RAC Foundation

The modelled impact of a range of GDL schemes. An update of the 2014 TRL report

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1. Introduction

In May 2014 the RAC Foundation published *Graduated Driver Licensing: A regional analysis of potential casualty savings in Great Britain* written by TRL. This report used road safety data from 2008 to 2012 to estimate the potential casualty and collision reduction for Great Britain based on the introduction of restrictions for newly licensed drivers typical to most Graduated Driver Licensing (GDL) schemes. This analysis uses the same method developed and outlined in the 2014 report to update the estimate of potential casualty and collision reductions based on the latest available road safety data (2012 to 2016).

2. Method

The 2014 TRL report outlines the basic method used to generate estimates for the potential casualty and collision reductions from the introduction of a GDL scheme. To update the potential reduction estimates the model needed to be calibrated by comparing data from the period used in by TRL in the 2014 report (2008 to 2012) with the results in the original report itself. Once calibrated the method was applied to latest data (2012 to 2016) to update the estimates.

Full road safety data regarding report road collisions (STATS19 data) in Great Britain was downloaded for **accidents, casualties and vehicles** relating to the road collisions from 2005 to 2016 - with 2016 the latest year for which this data is available (DfT, 2017a). The individual datasets were combined and filtered to create three datasets (accidents, casualties and vehicles) for reported road collisions from 2008 to 2016 - the three dataset related to each other by the accident index. The data was then spatially joined with the original regional shapefile created for the 2014 report which split Great Britain into 49 regions. As these regions are based on police constabulary areas, further cleaning ensured that the location of collisions were mapped to the correct location to be used in the analysis. This cleaning and joining generated two results tables - one for data relating to **casualties** and the other for **accidents**.

Table 2.1 below outlines the main components of a potential GDL system that would place restrictions on young drivers (or newly qualified drivers) in terms of the passengers that that could carry and/or the time of day they could drive - each have a "strong" and "weak" restriction level. Other typical components of a GDL scheme include a minimum learning period or a zero tolerance to alcohol when driving. As per the original report, 17-19 year old drivers were used as a proxy for newly qualified drivers due to the lack of data regarding newly qualified drivers. In addition, the 2014 report focused on the two most common and effective components of a GDL system – night-time and passenger restrictions. For the purpose of recreating the model to calculate the potential impact upon the collisions and casualties of a GDL scheme, the casualties and accidents data were filtered by certain parameters; for example did the collision involved a 17-19 year old car driver? For each condition a new column was added for which a value of "true" was assigned to each accident (and casualties associated with the collision in the

casualties table) if the collision met the criteria and a value of "false" was assigned if it did not. For each collision (and casualty), the conditions investigated were;

1. Involved a 17-19 year old driver (of all licensed motorised vehicles)
2. Involved a 17-19 car driver
3. If there was a 25+ year old passenger casualty within the 17-19 year old driver's vehicle (all vehicle types)
4. If there was a 25+ year old passenger casualty within the 17-19 year old driver's car
5. If it occurred between 9 p.m. and 6 a.m.
6. If it occurred between 12 a.m. and 5 a.m.
7. If it occurred on a Friday, Saturday or Sunday
8. If there were passenger casualties aged 15 -25 within the 17-19 year old driver's vehicle
9. If there was one passenger casualty aged 15-19 with in the 17-19 year old driver's vehicles
10. If there was more than one passenger casualty aged 15-19 with in the 17-19 year old driver's vehicles

As a consequence both the **accidents** and **casualties** results datasets contained additional columns for each of the criteria above that took the form "true" or "false" depending upon if the criteria was met for that collision and casualty.

Table 2.1 - Strong and weak passenger and night-time component criteria

	Passenger component	Night-time component
Strong	No 15-24 year old passengers (unless accompanied by a 25+ year old	No permission to drive between 9 p.m. and 6 a.m. (unless accompanied by a 25+ year old)
Weak	No more than one 15-19 year old passengers (unless accompanied by a 25+ year old)	No permission to drive between midnight and 5 a.m. (unless accompanied by a 25+ year old

The **accidents** and **casualties** data were then split into two groups (i) the original time period used in the 2014 report (2008 to 2012) and (ii) the more recent time period (2012 to 2016) with the original time period to be used to calibrate the modelled impact of a GDL system. Note that 2012 was including in both time periods to allow calibration and then replication of the method with the latest data. The 2014 report used an effectiveness level of 20% - the introduction of a GDL system would likely see a 20% reduction in the number of casualties in relevant collisions – as such this level of effectiveness was replicated for the new analysis. As the reported road safety data records the presence of only those who were injured in reported road collisions, the original report applied an adjustment factor to the casualties and collision datasets to better account for all those drivers not captured in the road safety data for each of the GDL criteria. This adjustment factor was based on data from the "On the Spot" database – an in-depth collision research project commissioned by the DfT that investigated approximately 4,000 crashes of all road users and injury severity between 2000 and 2010.

Firstly, the impact of a full GDL system was modelled. A full GDL system posits a 20% reduction in casualties from collisions that involved 17-19 year old car drivers (the original report focused on 17-19 car drivers rather than vehicles of all types). The casualty data relating to the original time period was filtered to give the total number of collisions and casualties that involved a 17-19 year old car driver for each region, 20% of this total was taken to give the direct overall reduction in casualties attributable to a full GDL system and this was converted to an annual figure. The same method was applied to the 2012

to 2016 time period to provide a new estimate of the impact of a full GDL system. To calculate the Killed and Seriously Injured (KSI) collision rate (the number of KSI collisions involving a 17-19 year old car driver per 10,000 17-19 year olds in the region), total mid-year ONS population estimates were used for the respective 5 year time period for each region (ONS, 2018).

To model the impact of strong and weak passenger and night time restrictions first the number of casualties and collisions for which the restriction would have applied were identified using the original time period. For example, the **strong passenger restriction** would result in newly qualified car drivers (throughout this analysis this is proxied by 17-19 year old drivers) unable to carry passengers aged 15-24 year old unless accompanied by a passenger aged 25 or older. As such, this analysis identifies the number of casualties and collisions which involved a car driver aged 17-19 with a passenger casualty aged 15-24 years old in their vehicle but without a passenger casualty aged over 25 years old in their car between 2008 and 2012. Once the number of collisions and casualties were correctly identified, 20% of total was taken to give the provisional overall reduction in casualties attributable to the GDL component and this was converted to an annual figure. An adjustment factor was then applied by comparing the calculated provisional figure for the original time period with the data in the 2014 report thus producing a modelled estimate for the potential savings from the specific GDL component for each region. Once the adjustment factors for each GDL component were identified, the same method as above was applied to the 2012 to 2016 dataset to produce updated estimates for each GDL components. As per the method in the original report, the expected value of benefits was calculated using the average value of the prevention of a road casualty from the Department for Transport's *Reported Road Casualties Great Britain 2016* (DfT, 2017b). In addition to producing updated data tables for each region and GDL component, updated maps were created and shown in section 3. These maps use the "jenks" method to determine the classes for each map.

It is worth noting that this analysis has not adjusted the casualty data due to the introduction of the CRASH (Collision Recording and Sharing) system. The switch to a new road collision reporting system at the end of 2015 and beginning of 2016 by approximately half of the English police forces is likely to have resulted in a more accurate categorisation of serious injuries within the 2016 casualty data (DfT, 2017a). This may slightly increase the estimated effectiveness of a potential GDL system (as the CRASH system likely increased the number of serious injuries) however this effect is likely to have been averaged out by using 5 years of data. In addition, if the new data is more accurate, any rise in serious injuries would mean a real increase in the impact of a GDL scheme.

3. Summary

The updated estimates show that the potential savings from the introduction of a GDL system would have less of an impact, in terms of expected reductions in casualties and collisions, now than if they were introduced in 2014. The population and proportion of young car drivers (those aged 17-19 years old), that this methods uses to calculate the potential reductions, remained fairly stable from the end of 2012 to 2016 which raises the question regarding why and how the number of young driver casualties have reduced that in turn has resulted in the reduction in the potential savings of implementing a GDL system. Has the reduction in young driver casualties occurred because of an increase use of telematics, or are young drivers in vehicles that are new and safer, or perhaps young drivers are driving less often due to cost reasons?

Table 3.1 - Summary of expected casualty reductions for a GDL system, 2014 GDL report vs GDL update, GB

		GB - 2014 report (2008 to 2012 data)		GB - GDL update (2012 to 2016 data)	
		Expected reduction in all annual casualties from collisions involving a 17-19 year old car driver	Expected reduction in KSI casualties from collisions involving a 17-19 year old car driver	Expected reduction in all annual casualties from collisions involving a 17-19 year old car driver	Expected reduction in KSI casualties from collisions involving a 17-19 year old car driver
Full GDL system		4478	433	2733	281
Strong	Night-time restriction	1613	220	894	126
	Passenger restrictions	2191	231	1226	137
	Both night and passenger restrictions	3201	355	1866	229
Weak	Night-time restriction	453	75	259	42
	Passenger restrictions	1166	159	622	91
	Both night and passenger restrictions	1651	220	892	130

4. Technical Annex

4.1 A full GDL system

Table 4.1 Summary of overall young car driver casualty and collision numbers and expected reduction attributable to a full GDL system

Country	Expected reduction in annual KSI collisions involving 17-19 car drivers	Expected reduction in annual collisions involving 17-19 car drivers	Expected reduction in annual KSI casualties from collisions involving 17-19 car drivers	Expected reduction in annual casualties from collisions involving 17-19 car drivers	Expected value of benefits (£ million)
England	140	1112	233	2371	110.2
Scotland	15	99	29	199	12.5
Wales	11	74	19	163	9.2
Great Britain	166	1285	281	2733	131.9

