

HGV Driver Recruitment and Retention Rapid Evidence Assessment

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Executive summary

There has been a continuing shortfall of HGV drivers across the UK and globally. The Department for Transport (DfT) commissioned a Rapid Evidence Assessment (REA) to understand the range of barriers and enablers to recruitment and retention of Heavy Goods Vehicle (HGV) drivers, including how and whether these vary across different demographic groups, HGV operator size and different route types. The secondary aims were to establish examples of good practice associated with recruitment and retention and highlight where there are gaps in the current evidence base.

The report presents findings from 59 pieces of literature that were selected following a process of systematic searching, screening, prioritising and extracting of the evidence.

The evidence reviewed predominantly comprised of primary research with HGV drivers and, to a lesser extent, industry stakeholders, which used quantitative and qualitative methods to explore respondents' views. The review found a lack of evidence that used more rigorous methodologies, such as a randomised control trial, to provide more robust evidence.

Key findings

The review found a wide range of barriers and enablers to recruitment and retention of HGV drivers, including issues relating to the role itself, business/HGV operator-related challenges and those associated with the wider environment. Many of the issues cited applied to both recruitment and retention. In some cases, enablers mirror and are a result of, the factors that emerge as key barriers to recruitment and retention in the HGV driver role when they are lacking or insufficient.

Drawing on research with drivers, there appeared to be some barriers to recruitment and retention that were perceived to be the most important. These were: **poor pay; high costs associated with training and maintaining qualifications; long hours; a lack of or poor facilities;** and finally, a barrier primarily to retention, was **a lack of supportive management.**

Additional barriers to recruitment and retention that were identified as less important by drivers included: **excessive rules and regulations; a lack of value and respect for the role among the public; poor health and wellbeing of drivers; poor treatment of drivers by delivery sites; personal safety concerns;** and, **truck design.**

While there were no explicit enablers associated with recruitment and retention found in the evidence, the literature explored what attracted drivers to the role, which can be seen as implicit enablers to recruitment. These included: the **role offering autonomy and freedom; enjoying driving; knowing someone in the role** and, **having secure employment.** Aspects of the HGV driver role that were found to be most important to drivers (and therefore seen as implicit enablers of retention) centred around **pay; working conditions;** and **good relationships with supportive management and dispatch staff.** Although there was variation across the evidence as to the relative importance of each factor and a distinction emerged between US and UK/European evidence; improved work life balance, having a trustworthy manager and general job satisfaction were more important than pay for UK and European than US drivers according to the evidence reviewed.

The review found limited evidence around whether and how barriers vary across groups. Where there was evidence exploring the experiences of different groups, **gender, age** and **experience** were in focus. Specific barriers to recruitment and retention cited by women drivers included **sexism, concerns around safety** and **features of the role, such as long hours and weekend work**, which were considered incompatible with family responsibilities, such as caring for children. For younger drivers, **high training and insurance costs for those under 25 years old** was considered a factor that stopped businesses employing younger drivers. Younger people were also found to **lack awareness of the wider sector**. The evidence suggests that those with more experience, typically older drivers, were sometimes treated with more respect and were in receipt of more favourable terms and conditions in relation to pay and workplace flexibilities.

There was limited evidence as to whether barriers to recruitment and retention differed by business/HGV operator size. Where evidence was available, it proved contradictory in its conclusions in relation to whether smaller or larger firms were better placed to retain employees. The review also found that **long-haul driving** and **working night shifts** were harder roles to recruit for. There is some European evidence that self employed drivers may have poorer access to benefits and insurance products compared with employed drivers

The review found no evidence that presented specific successful recruitment or retention approaches and practices. However, the literature presented a wide range of suggested or recommended practices that *could* support with recruitment and retention; these were largely based on the findings from primary research with drivers and wider sector stakeholders. Four suggested recruitment methods were cited extensively across the literature, these were: **targeted recruitment; introducing apprenticeships and better availability of training; raising interest and awareness of the sector** and; **improving the perceptions of the sector and HGV driver role**. A range of practical barriers to entering the role were also found, and a number of suggested approaches to overcoming these were cited, including: **supporting with the up-front costs associated with the Driver Certificate of Professional Competence qualification; supporting returning drivers with the costs associated with re-training; and addressing the higher insurance costs for new and young drivers**.

Identified good practice and recommendations for improving retention of HGV drivers related to three areas: **improving features of the role; improving the culture and support of the workplace; and improving the wider environment in which drivers operate**. The literature also highlighted the need for operators to consider tailoring retention practices for different groups of drivers, indicating that there is no 'one size fits all' approach.

1. Introduction

This report presents findings of a Rapid Evidence Assessment (REA) on the barriers and enablers to Heavy Goods Vehicle (HGV) driver recruitment and retention. The primary aim of this REA is to establish the range of enablers and barriers associated with recruiting and retaining HGV drivers, including whether and how these vary among different demographic groups. The secondary aim is to establish examples of good practice associated with recruitment and retention. The report highlights where there are key gaps in the evidence. This review will inform the design of future primary research the Department for Transport (DfT) intend to conduct, to address any evidence gaps identified and support future policy development.

1.1 Background to review

There have been continuing shortfalls of HGV drivers over several decades with an acute shortage emerging in 2021, and the issue is not unique to the UK. Existing research into the underlying causes of driver shortages identifies both 'external factors', such as the COVID-19 pandemic, exit from the EU, and wider national and international macroeconomic and demographic shifts, as well as 'internal' factors, such as long hours or the nature of the work itself (Piecyk & Allen, 2021; Logistics UK, 2020). Research has identified a lack of support from employers, poor facilities, and negative public attitudes (Welsh Parliament, 2021), and issues around low pay, contract issues and benefits (Ji-Hyland & Allen, 2020).

It should be noted that the literature cited in this report is largely historic - pre-dating recent acute driver shortages. Therefore, any changes to the market in response to these recent shortages will not be reflected in this report.

1.2 Research questions

The review attempts to answer the following questions:

1. What are the barriers and enablers to HGV driver recruitment and retention?
 - a. What *features of the role* are barriers and enablers to recruitment and retention? This could include, but is not limited to:
 - i. Working hours, shift patterns and flexibility
 - ii. Support for driver welfare, physical and mental health
 - iii. Pay and terms of employment
 - iv. Driver facilities
 - b. What are the *business/HGV operator-related* barriers and enablers to recruitment and retention? This could include, but is not limited to:
 - i. Higher insurance costs associated with employing less experienced drivers
 - c. Which enablers and barriers to recruitment and retention are most important?
2. Are there examples of best practice for recruiting and retaining HGV drivers? If so, what are these?
 - a. What recruitment methods are most successful for appointing HGV drivers? (e.g. via recruitment agencies, job centres, informal approaches etc.)

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- b. What approaches and conditions are most successful for retaining HGV drivers? (including but not limited to: shift patterns / flexibility, and support for welfare, physical and mental health)
 3. How do the barriers and enablers to HGV driver recruitment and retention vary across groups, including:
 - a. Business/HGV operator size; route type (domestic, long haul, short haul)?
 - b. Demographics (age, gender, ethnicity, and others) and specifically underrepresented groups, including ethnic minorities, women and younger people?
 4. What are the evidence gaps?

1.3 Methodology

The study used a Rapid Evidence Assessment (REA) methodology. An REA sits between a literature review and systematic review: it follows rigorous and explicit methods for searching, screening, assessing and synthesising evidence, whilst making informed compromises on aspects of the systematic review process in order to deliver findings quickly.

The REA involved a review and assessment of academic texts and grey literature; the former being identified through complex search strings and the latter through extensive web-site searches. A total of 208 papers were identified as meeting the inclusion criteria and 59 papers were selected for inclusion in the review after following a rigorous prioritisation process. Further details on the methodology can be found in chapter two.

When reading this report it should be noted that a number of the prioritised primary research studies are based on small sample sizes and use convenience sampling approaches. There is limited evidence that uses more rigorous methodologies, such as randomised control trials and forms of sampling, such as non-probability based and quota sampling, to provide more robust evidence of what acts as a barrier or enabler to recruitment or retention. **Appendix B** provides a summary of the prioritised evidence describing the sample size, the type of analysis undertaken and an overall assessment of quality.

1.4 Report structure

The report structure is as follows:

- **Chapter two:** detailed methodology used to conduct the REA
- **Chapter three:** addresses research question 1
- **Chapter four:** addresses research question 3
- **Chapter five:** addresses research question 2
- **Chapter six:** presents evidence gaps

2. Methodology

This chapter provides a summary of the methodological approach used to complete this REA including the criteria and processes for the search strategy, screening, data extraction and synthesis. Full methodological details can be found in Appendix A.

2.1 Search strategy

The study involved separate searches for academic and grey literature, the latter referring to research produced by organisations outside of the traditional commercial or academic publishing and distribution channels.

Academic literature was searched for using complex search strings in academic databases including, Scopus, Econlit, TRID (Transport Research International Documentation) and Business Source Primer. The search strings were informed by a set of inclusion and exclusion criteria which can be found in Appendix A.

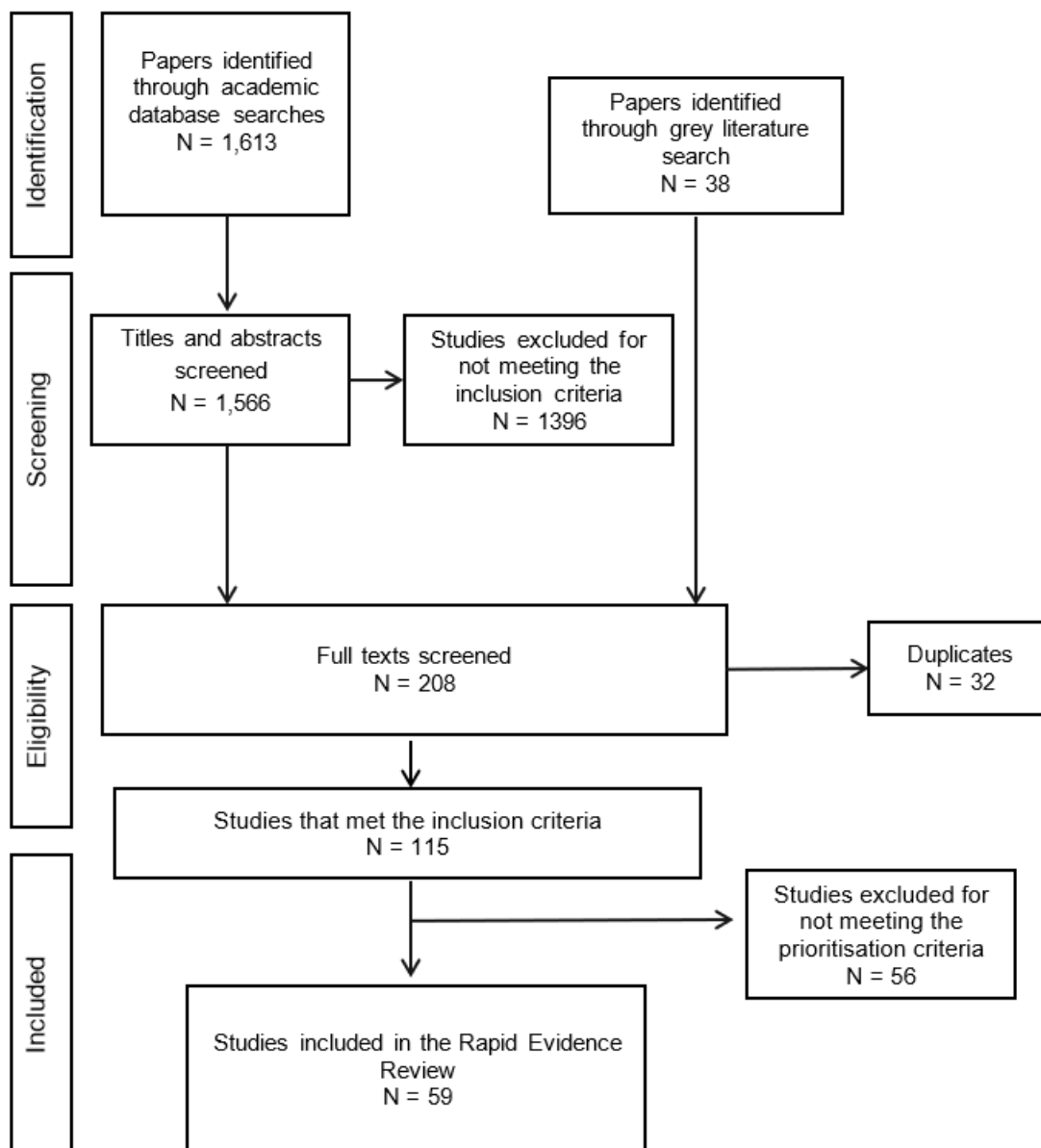
Grey literature was searched for using a list of relevant websites and a set of agreed search terms, that were identified with input from the DfT. The list of websites can be found in Appendix A. A limited search using Google and Google Scholar was also conducted using the same list of search terms.

In cases where a study was identified as particularly relevant, citation tracking was conducted. This involved looking through the list of references in the chosen paper and/or viewing all of the papers that were cited in the paper to establish their relevance for the REA.

2.2 Screening

Academic papers were screened at two stages - at title and abstract and at full text. A total of 1,566 were screened at title and abstract. 208 were then screened at full text, including 38 pieces of grey literature found. On completion of full text screening 115 papers met the inclusion criteria. A systematic prioritisation process was undertaken based on assessing the relevance and quality of each paper. A detailed overview of this process can be found in Appendix A. The PRISMA flowchart in Figure 1 outlines the results of the search and screening stages completed.

Figure 1 PRISMA flow diagram



2.3 Data extraction and synthesis

A thematic framework was developed to help organise the evidence extracted from the prioritised papers. The framework was structured by the key themes included in the research questions, including features of the role and HGV/ operator-led factors leading to barriers and enablers to recruitment and retention; which barriers and enablers are most important; whether and how barriers and enablers vary across groups; examples of proven best practice (i.e. where there is evidence to demonstrate success); and examples of recommended best practice (i.e. approaches that have yet to be proven). Members of the research team read each paper in full and populated the framework with the relevant evidence.

