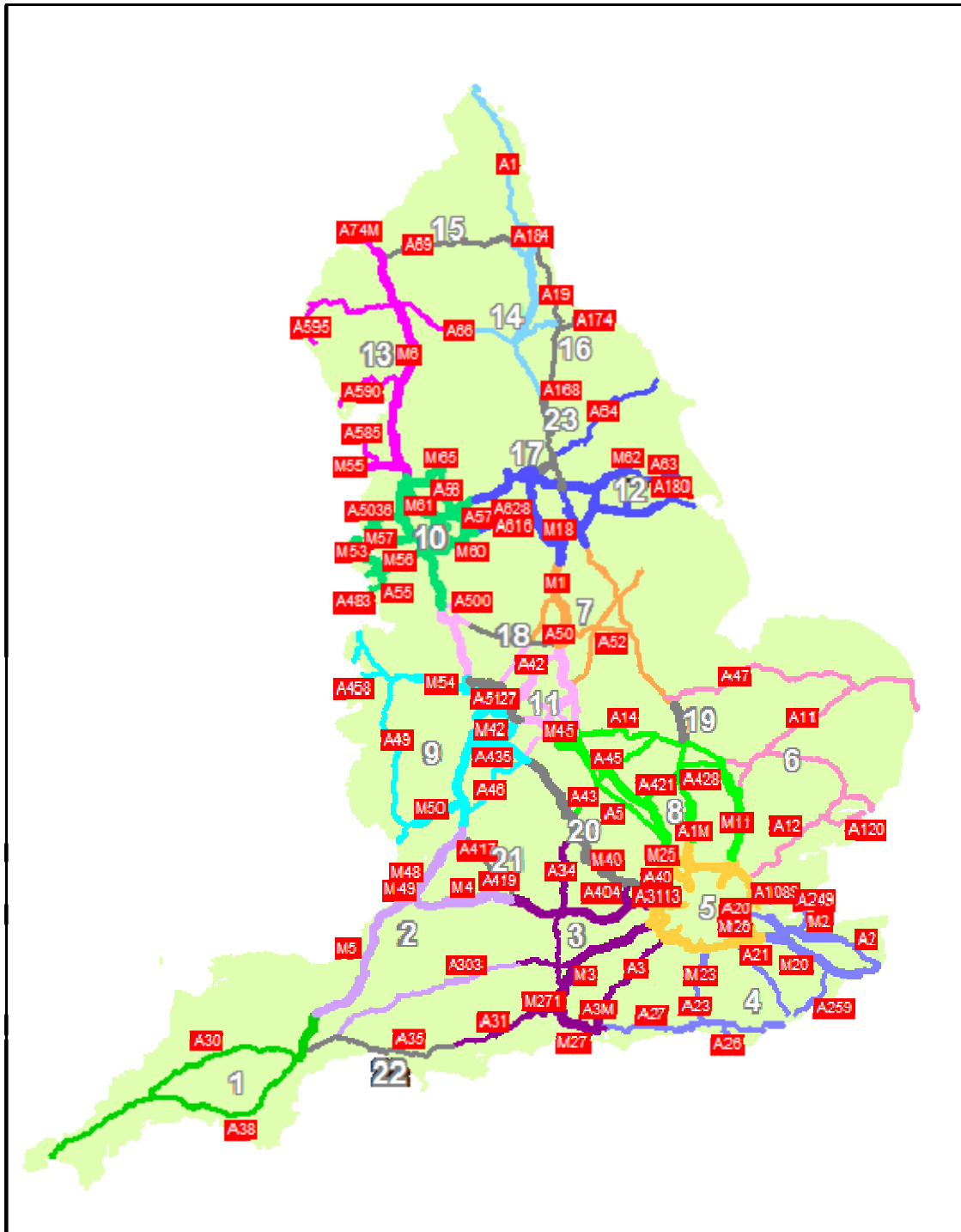




HIGHWAYS AGENCY

Accidents on the trunk network - 2006

Area Map – 2006 Core network



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1 SUMMARY

1.1 Targets

In 2000 the Government set a target to reduce road accident casualties on all roads by the year 2010. The target consists of three separate targets:

- A 40% reduction in the number of people killed or seriously injured (KSI) in road accidents;
- A 50% reduction in the number of children killed or seriously injured;
- A 10% reduction in the slight casualty rate, expressed as the number of people slightly injured per 10⁸ vehicle kilometres.

In July 2002 a fourth target was added to address the significantly higher number of road accident casualties that occur in disadvantaged areas. It is:

- to secure a greater reduction in the overall number of road casualties in the 88 Neighbourhood Renewal Fund Areas in England designated by the Office of the Deputy Prime Minister, than for England as a whole, comparing the figure with the average for 1999 to 2001 (see 'Tomorrows roads – safer for everyone – the first 3 year review' – published by DfT in 2004, for details)..

The Highways Agency will contribute to the new 2010 targets and will instigate measures to deliver, on the Trunk road network, reductions in fatal and serious casualties. The Agency has set its own targets for casualty reductions:

- a one-third reduction in the number of people killed or seriously injured on trunk roads;
- a 10% reduction in the slight casualty rate;
- and will contribute to the child casualty reduction target and to tackling the significantly higher incidence of road casualties in disadvantaged communities than elsewhere.

The KSI target is lower than the national target because of the already low accident rates and the relatively greater increases in traffic on the trunk road network, compared with those on other roads.

1.2 Delivery

This will be delivered by forming partnerships with others involved in, or affected by, road safety issues in order to tackle problems more comprehensively, efficiently and effectively. This will require better communication and working alongside others such as road operators, road users, DfT, the police and other organisations and improving safety through highway maintenance and engineering, education, encouragement, enforcement, operating practices management and monitoring.