Figure 4.1 Young driver KSI collision rate by region (number of KSI collisions involving a 17-19 year older car driver per 10,000 17-19 year olds in the region)

KSI collisions involving a 17-19 car driver per 10,000 17-19 year old persons, 2012-16 data

KSI collision rate
- 1.7 to 4.5
- 4.5 to 6.4
- 6.4 to 8.6
- 8.6 to 10.3
- 10.3 to 13.7

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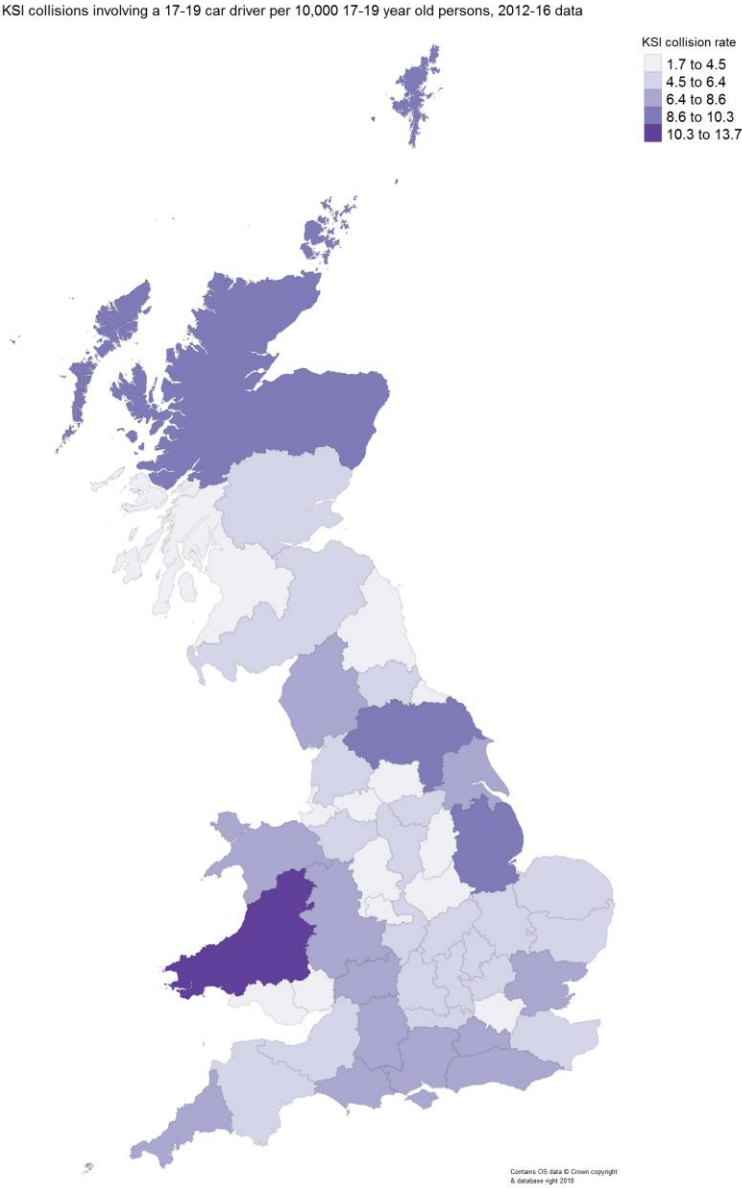& database right 2018

Figure 4.2 KSI casualty proportion by region (proportion of all KSI casualties from collisions involving a 17-19 year old car driver)

Proportion of all KSI casualties from collisions involving a 17-19 car driver, 2012-16 data

KSI-casualty proportion (%)
- 2.3 to 4.0
- 4.0 to 5.8
- 5.8 to 6.8
- 6.8 to 8.1
- 8.1 to 10.7

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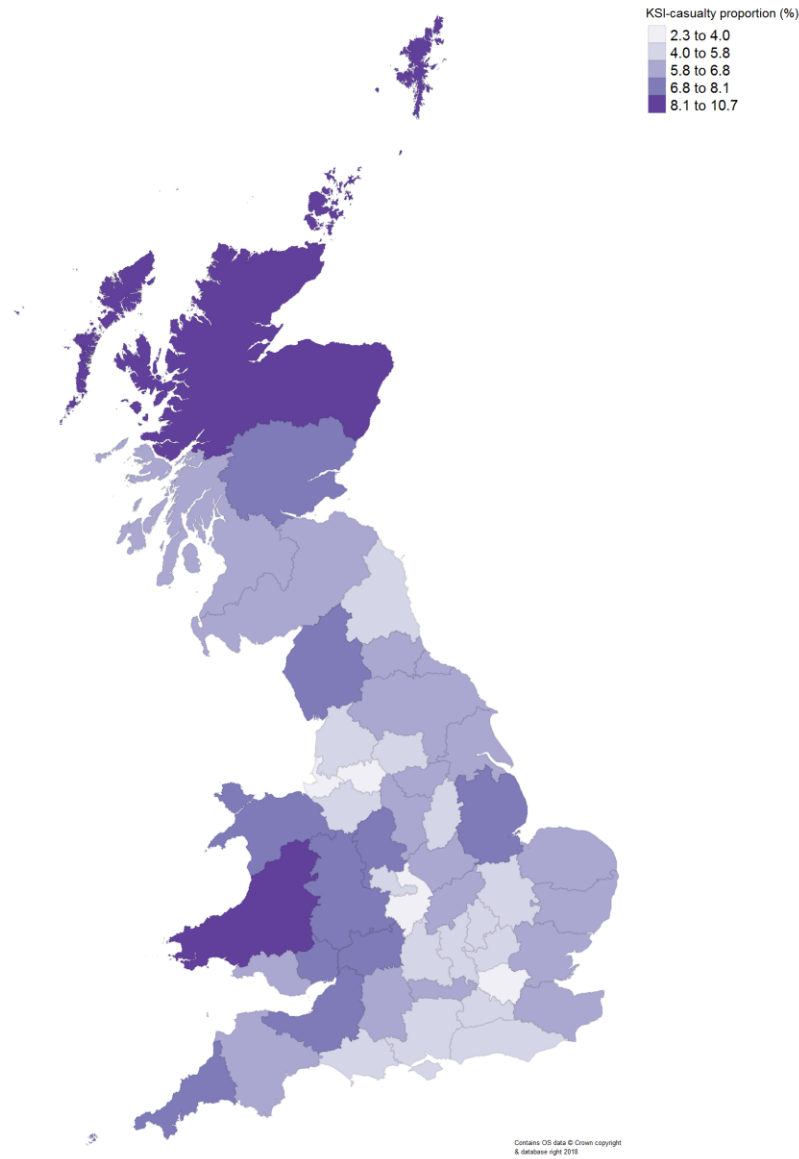
Table 4.2 Overall young car driver casualty and collision numbers and expected reduction attributable to a full GDL system

Region	Young Driver KSI collision rate (car)	KSI-casualty proportion	Proportion of all regional collisions that involved a 17-19 car driver	Proportion of all regional casualties that involved a 17-19 car driver	Expected reduction in annual KSI collisions involving 17-19 car drivers	Expected reduction in annual collisions involving 17-19 car drivers	Expected reduction in annual KSI casualties from collisions involving 17-19 car drivers	Expected reduction in annual casualties from collisions involving 17-19 car drivers	Expected value of benefits (£ million)
Avon and Somerset	4.7	7.3	7.6	8.9	4	36	7	75	3.9
Bedfordshire	4.8	5.4	6.0	7.1	2	13	3	28	1.3
Berkshire	4.7	6.1	6.7	7.9	2	19	4	40	1.6
Buckinghamshire	5.7	5.8	6.3	7.2	2	16	4	36	1.8
Cambridgeshire	4.8	5.0	5.8	7.0	2	18	4	39	1.8
Cheshire	6.1	5.2	5.7	6.7	3	22	5	46	2.3
Cleveland	4.5	6.5	7.9	9.8	1	11	2	25	1.2
Cornwall	7.4	7.8	8.9	10.2	2	17	4	37	1.8
Cumbria	8.6	7.5	10.1	11.4	2	20	4	40	1.8
Derbyshire	5.9	6.8	6.7	8.3	3	23	6	51	2.5
Devon	5.7	6.0	7.8	9.1	4	30	5	64	2.3
Dorset	6.8	5.8	7.2	8.8	3	19	5	42	1.7
Durham	5.6	6.8	8.6	10.3	2	15	3	35	1.8
Dyfed-Powys	13.7	10.7	10.0	11.2	4	19	7	41	3.3
Essex	6.9	6.6	7.9	9.3	6	46	10	95	4.6
Gloucestershire	7.2	8.0	8.4	9.7	2	11	4	23	1.8

Greater London	1.7	2.3	2.4	3.0	7	91	11	176	5.9
Greater Manchester	2.0	3.9	3.7	4.5	3	20	5	46	2.7
Gwent	3.6	7.0	9.4	10.9	1	11	2	24	1.1
Hampshire	6.9	5.6	6.7	7.9	8	45	12	88	4.6
Hertfordshire	4.8	5.7	6.9	8.1	3	26	5	57	2.6
Humberside	7.4	5.9	6.8	8.2	4	26	6	58	2.9
Kent	5.1	6.2	7.5	9.0	5	56	9	122	4.7
Lancashire	6.3	5.0	6.2	7.2	5	35	8	76	3.4
Leicestershire	4.2	6.0	6.0	6.8	3	21	4	42	2.3
Lincolnshire	9.2	8.1	8.2	9.6	4	27	6	58	3.1
Lothian and Borders and Dumfries and Galloway	5.6	6.7	6.6	7.9	3	24	6	48	2.7
Merseyside	2.6	2.7	3.8	4.8	2	16	3	38	1.3
Norfolk	6.4	6.3	7.8	9.2	3	21	5	45	2.5
North Wales	8.0	7.6	7.8	9.2	3	16	5	35	2.5
North Yorkshire	9.1	6.8	7.5	8.8	4	23	7	50	2.6
Northamptonshire	6.4	6.3	6.3	7.3	2	12	4	24	1.6
Northern and Grampian	10.3	10.2	10.0	11.4	5	19	9	38	4.0
Northumbria	4.1	5.8	6.2	7.4	3	29	6	63	2.7
Nottinghamshire	4.1	4.6	6.1	7.0	3	25	4	51	2.3
Oxfordshire	5.3	4.6	5.7	6.8	2	14	3	29	1.5
South Wales	3.4	6.8	8.4	10.1	3	28	5	63	2.3
South Yorkshire	4.7	6.8	6.8	8.5	4	32	7	75	4.0

