DriverMetrics®

Multi-drop Delivery Driving: What are the risks?

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Introduction

The British economy was changing even before the pandemic arrived on our shores. In the last decade there has been major growth in internet shopping and vans are taking much of the strain, delivering huge quantities of groceries, goods and parcels. Lockdown has led to an even greater internet retailing surge requiring an army of drivers' multi-drop delivering goods.

Internet retailing has led to a 27% increase in the number of vans (light goods vehicles below 3.5 tonnes) registered between 2011 and 2019 (DfT 2019c). The UK has seen 70% growth in road miles driven by vans over the last 20 years (DfT, 2016a) with the most common being the panel van but the term also includes Luton vans, tippers, flatbeds, dropsides and pickups. Light and short haul van drivers typically carry goods making multi-drop deliveries over relatively short (local) distances but some can also drive long distances.

About half the vans in the UK are registered to private individuals and the rest are registered to companies with men outnumbering women by 10:1 (DfT 2019c) hence the term 'white van man'.

Small

Medium

Large

Pickup

Source: Braithwaite, 2017

This white paper explores how organisational factors can affect delivery driver behaviour and the evidence around the risks of multi-drop driving. We consider how driver behaviour may be affected by the nature of the driving task involved. A discussion of how to assess driver behaviour and provide a targeted intervention will be presented and given that employers may struggle to recruit good drivers, we look at ways in which employers can use tools that better predict safe driving.

Organisational Factors and Delivery Driver Behaviour

Home deliveries are very convenient for customers and may even be beneficial for reducing congestion. Multi-drop driving means there are fewer on-road trips compared with the number of cars that would otherwise be on the road (Braithwaite, 2017). There are fleet safety implications though with concerns being raised about the safety of multi-drop delivery driving. These days courier and home delivery-based companies are focusing on driver safety given its impact on a company's brand reputation as well as the bottom line in terms of wear and tear on vehicles. Companies are also keen to avoid any serious human costs of injury and fatal crashes which cannot be tolerated.

Whether your company is a 'Pure play' online retailer that only sells online, or an omnichannel with both an online presence and physical shops ('bricks and clicks') - driver behaviour is a significant factor for customer satisfaction ratings. Customers that receive a poor delivery experience and are inconvenienced by delays are less likely to place further orders (Braithwaite, 2017). As the final point of contact with the customer, the behaviour of the delivery driver can be an influencing factor on your bottom line. Shopper behaviour is fuelled by the expectation of an increasingly personalised retail experience and high quality must be provided across every single touchpoint along the customer journey including the most important 'last mile'.

Companies are focused on doing all that they can to improve the customer experience but there is a balance between the profitability of timely deliveries and taking risks to complete too many deliveries on an impossible schedule. Companies must carefully consider how routes are scheduled and whether the number of parcels or goods being delivered in a working day is reasonable. In the pursuit of profit, companies may be unwittingly rewarding unsafe driving. Some drivers may not receive a regular salary but are self-employed and paid for each job, or 'gig' completed. Driver's pay can be based on a 'Drop Rate' with a fixed rate for each delivery (or collection) or based on a 'Parcel Rate' - a fixed rate for each individual parcel.

Industry experts working with delivery companies confirm that a parcel delivery target is typically 120 to 150 parcels per van per day. However, some courier-based companies make 20 to 80 parcel deliveries per day.

Taking these two estimates into account, an average of 80 deliveries for each driver may be a high workload depending upon the route. Delivery drivers are motivated to maximise their income, but may experience high levels of stress that affect their driving performance and increase their risk.

As well as unsafe driving behaviour, insufficient rest breaks, unreasonably tight deadlines and excessive working hours can lead to an increased risk of conflicts with customers.

Multi-drop Driving: What are the risks?

According to Friswell and Williamson (2010), a substantial percentage of delivery drivers have reported exceeding the speed limit or parking illegally at least once a week, and one fifth of drivers omitted to wear their seatbelt at least once a week. The reasons given by drivers who engaged in these behaviours showed that time and workload pressure was the most commonly reported reason for speeding, driving through a red light and disobeying traffic signs, and was the second most common reason given for regularly parking illegally and omitting to wear a seatbelt. Illegal parking was most often attributed to a lack of parking spaces that were not appropriate for the vehicle. Delivery drivers are also at greater risk of being involved in slow speed manoeuvring crashes when driving on residential and urban roads and having to execute dozens of parking manoeuvres a day.