Once extraction was complete, the evidence was narratively synthesised by research question. This was done by using a 'framework method', employing analytical matrices reflecting our primary and secondary research questions.

3. Enablers and barriers to recruitment and retention

This chapter provides an overview of the barriers and enablers to recruitment and retention of HGV drivers. It includes an examination of the relative importance of the various barriers and enablers identified. These sections also denote which barriers are intrinsic to the HGV driver role, business/HGV operator led, or related to the wider environment. The final section examines how barriers to and enablers of recruitment and retention vary by driver or operator type.

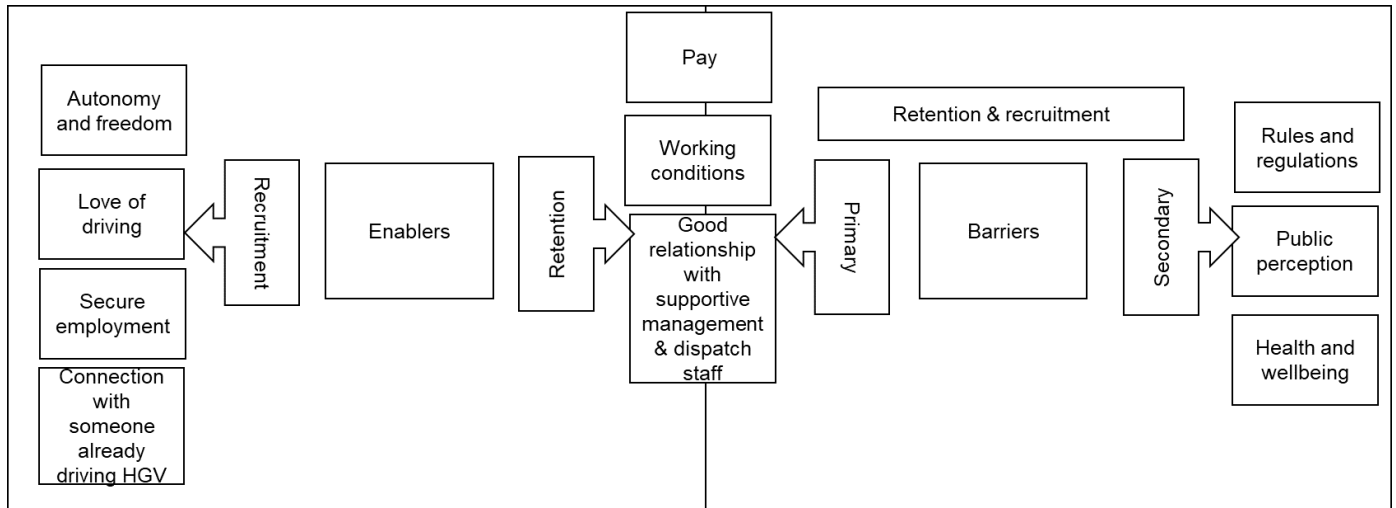
A clear distinction between recruitment and retention issues is made where possible. However, the evidence does not always distinguish between the two, and many barriers and enablers appear to apply to both recruitment and retention challenges.

3.1 Barriers to recruitment and retention of HGV drivers

The evidence draws on quantitative and qualitative research with HGV drivers (and to a lesser extent, industry stakeholders, including operators) that explores their views on the key barriers to recruitment and retention of HGV drivers. Figure 2 provides an overview of the enablers and barriers to recruitment and retention. It demonstrates that there are differences between the enablers associated with recruitment and those associated with retention. However, the factors of pay, working conditions, and quality of relationships with supportive management and dispatch staff can act as both enablers to retention and as barriers to retention and recruitment. The evidence suggests some barriers to recruitment and retention are more important than others to HGV drivers.

This section begins by exploring the barriers that the evidence suggests were most important to recruitment and retention, before examining the factors that were seen as of secondary importance, although nevertheless effective barriers.

Figure 2 Primary and secondary enablers and barriers to recruitment and retention



3.1.1 The most important barriers to recruitment and retention of HGV drivers

The evidence identifies the most important barriers to recruitment and retention of HGV drivers as:

- inadequate pay;
- the long hours of the role;
- a lack of access to quality facilities; and,
- unsupportive management.

Examples of studies that suggest that these factors are the most important barriers include a large-scale survey of UK drivers exploring views on what was causing the driver shortage (Talent in Logistics, 2020). The study found that 34% of drivers attributed shortages to poor pay, 19% to poor working hours, and 12% to a lack of respect for the role. Similarly, a survey of truck drivers in Europe (International Road Transport Union, 2019) found that sub-optimal working conditions, including poor facilities and long periods away from home were the biggest barriers deterring people from entering the road transport profession. Smith (2021c) also cites an Asset Alliance Group ‘industry monitor’ report that surveyed company owners and management who identified low wages and poor roadside facilities as key barriers to employers being able to source new drivers. These primary barriers to recruitment and retention of the HGV driver role are discussed in turn below.

Pay and costs

Two business/HGV operator-related barriers cited widely across the literature were poor pay and high costs associated with the initial and ongoing training required as part of the role. Several studies involving primary research with drivers found that pay was perceived as too low to reflect the responsibility, challenge and sacrifice involved in the role. This was identified as a barrier to both recruitment and retention in the literature (Le May et al., 2009; House of Commons Transport Committee, 2017; Piecyk, 2021; Welsh Parliament Economy, Trade and Rural Affairs Committee, 2021).¹

The impact of poor pay was exacerbated by perceived unfair and sometimes unavoidable fines. For example, a small-scale qualitative study carried out with current and former HGV drivers found that if a driver exceeded their driving limit due to traffic, they could face a £300 fine (Welsh Parliament, 2021). A report by the House of Commons Transport Committee based on consultation with industry stakeholders, exploring skills and workforce

¹ It should be noted that the sources citing poor pay as a barrier pre-date a reported increase in HGV drivers wages which occurred following an acute shortage of drivers, see Earnings and Hours Worked data (Earnings and hours worked, occupation by four-digit SOC: ASHE Table 14 - Office for National Statistics (ons.gov.uk)) for example.

planning in the road haulage sector, noted that the average hourly rate of pay for drivers of Large Goods Vehicles (LGV) was slightly lower than that of bus and coach drivers, and yet the LGV driver role requires a higher skills level and has a greater training requirement (House of Commons Transport Committee, 2017). It was also noted that some job adverts were not clear about the true take home pay or had unappealing caveats around pay, such as signing on bonuses that were only paid in small instalments or lost if sick leave was taken in the first six months (Welsh Parliament, 2021). (See discussion of lack of transparency of details of the role below)

Furthermore, the HGV driver role was seen as costly to enter and to maintain competency in. A member survey of drivers and operators across Europe carried out by the International Road Transport Union (2019) found that obtaining the Driver Certificate of Professional Competence (CPC) qualification cost up to £3000. The upfront costs of entering the sector for new drivers also include the cost of equipment and training. In addition to the cost of obtaining the Driver CPC, drivers must complete 35 hours of training every five years to retain their Driver CPC qualification and continue driving professionally, which costs an estimated £500-1000 to complete (Welsh Parliament, 2021). At the same time, a survey of German truck drivers suggests there is relatively low opportunity cost for drivers to change employer, which contributes to high turnover rates (Prockl et al., 2017).

Long hours

A key feature intrinsic to the role, is the requirement for HGV drivers to work long shifts (such as 12-14 hours), night shifts, irregular and unsociable hours and 41-60 hours or more per week. This was cited in the evidence as one of the most important barriers to both recruitment and retention of HGV drivers (Houtman et al., 2004; Beers et al., 2017; Caddick et al., 2017; Piecyk, 2021; Hyland and Allen, 2022). The unpredictability of working hours was found to compound the stressful nature of the role (House of Commons Transport Committee, 2017). A survey of female road transport workers found that over half of respondents worked over eight hours per day (International Transport Workers Federation, 2014).

Moreover, drivers felt that the issue of long, unpredictable hours was exacerbated by manipulative actions of their employers and/or delivery sites. For example, to circumvent the Working Time Directive legislation that limits working hours to no more than a 48 hour week average over a 17 week block, drivers in the Welsh Parliament (2021) study reported being pushed by their employer to work 60 hour weeks, then were stood down or given shorter runs towards the end of the block to bring the average back down to the legal limit.

The report by the House of Commons Transport Select Committee (2017) mentioned abuse of 'periods of availability', which is essentially waiting time, not a break or a rest, when drivers have to be at their place of work (for procedures such as unloading and loading) which can increase their total hours worked per week over the maximum. The report also found reports of drivers being kept waiting hours to unload a delivery. This made it more difficult to plan their home life and further work that they might have to do after waiting.

Long hours were perceived as one of the most important barriers to retention because of the associated impact of long, irregular hours on tiredness, stress, and reduced opportunities for physical exercise, family time and a social life outside of work, which affected drivers' overall wellbeing. The evidence found that being away from home for long hours placed a strain on drivers' family lives and relationships (Sousa and Ramos, 2018; Fitzpatrick, 2020; Welsh Parliament, 2021). Drivers also missed significant family events and experienced scheduling conflicts between their work and family plans, and missed scheduled appointments due to work trips taking longer than anticipated (Fernandez, 2011).

Facilities

A barrier that related to the wider environment, rather than the role or the industry, was poor access to quality facilities for hygiene and sanitation at rest stops and service stations. This was cited in several sources of evidence as a barrier to both recruitment and retention of HGV drivers (House of Commons Transport Committee, 2017; Gregson, 2018; Sousa and Ramos, 2018; International Road Transport Union, 2019, Welsh Parliament, 2021). Drivers complained of broken showers and dirty washing facilities at rest stops, as well as being refused access to toilets at delivery sites (see further discussion of drivers' treatment at delivery sites in section 3.1.2).

A lack of fit for purpose, safe and affordable parking was another important issue raised by drivers in relation to facilities. A lack of available parking meant drivers were sometimes forced to drive over the legal time limits to reach the next facility with available parking, which meant they incurred a fine (Welsh Parliament, 2021). Furthermore, several papers reported that drivers cited concerns about the lack of safety of overnight parking

facilities, and the fear of theft and violence was reported to affect drivers' levels of stress and ability to sleep overnight. (Gregson, 2018, Fitzpatrick, 2020; Welsh Parliament, 2021) (see further discussion of personal safety in section 3.1.2). Poor facilities, including insecure parking and a lack of healthy food available, were also seen as contributing to some of the health and wellbeing challenges described in section 3.1.2.

Relationship with employer/management

An important business/HGV operator-related barrier related to drivers feeling unsupported, undervalued, and not listened to by their employers. The evidence suggests this is a barrier, primarily to retention, but also potentially to recruitment. In one UK survey, only 21% of drivers felt their opinion mattered when their company was looking to change and improve things. Only 37% agreed that they would trust their manager if they spoke to them about a mental health concern, and 36% felt they were recognised by the company for the job they did (Talent in Logistics, 2020).

According to the evidence reviewed, the lack of support from management manifested in various ways, but centred around management pressuring drivers to work longer hours or under otherwise unfavourable conditions in order to meet business targets, and prioritising business needs over drivers' wellbeing. Examples in the literature include:

- A qualitative study involving older (age 50+) HGV drivers that found drivers reported being excessively pushed by managers to meet unrealistic delivery time targets with no margins of error, leading to high levels of stress (Beers et al., 2017);
- The House of Commons Transport Select Committee (2017) report suggested that the use of in-vehicle technology to monitor the driver was seen by some drivers as the 'spy in the cab' which was being used by employers to monitor and on some occasions to bully drivers in to doing more and faster; and,
- The Welsh Parliament (2021) qualitative study of UK HGV drivers explained that management of 'infringements' and disciplinary actions taken by employers were perceived by drivers as often unreasonable and excessively punitive.

Other challenges that emerged from the evidence relating to how drivers were treated by their employer included:

- **A lack of channels or mediation mechanisms through which drivers can raise grievances and issues** with their employer, such as employee committees (Welsh Parliament, 2021). Similarly, a qualitative study with drivers in the US found that participants perceived their employer's leadership to be unwilling to listen to feedback from employees. Most drivers who participated in the study felt that communication was not heard by leadership, and expressed little hope of seeing improvement in this area (Fernandez, 2011).
- **A lack of progression opportunities offered by the employer.** A UK survey of 1,300 drivers found that although 83% of 18-30 year old drivers wanted to progress in their career, only 30% saw their company as a good place to develop, and only 29% felt that career opportunities were clearly communicated by their employer (Talent in Logistics, 2020). This suggests a disparity between the number of drivers who see progression as a goal and the number who see it as a realistic possibility.
- **A lack of flexible working opportunities.** The same UK survey found that although 73% of drivers wanted the opportunity to work flexibly, 43% did not consider their company to allow flexible working. Only a third of drivers said their company supported the balance between work and personal life. (Talent in Logistics, 2020).
- **A lack of transparency about the true nature of the role with job candidates.** This issue emerged in US literature only. One US study involving secondary research (Miller et al., 2021) found that when new hires were not fully informed by their new employer of the features and conditions of the role, such as how long they will need to wait until they get paid, equipment maintenance practices, and loading and unloading times, this led to drivers leaving their job as they realised the job did not suit their needs as they had previously assumed. Fernandez (2011) found in their study that some truck drivers felt they had been deceived by their employers who had not kept promises made to attract drivers when hiring. Seventy-two per cent of drivers reported deception by their employer regarding payment when they first started in the job, 64% said they had experienced broken promises from their employer, and 40% said their contracts were unclear.