Staffordshire	4.3	7.8	8.7	10.2	3	36	4	77	2.6
Strathclyde	3.7	6.2	6.9	8.1	4	38	8	77	3.6
Suffolk	6.2	6.4	8.9	9.9	2	22	4	44	2.0
Surrey	7.5	5.5	7.4	8.6	5	43	7	90	3.3
Sussex	7.6	5.5	6.4	7.3	6	40	11	80	4.3
Tayside, Fife and Central	5.5	7.7	8.1	9.1	3	18	6	36	2.2
Warwickshire	6.1	4.0	6.3	7.4	2	14	3	31	1.4
West Mercia	6.8	8.1	8.3	9.7	4	29	7	63	3.2
West Midlands	3.4	4.8	4.6	5.8	6	38	9	87	4.1
West Yorkshire	3.9	4.8	4.9	6.2	5	37	9	88	4.2
Wiltshire	6.8	6.7	7.8	8.9	2	18	4	37	2.2

4.1 Night-time GDL system

Table 4.3 Expected reduction in collisions and casualties attributable to the implementation of GDL night-time component (strong vs weak)

Country	Strong - Expected reduction in annual number of collision involving 17-19 year old car drivers	Weak - Expected reduction in annual number of collision involving 17-19 year old car drivers	Strong - Expected reduction in annual number of KSI casualties from collisions involving a 17-19 year old car driver	Weak - Expected reduction in annual number of KSI casualties from collisions involving a 17-19 year old car driver	Strong - Expected reduction in annual number of casualties from collisions involving a 17-19 year old car driver	Weak - Expected reduction in annual number of casualties from collisions involving a 17-19 year old car driver	Strong - Expected value of benefits (£ million)	Weak - Expected value of benefits (£ million)
England	459	156	103	34	767	220	49.6	16
Scotland	46	17	14	5	72	22	5.9	1.8
Wales	31	10	9	3	55	17	4.3	1.1
Great Britain	536	183	126	42	894	259	59.8	18.9

Figure 4.3 Likely absolute reduction in casualties attributable to strong night-time component (9 p.m. to 6 a.m.)

Strong night GDL, 2012-16 data

Absolute reduction in casualties (%)
4 to 13
13 to 20
20 to 27
27 to 38
38 to 67

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Figure 4.4 Likely proportional reduction in casualties attributable to strong night-time component (9 p.m. to 6 a.m.)

Strong night GDL, 2012-16 data

Proportional reduction in casualties (%)
- 0.2 to 0.4
- 0.4 to 0.5
- 0.5 to 0.6
- 0.6 to 0.8
- 0.8 to 0.9

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Figure 4.5 Likely absolute reduction in casualties attributable to weak night-time component (12 a.m. to 5 a.m.)

Weak night GDL, 2012-16 data

Absolute reduction in casualties
- 1 to 3
- 3 to 4
- 4 to 6
- 6 to 11
- 11 to 22

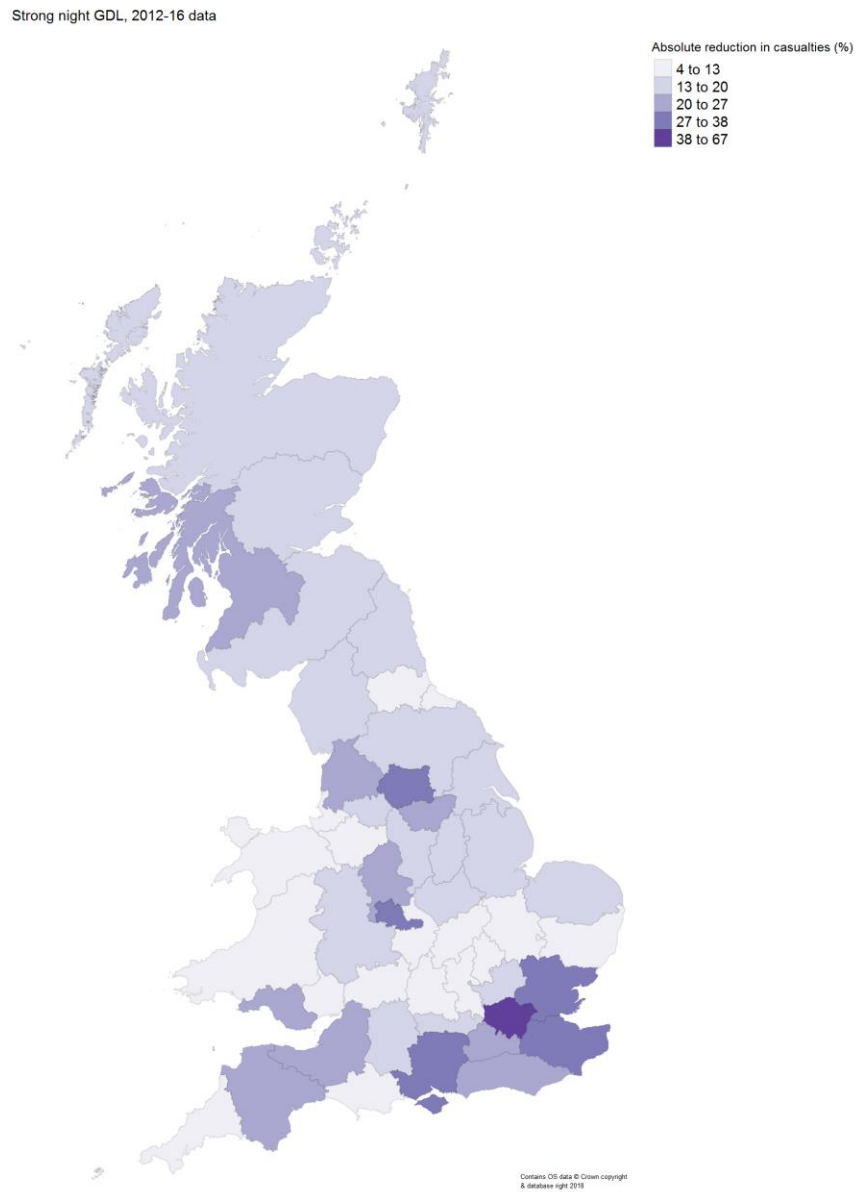Contains OS data © Crown copyright
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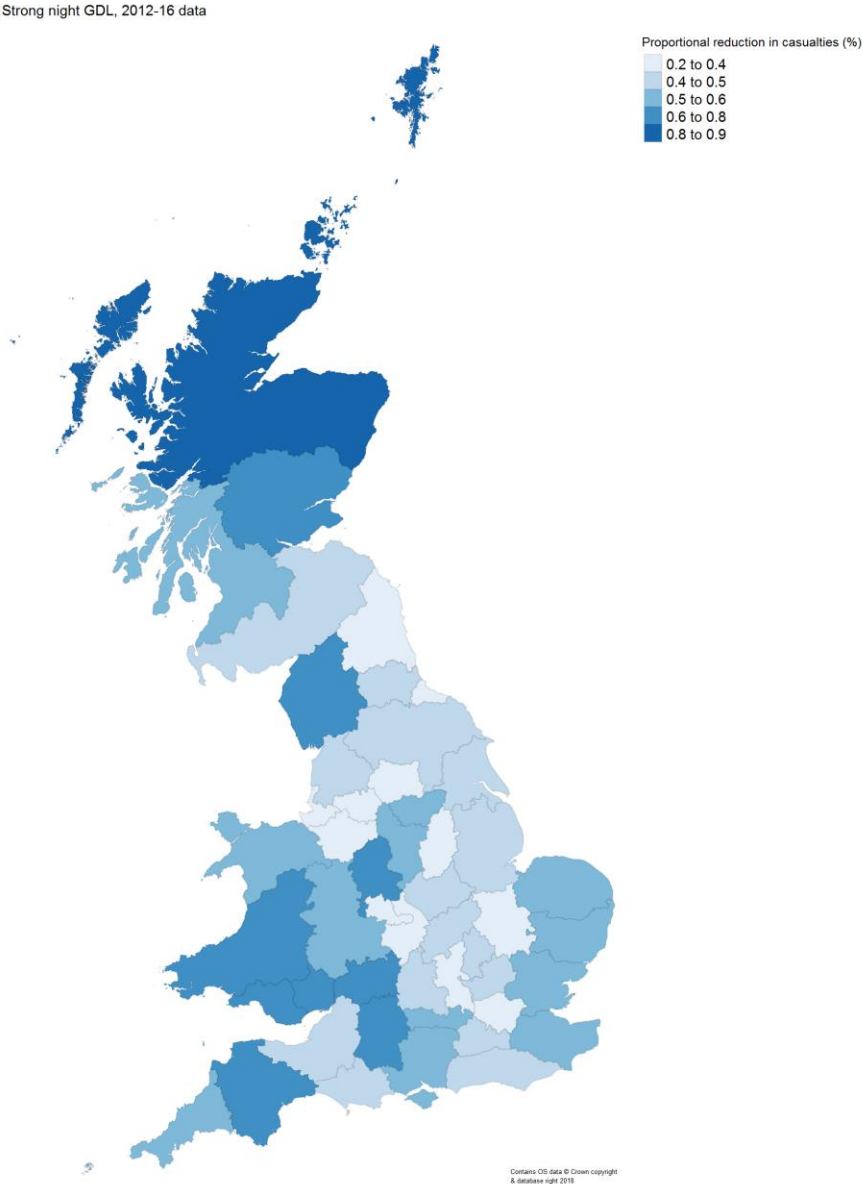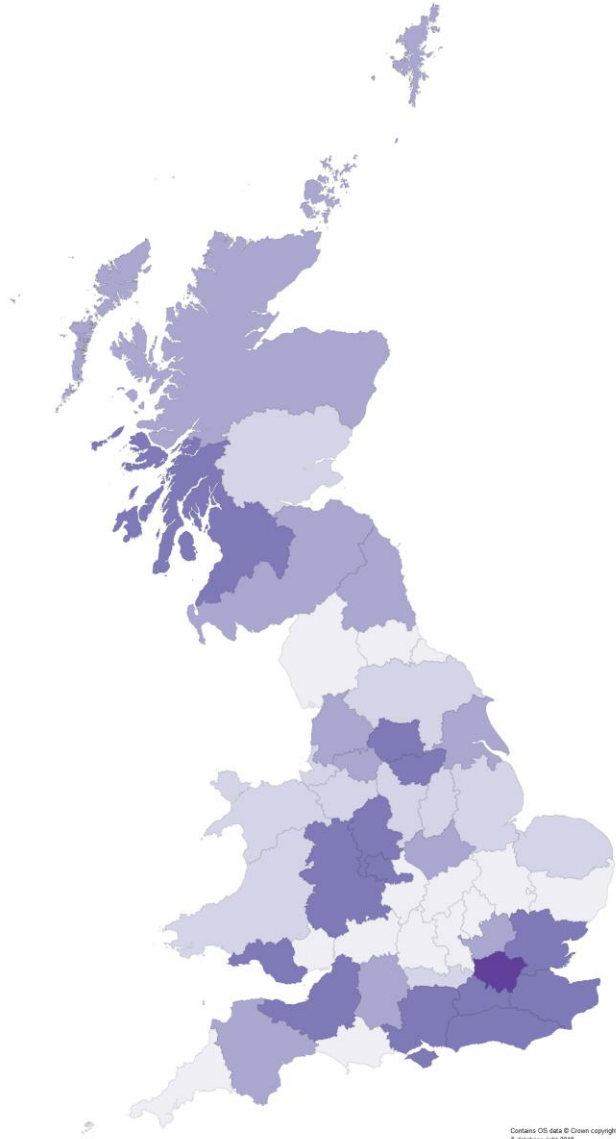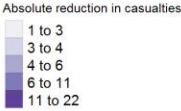# Figure 4.6 Likely proportional reduction in casualties attributable to weak night-time component (12 a.m. to 5 a.m.)