Driving is one of the riskiest activities undertaken during the course of a person's work. Bomel (2004) reported that commercial vehicles were involved in 26% of all road fatalities during 2001. However, the situation appears to have since worsened according to more recent statistics. In 2018, 520 working drivers/riders and their passengers were killed together with non-working road users in collisions where at least one driver was working (DfT 2019a). Based on their analyses of STATS19 data over an 8 year period, Ward et al (2020) estimate that 39% of killed pedestrians were hit by a driver at work at the time of the crash. This is the equivalent of over 9 deaths a month and represents about 1 in 3 road deaths, 1 in 5 seriously injured casualties and 1 in 4 casualties of all severities sustained.

The statistics are not so bleak when we look at the van 'accident rate' (for all severities) per billion vehicle miles in 2017 however. This has fallen by 29% since 2007 and the van 'fatal accident rate' per billion vehicle miles reduced by 29% in the same period. Over 12,000 vans were involved in crashes in Great Britain in 2017 and there was a 17% reduction in the number of casualties since 2007, even though the number of vans on the road increased by 24% over the same period (Van Excellence, 2018-19).

Delivery Driver Stress and Workload

Vans used by package and grocery e-commerce delivery operators have a much greater mileage than the average van (Braithwaite, 2017). Average miles has been estimated at 12,900 per year as compared to 8,000 for cars (DfT, 2016e; DfT, 2016f). Parcel operators are estimated to be driving 20,000 miles to 30,000 miles per year; and grocery home delivery about 25,000 miles to 50,000 miles per year. High mileage means increased work demands for delivery drivers, mostly isolated and driving in unfamiliar locations on congested roads. Drivers could also be working in multiple roles to earn enough pay, rushing from place to place with safety motives taking a back seat (Adams-Guppy and Guppy, 1995).

Time pressures, delivery targets and irregular and long hours spent driving contributes to long-term stress. A stressed driver is prone to risk taking, driver errors, traffic violations and crash involvement (Dorn, 2021). Crash involvement is often due to in-attentional factors and distracting (Talbot et al, 2013). It is difficult to know how many crashes are caused by inattention and distraction as drivers rarely admit to being distracted at the time. However, as much as 78% of the crashes and 65% of near crashes measured via in-vehicle technology and cameras show inattention or distraction as a contributing factor (Klauer et al., 2006).

The Transactional Model of Driver Stress

The transactional model of driver stress helps to explain how delivery drivers appraise the situation they find themselves in and how they cope with the demands placed on them. The model shown in Figure 1 states that stress arises out of dynamic transactions or encounters between the person and traffic environment. The transaction depends on cognitive aspects including what the driver thinks about the encounter, and their choice and regulation of coping strategies. Here, the outcome (the level of stress and its effect on driving performance) is generated by beliefs that the demands of the task exceed the driver's capabilities and coping resources. Some delivery drivers adopt ineffective coping strategies that increase their risk.

For example, the personality factor of aggression is associated with hostility and negative beliefs about other road users. Expressing hostility towards another road user is an ineffective coping strategy associated with risky driving decisions such as speeding. Profiling these individual differences in response to delivery driving identifies behavioural risk and whether ineffective coping strategies are being adopted.