1.3 Choice of network

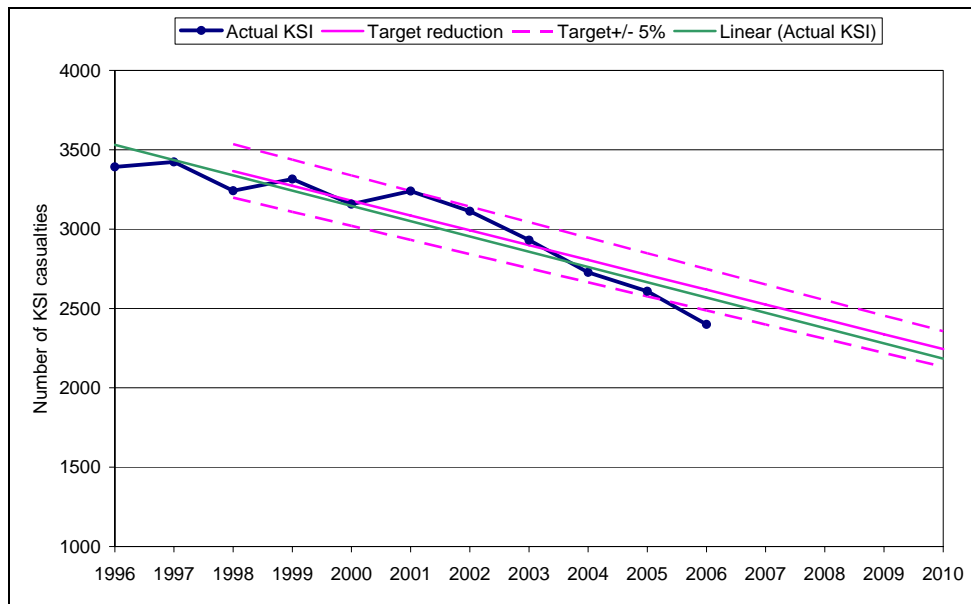
When the target was set, it was based on the 1999 network, which was used for monitoring purposes, although the HA network was changing. In 2004, accident numbers from 1994 were recalculated based on the 2004 core network (an estimate of what the 2006 network was expected to be), and a new baseline and 2010 target were calculated. The figures in this document are therefore comparable with 'accidents on the network – 2004' and later but are not directly comparable with those in earlier documents.

1.4 Progress towards 2010 targets

1.4.1 KSI target

The 2010 KSI target is to reduce by a third the number of people killed or seriously injured on the 2006 HA network measured against the 1994-98 average (3,366 casualties). There were 2,399 people killed or seriously injured in 2006, a reduction of 29% from the baseline and, as Figure 1-1 shows, this is on course to meet the target. The solid pink line indicates the trend required from 1998 to reach the target by 2010, assuming a linear reduction, and the dotted lines either side show the +/-5% of target. In 2006, the upper limit corresponds to a 23% reduction from the baseline. The green line indicates the current linear trend.

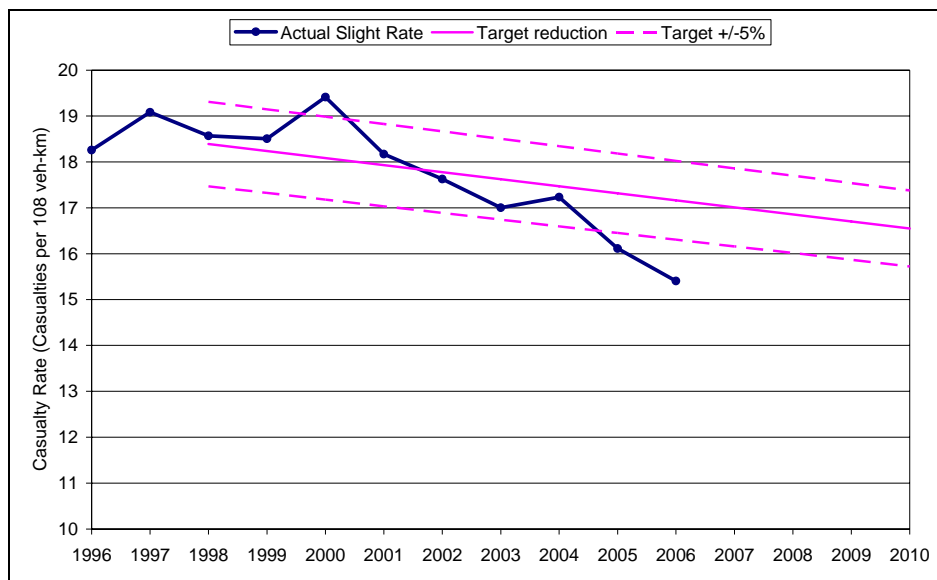
Figure 1-1: KSI target monitoring (2006 network)



1.4.2 Slight injuries target

The target is to reduce by 10% the slight casualty rate, measured against the 1994-98 average (18.4 casualties per 10⁸ vehicle-km). Figure 1-2 shows the performance against this target. The slight casualty rate in 2006 was 15.4, a reduction of 16.2% from the baseline, and below the 2010 target value of 16.6.