Weak night GDL, 2012-16 data

Proportional reduction in casualties (%)

- -0.05 to 0.05
- 0.05 to 0.15
- 0.15 to 0.25
- 0.25 to 0.35

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Table 4.4 Expected reduction in casualties and collisions attributable to a GDL night-time strong component

Region	Expected proportional reduction in total casualties (of all severities) resulting from reduction in collisions involving a 17-19 year old car driver	Expected reduction in annual number of collision involving 17-19 year old car drivers	Expected reduction in annual number of KSI casualties from collisions involving a 17-19 year old car driver	Expected reduction in annual number of casualties from collisions involving a 17-19 year old car driver	Expected value of benefits (£ million)
Avon and Somerset	0.5	14	3	22	2.0
Bedfordshire	0.5	5	2	10	0.7
Berkshire	0.6	9	2	15	0.7
Buckinghamshire	0.4	6	2	10	0.8
Cambridgeshire	0.3	6	1	9	0.4
Cheshire	0.4	8	3	13	1.1
Cleveland	0.3	2	0	4	0.3
Cornwall	0.6	7	2	12	1.0
Cumbria	0.8	9	2	14	0.6
Derbyshire	0.6	9	3	17	1.2
Devon	0.7	14	2	23	0.9
Dorset	0.5	7	2	12	0.9
Durham	0.5	5	1	9	0.8
Dyfed-Powys	0.7	8	3	12	1.5
Essex	0.6	18	4	29	1.9
Gloucestershire	0.7	5	2	8	0.8
Greater London	0.2	42	6	67	3.1
Greater Manchester	0.3	9	3	17	2.1
Gwent	0.8	4	1	8	0.3
Hampshire	0.6	19	5	31	2.1
Hertfordshire	0.5	11	2	19	0.9
Humberside	0.5	10	3	17	1.3
Kent	0.6	23	4	38	2.2
Lancashire	0.5	15	4	26	1.7
Leicestershire	0.5	10	2	16	1.2

Lincolnshire	0.5	10	2	16	0.8
Lothian and Borders and Dumfries and Galloway	0.5	11	3	17	1.2
Merseyside	0.3	7	1	13	0.6
Norfolk	0.6	9	2	14	1.1
North Wales	0.6	6	2	11	1.2
North Yorkshire	0.5	9	2	15	0.8
Northamptonshire	0.5	5	2	8	0.9
Northern and Grampian	0.9	10	5	15	2.3
Northumbria	0.4	10	3	18	0.9
Nottinghamshire	0.4	9	2	15	1.1
Oxfordshire	0.5	6	1	10	0.5
South Wales	0.8	13	3	24	1.3
South Yorkshire	0.6	14	4	27	2.7
Staffordshire	0.7	15	2	27	0.9
Strathclyde	0.6	17	3	26	1.3
Suffolk	0.6	9	2	12	0.9
Surrey	0.5	18	3	27	1.4
Sussex	0.5	16	5	25	1.9
Tayside, Fife and Central	0.7	8	3	14	1.1
Warwickshire	0.4	5	1	8	0.3
West Mercia	0.6	12	2	20	1.2
West Midlands	0.4	18	4	31	1.9
West Yorkshire	0.4	15	3	29	1.6
Wiltshire	0.7	9	2	14	1.4

Table 4.5 Expected reduction in casualties and collisions attributable to a GDL night-time weak component

Region	Expected proportional reduction in total casualties (of all severities) resulting from reduction in collisions involving a 17-19 year old car driver	Expected reduction in annual number of collision involving 17-19 year old car drivers	Expected reduction in annual number of KSI casualties from collisions involving a 17-19 year old car driver	Expected reduction in annual number of casualties from collisions involving a 17-19 year old car driver	Expected value of benefits (£ million)
Avon and Somerset	0.2	5	1	7	0.9
Bedfordshire	0.1	2	0	2	0.2
Berkshire	0.2	2	1	4	0.1
Buckinghamshire	0.1	2	1	3	0.2
Cambridgeshire	0.1	2	0	3	0.1
Cheshire	0.1	3	1	4	0.1
Cleveland	0.0	1	0	1	0.2
Cornwall	0.2	2	1	3	0.4
Cumbria	0.2	3	0	3	0.2
Derbyshire	0.1	3	0	4	0.2
Devon	0.2	4	1	6	0.2
Dorset	0.1	2	1	3	0.2
Durham	0.2	2	0	3	0.2
Dyfed-Powys	0.2	3	1	4	0.3
Essex	0.2	6	2	8	0.5
Gloucestershire	0.2	2	1	2	0.1
Greater London	0.1	15	2	22	1.0
Greater Manchester	0.1	3	2	5	1.1
Gwent	0.2	1	0	2	0.1
Hampshire	0.2	7	1	9	0.7
Hertfordshire	0.2	4	1	6	0.3
Humberside	0.1	3	1	5	0.4
Kent	0.2	8	1	11	0.9
Lancashire	0.1	4	1	6	0.4
Leicestershire	0.1	3	1	5	0.6

Lincolnshire	0.1	3	0	4	0.2
Lothian and Borders and Dumfries and Galloway	0.2	4	1	5	0.3
Merseyside	0.1	2	0	4	0.2
Norfolk	0.2	3	1	4	0.5
North Wales	0.2	2	1	4	0.2
North Yorkshire	0.1	3	1	4	0.2
Northamptonshire	0.2	2	1	3	0.2
Northern and Grampian	0.3	4	2	5	0.8
Northumbria	0.1	4	1	5	0.3
Nottinghamshire	0.1	3	1	4	0.4
Oxfordshire	0.2	2	1	3	0.2
South Wales	0.2	4	1	7	0.5
South Yorkshire	0.2	5	1	8	0.8
Staffordshire	0.2	5	1	7	0.4
Strathclyde	0.2	6	1	8	0.4
Suffolk	0.1	2	0	2	0.2
Surrey	0.2	7	1	8	0.3
Sussex	0.1	6	1	8	0.4
Tayside, Fife and Central	0.2	3	1	4	0.3
Warwickshire	0.1	2	0	2	0.1
West Mercia	0.2	5	1	8	0.5
West Midlands	0.1	6	1	9	0.8
West Yorkshire	0.1	5	1	7	0.7
Wiltshire	0.2	3	1	5	0.4

4.2 Passenger GDL system

Table 4.6 Expected reduction in collisions and casualties attributable to the implementation of GDL passenger component (strong vs weak)