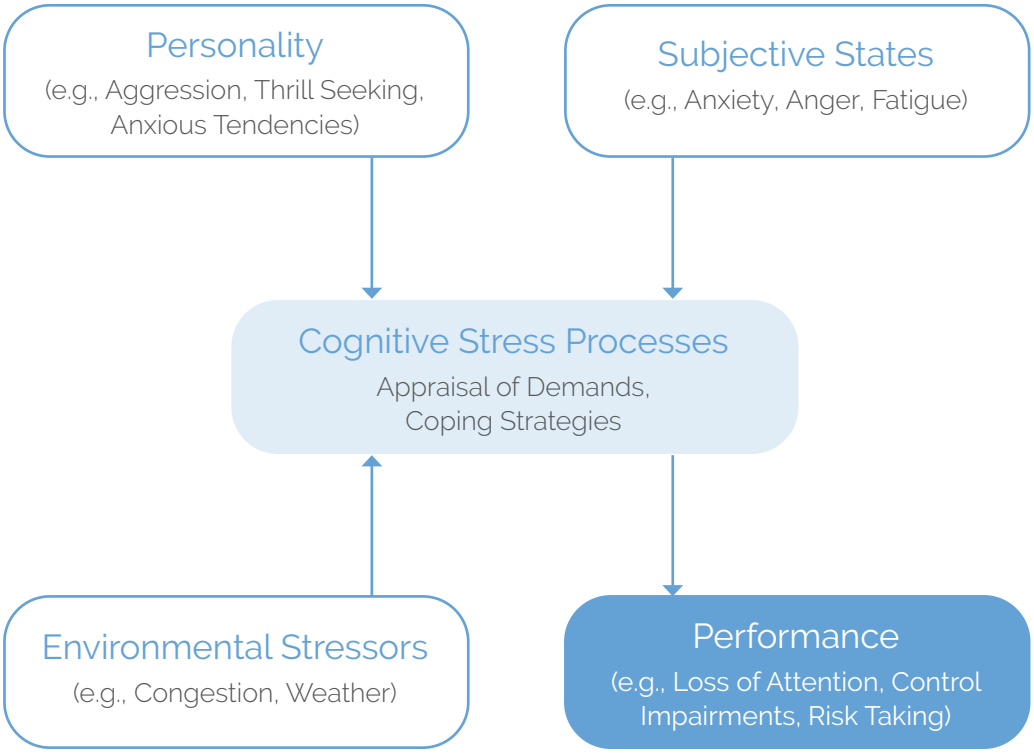

Figure 1 - Source: Matthews et al (2005)

What can companies do to improve multi-drop delivery driver safety?

Driver behaviour is best understood in terms of the goals or needs it serves. The key to understanding is contained within the motives that underlie and promote the specific driving behaviours. Drop rates and parcel rates may encourage risk taking by rewarding drivers based on how many deliveries they make. The sooner a delivery driver drops all the parcels and goods, the sooner they can finish work and this can motivate unsafe driving. Studies have shown that the perception of positive consequences (higher pay) are better predictors of involvement in risk-taking behaviours than perception of the costs (e.g. crash involvement, traffic penalties) (Parsons et al, 1997). Employers may wish to consider whether high risk delivery driver behaviour may be being reinforced and review the pay structure.

As well as changes to policies and procedures that may be influencing unsafe driving behaviour, companies may wish to implement behavioural interventions. Using the Transactional Model of Driver Stress as its theoretical base, the Driver Risk Index™ has been designed to assess behavioural and coping risks and available via the Cranfield University spin-out company DriverMetrics®. The validity of the Driver Risk Index™ has been tested using different research methods showing converging evidence. Stress vulnerabilities measured via the Driver Risk Index™ elicit different patterns of stress response that impact driving performance. Studies using the Driver Risk Index™ have shown that drivers for work are particularly prone to adverse stress and fatigue reactions (Matthews et al, 2001b; Desmond and Matthews, 2009: Öz et al, 2010; Bergomi et al, 2017). The scales have been found to predict various stress outcomes for professional drivers relating to general health, job related stress and daily hassles (Machin, 2001; Wickens and Wiesenthal 2005; Rowden et al, 2011; Wishart et al, 2017) suggesting a 'spillover' effect. That is, driver stress may be reciprocally related to stress in other domains including work and domestic life.

With regards to the stereotype of 'White Van Man' media reports suggest high levels of driver aggression for this road user group. Aggression (AGG) as measured via the Driver Risk Index™ is associated with mastery over other road users and appraising them as hostile. The transactional model explains that the cognitions typical of driving aggression are likely to be elicited by traffic delays. They also tend to cope by becoming confrontational with other road users (Matthews, 2001). High AGG drivers tend to drive faster, commit

more errors and execute more high-risk overtakes than drivers scoring low on AGG. Several studies have shown that high levels of Aggression is associated with crash frequency (e.g. Matthews et al, 1999a).

The ability to assess this characteristic when recruiting delivery drivers can be an effective method of predicting which drivers may not be suitable for the job. Those that are already employed and vulnerable to responding with aggression when stressed due to work and driving demands can participate in DriverMetrics® stress management online workshops.

The Driver Risk Index™

- Aggression: Negative appraisal of other drivers that tend to generate feelings of anger.
- Dislike of Driving: Assesses negative self-appraisal that generate worry and anxiety.
- Hazard Monitoring: reflects the active monitoring for hazards to pre-empt threat by the vigilant search for danger.
- Thrill-Seeking: Measures enjoyment of danger and increased risk taking.
- Fatigue Proneness: Measures vulnerability to suffer with driver fatigue.