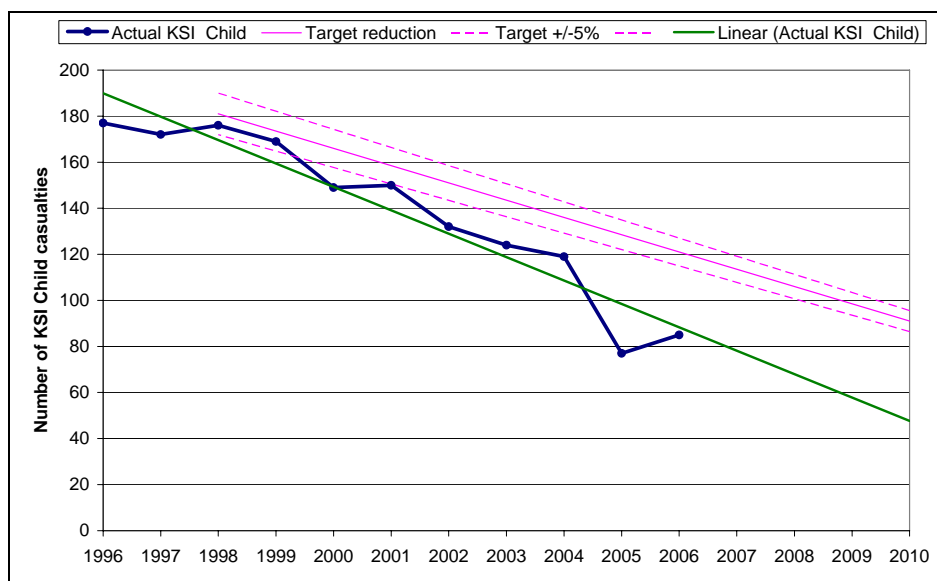
Figure 1-2: Slight casualty rate target monitoring (2006 network)



1.4.3 Child KSI target

The national target is to reduce by 50% the number of children killed or seriously injured in Great Britain. The Agency will contribute to this target, and aim to reduce the child casualties from the 1994-98 average of 181. The number of child casualties is shown in Figure 1-3, monitored against a 50% reduction. The number of children killed or seriously injured on the trunk road network in 2006 was 85, of which 70 were passengers, 13 were pedestrians, and 2 pedal cyclists. This is a reduction of 53%, which is lower than the 50% target reduction by 2010.

Figure 1-3: Child KSI casualty monitoring (2006 network)



1.4.4 Areas of deprivation target

The national target is to secure a greater reduction in the overall number of road casualties in the 88 Neighbourhood Renewal Fund (NRF) Areas in England, than for England as a whole, comparing the figure with the average for 1999 to 2001. The Highways Agency will contribute to this target.

The sections of the network in the 88 NRF areas may not be accessible from the area itself, i.e. a motorway that passes through an area, but does not have a junction.

The table below shows the total number of casualties on the HA network and in the 88 NRF councils. In 2006, the number of casualties on the whole network reduced from 2005, but increased for the sections of the network within the 88 NRF council areas. When compared with the 1999-2001 average, the reduction for the 88 NRF areas of 5.7% was a smaller reduction than over the network as a whole (10.7%).

Table 1-1: Total Trunk Road Casualties (All Severities) for NRF councils and England (2006 network)

	1999-2001 Average	2002	2003	2004	2005	2006	2006 % change from 1999-2001 average
88 NRF Councils (Total)	5,084	4,857	4,851	4,772	4,478	4,794	-5.7%
All England trunk	25,591	25,072	24,363	25,059	23,661	22,849	-10.7%

2 INTRODUCTION

In July 1998 the Government published a White Paper setting out its plans for a new integrated transport system¹. The Department for Transport (DfT) publication 'A New Deal for Trunk Roads in England' closely followed, giving a new strategic aim and new objectives for the Agency as a network operator and included commitments to give:

- a higher priority to better maintenance and making better use of existing roads;
- greater emphasis to environmental and safety objectives.

The Highways Agency's strategic plan for achieving these objectives has been set out in 'Making The Network Safer: Highways Agency Road Safety Strategic Plan'.

This document 'Accidents on the trunk network - 2006' is the 2006 edition of a document which has been issued annually since 1999 and which follows on from '*Making the Network Safer: Highways Agency Road Safety Strategic Plan*' providing quantified road safety *information and guidance* (rather than instruction) that describes the current state of the network.

2.1 Purpose of this document

The document is intended for use by Highways Agency staff, their Managing Agents and those in the public arena with an interest. .

This information is designed to enable them to:

- answer safety queries from Government, colleagues and the public;
- provide a national safety perspective for balancing needs across the network;
- help achieve the objectives of the Strategic Safety Action Plan (SSAP);
- make sound strategic and budgeting decisions concerning the future management and safety of the network;
- monitor changes in safety on the network year on year;
- assist in developing and monitoring the safety statements prepared by agents.

2.2 Objectives and content of this document

The objectives of this document are:

- to provide a national overview of current road safety strategies and targets (Summary);
- to provide an overview of the trunk road network's casualty trends, noting trends in severity (Section 3);
- to provide a perspective of injury accidents by road type (Section 4);
- to provide a perspective of injury accidents by area (Section 5);
- to provide a perspective of injury accidents by customer group (Section 6);
- to provide references to useful sources of information (Section 9).

¹ This white paper was added to in June 2003 and modified in October 2004.

3 ACCIDENTS AND CASUALTIES ON THE NETWORK BY SEVERITY

Note that for consistency, analyses for all years are based on the 2006 trunk road network. Documents prior to 'Accidents on the trunk road network – 2004' are based on the 1999 network, and therefore the figures are not comparable.

3.1 Casualty trends by severity

In 2006, there were 14,668 Trunk road accidents involving 31,565 vehicles and resulting in 22,849 casualties (of which 376 were killed, and 2,023 were seriously injured). These casualties accounted for 10% of all the reported road casualties in England.

Table 3-1 shows the number of accidents and Table 3-2 shows the number of casualties by injury for the 1994-98 baseline and 2001 to 2006. Table 3-1 shows that the total number of accidents in 2006 was almost the same as the baseline, with reductions in fatal and serious accidents and an increase in slight accidents.