Country	Strong - Expected reduction in annual number of collision involving 17-19 year old car drivers	Weak - Expected reduction in annual number of collision involving 17-19 year old car drivers	Strong - Expected reduction in annual number of KSI casualties from collisions involving a 17-19 year old car driver	Weak - Expected reduction in annual number of KSI casualties from collisions involving a 17-19 year old car driver	Strong - Expected reduction in annual number of casualties from collisions involving a 17-19 year old car driver	Weak - Expected reduction in annual number of casualties from collisions involving a 17-19 year old car driver	Strong - Expected value of benefits (£ million)	Weak - Expected value of benefits (£ million)
England	431	169	107	71	1043	524	52.7	34
Scotland	46	18	18	13	100	55	7.6	5.8
Wales	35	15	12	7	83	43	5.3	3.9
Great Britain	512	202	137	91	1226	622	65.6	43.7

Figure 4.7 Likely absolute reduction in casualties attributable to strong passenger component (no 15 to 24 year old passengers)

Strong passenger GDL, 2012-16 data

Absolute reduction in casualties
- 10 to 18
- 18 to 23
- 23 to 31
- 31 to 39
- 39 to 56

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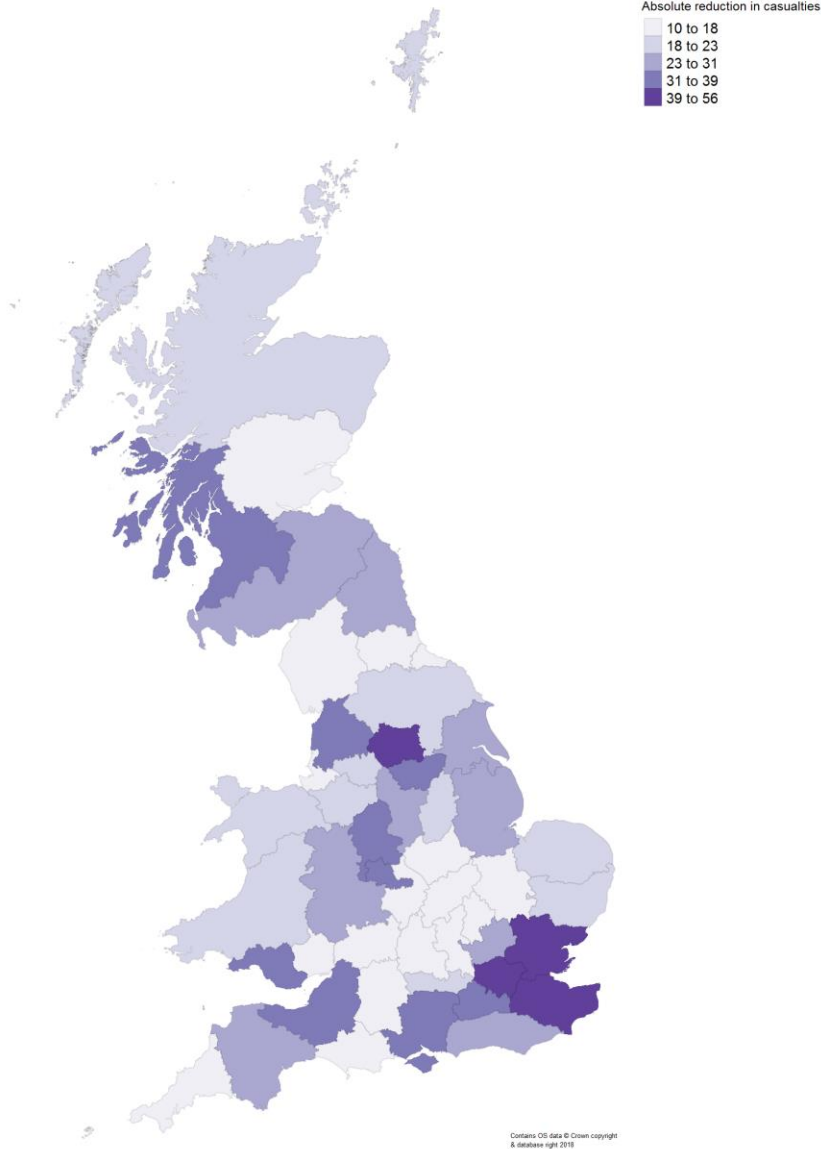
Figure 4.8 Likely proportional reduction in casualties attributable to strong passenger component (no 15 to 24 year old passengers)

Strong passenger GDL, 2012-16 data

Proportional reduction in casualties (%)
- 0.2 to 0.6
- 0.6 to 0.8
- 0.8 to 0.9
- 0.9 to 1.1
- 1.1 to 1.2

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Figure 4.9 Likely absolute reduction in casualties attributable to weak passenger component (no more than one 15 to 19 year old passenger)

Weak passenger GDL, 2012-16 data

Absolute reduction in casualties

3 to 9
9 to 13
13 to 16
16 to 21
21 to 26

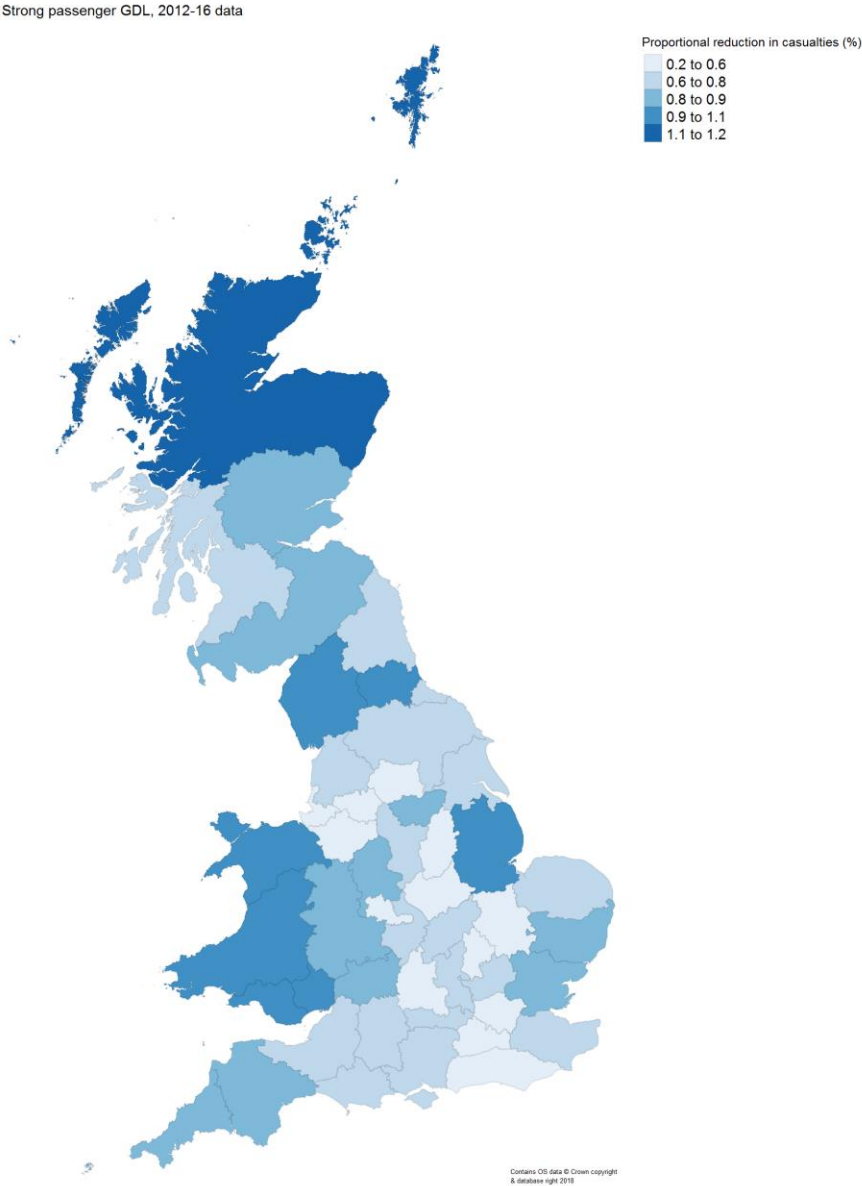Contains OS data © Crown copyright
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Figure 4.10 Likely proportional reduction in casualties attributable to weak passenger component (no more than one 15 to 19 year old passenger)
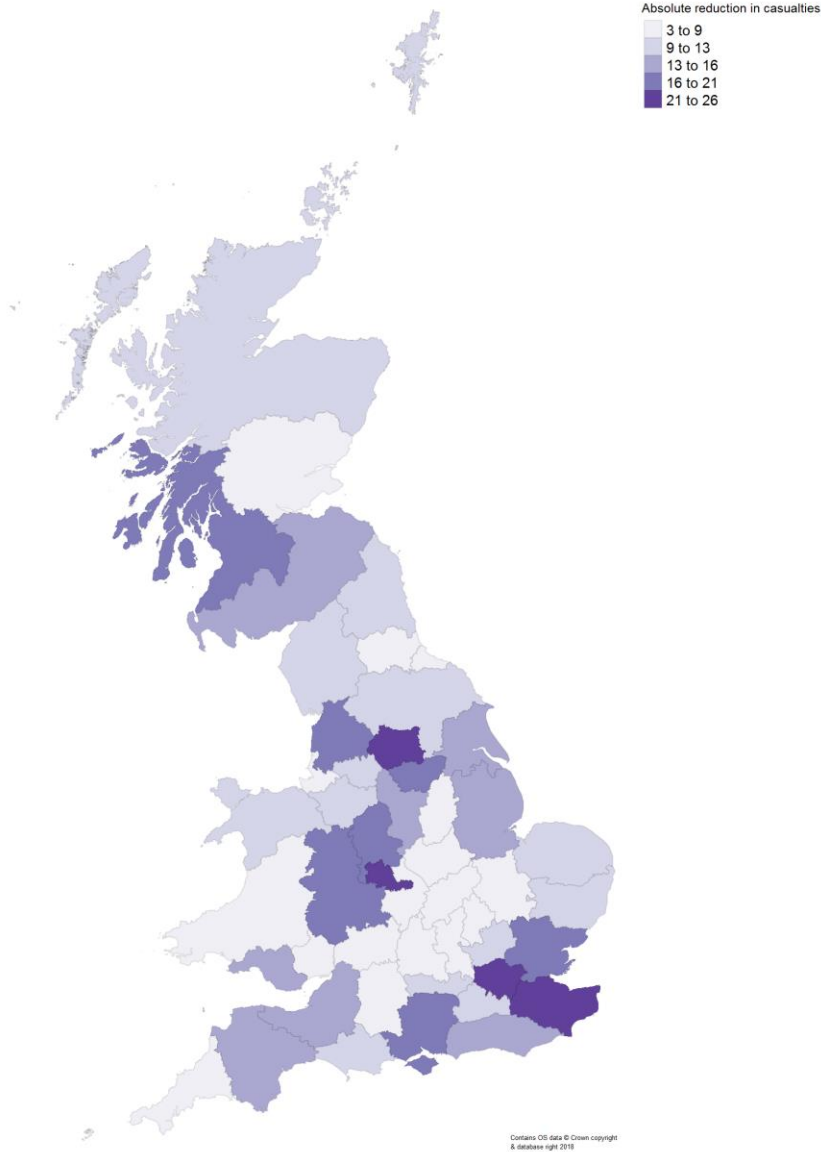
Weak passenger GDL, 2012-16 data