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- **Drivers being treated with lack of respect and support by dispatchers.** Fernandez (2011) also found that the majority of drivers participating in their study reported issues relating to micromanagement, unrealistic dispatcher expectations, and disputes with dispatchers relating to route selection. These drivers reported feeling helpless and unable to improve their work conditions. The Welsh Parliament (2021) study also found that drivers complained about poor and unrealistic route planning, that could fail to consider the suitability of the vehicle for the chosen roads, time constraints of the journey, or the need for overnight parking. A qualitative study conducted in Canada that involved drivers and dispatchers found that the quality of the driver-dispatcher relationship and communications is an important factor in influencing drivers' job satisfaction, and intention to quit. The study concluded that where drivers do not feel "heard" and are not treated with compassion, it can undermine drivers' trust in their employer and job satisfaction. Higher work volumes were also found to increase the likelihood of the driver-dispatcher relationship deteriorating (Fournier, et al., 2012).

3.1.2 Secondary barriers to recruitment and retention of HGV drivers

Although seen as less important, or 'secondary' barriers to those discussed above, there were other, additional barriers to recruitment and retention of HGV drivers identified in the evidence reviewed. These included: excessive rules and regulations; a lack of value and respect for the role among the public; poor health and wellbeing of drivers; poor treatment of drivers by delivery sites; personal safety concerns; and, truck design. These emerge as secondary rather than primary barriers because they are not identified by research respondents in the evidence as the most important barriers, but are nevertheless seen as issues affecting retention and recruitment.

Excessive rules and regulations

Excessive rules and regulations were identified as a wider environmental barrier. Several sources found that the requirement to abide by what were perceived to be excessive and increasingly strict regulations, including those around working hours, medical requirements and age restrictions, were barriers to working in the sector (Beers et al., 2017; House of Commons Transport Committee, 2017; Williams et al., 2017; Welsh Parliament, 2021; Hyland and Allen, 2022). Among the UK literature, there is little expansion on this theme to explore the ways in which regulations impact drivers. The 2017 House of Commons Transport Committee report explains that drivers are required to understand detailed rules on licensing, the Driver CPC, working hours, registration of operators and dangerous loads. Other regulations, such as bans on daytime delivery or air quality controls, force drivers to work unsociable hours. A meta-analysis of secondary data from various European countries found evidence that drivers lack the ability to influence the pace at which they work and their workload. It also found that drivers were not involved in pacing and planning their work (Houtman et al., 2004). This could be seen as being in direct conflict with the sense of freedom and autonomy which attracts many drivers to the role.

Pertaining to the rules and regulations in the US, a study by Williams et al., (2017) involving qualitative interviews with truck drivers provided insight into how regulations may impact drivers and their feelings about their role. Drivers spoke about the negative impact government regulations were having on their ability to maximise their pay, and how regulations increased scrutiny of the driver's safety record or health status and tightened requirements in order to remain eligible to drive. This increased drivers' stress as they feared they could lose their job if they could not meet the requirements. Although truck drivers understood the intent of many of the regulations, they also expressed frustration and felt they were being unfairly targeted by a regulatory system that was working against them

A lack of value and respect for the role among the public

Another barrier associated with the wider environment centred around a lack of value and respect for the role among the public. There was some evidence to suggest that drivers perceived there to be a negative public perception of and attitude towards HGV drivers, which they feel acts as a barrier to both recruitment and retention (Houtman et al., 2004; Lodovici et al., 2009; Piecyk, 2021). The Welsh Parliament (2021) qualitative study reported that drivers thought that the public saw HGV driving as an unskilled job, and do not appreciate the responsibilities that come with the role, despite drivers' efforts and the challenging working conditions that they endure. Another qualitative study of female drivers (Fitzpatrick, 2020) reported other road users being inconsiderate to lorry drivers, and showing them disrespect through their driving behaviour.

Drawing on primary and secondary data analysis Lodovici et al., (2009) also found that public perceptions of the HGV driver job were considered to be off-putting for anyone considering entering the role, due to its negative image as involving long, antisocial working hours, long periods away from home, stress and congestion, low wages and poor career prospects. The study conducted by Talent in Logistics (2020) also found that only 34% of drivers surveyed thought their job role is seen as a 'profession' by the public. Moreover, the House of Commons

Transport Committee's 2017 report claimed that HGV drivers are often implicated in media stories about cyclists who are killed or injured. The report also suggested that the stories about drivers being prosecuted for bringing migrants into the UK illegally, and the images of lorries on the approach to cross channel services in France being chased by migrants trying to stow away, and drivers fearful of being attacked, were considered likely to have an unsettling effect on anyone thinking about working as a driver or questioning whether they should stay in the sector.

Poor treatment of drivers at delivery sites

Although evidence of this barrier was relatively scant in the literature, poor treatment of drivers at delivery sites emerged as a both a business/operator and role-related barrier. Houtman et al., (2004) found that drivers felt they were not treated fairly or respectfully by delivery sites, where they often had to wait for long periods of time. In addition, a report by the International Road Transport Union (2022) claimed that, in addition to improving facilities, a key issue that should be addressed in order to improve drivers' working conditions was to improve the treatment of drivers at loading and unloading sites. It was suggested that issues at delivery sites that should be addressed included a lack of toilets for drivers to use, long waiting times, and drivers being required to unload and load and handle pallets.

Poor health and wellbeing

The evidence reviewed suggests that HGV drivers associated their job role with a range of physical and mental health issues, including tiredness and fatigue.

Physical health problems experienced by drivers were considered to be exacerbated by long shifts in a sedentary position, poor access to healthy food options, and irregular working hours, which made it challenging for drivers to fit exercise in to a regular schedule outside of work. The evidence reviewed found that drivers are required to stay with their vehicle during down time between deliveries which presents a further barrier to taking exercise (Beers et al, 2017). Furthermore, the long and unpredictable hours of the role could make it difficult for drivers to attend medical appointments (Welsh Parliament, 2021). Caddick et al (2017) determined that drivers' ability to be healthy was limited by the need to meet the demands of their job role and their employer. In this way, the study pointed to wider, socio-economic determinants of driver health rather than individual barriers such as a lack of knowledge or motivation among drivers of how to stay healthy.

Williams et al., (2017) found that the nature of the job encourages drivers to take up unhealthy eating habits, such as picking up fast food and drinking lots of caffeine to stay alert. Moreover, if a driver became ill while on the road, they found it challenging to get medical attention or rest when needed.

Truck drivers who took part in a Portuguese qualitative study (Sousa and Ramos, 2018) described their job as uncomfortable work, having to stay in one position for hours at a time. Several papers also reported that drivers attributed the sedentary nature of the role, stress on the body through loading and unloading activities, and the impact of constant truck vibrations on the body, as key causes of their physical health problems, which were most commonly musculoskeletal disorders and cardiovascular disease (Houtman et al., 2004; Staats et al., 2017; Sousa and Ramos, 2018).

A literature review exploring truck drivers' health found that a high proportion of truck drivers suffered from obesity, high blood pressure and sleep apnoea, which contribute to early death. The study claimed that health problems and fatigue increased the risk of driver human error that causes road accidents, which means the health problems and fatigue of truck drivers pose a serious risk to drivers' safety (Boyce, 2015).

Tiredness and fatigue were reported as another key challenge for HGV drivers. The evidence, including that from a US qualitative survey of long haul truck drivers (Sersland, 2015), suggested that insufficient and poor-quality sleep is highly prevalent among US HGV drivers, particularly when working irregular, long, and night shifts, and this is associated with poor psychological wellbeing and an increased risk of road traffic accidents in HGV drivers. Furthermore, the fatigue that accumulates over and towards the end of long working shifts was reported by drivers as taking time to recuperate from, which eats into drivers' time off (Bernard, 2000; Beers et al., 2017). A qualitative study with UK male lorry drivers conducted by Caddick et al., (2017) found that it was common for drivers to come home from work feeling exhausted, and drivers described their job as not physically exhausting but long and mentally draining, with no energy left to take exercise after a long shift.

Stress and mental health were also prevalent themes in the evidence reviewed. Loneliness was commonly experienced by drivers, not only when working in the role, when they spent long periods of time alone, but also

when home, as some reported feeling too tired to enjoy time with family (Williams et al., 2017; Gregson, 2018; Hyland and Allen, 2022). In addition, the pressure to meet targets of timed deliveries, while managing worsening congestion, was seen as a key contributor to stress in the role (House of Commons Transport Select Committee, 2017). Many EU member states that contributed to one report (Houtman et al., 2004) pointed to the problem of stress among drivers due to time pressure of the role triggered by tight deadlines. The role was considered to be increasingly time pressured as the sector becomes more competitive and demanding.

Personal safety concerns

Another barrier associated with the role itself was the issue of personal safety. Several papers found that some drivers reported experiencing, or fearing the threat of, violence and theft while working. Evidence from a European paper (Kubanova and Kubasoakova, 2020) highlighted that drivers have a huge responsibility for the goods they carry, which makes it a dangerous profession. It claimed that there are hundreds of new incident reports on freight theft every month. Houtman et al., (2004) also found that in the UK, there were reports of poor personal security for drivers, with thefts from vehicles and physical attacks reported.

A survey of US truck drivers (Swartz et al., 2017) found that drivers' perceptions of how their employer supports their safety in work was positively related to their overall job attitude and their intentions to leave. If drivers felt their employers' policy and practice did not support their safety, for example, if their employer penalised them for not working beyond their shift in order to deliver their final load, or incentivised drivers to do U-turns by not paying them for out-of-route miles when they miss an exit, this could increase their intention to leave.

Truck design

A survey of female truck drivers carried out in the US (Black et al., 2017) identified some challenges with the truck design for the comfort of drivers (although survey respondents were female, the authors of the study state that findings can be generalised to all genders). Survey respondents reported a lack of adjustability of seats which make them uncomfortable to sit in. Other issues raised included the steering wheel obstructing the driver's view of the dashboard, pedals being problematic, and handrails being inaccessible.

3.2 Enablers of recruitment and retention of HGV drivers

Through primary research with HGV drivers, the evidence reviewed provides some insight into what initially attracted them to the role (which can be seen as implicit enablers of recruitment) as well as aspects of the role that are most important to them (considered as primarily enablers of retention, but also of recruitment).

3.2.1 What attracted HGV drivers to the role

Considering enablers of recruitment of HGV drivers, some studies explored what had initially attracted HGV drivers to the role. Drivers most commonly cited the sense of autonomy and freedom offered by the role, their love of driving, knowing someone who works in the sector, and the prospect of secure employment, as reasons why they chose to enter the role.

- **Autonomy and freedom.** The main aspect of the role that drivers enjoyed was the sense of autonomy and freedom they have in their role, including being able to use their own judgement while driving, and to go about their job with little interference (Houtman et al., 2004; Le May et al., 2009; Fitzpatrick, 2020; Hyland and Allen, 2022). Feeling like they were their own boss was reported as a key aspect of the role that appealed to HGV drivers (Beers et al., 2017). Being an HGV driver was described as a nomadic experience, and some drivers reported enjoying a good social network with other drivers, with whom they could discuss life on the road and swap tips and information (Gregson, 2018).
- **Love of driving.** Enjoying driving was a common reason for choosing a career as a HGV driver (Talent in Logistics, 2020; Hyland and Allen, 2022).
- **Knowing someone who already works in the role.** Another reason for entering the role cited by drivers was knowing someone in their family or friendship circle who worked in the sector (Fitzpatrick, 2020, Talent in Logistics, 2020).

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- **Secure employment.** A HGV driving job was seen to offer secure employment, with ample work opportunity in a mixed methods study carried out in Ireland (Hyland and Allen, 2022).

The study conducted by Talent in Logistics (2020) provides a typical example of how the relative importance of these factors was expressed. The research found that, when drivers were asked what their favourite aspect of their jobs was, 28% of drivers said the independence/freedom of the role; 22% said travel opportunities/seeing the open road; 9% said being their own boss; 8% said driving; 7% said meeting new people, and 3% said variety.

3.3 Aspects of the HGV driver role that are most important to drivers

Through primary research carried out with drivers, the literature suggests that aspects of the HGV driver role that are most important to drivers (and therefore implicitly associated with both recruitment and retention) centre around pay, working conditions, and good relationships with supportive management and dispatch staff. These enablers mirror and act as a corollary to the themes that emerge as key barriers to recruitment and retention in the HGV driver role when they are lacking or insufficient, as discussed above. Further, these enablers are primarily industry-led factors.

3.3.1 Pay

There is a lack of research evidence exploring the nature of pay as an enabler of recruitment and retention. Although it is clear from the literature that sufficient pay is seen as a key enabler, there is a lack of evidence on what level of pay would be deemed 'sufficient', a threshold which determines the relative importance of pay, or which type of remuneration model would be most effective in enabling recruitment and retention. However, one study (Talent in Logistics, 2021) found that the two most attractive benefits to driver respondents were income protection insurance, and critical illness cover. The authors argue that this underlines the importance to drivers of receiving a fair and guaranteed wage, and this was seen by drivers as more important than one-off cash bonuses or other long-term benefits, such as increased holiday entitlement.

3.3.2 Management and working conditions

Regardless of the order of importance, it is clear in the evidence reviewed that, in addition to pay, supportive management and working conditions are seen as key enablers of retention of HGV drivers. Some examples of research evidence that suggests this is a primary enabler include:

- A US survey of truck drivers (Al Arkoubi, 2013) that found that if workers were treated fairly, they were more likely to be satisfied with their job, which was seen as an implicit enabler of retention.
- A US review of secondary sources (Mitchell and Rozell, 2007) found evidence to suggest that dispatchers who show understanding of and are responsive to drivers' concerns have lower levels of driver turnover. This review also cited evidence that dispatcher competence, that is, speed and accuracy in dispatch, payroll, emergency assistance and other areas that are important to drivers, was more important than the friendliness of dispatchers in retaining drivers.
- A German study (Large et al., 2014) found that perceived organisational support was the main determinant for drivers to change employers.
- In a survey of LGV and HGV drivers (Talent in Logistics, 2021) one of the most reiterated themes and used words in responses to the survey's open-ended questions was 'respect'. Being treated with respect by their employer was seen by drivers as a key factor that would keep them in their job. The authors suggested that to retain existing skilled drivers, employers must listen to what they really want and need, rather than offering incentives that they think drivers might like.
- Drivers who participated in a US survey listed the most important aspect of their role as being (in no particular order) their employer: being honest with them and quick to solve problems for them; offering them good compensation for their work; giving them adequate time to be at home with family and loved ones; showing loyalty to their drivers; and, providing adequate opportunities for advancement (Cosenza, 2012).