A separate set of scales to measure driver coping measures is also included in the Driver Risk Index™

- Confrontive coping: standing up to others to assert one's needs or relieving one's feelings through risk-taking e.g. tailgating a slow vehicle to encourage them to move out of the way.
- Task-focus: making an effort to drive safely when demands are high e.g. slowing down and being more vigilant.
- Emotion-focus: regulating feelings and thoughts about events, criticising oneself for mistakes e.g. thinking reassuring thoughts when upset, or reflecting on why another driver committed an unsafe action.
- Reappraisal: Looking on the bright side when driving is demanding e.g. viewing the drive as a learning experience.
- Avoidance: physical or mental disengagement from events by suppressing negative feelings. For example a driver might avoid a particularly congested route or seek to remain detached when driving is demanding.

Behavioural Coaching Interventions for Delivery Drivers

Selecting effective coping strategies helps to change internal feelings and thoughts towards traffic and work situations including active attempts to influence the external environment by changing routes to avoid heavy traffic for example. Therefore, from a transactional perspective, we encourage companies to ensure that delivery drivers have developed good stress management techniques and coping strategies. However, training interventions can be a challenge for small businesses with significant financial constraints on their operations. Developing fleet risk management programmes has historically meant allocating drivers to face to face interventions in workshops or in-vehicle. However, new online training approaches have emerged and become the norm. For example, since April 2020 NDORS deliver all classroom-based courses for offender drivers via an online format. Similarly, cost effective, live interactive online courses have been developed by DriverMetrics® called Insight into Action™. Insight into Action™ online workshops help drivers to develop safer coping responses to manage the stress of driving for work. Many DriverMetrics® case studies, available to view on our website, have shown significant reductions in crash rates as drivers develop safer coping strategies.

DriverMetrics® also deliver one-to-one coaching interventions by telephone or online conferencing based on the results of a Driver Risk Index™ assessment and telematics data, if available. Using behavioural change techniques, the DriverMetrics® coach encourages drivers to identity at risk behaviours and influence the way drivers think and feel about risk. An open and honest conversation with the driver about various driving situations where certain behaviours have been triggered takes place. This allows the driver to self-reflect on their behaviour behind the wheel and provides a basis for goals to be agreed.

Some companies prefer to deliver coaching interventions in-house by their own trainers and coaches, so DriverMetrics® offers a classroom-based and online CPD programme for all levels of management, supervisory personnel and in-house trainers. The DriverMetrics® Coaching Programme is a highly practical and tailored 2 day course giving your people the knowledge and skills to risk assess drivers and implement behavioural change programmes using the Driver Risk Index™.

Recruitment and Selection

Given staff shortage scores across the main logistics occupations, companies are having to convert car drivers to delivery drivers in order to fill vacancies. Vans are exempt from most of the heavy goods vehicle (HGV) regulations relating to tachograph reporting, driving times, more rigorous MOT testing and operator licensing. Any Category B driving licence holder can work as a delivery driver either employed or self-employed with no requirement for professional training and testing as is the case for other professional drivers. Anyone with a driving license can transport items from 'A' to 'B, but not everyone is suitable for the job.

The Driver Risk Index™ is a multivariate assessment increasingly being used to support the hiring of those drivers whose styles of cognition promote safety and thus are less likely to be crash involved and be a cost to the company that hired them. The Driver Risk Index™ is currently being used for selecting drivers based on key competences including staying calm and relaxed when held up in traffic; looking out for potential hazards and staying alert even when under stress; avoiding the need to take risks when under time pressure; employing safer driver coping strategies and demonstrating low levels of vulnerability to driving fatigue. Companies adopting this approach can be confident that they have a robust system at the selection and recruiting stage to filter out high risk drivers from the outset. Post-selection, the profiles are also used in coaching drivers to develop safer coping strategies.

Conclusion

Delivery drivers are exposed to high levels of stress given the nature of their work. Organisational and situational factors contribute to these high stress levels. We recommend that work practices that engender time pressure, fatigue and high workload be reviewed and that behavioural interventions should be put in place to manage driver stress and develop safer coping strategies. Selecting delivery drivers from the outset who are less vulnerable to driver stress would help to ensure that the workforce is more suitable for the job of multi-drop delivery driving.

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