Proportional reduction in casualties (%)
- 0.1 to 0.3
- 0.3 to 0.4
- 0.4 to 0.5
- 0.5 to 0.6
- 0.6 to 0.8

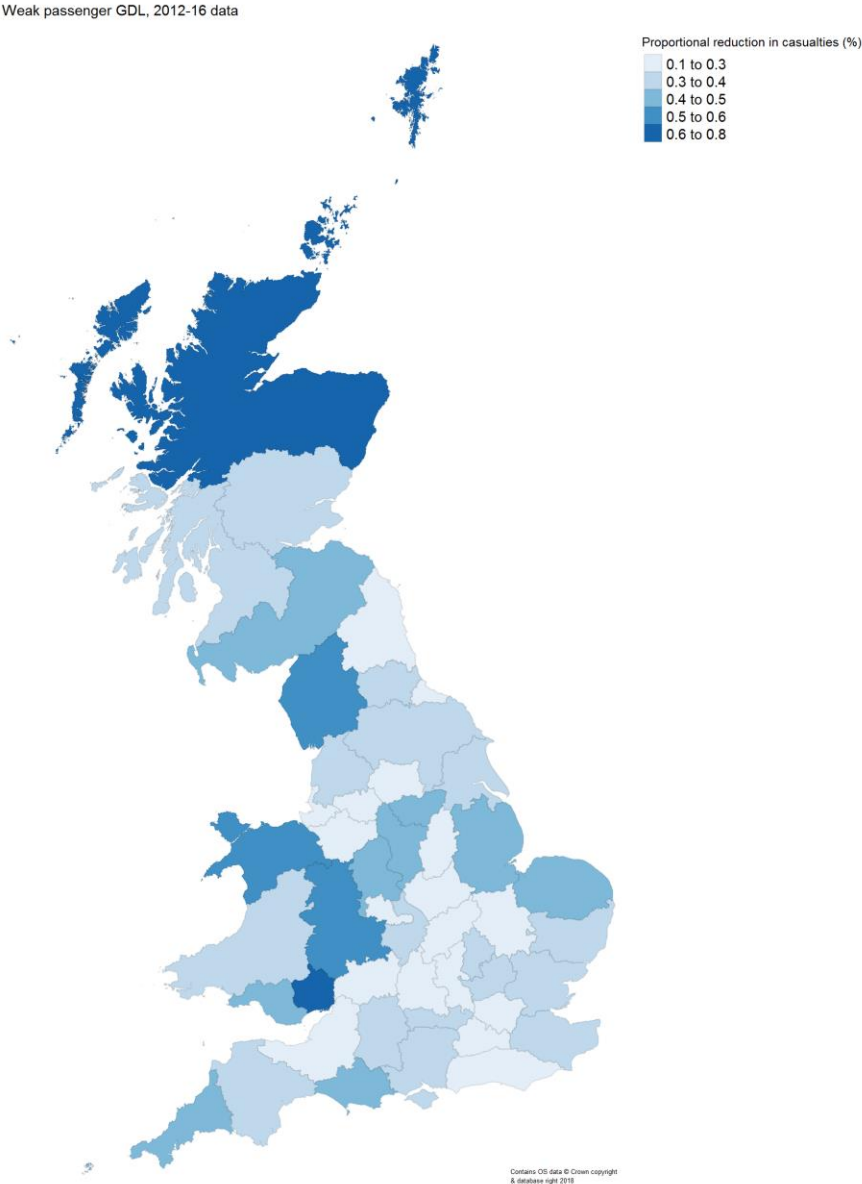Contains OS data © Crown copyright & database right 2018

Table 4.7 Expected reduction in casualties and collisions attributable to a GDL passenger strong component

Region	Expected proportional reduction in total casualties (of all severities) resulting from reduction in collisions involving a 17-19 year old car driver	Expected reduction in annual number of collision involving 17-19 year old car drivers	Expected reduction in annual number of KSI casualties from collisions involving a 17-19 year old car driver	Expected reduction in annual number of casualties from collisions involving a 17-19 year old car driver	Expected value of benefits (£ million)
Avon and Somerset	0.8	14	3	33	1.7
Bedfordshire	0.6	5	1	13	0.5
Berkshire	0.8	8	2	20	0.8
Buckinghamshire	0.7	7	2	16	0.7
Cambridgeshire	0.6	7	2	18	0.9
Cheshire	0.6	9	2	21	1.0
Cleveland	0.8	4	1	10	0.4
Cornwall	0.9	7	2	17	1.1
Cumbria	1.0	8	2	18	0.8
Derbyshire	0.8	10	3	26	1.4
Devon	0.9	13	2	30	1.0
Dorset	0.8	7	2	18	0.8
Durham	1.0	6	1	17	0.9
Dyfed-Powys	1.1	9	5	19	2.0
Essex	0.9	19	5	44	2.0
Gloucestershire	0.9	5	2	10	0.9
Greater London	0.2	23	4	56	2.0
Greater Manchester	0.4	7	3	19	1.8
Gwent	1.1	5	1	12	0.6
Hampshire	0.7	16	4	37	1.4
Hertfordshire	0.8	12	2	28	1.6
Humberside	0.8	11	3	29	1.6
Kent	0.8	23	5	53	2.8
Lancashire	0.7	14	3	35	1.4
Leicestershire	0.5	8	1	17	0.8

Lincolnshire	1.0	12	4	30	1.7
Lothian and Borders and Dumfries and Galloway	0.9	12	4	26	1.5
Merseyside	0.4	6	1	17	0.6
Norfolk	0.8	8	2	19	1.1
North Wales	1.0	8	3	19	1.4
North Yorkshire	0.8	10	3	23	1.1
Northamptonshire	0.7	5	3	11	1.0
Northern and Grampian	1.2	9	5	20	2.2
Northumbria	0.7	11	3	28	1.2
Nottinghamshire	0.5	9	2	19	1.1
Oxfordshire	0.6	5	1	12	0.6
South Wales	1.1	13	3	33	1.3
South Yorkshire	0.9	15	4	38	2.8
Staffordshire	0.9	15	2	36	1.1
Strathclyde	0.8	17	5	36	2.5
Suffolk	0.9	9	2	20	1.3
Surrey	0.6	14	3	33	1.4
Sussex	0.6	14	5	31	2.0
Tayside, Fife and Central	0.9	8	4	18	1.4
Warwickshire	0.7	5	1	14	0.7
West Mercia	0.9	11	3	28	1.5
West Midlands	0.5	15	4	39	1.7
West Yorkshire	0.6	17	5	44	2.3
Wiltshire	0.8	7	2	16	1.2

Table 4.8 Expected reduction in casualties and collisions attributable to a GDL passenger weak component

Region	Expected proportional reduction in total casualties (of all severities) resulting from reduction in collisions involving a 17-19 year old car driver	Expected reduction in annual number of collision involving 17-19 year old car drivers	Expected reduction in annual number of KSI casualties from collisions involving a 17-19 year old car driver	Expected reduction in annual number of casualties from collisions involving a 17-19 year old car driver	Expected value of benefits (£ million)
Avon and Somerset	0.3	5	2	15	1.1
Bedfordshire	0.4	3	1	8	0.5
Berkshire	0.4	3	1	10	0.6
Buckinghamshire	0.3	2	1	7	0.5
Cambridgeshire	0.3	3	1	8	0.5
Cheshire	0.3	3	2	10	0.9
Cleveland	0.3	1	0	4	0.3
Cornwall	0.5	2	2	8	0.7
Cumbria	0.6	4	1	11	0.4
Derbyshire	0.5	5	2	16	1.0
Devon	0.4	5	1	15	0.5
Dorset	0.5	3	2	11	0.7
Durham	0.4	2	0	8	0.3
Dyfed-Powys	0.4	3	3	8	1.6
Essex	0.4	7	4	20	1.1
Gloucestershire	0.3	1	1	3	0.1
Greater London	0.1	9	2	26	1.5
Greater Manchester	0.2	3	2	10	1.4
Gwent	0.8	3	1	9	0.6
Hampshire	0.4	6	2	20	0.9
Hertfordshire	0.4	5	1	13	0.9
Humberside	0.4	4	1	14	0.8
Kent	0.4	8	3	25	1.5
Lancashire	0.4	6	2	19	0.8
Leicestershire	0.2	2	0	6	0.2