Although the number of KSI casualties has reduced by 29% from the baseline in 2006, this reduction is mainly due to a reduction in serious casualties, which have reduced by 31% compared with a smaller reduction of 10% in fatalities. The number of fatalities fluctuates more between years than the serious casualties, as they are smaller in number.

The slight casualties illustrate an interesting trend, i.e. increasing up to the year 2000, and decreasing in the last few years. DfT is currently looking closely at the trends in slight casualties to assess whether the reductions are due to a change in the level of reporting of road injuries by or to the police. This will provide a better understanding of how much the fall over recent years is due to genuine improvements in safety.

Table 3-1: Accidents by severity and year

Accident severity	1994-1998 average	2001	2002	2003	2004	2005	2006	2006 % change from baseline
Fatal	364	369	388	387	330	352	332	-8.8%
Serious	2,167	2,151	2,019	1,962	1,824	1,719	1,616	-25%
Slight	12,166	13,453	13,722	13,319	13,779	12,938	12,720	+4.6%
Total accidents	14,697	15,973	16,129	15,668	15,933	15,009	14,668	-0.2%

Table 3-2: Casualties by injury and year

Casualty injury	1994-1998 average	2001	2002	2003	2004	2005	2006	2006 % change from baseline
Killed	416	418	457	444	367	408	376	-10%
Seriously injured	2,950	2,822	2,656	2,487	2,361	2,201	2,023	-31%
KSI	3,366	3,240	3,113	2,931	2,728	2,609	2,399	-29%
Slightly injured	20,114	22,324	22,067	21,488	22,331	21,052	20,450	+1.7%
Total casualties	23,480	25,564	25,180	24,419	25,059	23,661	22,849	-3%

Figure 3-1 shows the trend in casualty numbers by injury, and Figure 3-2 shows the figures relative to the 1994-98 baseline. This allows all three injury trends to be compared more easily, and shows how the trends in fatalities and serious injuries were similar from the baseline to about 2002, but then the injuries started to show slightly different trends. The overall effect of the killed and seriously injured trends results in a reduction that is on target for the 2010 target in 2006 (see Figure 1-1).

Figure 3-1: Casualties by casualty injury 1994-2006

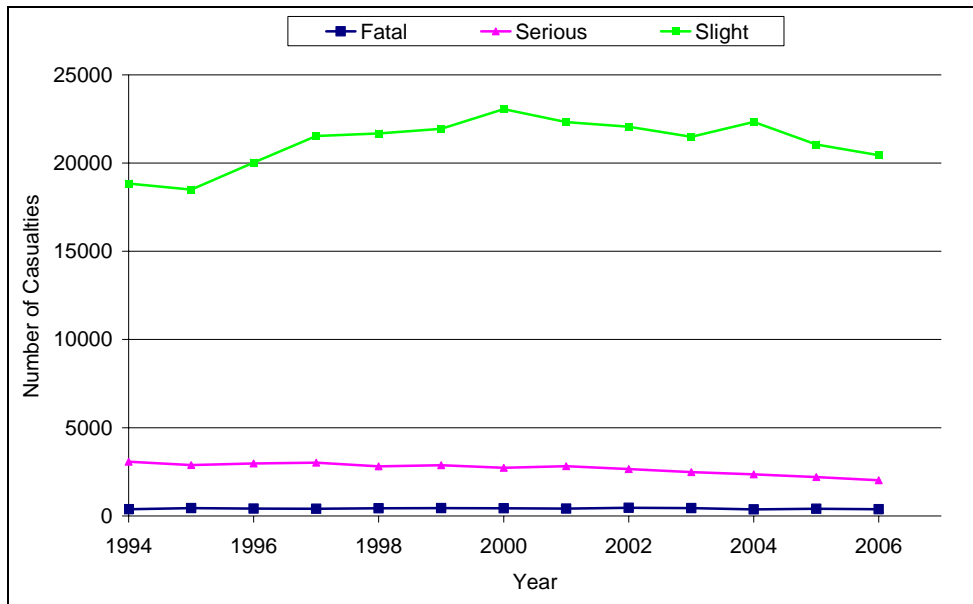
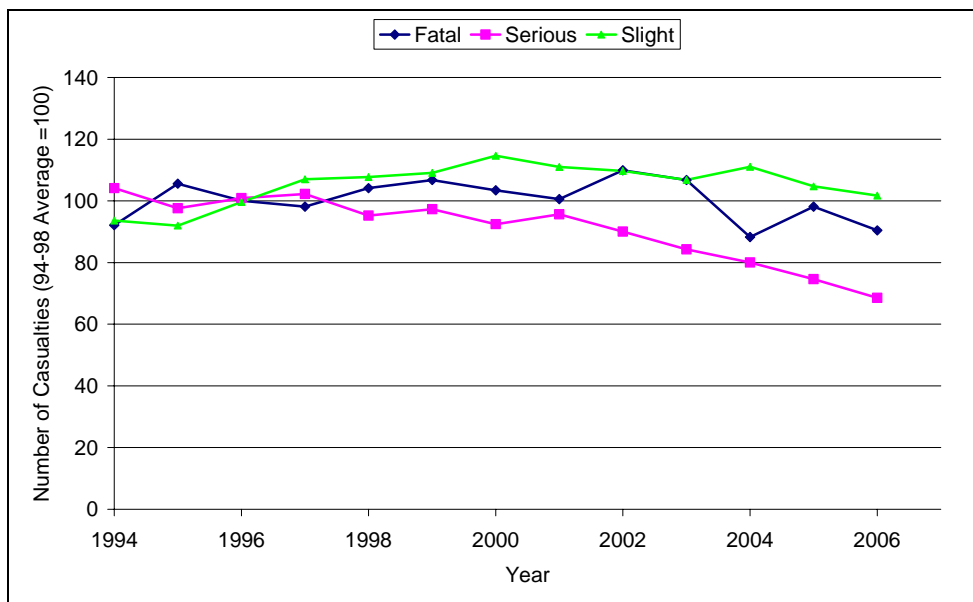


