Údarás Um Shábháilteacht Ar Bhóithre
Road Safety Authority

INSIGHT
STATISTICAL CONSULTING

Survey of vehicle roadworthiness of HGVs and driver compliance with EU rules on driving times, breaks and rest periods

Summary of HGV and Bus Survey results - 2018 Data

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1 Introduction

This study has been undertaken by the Road Safety Authority (RSA) to measure the compliance of commercial vehicles and their drivers and operators with the applicable legislative rules. The study samples, in a non-biased manner, the compliance with roadworthiness rules of Heavy Goods Vehicles (HGVs) and buses, and the compliance of drivers of these vehicles with EU rules on driving times, breaks and rests. This is the fourth survey of its kind; the previous surveys were conducted in 2012, 2014 and 2016.

The aim of these surveys is to determine the roadworthiness of vehicles and compliance of drivers of HGVs and buses in Ireland with operator licencing, tachograph, and EU drivers' hours regulations. The results from these surveys are used to measure the effectiveness of current policies, strategies and enforcement and allow the RSA to target enforcement of roadworthiness, operator licencing, tachograph, and drivers' hours rules in a more effective, data-led manner.

The sample collected is of inspections that are 'non-targeted'; that is vehicles randomly selected for inspection, and specifically excludes any vehicles that have been 'targeted' for inspections due the greater likelihood of these 'targeted' vehicles being non-compliant with their legal obligations.

This report is a summary of the results from the 2018 survey. The main aim of this report is to compare the results to those from previous surveys and to determine trends in the data. Throughout this summary report comparisons are made to the results from the 2016, 2014 and 2012 surveys.

2 Definitions

In this report, the term 'roadworthiness inspection' refers to the roadside inspection carried out by the Vehicle Inspectors as part of the survey. The term 'driver compliance check' refers to the roadside check of the compliance of drivers with EU rules on driving times, breaks and rest periods carried out by the Transport Officers as part of the survey. The term 'vehicle' can refer to a HGV (including tractor units and rigid vehicles), a trailer, or a bus. The term 'defect' refers to a motor vehicle or trailer roadworthiness defect, and for the purpose of this report includes the absence of a Certificate of Roadworthiness (CRW). The term 'infringement' refers to a breach of the licencing, tachograph or drivers' hours requirements.

For the purposes of this report the 'HGV survey' refers to the survey of HGVs (vehicle categories N2 and N3) and trailers (vehicle categories O3 and O4). 'Bus survey' refers to the survey of passenger vehicles with more than eight passenger seats (vehicle categories M2 and M3). Each roadworthiness inspection can consist of a HGV (i.e. a tractor unit with no trailer or a rigid vehicle); a HGV tractor unit and a trailer, a trailer unit only (though trailers are not typically inspected without the associated tractor unit being inspected at the same time), or a bus. Other vehicle types that have been inspected but fall outside of these categories have been excluded from the analysis.

3 Notes about the Data

In the analysis on the 2012 data, Reeves (2014) identified that there was a statistically significant difference in the proportion of HGVs with at least one defect across the different categories of inspection site (motorway, national road, regional road, port, and weighbridge). In the follow-up surveys the distribution of inspections across these roads has been different each time. As such, if the data was presented as collected and not weighted it would not be clear if differences in the overall number of vehicles with at least one defect (or differences across the defect severities) was due to a change in the roadworthiness of the vehicles, or if

this could be explained purely due to the selection of locations at which the inspections took place.

Because of this reason, throughout this report, results related to the HGV and trailer surveys have been weighted using the road type of the inspection site as the basis to construct a set of weights. Weighting the data adjusts the results to take into account differences in the location of the inspections from the first survey (2012) to ensure, as far as possible, the results from subsequent analysis are comparable to the results from 2012. The weighting process for this report calculates the proportion of inspections on each road type within 2012 and 2018 and adjusts the counts in this analysis to ensure the proportion of inspections conducted in 2018 by road type aligns with the proportions found in 2012. A similar weighting was applied in 2014 and 2016.

This report only contains inspections which were not the result of targeted enforcement i.e. vehicles were selected at random to be included in the survey. As a result, the number of vehicles and drivers inspected is likely to differ from the numbers presented in other RSA publications, since these also include targeted inspections.

4 Key Findings – Roadworthiness Inspections Survey

4.1 HGV Roadworthiness Inspections Survey

Between the 2nd of January and the 20th of December 2018, 8,124 roadworthiness inspections (5,389 HGVs and 2,735 trailers) were carried out by Vehicle Inspectors as a component of this study. Of the 5,389 HGVs inspected 45 percent had at least one defect recorded. The breakdown by defect severity (that is, the highest severity of all defects found per vehicle inspection) was as follows: 17 percent of the inspections had a maximum defect severity of minor, 24 percent were major and 4 percent were dangerous.