The evidence suggests that although pay and supportive management and working conditions are the most important aspects of the role to drivers, there is variation between individual studies in the relative importance placed on each of these factors. In the evidence reviewed, a distinction emerged between findings from US and UK/European studies.

Some US studies suggested that pay was the most significant enabler of retention. For example, Garver et al., (2008) surveyed US truck drivers and found that sufficient pay was a statistically significant predictor of driver intention to stay with their employer company for 100% of participants, while good relationships between drivers and dispatch staff, and between drivers and top management were both statistically significant for 78% of participants. Williams et al., (2011) also surveyed US drivers and found the most important variables to drivers were (in descending order of importance): pay, personal safety, time at home and equipment, opportunities for career advancement, workload, dispatcher relationship, and career development. Similarly, Sersland (2015) found that pay and time at home were important considerations when US drivers were choosing which company to work for.

In contrast, evidence from some UK and European studies suggests that pay is not always the most important enabler of retention. In one study, when UK drivers were asked whether they would rather have a better work/life balance or a 5% pay rise, 68% chose a better work/life balance over the pay rise. Moreover, 52% said they would rather have a trustworthy manager than a pay rise (Talent in Logistics, 2020). Prockl et al., (2017) also found when surveying German drivers that more important than pay in determining job satisfaction were factors such as work time allocation, work environment, the management team and style, and career development opportunities.

3.3.3 Implicit enablers

It is also implied by the findings on barriers to recruitment and retention that if such barriers are removed, it would consequently enable recruitment and retention. For example, the findings on barriers to a healthy lifestyle for HGV drivers imply that activity to support a healthy lifestyle for drivers would enable recruitment and retention. Such ideas for best practice are explored further in chapter 4.

Although it may be possible to identify enablers by understanding and removing barriers, there is however a lack of evidence about the relationship and relative importance of different enabling factors and barriers. For example, it is unclear whether supporting healthy lifestyles would support recruitment and retention without also taking action on other issues, such as pay. This is a potential future area of research to consider.

4. How barriers and enablers vary across groups

This chapter provides an overview on how barriers and enablers to recruitment and retention vary across different groups. It begins by summarising the evidence relating to demographic differences and moves on to describe how barriers and enablers vary in term of size of HGV operator and different route types.

4.1 Women drivers

Some evidence was found about the specific experiences and barriers to recruiting and retention experienced by women drivers.

4.1.1 Sexism in the workplace

In their qualitative study with women drivers, Fitzpatrick (2020) reported that the majority of women drivers had had some type of experience where they felt as though they had been unfairly judged due to their gender. Examples included receiving unwarranted and critical comments about their driving ability and the sense that they were being watched by others who were waiting for them to make a mistake and to blame this on them being a women. It was argued that such unfair and inappropriate treatment could lead women to leave the industry if they felt they were being treated as inferior to men. In an international survey of women members of transport unions, reports of sexual harassment and discriminating behaviour from male work colleagues were reported as a key concern, although the survey covered the whole logistics sectors, rather than just the roles related to HGV driving (International Transport Workers' Federation, 2014).

4.1.2 Safety

Although the perceived lack of safety is a challenge reported across all groups of drivers (as described in section 3.1.2), there is evidence that this may be a heightened concern for women drivers. For example, the International Transport Workers' Federation (2014) study found that women surveyed cited safety concerns associated with poorly lit and lonely stopover/turnaround/refuelling areas and communication systems for raising the alarm at parking and resting facilities which do not function. Similarly, it has been suggested that better security and well-equipped rest zones (showers, separate toilets for men and women, and safe sleeping zones) would be particularly important measures in helping to attract and retain women truck drivers (The International Road Transport Union, 2019).

4.1.3 Family responsibilities

Flexible and part time working hours have also been identified as a potential universal enabler for driver recruitment (see section 3.1.1) which many employers may not take into account (International Transport Workers' Federation, 2014). However, the evidence suggests that women drivers may place particular value on these enablers due to a greater emphasis in balancing the driving role with caring and family responsibilities. For example, Hopkins and Akyelken (2022) found that women interviewed with caring responsibilities preferred to

have night-time shifts so that they could do care related work during the day and plan their time effectively. The study also found that women wanted to work closer to home and take shorter trips so that they can manage other responsibilities. Furthermore, the study conducted by Talent in Logistics (2020) found that female respondents were more likely than males to value the opportunity to work flexibly, although all respondents rated this as a priority.

4.2 Age and Experience

The evidence reviewed found that HGV operators are sometimes reluctant to take on younger and newly qualified drivers due to increased training and insurance costs. A further recruitment barrier cited in the literature was a lack of career guidance aimed at young people in education and other settings. Several papers also suggested that drivers may experience differential treatment and job satisfaction depending on their age and longevity within the driving role.

4.2.1 Training and insurance costs

According to the evidence, insurance and training costs are higher for younger drivers (Department of Transport, 2016; Piecyk and Allen, 2021) and this was believed to be driving a reluctance among operators to hire younger drivers (House of Commons Transport Committee, 2017). Stakeholders consulted as part of the report, stated that younger drivers tended to make more insurance claims, and these can cost significantly more than for older drivers (House of Commons Transport Committee, 2017). Furthermore, as discussed in chapter 3, the cost of obtaining relevant driver qualifications can be as high as £3000 without the additional costs for equipment, training and insurance. Additionally, the report also cited that there is evidence that smaller employers may find it harder to afford the costs of training, license acquisition and insurance than larger HGV companies creating a bigger challenge for the recruitment of younger drivers (Ibid).

4.2.2 Lack of career advice and information

A lack of awareness of the sector and the wide range of opportunities available were also cited as related recruitment barriers. It was argued this is because there is limited exposure to careers in logistics throughout the educational system. One of the factors most responsible for the driver shortage, according to participants in a study of HGV companies, was a lack of access to career advice (The Chartered Institute of Logistics and Transport, 2015) and wider communication of the opportunities. In 2020, a survey with 1,300 drivers was conducted to investigate the problem areas undermining employee engagement in logistics and to understand drivers' perspectives of the sector. Only 29% of survey respondents felt that career opportunities were clearly communicated (Talent in Logistics, 2020). Similarly, a total of 42% of survey respondents attending the World Skills Live Exhibition stated that they were unsure what the term 'logistics' meant. In addition to this, only 8% of those surveyed considered the sector to be an attractive career option (Talent in Logistics, 2018). Responding to this challenge it has been recommended that HGV driving should be promoted as a positive choice and interesting industry (House of Commons Transport Committee, 2017).

4.2.3 Differential treatment and satisfaction

The evidence presented a mixed picture as to whether age had a bearing on job satisfaction and how HGV drivers were treated. For example, in a qualitative study involving drivers and managers, some drivers reported being treated more respectfully, and their needs were better accommodated because of their experience (Beers, Day and Johnson, 2017). A study conducted by the Welsh Parliament (2021) also found that drivers feel there are differences in working conditions, contractual obligations and wages particularly for more experienced drivers which can be a barrier to retention for those with less experience. However, both experienced and new drivers felt that more could be done to retain new drivers including support with understanding and managing the regulations, fines and responsibilities of the job (Welsh Parliament, 2021).

Relatedly, there is higher commitment and longevity in older drivers. For example, in a mixed methods study, older drivers were found to have greater commitment and satisfaction in carrying out their duties of the job (Ji-Hyland and Allen, 2020). Subgroup analysis found that positive relationship exists between the length of time working as a driver and their commitment to their role. Furthermore, older drivers had fewer intentions to quit due to their greater satisfaction, and younger drivers felt less obligated to stay in the profession. Drivers who have been working with the same firm for less than six years were more likely to quit their job compared to those in the same firm for six or more years (Min and Emam, 2003). Another national survey distributed to 604 commercial drivers found that younger drivers were more likely to express a desire to quit over a proposed

policy, further suggesting that they may hold lower levels of commitment or loyalty to the profession (Cantor et al, 2011).

Other evidence however found that younger drivers were more satisfied than their older colleagues. For example, a survey of European drivers found that younger drivers were more satisfied with their job than those aged 45 and over (The International Road Transport Union, 2019). Likewise, a survey with three groups (new drivers, experienced drivers and management) concerning job satisfaction found that the new drivers' level of satisfaction was higher than the other two groups (LeMay, Williams and Carver, 2009).

4.3 Other factors and groups

Several sources of evidence also explored how barriers and enablers vary by size of HGV operator or route type, although the evidence was very limited.

4.3.1 Size of HGV operator

There is contradictory evidence as to whether operator size influences the ability to retain drivers. For example, qualitative research with drivers conducted by the Welsh Parliament found that smaller employers paid less and thus were found to have more problems with driver retention (Welsh Parliament, 2021). In contrast, Min and Emam (2003), who surveyed 443 US driver firms, found that trucking firms' organisational characteristics such as firm size and carrier type seem to influence turnover where smaller firms with less than 50 full time drivers were better positioned to retain their drivers for a long time. Overall, given the limited evidence, it is not possible to draw conclusions on whether smaller or larger operators are more successful at retaining drivers.

4.3.2 Route type and employment conditions

As noted in Section 3.1.2, the requirement for HGV drivers to work long shifts (up to 12-14 hours) has been cited as one of the most important barriers to both recruitment and retention. As discussed previously, long-haul drivers face greater barriers to retention because of the impacts of long hours on their tiredness, stress, social and family life, and overall wellbeing (Sousa and Ramos, 2018).

This includes the requirement for HGV drivers to work night shifts. Here a cross sectional study of 329 drivers using a wrist-worn accelerometer to assess sleep found that night shift workers were at the highest risk of sleep deprivation (Sherry et al, 2021). This the study suggests, is a potential barrier to retention.

Min and Emam (2003) reported that full-time contracts are a potential enabler for retention as firms participating in their survey perceived them to increase a driver's sense of belonging and therefore job satisfaction.

Finally, according to a literature review conducted by Houtman et al., (2004) employed drivers in HGV firms have better financial and benefit packages than self-employed drivers. Self-employed workers are generally required to insure themselves which is expensive. Evidence suggests that some self-employed drivers do not obtain insurance due to the costs, putting them financially and physically at risk. This indicates that insurance costs pose a greater barrier for those who are self-employed opposed to those working for HGV operators (Ibid).

5. Best practice in recruiting and retaining drivers

This chapter summarises examples of proven good practice and recommended/suggested practices that could improve HGV driver recruitment and retention. The review found very little evidence of proven good practice. It was therefore not possible to answer research questions 2a2 and 2b3. As such, the focus of this chapter is largely on suggested approaches or recommendations on how to improve recruitment practices and retention actions. Where practices are proven rather than suggested or recommended, this is clearly identified in the chapter.

5.1 Suggested approaches for improving recruitment practices

The review found no evidence as to which specific recruitment methods were most successful for appointing HGV drivers. There were however four suggested ways that recruitment practices could be improved. These were:

- targeted recruitment;
- apprenticeships and training;
- raising awareness and interest; and,
- improving perceptions of the sector.

Targeted recruitment approaches involved more immediate and specific actions which could be implemented by individual HGV operators. The remaining three approaches were more strategic and longer-term in nature, often needing a more coordinated sector-wide approach.

5.1.1 Targeted recruitment

Targeted recruitment covers recruitment partnerships, targeting of specific groups, broadening of recruitment avenues, and the use of referrals.

2 What recruitment methods are most successful for appointing HGV drivers (e.g. via recruitment agencies, job centres, informal approaches etc.)

3 What approaches and conditions are most successful for retaining HGV drivers? (including but not limited to: shift patterns / flexibility, and support for welfare, physical and mental health)

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- **Recruitment partnerships** were one of the only methods identified in the evidence that demonstrated results. The approaches highlighted involved partnerships between the sector and specific agencies, and three examples were provided in the evidence reviewed:
 1. The Manchester LGV Driver Academy launched a programme focused on recruiting Jobseeker's Allowance claimants with Department for Work and Pensions Flexible Support Funding. In 2015 the programme secured places for 177 jobseekers of which 40 have gained LGV driver jobs (DfT, 2016).
 2. The Road to Logistics programme, founded by the Road Haulage Association (RHA) and Microlise, involved working with military service leavers, long term unemployed and ex-offenders to train and guide new drivers, and resulted in 300 drivers being trained in the first year (Keckarovska, 2021).
 3. A sector-led scheme launched in 2015 called Driving Britain's Future which worked with Jobcentre Plus (JCP) to bring new recruits into the industry by giving JCP customers experience of working in the industry (House of Commons Transport Committee, 2017). The scheme aimed to identify 2,400 work experience placements for JCP customers with logistics employers more widely, although no detail was provided on programme outcomes.
 - **Targeting specific groups** such as warehouse workers (Welsh Parliament, 2021); ex-armed forces personnel (The Chartered Institute of Logistics and Transport, 2015; Keckarovska, 2021); and convicted offenders (Keckarovska, 2021) were also suggested as ways of recruiting new-joiners to the profession, as they represent large pools of potential drivers. Targeting younger people (18- to 25-year-olds) was also proposed as a useful approach, with Smith (2021a) arguing that the job may be more appealing to them since the negative aspects of the role that pose a barrier to recruitment, such as long, unpredictable working hours, could be less of an issue.
 - **Broadening of recruitment avenues.** Using social media as a recruitment route was also suggested, particularly to entice younger people into the profession, due to the centrality of social media in their daily lives (The International Road Transport Union, 2019; Talent in Logistics, 2019). Although the focus of one study conducted by Talent in Logistics was on the wider logistics sector, rather than solely HGV driving, the UK-based survey with young people highlighted the value of visual and engaging content on Instagram, Snapchat and YouTube. Specific suggestions included using video case studies of young employees currently in the sector discussing their role and discussing what a typical day would look like, and sharing company values on YouTube, so that young people can consider whether the company culture aligns with their own values (Talent in Logistics, 2019).
 - **Use of personal referrals** where existing drivers refer potential individuals into the company, and the referrer receives a bonus for the referral, appeared to be successful according to one US-based study that provided an example of one operator having created a specific 'driver referral team' (Suzuki, Crum and Pautsch, 2009). The aim of the team was to increase the number of drivers recruited into the company via referrals, and the approach also involved providing monetary rewards to the top 15 drivers whose referral efforts resulted in the highest number of drivers recruited. Although data were not provided on the number of drivers recruited using this method, findings suggested that this approach also benefited retention, as it resulted in a decrease to the driver turnover rate. Another US based study comparing referred and non-referred employees suggested that that drivers referred into the company were not only more likely to be hired, but also more likely to stay in the company (Burks et al., 2015). However, it should be noted that some diversity related guidance cautions against relying too heavily on referrals, as this can prevent certain social groups from gaining access to the jobs and result in a more homogenous workforce (The Chartered Institute of Personnel and Development, 2021; Society for Human Resource Management, no date).

