

Commercial advantage - Safer operations will also help protect you from claims, adverse publicity, and downtime.

To obtain your checklist, go to:

http://www.hsa.ie/eng/Sectors/Transport/Information_and_Guidance/

A checklist cannot address all areas and some areas may not be relevant to all workplaces. There is no substitute for specific risk assessments.

HEALTH AND SAFETY AUTHORITY

WATCH OUT ... TRAFFIC ABOUT!

WORKPLACE TRANSPORT CASE STUDY: MANAGING PEDESTRIAN SAFETY

The challenge

Recent research carried out on behalf of the Health and Safety Authority (HSA) indicated that all 111 organisations surveyed said they had pedestrians moving around their workplace. Worryingly, 45% of these organisations believed that pedestrians were not aware of the risks associated with workplace transport.

Pedestrians may be employees, members of the public or visiting workers that pass near vehicles in the workplace. This could range from someone walking across a bank's car park or a maintenance engineer arriving on site, to a customer walking near a fork-lift truck at a supermarket or builder provider's yard, or even someone passing near a mobile crane.

What can you do to help keep all pedestrians safe?

The solution

The single most effective way to protect pedestrians is to keep them apart from vehicles, but this is often not enough. The following steps are useful ways to protect pedestrians:

Warn them - When pedestrians enter your workplace for the first time, warn them about the hazards that exist. This can be achieved by using signs, notices, leaflets and telling them about the hazards.

Enable them - So that they can negotiate the hazards, pedestrians need to be clear about how to stay safe in the workplace. Site rules, procedures and instructions need to be clearly described to pedestrians. You need to instruct pedestrians about what they need to do to stay safe - don't let them move around your workplace until you are certain they know what to do.

Refresh them – Pedestrians that are familiar with a workplace may become complacent with hazards and start taking short-cuts. Refresher training and provision of information will help combat this, and also shows your commitment to their safety.

HEALTH AND SAFETY AUTHORITY

WATCH OUT ... TRAFFIC ABOUT!

Control them - Segregate pedestrians and vehicles as soon as they enter the workplace. Prevent pedestrians from entering prohibited areas and provide clearly marked walkways where possible. Prohibit people from entering areas where vehicles operate or use barriers or guard rails to segregate them from vehicles. Where people have to cross vehicle routes, provide designated crossing points that have clear visibility for pedestrians and drivers, day and night.

Stay with them - Do not let pedestrians walk freely around your workplace. Visitors should be accompanied at all times to keep them away from the danger areas.

Equip them - Where pedestrians must work in the vicinity of workplace transport, or pass close to areas where vehicles operate, provide them with adequate personal protective equipment such as high visibility clothing.

The benefits

Safer pedestrians - Following these simple steps will help protect pedestrians from injury.

Smoother operations - Segregating pedestrians from vehicles means smoother and more efficient operations. It lets drivers and pedestrians focus on their jobs.

Commercial advantage - It will also protect you from claims, adverse publicity, and downtime.

WORKPLACE TRANSPORT CASE STUDY: MANAGING PEDESTRIAN SAFETY