Statistical tests were used to test for a significant difference between the proportion of inspections with at least one defect and those with no defects. The vehicle's country of origin,

vehicle age, and the province the inspection was carried out in were all significant predictors of the proportion of vehicles with at least one defect. The analysis showed that:

- A higher proportion of vehicles from Ireland had defects (46 percent) than those from outside of Ireland (33 percent).
- Defects were more commonly recorded for older vehicles than newer vehicles: the proportion of HGVs with at least one defect increased from 18 percent for vehicles aged 0-2 years to 68 percent for vehicles aged over 21 years.
- Inspections in Munster had the highest proportion of vehicles (51 percent) with at least one defect and Ulster had the lowest (27 percent).

In total, 4,710 defects were detected across 5,389 HGVs: an average of 0.87 defects per HGV inspection.

HGVs most commonly failed the inspection due to defects with the lighting and electrical equipment (19 percent of inspections). However, when the data are broken down into the defect sub-categories, defects with the tyres were the most common defect identified (584 cases) with eighty percent being recorded as major or dangerous defects. Defects with the vehicles' ABS (anti-lock braking system) were less likely to be observed (229 cases) but had a higher proportion of defects given the severity of major or dangerous (97 percent).

Comparing the results to the previous surveys we see that:

- The proportion of HGVs with at least one defect was similar across all surveys (46 percent in 2012 and 2014, 44 percent in 2016, and 45 percent in 2018).
- However, the proportion of inspections with a maximum defect severity of major and dangerous has increased since the 2014 survey, and the percentage of major defects has exceeded that observed for minor defects.
- The average number of defects per inspection was 1.0 in 2012, 0.9 in 2014, 0.86 in 2016, and 0.87 in 2018.
- 'Tyres' remains the most common defect across all surveys.

4.2 Trailer Roadworthiness Inspections

Of the 2,735 trailers inspected, 36 percent had at least one defect recorded. The breakdown by defect severity was as follows: 11 percent of the inspections had a maximum defect severity of minor, 19 percent were major, and 6 percent were dangerous.

Statistical tests found that the vehicle country of origin, and province were significant factors in identifying trailers with at least one defect:

- Similarly to that observed for HGVs, trailers originating in Ireland are more likely to have a defect recorded than those from outside of Ireland (26 percent compared against 39 percent of Irish trailers).
- Inspections in Munster had the highest proportion of trailers with at least one defect (39 percent). In contrast, Ulster had the lowest proportion of vehicles with at least one defect (26 percent).

In total, 1,537 defects were detected across 2,735 trailers: an average of 0.56 defects per trailer inspection. Sixty-eight percent of the trailers with at least one defect had just one defect recorded.

Trailers most commonly failed the inspection due to defects in the lamps, reflectors and electrical equipment, closely followed by the braking equipment (around 13 percent each). However, when the data are broken down into the defect sub-categories, defects with the tyres was most common breach identified (226 cases). Like that seen in the HGV results, defects with the vehicles' ABS (anti-lock braking system) were also common (170 cases) and also had a high proportion of defects recorded as being major or dangerous (98 percent).

Comparing the results to the previous surveys we see that:

- The proportion of trailers with at least one defect decreased significantly from 45 percent in 2012 to 37 percent in 2014 and 2016. This remained similar in 2018 (36 percent). However, the proportion of inspections with a maximum defect severity of

major and dangerous has increased since the 2014 survey, and the percentage of major defects still exceeds that observed for minor defects.

- The average number of defects has decreased from 1.0 per inspection in 2012 to 0.6 per inspection in 2014 and 2016, to 0.56 in 2018.
- 'Tyres' has overtaken 'Absence of technical inspection (CRW)' as the most common breach in the trailer survey.

4.3 Bus Roadworthiness Inspections Survey

Between the 8th of January 2018 and the 18th of December 2018, 832 bus roadworthiness inspections were carried out by the Vehicle Inspectors as part of this survey. No weighting has been applied to this portion of the study.

Fifty-one percent of buses inspected had at least one defect: 4 percent had a maximum defect severity of dangerous, 28 percent were major, and 19 percent were minor. In total, 887 defects were detected across the 832 inspections: an average of 1.07 defect per inspection. For Buses, the most common inspection failure was due to defects with the 'other equipment' (20 percent of inspections). Failure due to defects with the chassis, axles, and lighting and electrical equipment were also all common. When defects were broken down into the sub-categories, defects with the fire extinguisher and tyres were the most common defects identified (95 and 90 defects respectively). Approximately 87 percent of the tyre defects were given the severity 'major' or 'dangerous'.

The proportion of roadworthiness inspections with at least one defect decreased from 60 percent in 2012 to 48 percent in 2016, this has only changed marginally to 51 percent in 2018.

5 Key Findings - Driver Compliance Checks

5.1 HGV Driver Compliance Checks

Between the 2nd of January 2018 and the 20th of December 2018, 1,184 HGV driver compliance checks were carried out by the Transport Officers as part of this survey. These data were weighted by inspection site to ensure these results were comparable to the previous surveys.