5.1.2 Apprenticeships and training

The creation of driving apprenticeships was cited as a potentially useful approach to recruiting young drivers. Both a national campaign or private schemes were suggested (Ji-Hyland and Allen, 2022), although the potential merits of one approach over the other were not discussed.

The House of Commons Transport Committee highlighted that the use of apprenticeship schemes and driver training academies is something already being undertaken by some larger operators in the UK (House of Commons Transport Committee, 2017). Earning while learning was identified as a key incentive that might attract younger people (Keckarovska, 2021; Ji-Hyland and Allen, 2022). Furthermore, specific schemes to help

train and support women to join the sector could be useful, to specifically target their underrepresentation in driving roles (Keckarovska, 2021).

Although details on the specific set-up and content of apprenticeships were lacking, on the whole, the evidence called for broader investment by the industry in training and apprenticeship schemes (The International Road Transport Union, 2022; The Chartered Institute of Logistics and Transport, 2015; Lodovici et al., 2009; Freight Transport Association, 2019). Such calls came from operators, researchers and drivers. Current and former HGV drivers participating in the Welsh Parliament study suggested that apprenticeships should be government funded or subsidised, and that they should be available to all new drivers (Welsh Parliament, 2021). They also suggested that apprenticeships should be combined with government grants to support new entrants with the initial setup costs, which involve equipment related costs, training related costs, and the Driver CPC qualification (Welsh Parliament, 2021).

5.1.3 Raising interest and awareness

Raising interest in, and improving awareness of, HGV driving as a career option was cited extensively across the evidence as a key strategy to support recruitment. However, the approaches discussed often related to promoting the road transport sector more widely, rather than focusing solely on raising interest in and awareness of HGV driving specifically.

In particular, working with educational institutions, to ensure that young people are aware of such career options was suggested. For example, the House of Commons Transport Committee (2017) highlighted the need to promote the sector better in schools and colleges. The International Road Transport Union (2019) similarly proposed that operators in the sector needed to establish partnerships and links with educational institutions to enable the development of toolkits to help raise awareness of the opportunities.

Government enforced legislation can be used to facilitate this. For example, the study by Talent in Logistics (2019) focusing on young people noted that logistics companies should take advantage of the Baker clause introduced in 2018, which states that schools must allow vocational training and apprenticeship providers to advertise their course to pupils in years 8 to 13. Other sources suggested that such school focused efforts could emphasise the importance and key role of the transport sector, as well as highlight career prospects associated with logistics roles (Lodovici et al., 2009; Talent in Logistics, 2019). Such prospects include, for example, progression routes from LGV driver to more strategic or managerial roles such as a freight transport planners, LGV training instructors, or managers in transport or logistics (Talent in Logistics, 2019). The study also highlighted an existing approach which focused on the logistic sector more widely and involved an initiative called Think Logistics, which connected more than 40 leading logistics companies in the UK to schools and colleges. Activities included mentoring, workshops and internships to raise awareness of job opportunities, although detail on the success of this initiative was not provided in the source (Talent in Logistics, 2019).

Another method of awareness raising centred around promoting the sector at events, for example:

- Increasing representation at careers fairs and events, such as Big Band and WorldSkills UK (Talent in Logistics, 2019);
- Hosting additional specific road sector focused events such as the Road Haulage Association's National Lorry Week (House of Commons Transport Committee, 2017); and
- Hosting tailored events to raise interest and awareness among specific groups, such as having events focusing on women in road transport on days such as International Women's Day (International Transport Workers' Federation, 2014).

5.1.4 Improving perceptions

Several papers highlighted the need for government and industry to make substantial efforts to improve perceptions of the industry if recruitment efforts are to succeed (Ji-Hyland and Allen, 2022; The International Road Transport Union, 2022; Leading UK Logistics, 2019; Smith, 2021b; The Chartered Institute of Logistics and Transport, 2015; Bernard and Bouck, 2000; Keckarovska, 2021; The International Road Transport Union, 2019; Freight Transport Association, 2019). It was acknowledged that achieving these changes would not be simple and would require wide-ranging efforts. Furthermore, it was argued that the key focus should be on improving diversity, improving working conditions and professionalising the industry.

Increasing diversity

The evidence highlighted the importance of needing to attract more diverse drivers and address imbalance in the sector, where most drivers are white men (House of Commons Transport Committee, 2017). Drawing on evidence from across Europe, including the UK, the International Road Transport Union (2019) report argued that taking action to improve the HGV driver gender balance would help to improve the “image” of the industry. The report also highlighted that the formation of a Women in Transport Network and the creation of awards such as best female drivers and best performing companies in terms of recruitment, inclusiveness and retention, was working towards this goal. Another example was She’s RHA, a scheme aiming to address the acute shortage of women in road transport through networking events and mentoring programmes (House of Commons Transport Committee, 2017). To help with efforts in increasing diversity, it was recommended that women and people from ethnic minority backgrounds are not only represented in recruitment materials, but also visible in senior positions in the industry (Talent in Logistics, 2019).

Improving working conditions

As outlined in Chapter 3, the sector is known for a range of poor working conditions which negatively impact the perception of the sector. These relate to amenities, work-life balance, long hours, low pay, terms and conditions of contracts, and lack of flexibility in the role (Ji-Hyland and Allen, 2022; Talent in Logistics, 2020; The Chartered Institute of Logistics and Transport, 2015; House of Commons Transport Committee, 2017; Smith, 2021c). Multiple sources included in the review argued that action must be taken on these aspects to help improve the wider perception of the sector, thereby facilitating further recruitment.

Professionalisation of the industry

The need to professionalise the industry to help create further career progression opportunities was also suggested (Ji-Hyland and Allen, 2022; House of Commons Transport Committee, 2017). Ji-Hyland and Allen (2022) suggested having clear, measurable training guidelines and qualifications could help with this. Although the paper acknowledged the implementation of the CPC qualification, the authors deemed the programme broad in its scope and lacking tailoring for specific operator requirements and driver well-being.

5.2 Addressing practical barriers to recruitment

Much of the literature outlined above examined recruiting individuals who may not be considering or have never considered becoming an HGV driver. However, evidence both from the UK and European context acknowledged that there were individuals who wanted to become HGV drivers, but who faced practical barriers to entering the role. A range of practical suggestions were put forward, including:

- **Supporting with the up-front costs involved in becoming a driver with student loan type finance** (Freight Transport Association, 2016); employers funding some of the training and licence acquisition (House of Commons Transport Committee, (2017); and government grants (Welsh Parliament, 2021).
- **Supporting returning drivers** by providing government subsidies to cover the CPC qualification and refresher HGV courses and focusing on addressing the HGV licence renewal backlog (Smith 2021a; Smith 2021b). The latter recommendation was based on anecdotal evidence cited by Smith (2021b) which suggested that some returning drivers experienced challenges providing evidence of their HGV medical results and their DVLA licence renewal submission, and that many operators are not allowing drivers to continue driving without this.
- **Addressing high insurance costs for young or inexperienced drivers.** Evidence provided to the House of Commons Transport Committee (2017) suggested that training and insurance companies work with operators to deliver training which would then enable insurance companies to lower premiums for those drivers. Further suggestions provided to the Committee also included utilising fleet insurance, as some insurance providers provide fleet policies that do not involve age restrictions and increased premiums, even though higher excesses may remain (House of Commons Transport Committee, (2017).

5.3 Suggested actions for improving retention

Identified good practice and recommendations for improving retention of HGV drivers related to three areas: improving features of the role; improving the culture and support of the workplace; and improving the wider

environment in which drivers operate. The literature also highlighted the need for operators to consider tailoring retention practices for different groups of drivers, indicating that there is no 'one size fits all' approach.

5.3.1 Improving features of the role

Improving features of the role was considered a key facilitator to improve retention of HGV drivers. Key areas that were identified in the evidence as in need of improvement were: remuneration and contract terms and conditions; and hours, shift patterns and journey planning. It was argued improvements to these features would not only support retention but would also help to improve the general perception of the industry, which may help with recruitment in the long term.

Remuneration and contract terms and conditions

Multiple sources, drawing conclusions from primary research with drivers, recommended that driver pay needs increasing so that it more fairly reflects the responsibility, lifestyle challenges, and training and qualifications associated with the role (The Chartered Institute of Logistics and Transport, 2015; Talent in Logistics, 2020; Welsh Parliament, 2021; Smith 2021b; Smith, 2021c; Fernandez, 2011). Improving the terms and conditions of driver's employment contracts, introducing a tax relief for drivers, and offering drivers rewards and discount schemes were also cited as potential practices to support retention (The Chartered Institute of Logistics and Transport, 2015; Smith, 2021b; The International Road Transport Union, 2022). For example, in one study it was suggested by drivers that they are included in the Blue Light Card discount scheme (which offers discounts to those working in the health, social care, emergency services, or armed forces) to purchase food and drink (Welsh Parliament, 2021). Another paper which focused on road transport workers more widely suggested that ensuring adequate maternity policies are in place is important for female employees, although further details on why this was important were not provided, it can be inferred that this might encourage more females to join the sector (International Transport Workers' Federation, 2014). Additionally, Piecyk (2021) suggested that direct employment should also be favoured over employing agency drivers to support improved working conditions and worker retention.

Hours, shift patterns and journey planning

As mentioned above, improving working conditions was highlighted as key to supporting retention. A range of ways to improve practices to support retention were put forward in the evidence reviewed:

- **Flexible working.** Several papers, including evidence that drew on primary research with drivers, argued that flexible and part-time working should be offered, including 3-day weeks and zero hours contracts (Talent in Logistics, 2020; Beers, Day and Johnson, 2017; Crizzle, Thiffault, and Myers, 2018; International Transport Workers' Federation, 2014; Sersland and Natarajan, 2015; Wijngaards, Hendriks and Burger, 2019). One study suggested that this was particularly important for older drivers, as it may increase driver satisfaction and help alleviate tiredness, thereby helping them to work into older age (Beers, Day and Johnson, 2017). Flexible and part-time working may also be of particular importance to female road transport workers, including drivers (International Transport Workers' Federation, 2014). In addition, another paper found that drivers wanted to primarily work Monday to Friday, with additional pay offered for weekend working (Welsh Parliament, 2021). It was also suggested that shift patterns should also aim to maximise the amount of time drivers spend at home (Caddick et al., 2017; Keller, 2002).
- **Improving journey planning.** According to the Welsh Parliament study, drivers felt improved journey planning might aid retention (Welsh Parliament, 2021). Drivers called for dispatchers and managers to ensure that journey planning was reasonable, realistic and that unavoidable delays were considered. The authors suggested that employing people with driving experience or HGV licenses in these roles would support this (Welsh Parliament, 2021). A US study also suggested that the use of transportation relay points may be beneficial for retention (Melton and Ingalls, 2012). Relay points are physical locations where truck equipment can be changed and the transported goods divided into two separate legs, and as a result, drivers spend shorter periods of time driving and can be at home more often.
- **Working patterns.** The same paper found that drivers recommended that the 48-hour working week cap is more rigorously enforced, including by removing the requirement for employers to report average weekly hours over a '17-week reference block', as this allows carriers to obscure excessive working weeks. Drivers called for this to be replaced with an actual 48-hour working week cap, and weekly or fortnightly rotas (Welsh Parliament, 2021). Sousa and Ramos, (2018) also highlighted the importance of drivers having a level of autonomy in relation to their timetabling, so they feel they have some control over it.

5.3.2 Improving the culture and support of workplace

As highlighted in Chapter 3, a poor working culture and a lack of support were both barriers to retention. A range of practices were identified in the literature to improve this, including having supportive management that recognises the challenges of the role; fostering a culture of driver engagement; consideration of driver health and wellbeing; provision of training and opportunities for professional development; and facilitating support and communication with peers.

Recognition and understanding from management

Taking a 'people over profit' approach was identified as a useful way of retaining drivers. According to Prockl et al., (2017), even small actions, such as providing drivers with mobile phones and fuel cards, could have the potential to improve retention. Mumphrey (2020) suggested that receiving recognition, both monetary and non-monetary, such as sharing gratitude towards employees, was important to create an environment where drivers feel valued. Another study by Al Arkoubi, Bishop and Scott (2013) also highlighted the importance of recognition from management and went so far as to suggest that managers should work on understanding and identifying the specific ways in which their drivers prefer recognition, although the authors did not specify what such an approach could look like in practice. A US study recommended awards for safe driving as a potential form of recognition (Sersland and Natarajan, 2015). Several papers also suggested that managers also need to understand and acknowledge the stresses of the driving job (LeMay, Williams, and Carver, 2009; Beers, Day and Johnson, 2017; Sousa and Ramos, 2018; Williams, Thomas and Liao-Troth, 2017). This could be done by demonstrating empathy for the demands of the job, for example by adopting policies to assist drivers with family issues when they are out on the road (Williams, Thomas and Liao-Troth, 2017).