Figure 3-2: Casualties by casualty injury 1994-2006 relative to 1994-98 average



3.2 Casualty rate trends by injury

Table 3-3 gives the traffic and casualty rates (i.e. the number of casualties per 10⁸ vehicle-km travelled) by injury. The trunk road traffic has increased by over 21% from the baseline, and the killed and serious casualty rates have reduced by 25% and 43% respectively. The slight casualty rate has reduced by 16%, which is already lower than the target reduction of 10%. The trends in casualty rates are illustrated in Figure 3-3 and Figure 3-4.

Table 3-3: Casualty rates by year

	1994-1998 average	2001	2002	2003	2004	2005	2006	2006 % change from baseline
Traffic (10 ⁸ vehicle-km)	1,093	1,229	1,252	1,264	1,296	1,307	1,327	21.4%
Killed rate	0.38	0.34	0.37	0.35	0.28	0.31	0.28	-25.4%
Serious rate	2.7	2.3	2.1	2.0	1.8	1.7	1.5	-43.5%
KSI rate	3.1	2.6	2.5	2.3	2.1	2.0	1.8	-41.7%
Slight rate	18.4	18.2	17.6	17.0	17.2	16.1	15.4	-16.2%
All casualties rate	21.5	20.8	20.1	19.3	19.3	18.1	17.2	-19.9%

Casualty rate measured in casualties per 10⁸ vehicle-km.

Figure 3-3: Casualty rates by casualty injury 1994-2006

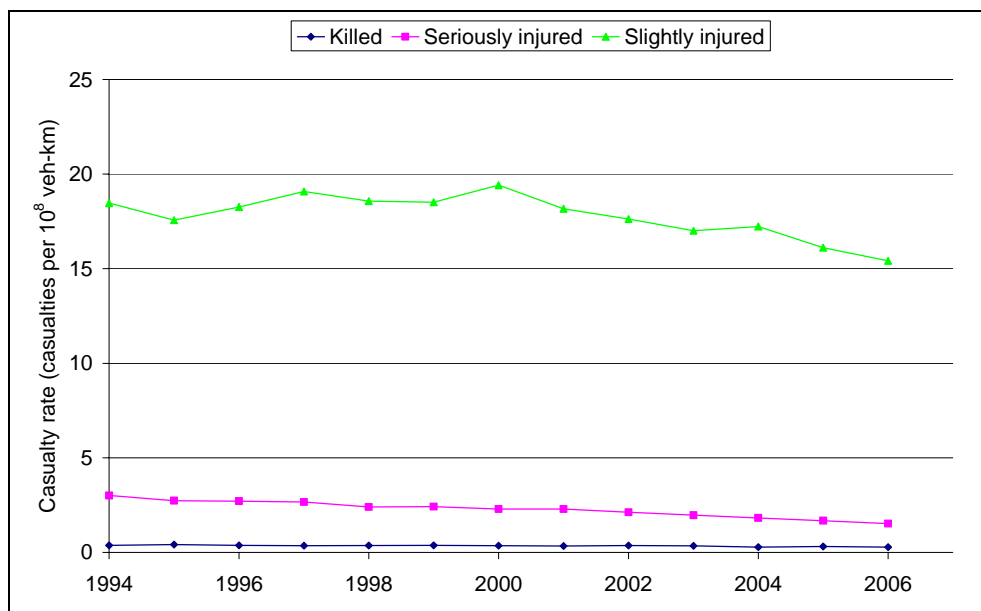
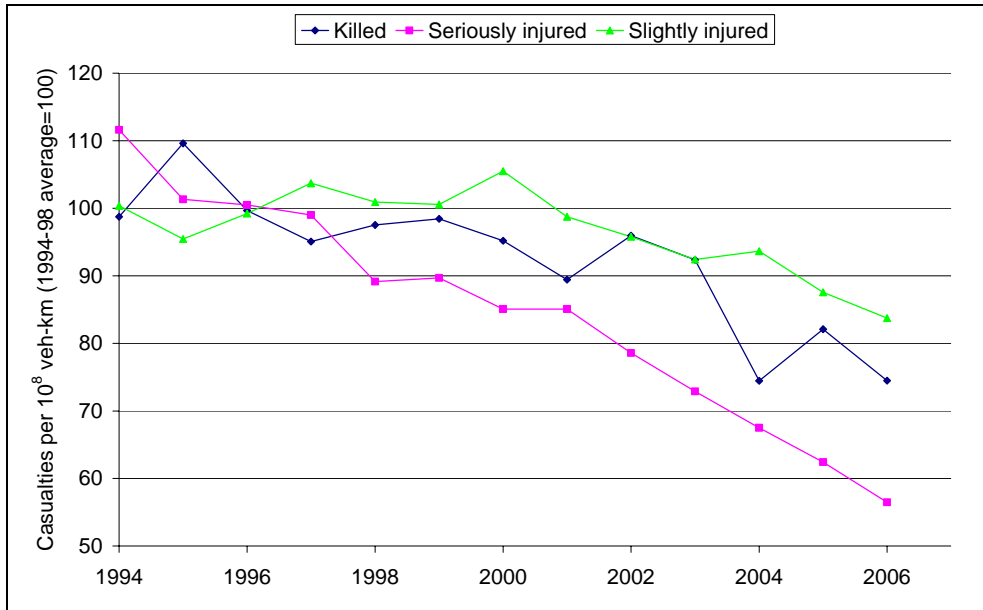


Figure 3-4: Casualty rates by severity relative to 1994-98 average



3.3 Casualty trends summary

- Overall, the KSI casualties have reduced by 29%. This is on target, but the serious casualties have reduced more than the fatalities.
- The number of fatalities shows more fluctuation than the serious casualties due to the smaller numbers, and in 2006 showed a reduction of 10% from the baseline.
- The number of serious casualties has reduced steadily, with a reduction of 31% from the baseline.
- The slight casualties illustrate an interesting trend, i.e. increasing up to the year 2000, and decreasing in the last few years.
- Casualty rates for all severities have reduced from the baseline, the fatality rate by 25%, the serious injury rate by 43% and the slight casualty rate by 16%.