Lincolnshire	0.5	5	3	15	1.2
Lothian and Borders and Dumfries and Galloway	0.5	5	3	15	1.1
Merseyside	0.2	3	1	8	0.4
Norfolk	0.5	4	2	11	1.0
North Wales	0.6	4	2	11	0.8
North Yorkshire	0.4	4	2	12	0.8
Northamptonshire	0.3	2	2	6	0.6
Northern and Grampian	0.7	4	4	12	2.1
Northumbria	0.3	4	2	12	0.8
Nottinghamshire	0.3	3	1	9	0.4
Oxfordshire	0.3	2	1	7	0.3
South Wales	0.5	5	1	15	0.9
South Yorkshire	0.5	7	4	21	2.8
Staffordshire	0.5	6	2	18	0.7
Strathclyde	0.4	6	3	19	1.7
Suffolk	0.4	3	2	10	0.8
Surrey	0.2	4	1	12	0.6
Sussex	0.3	5	4	16	1.7
Tayside, Fife and Central	0.4	3	3	9	0.9
Warwickshire	0.4	3	1	8	0.4
West Mercia	0.6	5	3	18	1.4
West Midlands	0.3	7	2	22	1.0
West Yorkshire	0.3	7	3	24	1.3
Wiltshire	0.4	3	1	8	0.6

4.3 Both night-time and passenger GDL system

Table 4.11 Expected reduction in collisions and casualties attributable to the implementation of GDL both night-time and passenger component (strong vs weak)

Country	Strong - Expected reduction in annual number of collision involving 17-19 year old car drivers	Weak - Expected reduction in annual number of collision involving 17-19 year old car drivers	Strong - Expected reduction in annual number of KSI casualties from collisions involving a 17-19 year old car driver	Weak - Expected reduction in annual number of KSI casualties from collisions involving a 17-19 year old car driver	Strong - Expected reduction in annual number of casualties from collisions involving a 17-19 year old car driver	Weak - Expected reduction in annual number of casualties from collisions involving a 17-19 year old car driver	Strong - Expected value of benefits (£ million)	Weak - Expected value of benefits (£ million)
England	814	256	186	103	1606	755	86.5	50.6
Scotland	76	28	28	18	144	80	12.3	8.4
Wales	57	17	15	9	116	57	6.5	5.2
Great Britain	947	301	229	130	1866	892	105.3	64.2

Note: The combined night time and passenger restriction impacts are less than the sum of the individual restrictions this is due to the overlap between collisions that occurred both at night and with passengers within the 17-19 year old's car.

Figure 4.12 Likely absolute reduction in casualties attributable to strong both night-time and passenger component

Strong night and strong passenger GDL, 2012-16 data

Absolute reduction in casualties

- 15 to 25
- 25 to 34
- 34 to 45
- 45 to 64
- 64 to 109

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Figure 4.13 Likely proportional reduction in casualties attributable to strong both night-time and passenger component

Strong night and strong passenger GDL, 2012-16 data

Proportional reduction in casualties (%)

- 0.4 to 0.6
- 0.6 to 1.0
- 1.0 to 1.2
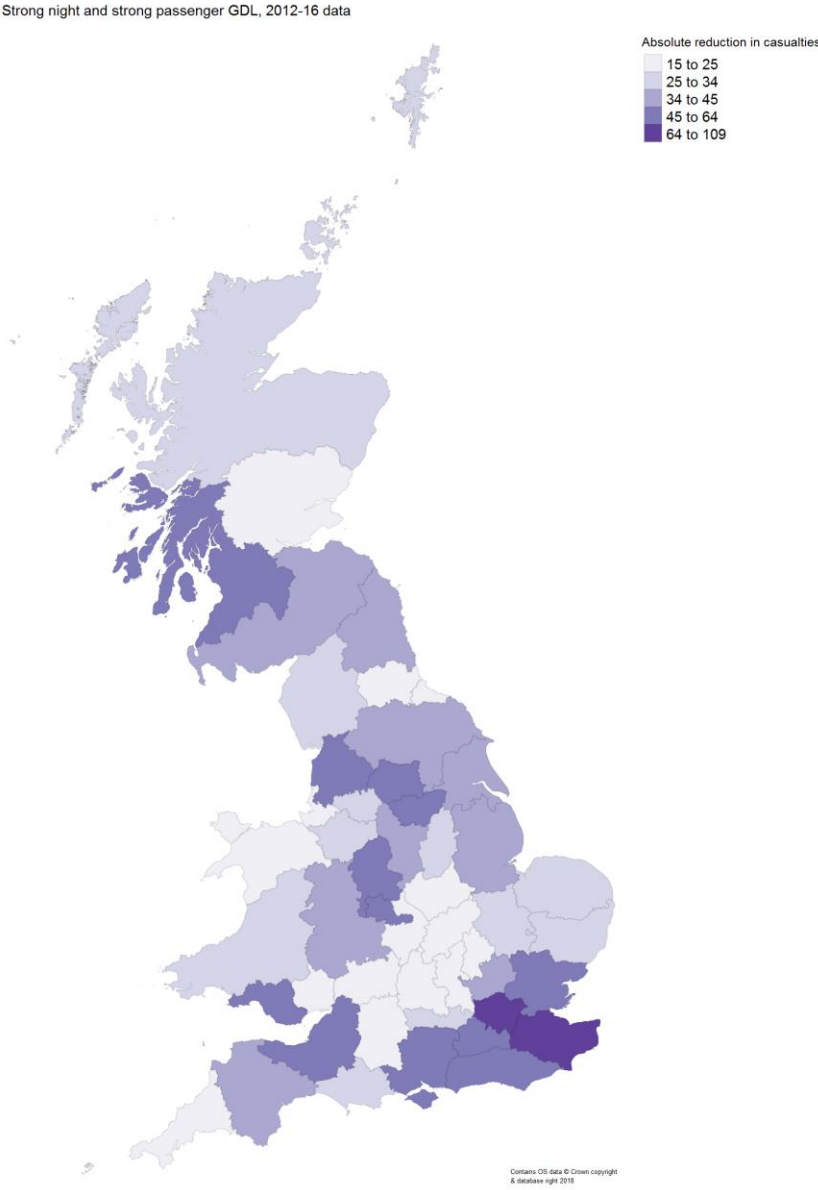- 1.2 to 1.4
- 1.4 to 1.7

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Figure 4.14 Likely absolute reduction in casualties attributable to weak both night-time and passenger component

Weak night and weak passenger GDL, 2012-16 data

Absolute reduction in casualties

- 5 to 14
- 14 to 20
- 20 to 25
- 25 to 34
- 34 to 52

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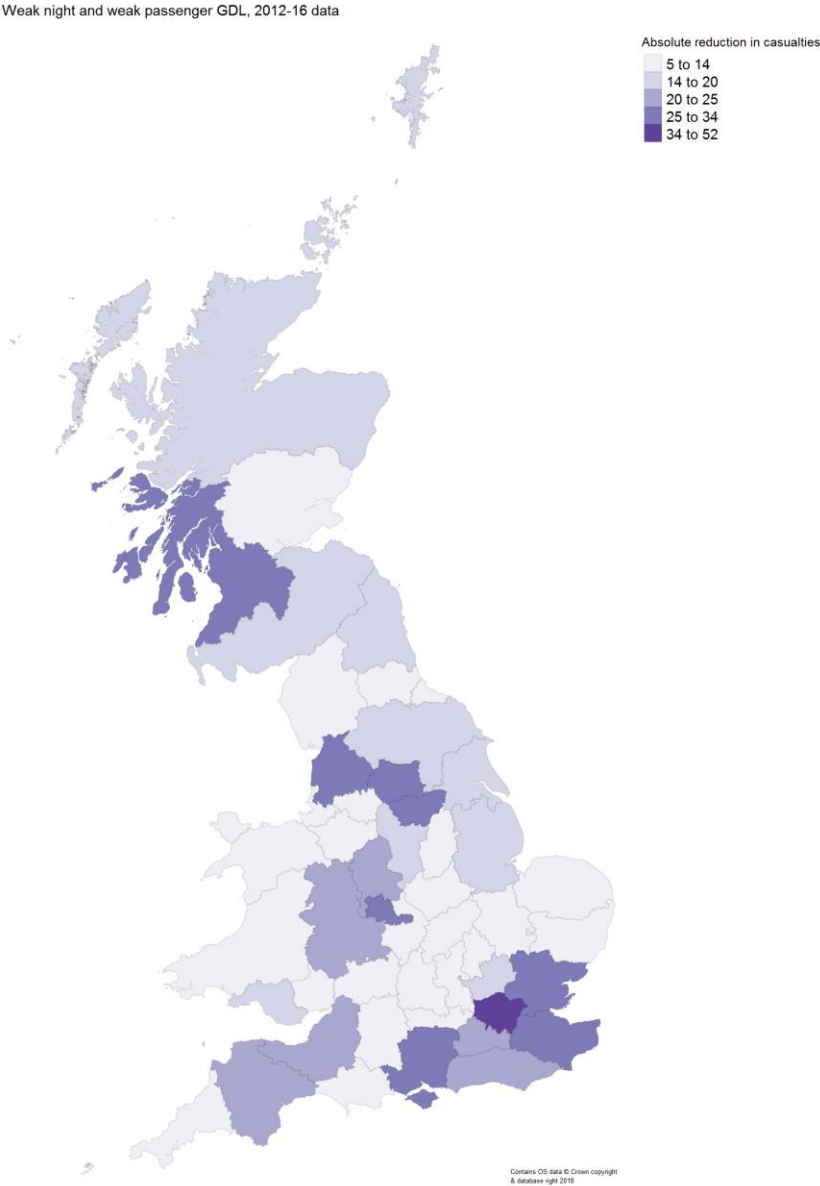## Figure 4.15 Likely proportional reduction in casualties attributable to weak both night-time and passenger component