Having opportunities and avenues to communicate any feedback and concerns was also highlighted as a way to improve the workplace culture, as it was thought to engender a sense of empowerment and would make drivers feel listened to. Specific suggestions included:

- Having employee committees (Welsh Parliament, 2021)
- Use of employee representatives as advisors in early phases of decision making (Talent in Logistics, 2020)
- Operation involvement in driver training, such as monthly meetings with the purpose of gathering feedback to see what needs improving in operations (Sersland and Natarajan, 2015)
- Introducing a feedback mechanism, such as the use of a team leader who can voice feedback to managers on others' behalf, or use of a suggestion box (Mumphrey, 2020)

Health and wellbeing

As outlined in Chapter 3, health and wellbeing issues faced by drivers were widely discussed in the literature. Several papers concluded that a key factor facilitating driver retention would be operators considering and prioritising driver health and wellbeing. Approaches to improve occupational health focused on:

- **Provision of health and safety educational training and materials**, including more general health and educational training and resources (Beers, Day and Johnson, 2017; Staats et al., 2017; Wise, Heaton and Shattell, 2020), as well as toolkits and resources promoting health literacy (suggested by older drivers in one study) (Beers, Day and Johnson, 2017). It could also involve the provision of more specific programmes or training, such as those focused on: minimising stress (Bernard and Bouck, 2000; Beers, Day and Johnson, 2017); mindfulness techniques (Wise, Heaton and Shattell, 2020); preventing fatigue (Bernard and Bouck, 2000); awareness of sleep behaviour awareness (Sherry et al., 2021); management of weight (Sherry et al., 2021); and physical exercise (Bernard and Bouck, 2000). The importance of awareness programmes and safety training for women around their rights in safety and health related issues was also discussed, although this was in relation to the wider road transport sector in Europe rather than specific to HGV drivers (International Transport Workers' Federation, 2014).
- **Provision of more proactive health support**, including setting up a 'know your numbers clinic' where an occupational health provider produced personalised health reports for older drivers (Beers, Day and Johnson, 2017). Other suggestions involved the setting up of health care clinics that could help drivers have access to health care while on the road (Williams, Thomas and Liao-Troth, 2017). Or linking drivers to healthcare

professionals and cooperating with on the road medical services (such as DocStop, which operates across a number of European countries) (Staats et al., 2017). Sousa and Ramos (2018) suggested recruiting a specific team to support drivers with work-life balance. Making the working environment less physically demanding, was found to be a way of retaining older drivers specifically (Beers, Day and Johnson, 2017).

- **Provision of healthy food options** to overcome the challenge of lacking, poor quality or overpriced food at facilities, it was suggested that companies offer healthy food to drivers, including fruit and vegetables which are not often available on the road (Staats et al., 2017; Beers, Day and Johnson, 2017). A UK based study found that one company already provided healthy packed lunches to their drivers, and another company stated that this was something they were considering (Beers, Day and Johnson, 2017).
- **Provision of training and opportunities for professional development** was highlighted as an area to focus on in multiple studies (The Chartered Institute of Logistics and Transport, 2015; Ji-Hyland and Allen, 2022; Sousa and Ramos, 2018; Houtman et al., 2004; Sersland and Natarajan, 2015; Min and Eman, 2003; The International Road Transport Union, 2019; Williams, Garver and Taylor, 2011; Prockl et al., 2017). It was argued as not only helping to improve specific skills, but could also play a role in making drivers feel recognised for the role that they play (Ji-Hyland and Allen, 2022). The literature cited a range of different types of training and professional development opportunities, including: leadership training, support with career planning; and driver mentor schemes. One paper provided an example of a mentoring scheme in one Portuguese company (Sousa and Ramos, 2018). Drivers participating in the scheme felt it helped with their personal and professional development. Another source suggested that offering drivers mentoring from people who used to work as drivers, but then moved into non-driving roles in transport, might be particularly beneficial for drivers who value career progression and development (Williams, Garver and Taylor, 2011).

Facilitating support and communication with peers

Finally, increasing support and communication with peers, to improve the feelings of loneliness and isolation faced by some drivers was suggested as a way of improving workplace culture. Suggestions involved organising team events (Wijngaards, Hendriks and Burger, 2019); facilitating colleague support and communication by creating a platform/social media group (Wijngaards, Hendriks and Burger, 2019); and ensuring shift patterns allow drivers to spend some time with co-workers (Caddick et al., 2017). Williams, Thomas and Liao-Troth's (2017) US based study also suggested annual cookouts, which could include driver families.

Although this was a sector wide, rather than just an operator focused example, the Young Forwarder Network (launched by the British International Freight Association) was highlighted as a networking group which aims to support young people who have recently joined the sector (Talent in Logistics, 2019). However, it should also be noted that not all drivers may want to take part in team events. For example, drivers working for a Portuguese operator stated that they may not always want to participate, as they may prefer to spend the time with family or friends, or do not want to go back to the company headquarters to spend time there outside of their working hours (Sousa and Ramos, 2018).

5.3.3 Improving the wider environment

Drivers operate in an environment where they spend a lot of time on the road and in their trucks, and rely heavily on driver facilities along the road. A large share of driver interactions are therefore with managers and individuals at delivery sites. A range of suggestions were put forward to improve this, including: improving facilities and truck design; improving the treatment of drivers; and raising the awareness and understanding of other road users in terms of driving alongside a HGV. The nature of these suggestions mean that the majority would require a collaborative approach and the involvement of wider actors such as trade associations and government.

Facilities and truck design

Improving the accessibility and quality of driver facilities including parking sites emerged as a key retention issue requiring action across evidence from the UK, Europe and the US. Specific areas for improvements highlighted in the papers reviewed included: providing clean and adequate washing facilities, toilets and rubbish bins; better security (e.g. CCTV); better equipped rest zones; and affordable pricing and improved food options (Piecyk, 2021; House of Commons Transport Committee, 2017; Lodovici et al., 2009; Smith, 2021b; Smith 2021c; Kubanova and Kubasakova, 2020; Fitzpatrick, 2020; Freight Transport Association, 2016; International Transport Workers' Federation, 2014; Crizzle, Thiffault, and Myers, 2018; Beers, Day and Johnson, 2017). One paper suggested that a 'facilities standard mark' be developed to ensure better minimum standards (Welsh

Parliament, 2021). Kubanova and Kubasakova (2020) argued that it was not just the quality of the facilities requiring improvement; but that the quantity of facilities to be increased, such as more parking areas being made available.

The availability of showers, separate toilets for men and women, and safe sleeping was highlighted as particularly important to attract and retain female road transport workers, including HGV female drivers (International Transport Workers' Federation, 2014; The International Road Transport Union, 2019). An example of good practice for separate toilet facilities for men and women was given, which involved a new facility at an HGV parking area utilising a special key system to protect the use of specific toilets for women's use only (International Transport Workers' Federation, 2014). Similarly, the safety of truck stops, although raised as an issue requiring attention for all drivers, was deemed as particularly important for female drivers (Bernard and Bouck, 2000).

Changing the design of lorries to include fridges and microwaves could also improve driver eating conditions on the road (Beers, Day and Johnson, 2017). As well as increasing the adjustability options of driving equipment, particularly for women (International Transport Workers' Federation, 2014; Black et al. 2017). Recommendations included increased seat adjustability, improved handrail accessibility, and adjustable steering wheels, mirrors and foot pedals (Black et al., 2017).

Improving treatment of drivers

As noted in chapter 3, drivers can be subjected to poor behaviour and treatment from dispatchers and others they engage with at delivery sites. One suggested approach to combat this included introducing an official code of conduct around driver treatment as these would recognise and strive to improve the issues around treatment of drivers. For example, the House of Commons Transport Committee (2017) suggested that work needed to be undertaken by Freight Transport Association (FA), RHA and relevant trade associations to consider the usefulness of creating a good practice standard or a code of conduct. A similar approach has already been considered in the European context, with the International Road Transport Union's launching of a joint initiative with the European Shippers Council to develop common principles to improve the treatment of drivers at delivery sites (The International Road Transport Union, 2019).

Several pieces of evidence also suggested focusing specifically on improving the treatment of drivers by those they interact with on a daily basis, such as dispatchers, managers, and receivers/shippers. This could involve: supporting managers to improve their interpersonal skills (Fournier, Lamontagne, and Gagnon, 2012); providing them with training around the pressures faced by drivers (Williams, Thomas and Liao-Troth, 2017); and monitoring the behaviour of receivers and shippers, and if needed, ceasing to work with receivers and shippers who consistently delay drivers and subject them to poor treatment (Mitchell and Rozell, 2007). It is important to note that all these sources were North American, which could mean some of these working practices, may not be applicable to the UK context.

HGV awareness raising among other road users

The evidence suggested road users are not necessarily aware and accommodating of HGVs when driving, which can increase stress and frustration for HGV drivers. A range of suggestions were put forward to improve awareness and accommodation of drivers, including educating other road users through public information campaigns on safe driving to accommodate HGVs, and the incorporation of training on how to accommodate driving alongside a truck into all learner drivers' highway code exams (Welsh Parliament, 2021; Fitzpatrick, 2020).

5.4 Tailoring and targeting of retention approaches

Some evidence suggested tailoring and targeting retention approaches to either specific driver demographics, or segments of drivers.

5.4.1 Targeting a specific demographic of drivers

A study conducted by Min and Emam (2003) which involved a survey of current drivers from multiple operators, suggested targeting retention approaches to drivers who have shorter driving experience with the same company, as they found that those with shorter tenure at the company were more likely to quit. Similarly, drivers with shorter total driving experience and therefore less experience in the profession more widely were also found to be more likely to quit. Therefore, to improve operator-specific driver retention in the long term, the authors suggested that operators should focus their recruitment efforts on drivers with longer (5+ years) experience in the profession. This could be done by offering incentives to more experienced drivers at recruitment stage, such as: sign-on bonuses; enumeration which takes into account years of experience; or greater autonomy.

5.4.2 Tailoring approaches to ensure they address what is most important to drivers

The evidence highlighted the importance of operators understanding what is important to the drivers working for them. For example, several papers emphasised the importance of operators investing time in understanding and segmenting the needs and priorities of drivers, as opposed to taking a one-size-fits-all approach to addressing driver retention (Williams, Garver and Taylor, 2011; Garver, Williams and Taylor, 2008; Cosenza et al., 2012; Suzuki, Crum and Pautsch, 2009; Min and Emam, 2003). Operators can then make better informed decisions on what approaches might be most effective and then prioritise those, rather than spread resources too thinly. Mumphrey (2020) suggested that retention approaches could also be monitored for success and drivers should have the opportunity to highlight their satisfaction and reaction to the implemented approaches.

Different pieces of evidence segmented HGV drivers into slightly different categories, however, some common themes emerged. For example, one US study focusing on one operator found four segments which broadly fell into two larger groups of drivers: 1) drivers that were more relationship driven and 2) drivers who were more functionally driven (i.e. driven by tangible aspects of the role such as pay and equipment) (Garver, Williams and Taylor, 2008). Another US study by the same authors, also analysing data from drivers from one operator, identified three segments where drivers differed depending on whether they were driven by primary needs (e.g. pay, time at home, equipment), by relationships, or by career progression (Williams, Garver and Taylor, 2011). The latter study found that for the one operator they examined, the largest 'segment' was the primary needs group, which involved drivers who placed most importance on pay, time at home, and equipment (Williams, Garver and Taylor, 2011). This group had the longest tenure in the company, and the highest self-reported intention to leave, so it was suggested that retention efforts should be focused on this group first. Potential suggestions for the group included creating or extending programmes which would provide benefits (such as increased home time and paid holiday) for drivers based on their time/seniority in the company, and more frequently updating equipment.

6. Evidence gaps

This chapter describes the coverage of evidence across the REA research questions, highlighting in particular where there are gaps and potentially how these could be addressed. In summary, there is a good coverage of enablers and barriers to recruitment and retention. However, there is limited evidence relating to a) specific and underrepresented groups (beyond some evidence relating to women drivers and new and less experienced drivers) and b) relating to operator size and route type. In terms of taking action to address recruitment and retention challenges, whilst there is a wealth of recommendations made in the literature and some examples of actions and interventions being taken forward, there is limited evaluation evidence about what has proven to be effective.

6.1 What are the barriers and enablers to HGV driver recruitment and retention?

There is a good amount of both UK and international evidence about the enablers and barriers to recruitment and retention, including which factors are most important. The factors described in the evidence include those that are more intrinsic to the role, as well as factors associated with HGV operators and also the wider environment that they operate in.

A potential evidence gap is understanding of the relationship and relative importance of different enabling factors and barriers. For example, it is unclear whether supporting healthy lifestyles would enable recruitment and retention without also taking action on other issues, such as pay. This is a potential future area of research to consider.

The evidence relating to barriers and enablers is predominantly comprised of primary research with HGV drivers and, to a lesser extent, industry stakeholders, which uses quantitative and qualitative methods to explore respondents' views. The use of convenience sampling and relatively small samples is quite common across the cited studies, whilst there is a lack of evidence that uses more rigorous methodologies, such as randomised control trials and forms of sampling, such as non-probability based and quota sampling, to provide more robust evidence of what acts as a barrier or enabler to recruitment or retention.

6.2 How do the barriers and enablers to HGV driver recruitment and retention vary across groups different demographic groups and in terms of operator size?

There is some UK and international evidence related to the recruitment and retention enablers and barriers experienced by women and by less experienced and younger drivers. No evidence was found which covers other demographic and underrepresented groups. For example, the enablers and barriers experienced by disabled people or by people from different ethnic and cultural backgrounds. In line with the evidence about the general enablers and barriers, the majority of evidence comes from a mix of primary qualitative and quantitative studies.

6.3 Are there examples of best practice for recruiting and retaining HGV drivers? If so, what are these?

There is little evidence relating to the use and effectiveness of different methods for recruiting and appointing HGV drivers. However, many of the sources make suggestions and recommendations based on their findings

about what might support successful recruitment. Similarly, in terms of retention, there is little evidence covering proven best practice. However, again, many sources discuss the conditions and make recommendations - on the basis of study findings – about how to retain HGV drivers. There is some evidence about actions and ways of working that are already being undertaken in both UK and international contexts. However, this is not accompanied by evaluation evidence demonstrating effectiveness.