4 ACCIDENTS AND CASUALTIES BY LOCATION AND ROAD TYPE

There are about 6,800 kilometres of Trunk road (2.3% of all roads in England). Trunk roads service 130 billion vehicle-km of traffic (30% of all traffic in England).

4.1 Accidents and casualties by road type

Trunk roads comprise of motorways and All Purpose A-roads. A-roads are described as built-up (speed limit 40mph or less) or non-built-up (speed limits of 50mph or more), and also as dual carriageway or single carriageway.

Of all accidents on English Trunk roads:

- 51.0% (7,479) were on motorways.
- 49.0% (7,189) were on All Purpose Trunk A-roads -
 - 41.1% (6,035) were on non-built-up A-roads;
 - 7.9% (1,154) were on built-up A-roads;
 - 36.0% (5,282) were on dual carriageway² A-roads
 - 12.8% (1,879) were on single carriageway A-roads

Table 4-1 gives the number of accidents in 2006 by road type and accident severity. The percentage KSI (also called the severity ratio) is also given, which is the percentage of accidents on a particular road type that are fatal or serious. This shows that accidents on single carriageway or non built-up A-roads have the highest severity and accidents on built-up A-roads and motorways have the lowest severity.

Table 4-2 gives the same information for casualties.

Table 4-1: Number of accidents by road type and accident severity, 2006

Road class	Type	Fatal	Serious	Slight	Total	% KSI
Motorways	All	146	708	6,625	7,479	11.4%
A-roads	All	186	908	6,095	7,189	15.2%
	Built-up	9	97	1,048	1,154	9.2%
	Non built-up	177	811	5,047	6,035	16.4%
	Dual carriageway	129	609	4,544	5,282	14.0%
	Single carriageway	57	295	1,527	1,879	18.7%
Total		332	1,616	12,720	14,668	13.3%

² Figures for dual carriageways include accidents on roundabouts, one-way streets and slip roads

Table 4-2: Number of casualties by road type and casualty injury, 2006

Road class	Type	Killed	Seriously injured	Slightly injured	Total	%KSI
Motorways	All	169	874	10,953	11,996	8.7%
A-roads	All	207	1,149	9,497	10,853	12.5%
	Built-up	11	113	1,442	1,566	7.9%
	Non built-up	196	1,036	8,055	9,287	13.3%
	Dual carriageway	139	751	6,853	7,743	11.5%
	Single carriageway	68	391	2,612	3,071	14.9%
Total		376	2,023	20,450	22,849	10.5%

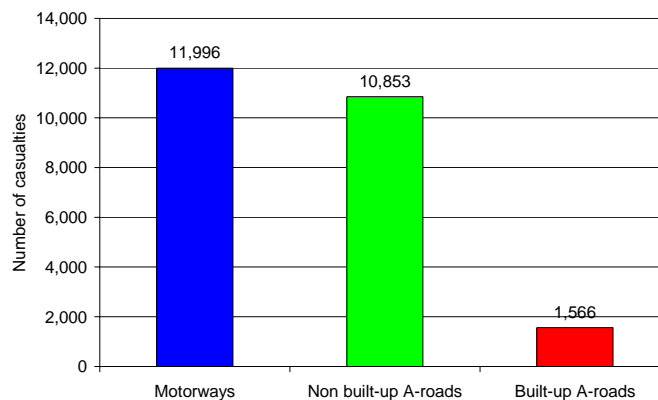
4.2 Casualty rates and accident rates

Figure 4-1 shows the number of casualties, length, traffic and likelihood of being injured on motorways, non built-up and built-up A-roads. The casualty rate is the number of casualties per vehicle-km travelled, otherwise described as the likelihood of an individual being injured.

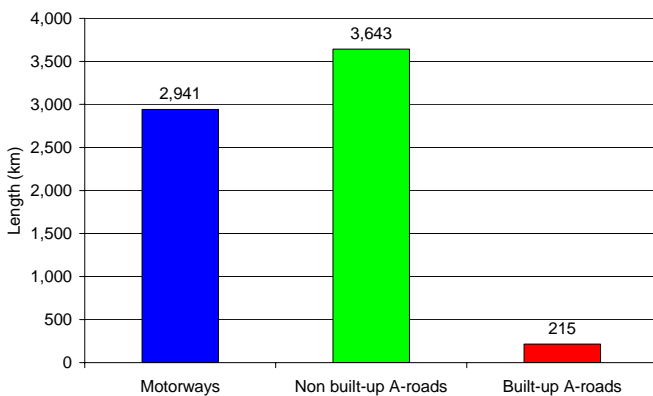
Although motorways have the greatest number of casualties and the greatest traffic (Figures (a) and (c)), their casualty rate is the lowest, and motorways are relatively safer per vehicle-km travelled, as shown in Figures (d) and (e). The built-up A-roads, which account for a small proportion of the network, have a smaller number of casualties, but have the highest casualty rates.