Fifty-five percent of HGV driver inspections had at no infringements. Of the 45 percent with at least one infringement, for 9 percent the maximum infringement severity was minor, 15 percent the maximum infringement severity was serious, 20 percent was very serious, and 1 percent was most serious.

The results showed that:

- There was a general trend towards drivers of older vehicles being less likely to have an infringement recorded, though drivers of vehicles between zero and two years old were an exception to this.
- The province where the driver was inspected appears to affect the infringement rate, with Leinster and Ulster having lower infringement rates than the average, and Munster and Connacht having higher infringement rates than average.

In total, 1,232 infringements were detected across 1,184 checks: an average of 1.04 infringements per driver compliance check. The most common infringements were 'Failing to take adequate breaks' (374 infringements) and 'Failure to take daily rest period' (98 infringements).

Compared to the results from the previous surveys: The proportion of drivers with at least one infringement increased significantly from 27 percent in 2016, to 45 percent in 2018. The

average number of infringements per inspection in 2012, 2014 and 2016 was 0.7 and is 1.04 in 2018.

5.2 Bus Driver Compliance Checks

Between the 17th of January 2018 and the 18th of December 2018, 93 bus driver compliance checks were carried out by the Transport Officers as part of this survey. The restricted sample size means caution should be taken when interpreting the results from this part of the survey as the results may not be robust. 46 percent of bus drivers inspected had at least one infringement: 23 percent had a maximum infringement severity of very serious, 18 percent were serious, and the final 5 percent were minor. There were no most serious infringements recorded.

6 Factors that Influence Infringement and Defect Rates

Throughout the study a number of factors were found to significantly affect the likelihood of having a defect or infringement recorded. For example, the age of a vehicle, its country of origin (with vehicles from outside of Ireland being less likely to record an infringement or defect, compared against Irish-based vehicles), and the province in which it was examined repeatedly appeared to have a significant effect on recording an infringement or defect. The reason why the age of a vehicle may be an influence is straight-forward, in that older vehicles are more likely to have developed faults over time compared to younger vehicles. However, the reasons why non-Irish vehicles and province should affect infringement and defect rates is worthy of further investigation.

From our discussions with the RSA, a hypothesis that operators typically send their best and newest vehicles on international journeys was proposed. The theory being that they cannot afford breakdowns or enforcement related delays, so mitigate against this risk by sending the vehicles that are in the ‘best-shape’. The evidence found throughout this study supports this, as vehicles from outside of Ireland have been shown to be significantly less likely to record a defect or infringement.

This evidence is summarised below in Table 1 which provides the percentages of Irish HGVs and HGVs based outside of Ireland with at least one defect taken from the Roadworthiness Inspections survey. Colours have been added to this table to highlight the differences found across defect rates.

Table 1: Defect rates of Irish/non-Irish HGVs across provinces

	Province	No defects	At least one defect	Total N
Non-Irish Vehicle	Connacht	63%	37%	90
	Leinster	66%	34%	214
	Munster	64%	36%	90
	Ulster	71%	29%	211
	Overall	**67%**	**33%**	**604**
Irish Vehicle	Connacht	53%	47%	1,009
	Leinster	52%	48%	1,903
	Munster	48%	52%	1,336
	Ulster	74%	26%	536
	Overall	**54%**	**46%**	**4,785**
Total		**55%**	**45%**	**5,389**

As can be seen in this table, at an overall level, HGVs from outside of Ireland are more likely to have no defects (67 percent compared against 54 percent for Irish HGVs), and a similar pattern is observed at the provincial level. However, this by itself is not driving the observed differences found in the study. Instead, when we look at the distribution of Irish/Non-Irish vehicles inspected across provinces, as shown in Table 2, it is clear that inspections outside of Ulster are relatively unlikely to inspect a non-Irish vehicle, whereas in Ulster almost 30 percent of inspections were of non-Irish vehicles.

Table 2: Percentage of roadworthiness inspections of Irish/non-Irish HGVs by province

Province	Not Irish Vehicle	Irish Vehicle	Total N
Connacht	8%	92%	1,099
Leinster	10%	90%	2,117
Munster	6%	94%	1,426
Ulster	28%	72%	746
Overall	**11%**	**89%**	**5,389**

As a result of this, these explanatory factors should not be seen as isolated factors, instead there is an interconnected relationship between the two. Non-Irish vehicles are more likely to record fewer defects and infringements because they are perceived to be the operators' best vehicles which are sent abroad because operators do not want to risk having to pay costs if these vehicles' breakdown. In addition, because of Ulster's proximity to the border, vehicles from outside of Ireland are more likely to be inspected in Ulster. Table 1 also shows that Irish vehicles inspected in Ulster are also more likely to have no defects, which suggests a similar approach by Irish operators in that they send their best vehicles into Northern Ireland to avoid breakdown costs and enforcement related delays.