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The Chartered Institute of Personnel and Development (2021) *Anti-racism guide for line managers*. Available at: <https://www.cipd.co.uk/knowledge/fundamentals/reasons/relations/diversity/line-manager-role-tackling-racism-in-workplace#ref>

The International Road Transport Union. (2019) *Tackling Driver Shortage in Europe*. rep., pp. 1–16.

The International Road Transport Union. (2022) *European Driver Shortage Report: Understanding the impact of transport shortages in the industry*.

Welsh Parliament. (2021) *HGV driver shortage and supply chain issues: Engagement findings*. Economy, Trade and Rural Affairs Committee. rep. pp1-20.

Wijngaards, I., Hendriks, M. and Burger, M.J. (2019) "Steering towards happiness: An experience sampling study on the determinants of happiness of truck drivers," *Transportation Research Part A: Policy and Practice*, 128, pp. 131–148. Available at: <https://doi.org/10.1016/j.tra.2019.07.017>.

Williams, D.F., Thomas, S.P. and Liao-Troth, S. (2017) "The truck driver experience: Identifying psychological stressors from the voice of the driver," *Transportation Journal*, 56(1), pp. 54–76. Available at: <https://doi.org/10.5325/transportationj.56.1.0054>.

Williams, Z., Garver, M.S. and Stephen Taylor, G. (2011) "Understanding truck driver need-based segments: Creating a strategy for retention," *Journal of Business Logistics*, 32(2), pp. 194–208. Available at: <https://doi.org/10.1111/j.2158-1592.2011.01016.x>.

Wise, J.M., Heaton, K. and Shattell, M. (2020) "Mindfulness, sleep, and post-traumatic stress in long-haul truck drivers," *Work*, 67(1), pp. 103–111. Available at: <https://doi.org/10.3233/wor-203256>.

Appendix A: detailed methodology

Below is a detailed overview of the approaches taken to searching, screening and prioritising for the REA. This includes an overview of the databases and search strings used to search for academic literature and the websites and search terms used to search for grey literature.

6.1 Searching

6.1.1 Inclusion and exclusion criteria

The detailed eligibility criteria for study inclusion was as follows:

- **Language.** studies written in English only.
- **Publication status.** published academic literature in addition to published grey literature.
- **Date of publication.** studies published from 2000 onwards.
- **Countries.** evidence relating either to the UK, Europe and North America.
- **Topic.** evidence relating to HGV recruitment and retention. This will include: evidence that directly addresses the barriers and enablers to recruitment and retention; and evidence that explores the nature of the HGV driver role.
- **Study design.** both primary and secondary research studies. We will take a broad view on appropriate methodologies given the relatively open nature of the research questions.

6.1.2 Academic literature

The following academic databases were searched using a complex search string:

- Scopus
- Econlit (Ovid)
- TRID (Transport Research International Documentation)
- Business Source Premier

Table 1 search strings to identify papers in academic literature search

String	String text
1	(TITLE-ABS-KEY(hgv* OR "heavy goods vehicle*" OR lgv OR "large goods vehicle*" OR CMV OR "commercial motor vehicle*" OR "road freight" OR "road haul*" OR ((long-haul* OR "long distance" OR "short-haul*")) W/3 (truck* OR transport*)) OR truck* OR lorry OR lorries)) W/5 (TITLE-ABS-KEY(driver* OR trucker* OR hauler* OR haulier* OR workforce OR labor OR labour OR employee* OR worker*))
2	TITLE-ABS-KEY(retention OR recruit* OR hiring OR gender OR women OR minorit* OR {young people} OR welfare OR training OR shortage* OR supply OR {logistics} OR {job satisfaction} OR retain* OR turnover OR burnout)
3	#1 AND #2
4	TITLE-ABS-KEY(hepatitis OR HIV OR glucose OR CHGV OR anti-HGV OR metabolic OR cardiovascular OR musculoskeletal)
5	#3 AND NOT #4
6	Date Limit: 2000-present
7	TITLE-ABS-KEY(africa OR china OR india OR asia OR australia)
8	#6 AND NOT #7

The searching of academic database searches identified **1,613** sources.

6.1.3 Grey literature

The following websites were searched to find grey literature:

- General:
 - The Department for Transport
 - TRL
 - Health and Safety Executive
- Topic specific:
 - Office for Rail and Road
 - National Highways
 - Driver Require
 - Logistics UK
 - Centre for Sustainable Road Freight
 - Transport Focus
 - The Road Haulage Association
- University centres
 - Universities' Transport Study Group

- Institute for Transport Studies (Leeds)
- Centre for Transport Studies (Imperial)
- Centre for Transport Research (Aberdeen)
- Centre for Transport and Society (UWE Bristol)
- Transport and Mobility Research (UCL)
- Transport Research Institute (Edinburgh Napier)
- Transportation Group (Southampton)
- Centre for Mobility and Transport (Newcastle)
- Transport Studies Unit (Oxford)
- Transport and Mobilities Research Group (Westminster)
- Transportation Research Group (Cambridge)
- Centre for Logistics and Sustainability (Heriot-Watt)
- Europe/international:
 - OECD
 - European Commission
 - UN Economic Commission for Europe
 - European Road Transport Research Advisory Council
 - Paris Process on Mobility and Transport
 - The International Road Transport Union (IRU)
 - Transport Intelligence

Table 2 search terms used to identify papers in grey literature search

Key words relating to HGV drivers	Key words relating to enablers and barriers around HGV recruitment and retention	Key words relating to demographics
Heavy Goods Vehicle	Recruitment	Young people
HGV	Retention	Gender
Lorry driver	Shortage	Women
Road freight	Supply	Men
Haulier	Shift patterns	Ethnic minorities
Long-haul	Demand	Age
Freight operator	Job satisfaction	
Large Goods Vehicle	Best practice	
LGV	Hiring	
	Working hours	
	Attracting	

The final stage of searching involved forwards and backwards citation tracking of papers that looked highly relevant. Backward tracking involved looking through the list of references in the chosen paper. Forward tracking involved using Google Scholar to view all the papers that cite the chosen paper.

The grey literature searching identified **38** sources.

6.2 Screening

Studies were screened for inclusion at two stages – title and abstract and at full text. At the title and abstract stage **1,566** sources were screened and **1396** were excluded. At the full text screening stage **208** sources were screened, and **115** were moved forward to the prioritisation stage.

Studies were screened against the inclusion and exclusion criteria.

At both stages a screening tool was developed and piloted by a senior member to ensure reliability of the screening process. This involved multiple reviewers applying inclusion/exclusion criteria to the same subset of studies, comparing decisions, then making any necessary changes. After the pilot stage, all studies returned by the search were assessed by a single reviewer only. The screening process was undertaken using Covidence – a management tool for evidence reviews

At full text screening reviewers were asked to identify whether the paper met the inclusion and exclusion criteria and score the relevancy of the paper. This involved identifying whether and which research questions the paper included evidence on. For each question or sub-question, a paper provided evidence for they were given a score of one. Reviewers were also asked to assess the quality of each paper using the Weight of Evidence Framework.

6.3 Weight of Evidence

The Weight of Evidence Framework was used to assess the quality and relevance of the studies. Studies were graded on quality using four questions:

- 1 Is there a clear statement of the aims/objectives or clear research questions?
- 2 Is the sampling strategy (or data selection strategy if not collecting primary data) clearly described and appropriate?
- 3 Is the method of data collection clearly described, and appropriate to answer the aims/research questions?
- 4 Are there any concerns regarding accuracy (e.g. discrepancies within the report)?
- 5 Reviewers were asked to give each paper a score of 0-4.
- 6 At full text screening each paper was given a score between 0-18. This scoring was used to inform the prioritisation process outlined below.

6.4 Prioritisation

115 sources were considered at the prioritisation stage. **56** were rejected and **59** were included in the Rapid Evidence Assessment. To determine and select the most relevant studies two stages of prioritisation was undertaken.

1. The first involved selecting all the papers that received a high combined score⁴ of 7 or above in relation to a) whether they met the screening criteria, b) the number of research questions the paper responded to and, c) the quality of evidence presented were selected.
2. This approach presented us with 115 papers and the second stage involved implementing a number of other steps to identify the most relevant high quality evidence for review:
 - a. The first step involved assessing evidence quality and removing papers that were identified as relevant but were of lower quality than other papers. Largely this included grey literature in the form of news articles and opinion pieces that had not drawn on any primary data collection.
 - b. The second step involved reviewing the date of each selected paper and making an assessment as to whether the evidence covered in older papers was similar to the evidence included in more recent papers. Where this was the case, older papers were removed.
 - c. The third step involved reviewing the breadth of evidence and assessing whether we had evidence to answer all of the research questions. At this stage it was identified that there were

⁴ The maximum total score was 18

limited papers that explored Q1c (ranking of enablers and barriers). In response to this we returned to the deselected papers (i.e. older papers or those assessed as lower quality) and included two papers back that were removed at the first step.

- d. The final step involved ensuring we had sufficient balance between UK, North American and European evidence. UK evidence was prioritised but was complemented with North American evidence that addressed a good breath of the research questions and scored highly in relation to quality. In some cases, some North American evidence scored highly in relation to research question coverage and quality but was focused on a specific US or Canadian State and its context. These papers were excluded on this basis.

During data extraction, five papers of the **59** prioritised were identified for substitution, owing to not adequately answering the research questions (n=4) and being of a poor quality (n=1). These papers were either replaced by others included in the long list identified at full-text screening or new papers that had not been identified during the searching stage and were identified as part of backwards citation tracking during data extraction.

Appendix B: evidence overview

Source	Country	Grey or academic	Sample size/ no. of data sources	Analytical approach	Weight of Evidence ⁵
A. Schulz, S., W. Luthans, K. and G. Messersmith, J. (2014) "Psychological capital," International Journal of Physical Distribution & Logistics Management, 44(8/9), pp. 621–634.	USA	Academic	251 HGV drivers	Correlation, regression and path analysis	4
Arkoubi, A., Bishop, J., & Scott, D. (2013). An Investigation of the Determinants of Turnover Intention among Truck Drivers in the USA. Advances in Management, 6.	USA	Academic	484 HGV drivers	Multivariate statistical analysis utilising the structural equation model (SEM) approach	4
Beers, H., Day, N. and Johnson, S. (2017) Occupational health and extended working lives in the transport sector. rep. London: Crown Copyright, pp. 1–52.	UK	Grey	21 - comprised of 14 HGV drivers and 7 managers/ supervisors	Thematic analysis	4
Bernard, T.M., & Bouck, L.H. (2000) Stress Factors Experienced by Female Commercial Drivers in the Transportation	USA	Grey	27 female long-haul truck drivers	Statistical Analysis Software (SAS)	4

⁵ The weight of evidence score was determined by whether the research has 1) a clear statement of the aims/objectives or research questions Y/N 2) a clear description of the data collection methods Y/N 3) a clearly described sampling (or data selection) strategy Y/N 4) whether there any concerns or discrepancies within the report Y/N. The highest score for the weight of evidence is 4 and the lowest is 0. See page 41 for more details on the weight of evidence assessment.

Source	Country	Grey or academic	Sample size/ no. of data sources	Analytical approach	Weight of Evidence ⁵
Industry, American Society of Safety Engineers, pp. 20-26					
Black et al. (2017) "Truck cab design: Perceptions of women truck drivers," Journal of Traffic and Transportation Engineering, 5(1).	USA	Academic	122 female truck drivers	Quantitative results were analysed using cross tabulation analysis and frequency tables. Qualitative results were analysed using coding methods to create themes and subthemes.	4
Boyce, W.S. (2016) "Does truck driver health and wellness deserve more attention?" Journal of Transport & Health, 3(1), pp. 124–128.	USA	Academic	Not applicable - the study uses secondary evidence and does not define how many sources are used	Literature review	2
Bujold, A., Parent-Rochelleau, X. and Gaudet, M.-C. (2022) "Opacity behind the wheel: The relationship between transparency of algorithmic management, Justice Perception, and intention to quit among truck drivers," Computers in Human Behavior Reports, 8, p. 100245. Available at:	Canada	Academic	110 respondents from online communities of truck drivers.	Confirmatory factor analysis (CFA) of the five-factor theoretical model through Amos 28.	4
Burks, S.V. et al. (2015) "The value of hiring through employee referrals" The Quarterly Journal of Economics, 130(2), pp. 805–839. Available at:	USA	Academic	Data from nine US trucking companies.	Secondary analysis of datasets	4
Caddick, N. et al. (2017) "Understanding the health of lorry drivers in context: A critical discourse analysis," Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine, 21(1), pp. 38–56.	UK	Academic	<ul style="list-style-type: none"> • 17 drivers in ride along interviews • 2 focus groups with drivers (no number are given) 	Critical discursive analysis	2
Cantor, D.E., Macdonald, J.R. and Crum, M.R. (2011) "The influence of workplace	USA	Academic	604 HGV drivers	Confirmatory factor analysis (CFA) - used to explore the	4