Figure 4-1: English Trunk roads and casualties, 2006

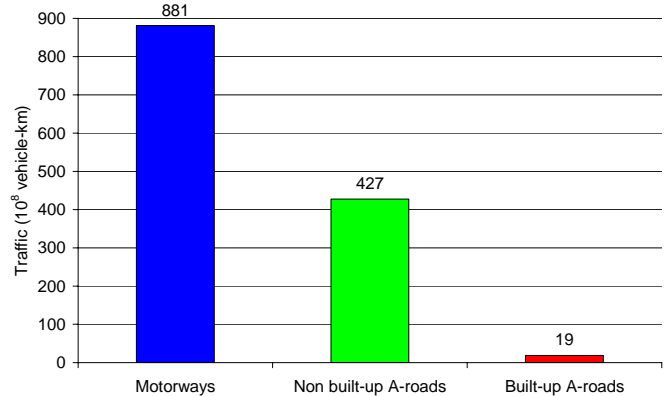
(a) Number of casualties



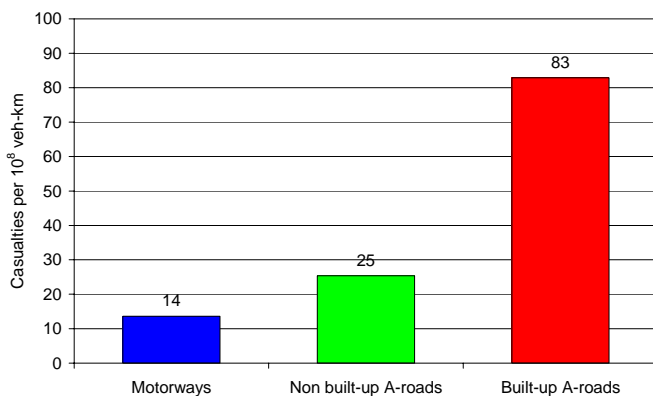
(b) Length (km)



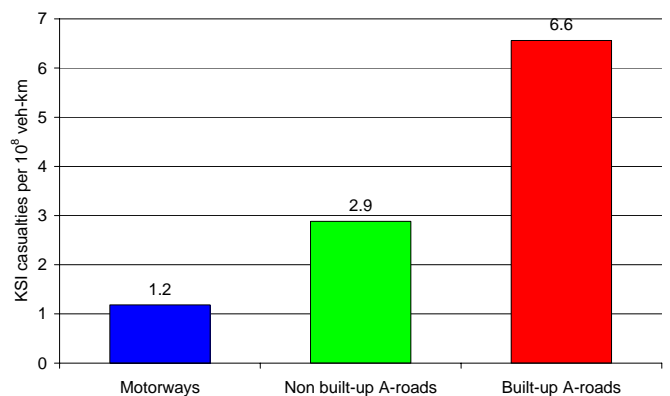
(c) Traffic (10⁸ vehicle-km)



(d) Likelihood of being injured



(e) Likelihood of being killed or seriously injured



4.3 Casualty and casualty rate trends by injury and road class

Table 4-3 and Table 4-4 show the number of casualties and casualty rates for motorways and trunk A-roads. On motorways there was a rise in the number of fatalities until 2003, and since the fatalities have fluctuated, with a 9.7% increase from the baseline figure in 2006. Serious injuries on motorways have reduced steadily to a figure 26% below the baseline. On A-roads, the numbers of both fatalities and serious injuries have reduced from the baseline.

Table 4-3: Motorway casualties and rates by year

	1994-1998 average	2001	2002	2003	2004	2005	2006	2006 % change from baseline
Killed	154	176	194	196	147	182	169	+9.7%
Seriously injured	1,176	1,269	1,170	1,106	1,037	934	874	-25.7%
KSI	1,330	1,445	1,364	1,302	1,184	1,116	1,043	-21.6%
Slightly injured	10,087	11,794	11,465	11,326	11,681	11,271	10,953	+8.6%
All casualties	11,417	13,239	12,829	12,628	12,865	12,387	11,996	+5.1%
Traffic (10 ⁸ veh-km)	724	811	826	828	857	864	881	21.7%
Killed rate	0.21	0.22	0.23	0.24	0.17	0.21	0.19	-8.7%
Serious rate	1.63	1.56	1.42	1.34	1.21	1.08	0.99	-39.1%
KSI rate	1.84	1.78	1.65	1.57	1.38	1.29	1.18	-35.7%
Slight rate	13.9	14.5	13.9	13.7	13.6	13.1	12.4	-10.6%
All casualties rate	15.7	16.3	15.5	15.3	15.0	14.3	13.6	-13.3%

Casualty rate measured in casualties per 10⁸ vehicle-km.

Table 4-4: A-road casualties and rates by year

	1994-1998 average	2001	2002	2003	2004	2005	2006	2006 % change from baseline
Killed	263	242	263	248	220	226	207	-21.3%
Seriously injured	1,775	1,553	1,487	1,381	1,324	1,267	1,149	-35.3%
KSI	2,038	1,795	1,750	1,629	1,544	1,493	1,356	-33.5%
Slightly injured	10,043	10,530	10,607	10,162	10,650	9,781	9,497	-5.4%
All casualties	12,081	12,325	12,357	11,791	12,194	11,274	10,853	-10.2%
Traffic (10 ⁸ veh-km)	369	418	426	436	439	442	446	+20.9%
Killed rate	0.71	0.58	0.62	0.57	0.50	0.51	0.46	-34.6%
Serious rate	4.83	3.72	3.48	3.17	3.02	2.86	2.58	-46.7%
KSI rate	5.54	4.30	4.10	3.74	3.52	3.38	3.04	-45.1%
Slight rate	27.2	25.2	24.9	23.3	24.3	22.1	21.3	-21.7%
All casualties rate	32.7	29.5	29.0	27.1	27.8	25.5	24.3	-25.6%

Casualty rate measured in casualties per 10⁸ vehicle-km.