Weak night and weak passenger GDL, 2012-16 data

Proportional reduction in casualties (%)

- 0.2 to 0.4
- 0.4 to 0.5
- 0.5 to 0.6
- 0.6 to 0.8
- 0.8 to 1.1

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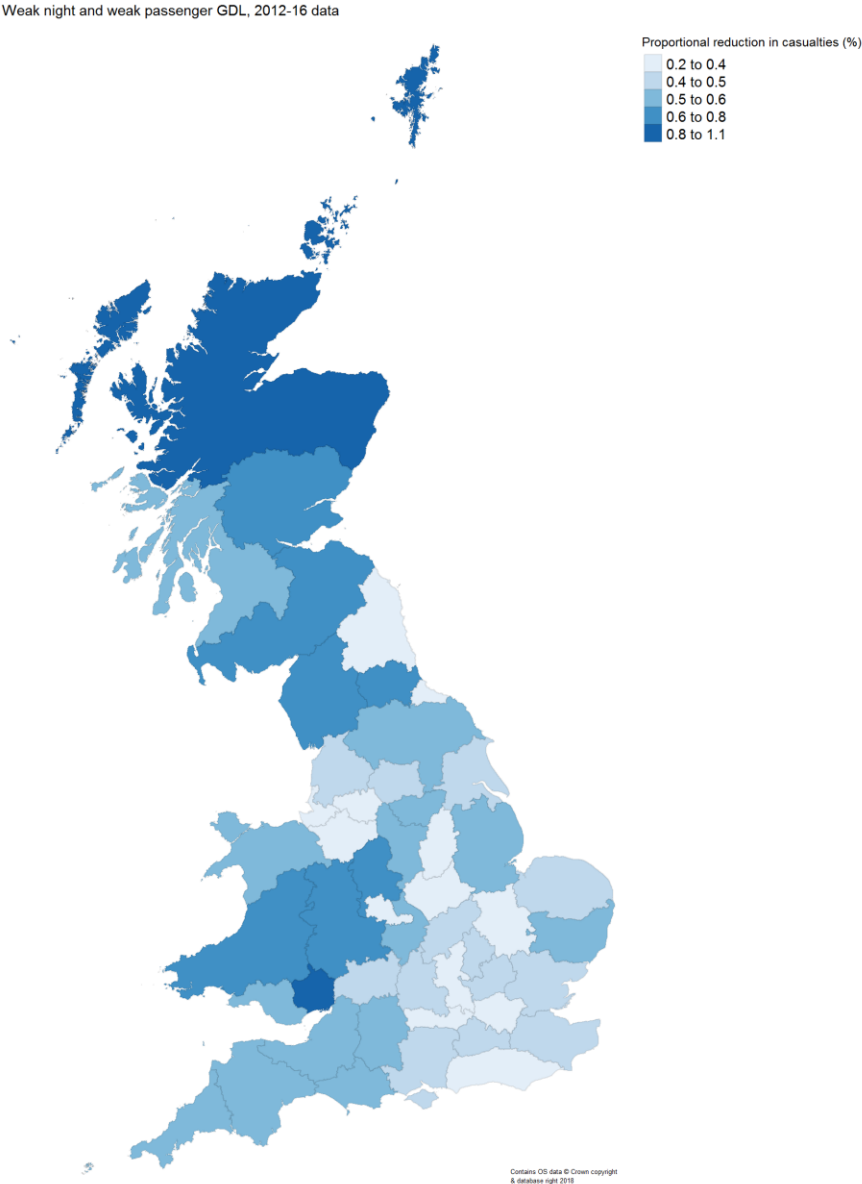& database right 2018

Table 4.10 Expected reduction in casualties and collisions attributable to a GDL both night-time and passenger strong component

Region	Expected proportional reduction in total casualties (of all severities) resulting from reduction in collisions involving a 17-19 year old car driver	Expected reduction in annual number of collision involving 17-19 year old car drivers	Expected reduction in annual number of KSI casualties from collisions involving a 17-19 year old car driver	Expected reduction in annual number of casualties from collisions involving a 17-19 year old car driver	Expected value of benefits (£ million)
Avon and Somerset	1.2	26	7	52	4.2
Bedfordshire	0.9	10	1	19	0.8
Berkshire	1.1	15	3	29	1.7
Buckinghamshire	0.9	10	2	21	1.1
Cambridgeshire	1.0	13	4	28	1.7
Cheshire	0.9	16	3	32	1.6
Cleveland	1.4	7	2	17	1.1
Cornwall	1.4	12	4	25	1.5
Cumbria	1.7	16	3	30	1.1
Derbyshire	1.2	17	5	36	2.1
Devon	1.3	24	4	45	1.8
Dorset	1.2	13	4	28	1.3
Durham	1.5	11	2	25	1.6
Dyfed-Powys	1.6	15	7	29	2.5
Essex	1.3	32	9	64	3.7
Gloucestershire	1.4	9	3	16	1.2
Greater London	0.4	64	8	109	4.2
Greater Manchester	0.5	13	3	27	1.8
Gwent	1.3	7	1	15	0.8
Hampshire	1.0	31	8	56	3.0
Hertfordshire	1.2	20	4	42	2.8
Humberside	1.2	20	4	43	2.3
Kent	1.2	42	7	81	3.1
Lancashire	0.9	24	6	50	2.6
Leicestershire	0.8	15	4	25	2.0

Lincolnshire	1.5	22	7	45	2.5
Lothian and Borders and Dumfries and Galloway	1.3	20	8	39	3.3
Merseyside	0.6	12	2	24	1.0
Norfolk	1.2	15	4	30	1.7
North Wales	1.3	12	4	25	1.8
North Yorkshire	1.3	19	7	36	2.0
Northamptonshire	1.1	10	4	17	1.6
Northern and Grampian	1.6	15	8	28	3.7
Northumbria	0.9	18	4	39	1.4
Nottinghamshire	0.9	17	4	34	2.3
Oxfordshire	0.9	10	3	20	1.1
South Wales	1.5	23	3	47	1.4
South Yorkshire	1.2	23	5	51	2.9
Staffordshire	1.4	27	3	52	2.1
Strathclyde	1.1	28	7	52	3.9
Suffolk	1.5	18	4	34	2.7
Surrey	1.1	30	6	58	2.2
Sussex	0.9	28	8	51	3.3
Tayside, Fife and Central	1.3	13	5	25	1.4
Warwickshire	1.1	10	2	23	1.4
West Mercia	1.3	22	5	43	2.7
West Midlands	0.8	30	8	61	3.1
West Yorkshire	0.9	28	8	63	3.3
Wiltshire	1.2	15	2	25	0.9

Table 4.11 Expected reduction in casualties and collisions attributable to a GDL both night-time and passenger weak component

Region	Expected proportional reduction in total casualties (of all severities) resulting from reduction in collisions involving a 17-19 year old car driver	Expected reduction in annual number of collision involving 17-19 year old car drivers	Expected reduction in annual number of KSI casualties from collisions involving a 17-19 year old car driver	Expected reduction in annual number of casualties from collisions involving a 17-19 year old car driver	Expected value of benefits (£ million)
Avon and Somerset	0.6	9	4	24	2.5
Bedfordshire	0.5	3	2	10	0.8
Berkshire	0.4	4	1	11	0.7
Buckinghamshire	0.4	3	2	10	0.8
Cambridgeshire	0.4	4	2	12	0.8
Cheshire	0.4	5	2	14	1.1
Cleveland	0.4	1	0	5	0.6
Cornwall	0.6	4	3	11	1.2
Cumbria	0.8	5	2	14	0.7
Derbyshire	0.6	5	3	18	1.3
Devon	0.6	7	2	22	0.8
Dorset	0.6	4	3	14	1.1
Durham	0.7	3	1	12	0.3
Dyfed-Powys	0.7	4	4	13	2.2
Essex	0.5	10	5	28	1.5
Gloucestershire	0.5	2	1	6	0.4
Greater London	0.2	21	6	52	2.9
Greater Manchester	0.3	4	1	13	0.9
Gwent	1.1	3	1	12	0.7
Hampshire	0.5	10	4	30	2.0
Hertfordshire	0.5	7	2	19	1.3
Humberside	0.5	6	2	19	1.3
Kent	0.5	12	3	34	2.1
Lancashire	0.5	8	3	26	1.5
Leicestershire	0.4	5	2	12	1.1

Lincolnshire	0.6	6	4	18	1.6
Lothian and Borders and Dumfries and Galloway	0.7	7	4	20	1.5
Merseyside	0.3	4	1	13	0.7
Norfolk	0.5	4	2	13	1.2
North Wales	0.6	3	2	12	1.1
North Yorkshire	0.6	6	4	16	1.2
Northamptonshire	0.5	3	2	8	0.6
Northern and Grampian	1.1	6	6	18	3.3
Northumbria	0.4	6	2	18	0.8
Nottinghamshire	0.4	5	2	14	1.0
Oxfordshire	0.5	3	1	9	0.5
South Wales	0.6	7	2	20	1.2
South Yorkshire	0.6	9	4	28	2.9
Staffordshire	0.7	8	2	25	1.3
Strathclyde	0.6	10	5	28	2.3
Suffolk	0.6	4	2	13	1.0
Surrey	0.5	10	3	25	1.1
Sussex	0.4	9	5	24	1.9
Tayside, Fife and Central	0.7	5	3	14	1.3
Warwickshire	0.6	4	1	12	0.7
West Mercia	0.7	8	2	23	1.6
West Midlands	0.4	10	3	33	1.5
West Yorkshire	0.5	10	5	34	2.1
Wiltshire	0.6	5	2	13	1.2

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