Source	Country	Grey or academic	Sample size/ no. of data sources	Analytical approach	Weight of Evidence ⁵
justice perceptions on commercial driver turnover intentions,” Journal of Business Logistics, 32(3), pp. 274–286.				factor structure of a set of observed variables emerging from the dataset.	
Cosenza, R.M. et al. (2012) “Reducing long distance truck driver’s intention to leave: An analysis of professional drivers and owner operators using importance/performance methods,” Journal of Transportation Management, 23(2), pp. 57–70.	USA	Academic	862 HGV drivers and 292 owner operators	Importance-performance analysis (a business research technique developed as a market tool to examine and suggest management strategies)	4
Crizzle, A. et al. (2018) “Health and wellness of Canadian Commercial Motor Vehicle Drivers,” International Journal of Workplace Health Management, 11(5), pp. 319–332.	USA	Academic	A stakeholder group that was comprised of 11 participants from 10 different organisations that represented various sectors of the Canadian bus and trucking industry, both national and provincial or territorial associations	Inductive thematic analysis	4
Department for Transport. (2016) Evidence on Road haulage sector: Skills and workforce planning. rep., pp. 1–11.	UK	Grey	Not applicable	Not applicable	2
Fernandez, D. (2011) EMPLOYEE RETENTION AND TRANSFORMATIONAL LEADERSHIP: A PHENOMENOLOGICAL STUDY. dissertation.	USA	Academic	25 HGV drivers	Thematic analysis which involved coding and categorising the data.	4
Fitzpatrick, A.M. (2020) Being a Female Truck Driver in the UK: The Motivations and Challenges. dissertation	UK	Academic - BSc dissertation	16 female HGV drivers	Thematic analysis	4
Fournier, P.-S., Lamontagne, S. and Gagnon, J. (2012) “Interactions between dispatchers and truck drivers in a high	Canada	Academic	• 17 interviews - 8 HGV drivers, 4 management representatives, 3 dispatchers	Thematic analysis	4

Source	Country	Grey or academic	Sample size/ no. of data sources	Analytical approach	Weight of Evidence ⁵
turnover context," Articles, 67(2), pp. 263–282.			and 2 labour representatives • 3 group discussions - 4 dispatchers, 4 drivers and 3 labour representatives.		
Freight Transport Association (2016) The Driver Shortage: Issues and Trends. An Independent Analysis of Professional Drivers in the UK. rep. Freight Transport Association, pp. 1–20.	UK	Grey	Not applicable - the study analyses secondary evidence and does not define how many sources are used.	Frequency tables and cross-tabulation analysis	3
Freight Transport Association (2019) Logistics Report. rep. Freight Transport Association, pp. 1–88.	UK	Grey	500 businesses from across logistics sector	Not discussed	4
Garver, M., Williams, Z. and Taylor, G.S. (2008) "Employing Latent Class Regression Analysis to Examine Logistics Theory: An Application of Truck Driver Retention", Journal of Business Logistics, 29(2), pp. 233-257	USA	Academic	431 truck drivers working for one long-haul trucking company in the US.	Latent class analysis and regression analysis	3
Gregson, N. (2018) "Mobilities, mobile work and habitation: Truck Drivers and the crisis in Occupational Auto-mobility in the UK," Mobilities, 13(3), pp. 291-307	UK	Academic	Not clear - at least 2 drivers were observed.	Not discussed	2
Hopkins, D. and Akyelken, N. (2022) "Mothertruckers? the gendered work of freight and logistics," Transport and Sustainability, pp. 71–86.	US	Academic	18 truck drivers (8 female, 10 male), 8 freight companies, 8 freight sector organisations and 12 regional and national government departments	Not discussed	4
House of Commons Transport Committee. (2017) Skills and workforce planning in the road haulage sector. rep. House of Commons, pp. 1–47.	UK	Grey	Not applicable	Not applicable	1

Source	Country	Grey or academic	Sample size/ no. of data sources	Analytical approach	Weight of Evidence ⁵
Houtman, I.L.D. et al. (2004) EU road freight transport sector: Work and employment conditions. rep., pp. 1–77.	The EU	Grey	15 national reports, and interviews (number not given)	Secondary analysis - cross-sectional overview of working and employment conditions	3
International Transport Workers' Federation. (2014) Road Transport Women's Health and Safety Handbook	A variety of countries including the UK and USA	Grey	380 female transport workers	Not discussed	2
IRU. (2022) European Driver Shortage Report: Understanding the impact of transport shortages in the industry	Europe	Grey	Not discussed	Not discussed	2
Ji-Hyland, C. and Allen, D. (2020) "What do professional drivers think about their profession? an examination of factors contributing to the driver shortage," International Journal of Logistics Research and Applications, 25(3), pp. 231–246.	Ireland	Academic	111 survey respondents, and 5 qualitative participants	Survey results were analysed using cross-case tabulation analysis in SPSS. Interviews were analysed using thematic analysis/coding.	3
Keckarovska, V. (2021) EUROPEAN DRIVER SHORTAGES. rep. pp. 1-12	Europe and the UK	Grey	Not applicable	Not applicable	1
Keller, S.B. (2002) "Driver relationships with customers and driver turnover: Key mediating variables affecting driver performance in the field," Journal of Business Logistics, 23(1), pp. 39–64.	USA	Academic	149 dispatchers	Statistical tests for the hypotheses were used including employing a series of regression models.	4
Kubanova, J. and Kubasakova, I. (2020) "Security risks in the trucking sector," Transportation Research Procedia, 44, pp. 234–239.	Europe	Academic	Not applicable - the study uses secondary evidence and does not define how many sources are used.	Not applicable	3
Large, R.O., Breitling, T. and Kramer, N. (2014) "Driver shortage and fluctuation: Occupational and organizational	Germany	Academic	624 HGV drivers	SmartPLS (a software with graphical user interface for variance-based structural	4

Source	Country	Grey or academic	Sample size/ no. of data sources	Analytical approach	Weight of Evidence ⁵
commitment of truck drivers,” Supply Chain Forum: An International Journal, 15(3), pp. 66–72.				equation modeling using the partial least squares modeling method. It combines methods with an easy to use and intuitive graphical user interface).	
LeMay, S.A., Williams, Z., & Carver, M. (2009) A triadic view of truck driver satisfaction, Journal of Transportation Management, 21(2), pp. 1-15	USA	Academic	328 HGV drivers; 59 HGV driver managers	ANOVA and Bonferroni analysis	4
Lodovici, M.S. et al. (2009) SHORTAGE OF QUALIFIED PERSONNEL IN ROAD FREIGHT TRANSPORT. rep. European Parliament, pp. 1–194.	Europe	Grey	Not discussed	Both quantitative analysis (e.g. statistical analysis, forecasting analysis) and qualitative analysis (direct interviews, reports, databases) of primary and secondary information.	4
Melton, K. and Ingalls, R. (2012) “Utilizing Relay Points to Improve the Truckload Driving Job,” International Journal of Supply Chain Management, 1(3), pp. 1–10.	USA	Academic	Case study involving 169 drivers for both the relay and non-relay point scenarios.	Analysis of driver performance data	4
Miller, J.W., Bolumole, Y. and Muir, W.A. (2020) “Exploring longitudinal industry-level large truckload driver turnover,” Journal of Business Logistics, 42(4), pp. 428–450.	USA	Academic	22 sources of evidence	Econometric analysis	4
Min, H. and Emam, A. (2003) “Developing the profiles of truck drivers for their successful recruitment and retention,” International Journal of Physical Distribution & Logistics Management, 33(2), pp. 149–162.	Variety of countries including UK and USA	Academic	422 valid responses were received.	Statistical analysis and hypotheses testing	4

Source	Country	Grey or academic	Sample size/ no. of data sources	Analytical approach	Weight of Evidence ⁵
Mitchell, S. and Rozell, E.J. (2007) "Driver Retention: A Framework for Restructuring Carrier Management Practices," <i>Regional Business Review</i> , 26, pp. 25–44.	USA	Academic	Not applicable - the study uses secondary evidence and does not define how many sources are used.	Not applicable	3
Mumphrey, J. (2020) <i>Strategies Road Freight Transport Leaders Use to Increase Driver Retention</i> . dissertation.	USA	Academic - doctoral thesis	5 RFT leaders from two separate road freight companies who had each successfully managed truck drivers for a minimum of 5 years	Thematic Analysis combined with triangulation of secondary sources.	4
Piecyk, M. and Allen, J. (2021) 'Understanding and Addressing HGV Driver Shortages in the UK - Briefing Report', Centre for Sustainable Road Freight, pp. 1–18.	UK	Academic	Not applicable	Not applicable	2
Prockl, G. et al. (2017) "Antecedents of Truck Drivers' Job Satisfaction and Retention Proneness", <i>Journal of Business Logistics</i> 38(3) pp. 184–196	Germany	Academic	138 German HGV drivers	Regression analysis	4
Sersland, D. and Natarajan, R. (2015) "Driver turnover research: Exploring the missing angle with a global perspective," <i>Journal of Service Management</i> , 26(4), pp. 648–661.	USA	Academic	15 long-haul truck drivers	Thematic analysis	4
Sherry, A.P. et al. (2021) "Sleep duration and sleep efficiency in UK long-distance heavy goods vehicle drivers," <i>Occupational and Environmental Medicine</i> , 79(2), pp. 109–115.	UK	Academic	329 HGV drivers	Cross-sectional analyses and logistic regression	4
Smith, K. (2021a) <i>A Perfect Storm of Elevated Demand and Reduced Supply in the UK Haulage Sector 2021</i> :	UK	Grey	Experts drawn from 8 groups including Haulage and distribution operators,	Not discussed	4

Source	Country	Grey or academic	Sample size/ no. of data sources	Analytical approach	Weight of Evidence ⁵
Investigating HGV Driver Demand & Supply. rep., pp 1-33.			logistics UK, and a large established LGV training school		
Smith, K. (2021b) Bulletin: The HGV Driver Shortage Crisis, rep., pp. 1–16.	UK	Grey	Not applicable	Not discussed	3
Smith, K. (2021c) UPDATED: The Answer to the UK's HGV Driver Shortage. rep., pp. 1-5	UK	Grey	Not discussed	Not discussed	2
Smith, K. (2022) DRIVER REQUIRE THINK TANK BULLETIN 4 The HGV Driver Shortage Crisis Q2 2022 Analysis. rep., pp. 1-19	UK	Grey	Not discussed	Not discussed	3
Sousa, I.C. and Ramos, S. (2018) "Working Conditions, health and retirement intentions: A case study of truck drivers," International Journal of Workplace Health Management, 11(3), pp. 114–129.	Portugal	Academic	16 male HGV drivers	Deductive and inductive data analysis to create categories that were then independently assessed to establish consistency in the codification procedure.	4
Staats, U. et al. (2017) "Fighting against a shortage of truck drivers in logistics: Measures that employers can take to promote drivers' work ability and health," Work, 58(3), pp. 383–397.	Germany	Academic	56 HGV drivers	Content analysis - inductive category development and deductive category application	4
Suzuki, Y., Crum, M.R. and Pautsch, G.R. (2009) "Predicting truck driver turnover," Transportation Research Part E: Logistics and Transportation Review, 45(4), pp. 538–550.	USA	Academic	There was one medium sized company with more than 500 HGV drivers (carrier A) and one large company with more than 5000 HGV drivers (carrier B). In carrier A, 971 drivers took part in the weekly observations and in carrier B,	Not discussed	4

Source	Country	Grey or academic	Sample size/ no. of data sources	Analytical approach	Weight of Evidence ⁵
			5016 took part in the observations.		
Swartz, S.M., Douglas, M.A., Roberts, M.D., & Overstreet, R.E. (2017). Leavin' on My Mind: Influence of Safety Climate on Truck Drivers' Job Attitudes and Intentions to Leave. <i>Transportation Journal</i> , 56, 184 - 209.	USA	Academic	553 HGV drivers, including both employees and owner-operators	Partial least squares (PLS) Structural equation modelling	4
Talent in Logistics (2018) Changing Perceptions: Attracting Young Talent into Logistics. rep, pp. 1-20.	UK	Grey	449 students and 42 teachers	Not applicable	2
Talent in Logistics. (2020) WHITE PAPER: DRIVING ENGAGEMENT IN LOGISTICS. rep, pp. 1–21.	UK	Grey	1,300 HGV drivers	Not applicable	4
Talent in Logistics. (2021) THE DRIVERS FOR DRIVERS; WHICH INCENTIVES AND BENEFITS REALLY MATTER? rep., pp. 1–8.	UK	Grey	130 HGV drivers	Not discussed	3
The Chartered Institute of Logistics and Transport. (2015) CILT Driver Shortage Crisis 2015 Report. rep., pp. 1-12.	International including the UK	Grey	103 responses members of the Chartered Institute of Logistics and Transport	Not discussed	3
The International Road Transport Union. (2019) Tackling Driver Shortage in Europe. rep., pp. 1–16.	Europe	Grey	365 IRU members and companies for one survey, and 406 truck drivers, freight forwarders, brokers, and operators for the other survey	Not discussed	4
Welsh Parliament (2021) HGV driver shortage and supply chain issues: Engagement findings. Economy, Trade and Rural Affairs Committee rep.pp 1-20	UK	Grey	6 Welsh HGV drivers	Thematic analysis	4

Source	Country	Grey or academic	Sample size/ no. of data sources	Analytical approach	Weight of Evidence ⁵
Wijngaards, I., Hendriks, M. and Burger, M.J. (2019) "Steering towards happiness: An experience sampling study on the determinants of happiness of truck drivers," <i>Transportation Research Part A: Policy and Practice</i> , 128, pp. 131–148.	The Netherlands	Academic	339 HGV drivers	Within-subject fixed-effects regression	4
Williams, D.F., Thomas, S.P. and Liao-Troth, S. (2017) "The truck driver experience: Identifying psychological stressors from the voice of the driver," <i>Transportation Journal</i> , 56(1), pp. 54–76.	USA	Academic	<ul style="list-style-type: none"> • 61 HGV drivers participated in either the written questionnaires or interviews • 10 blogs from 8 male and 2 female HGV drivers 	Thematic Analysis	4
Williams, Z., Garver, M.S. and Stephen Taylor, G. (2011) "Understanding truck driver need-based segments: Creating a strategy for retention," <i>Journal of Business Logistics</i> , 32(2), pp. 194–208	USA	Academic	197 HGV drivers	Hierarchical Bayes within Sawtooth Software was used to analyse Maximum Difference Scaling data (a survey method that is used to gain an understanding of consumers' likes and dislikes)	4
Wise, J.M., Heaton, K. and Shattell, M. (2020) "Mindfulness, sleep, and post-traumatic stress in long-haul truck drivers," <i>Work</i> , 67(1), pp. 103–111.	USA	Academic	140 HGV drivers	Descriptive statistics, bivariate analysis and regression analysis were used to examine variables of interest	4