The trends in the casualty rates for motorways and A-roads are illustrated in Figure 4-2 and Figure 4-3.

Figure 4-2: Killed and serious casualty rates by road class 1994-2006

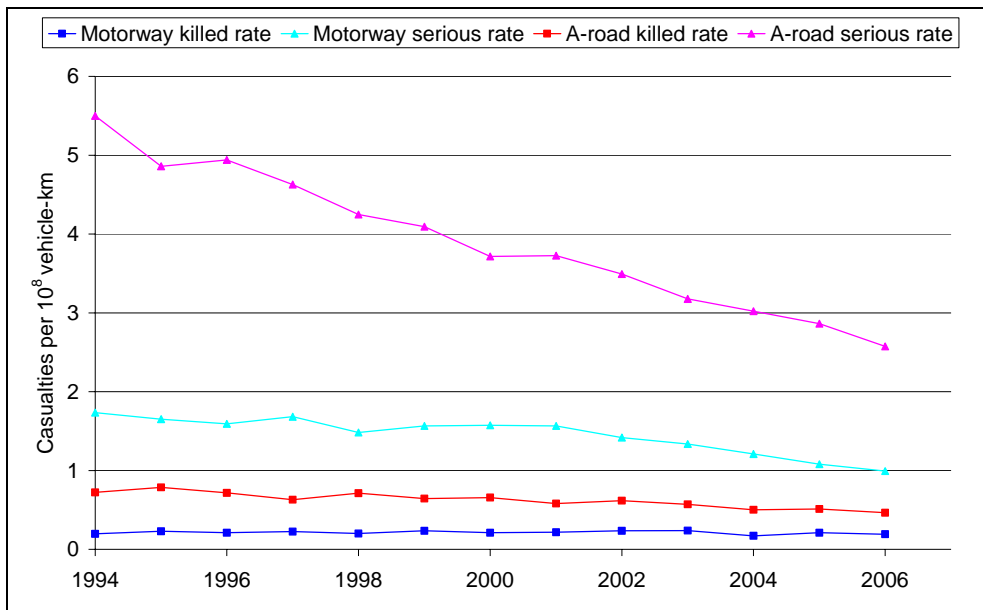
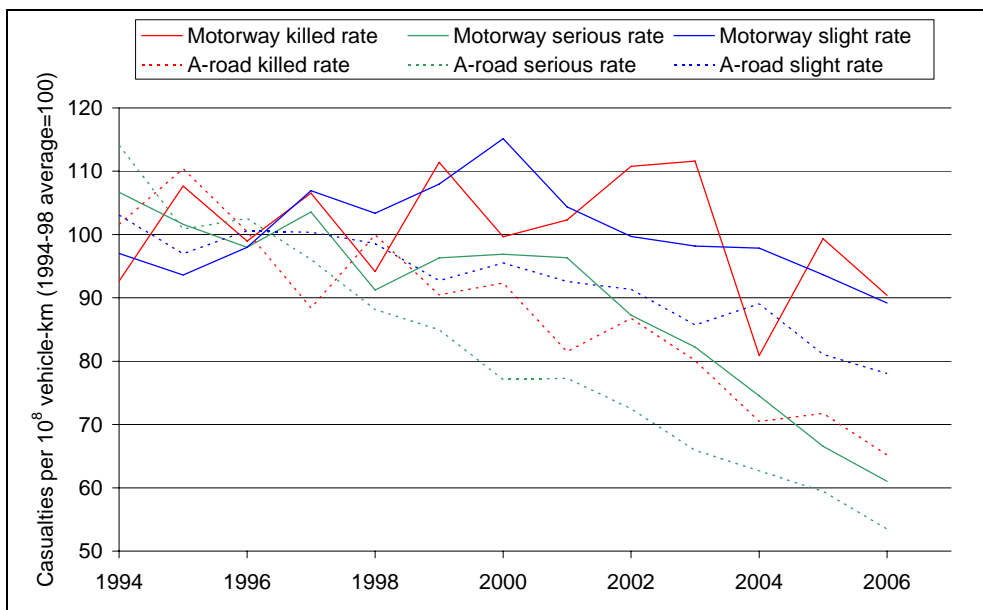


Figure 4-3: Casualty rates by injury and road class relative to 1994-98 average



4.4 Accident types by road class

4.4.1 Motorways

Many of the differences between the types of accidents on motorways and Trunk A-roads arise largely because of unique characteristics of motorways (e.g. high design standards, fewer junctions, more hard shoulders etc.), differences in traffic volumes, vehicle mileage, and the smaller speed differentials between road users (largely because pedestrians and pedal cyclists are prohibited from using motorways).

All these factors contribute to motorways having lower casualty severities and casualty rates than A-roads, fewer junction accidents³ and pedestrian accidents than on A-roads, but more multi-vehicle⁴ accidents and accidents at roadworks than on A-roads. Comparing the vehicles involved in motorway accidents with the vehicles in A-road accidents, vehicles in motorway accidents were more likely to be HGVs, to be 'changing lane', to leave the carriageway and hit a crash barrier off the carriageway, and less likely to be 'turning right' or 'going ahead left or right bend'.

4.4.2 Non-built-up and built-up A-roads

About half (52%) of fatalities on the whole Trunk network were on non-built-up A-roads. Comparing built-up and non-built-up A-roads, total casualty rates were much higher on built-up A-roads than on non-built-up A-roads but built-up fatality rates were similar to non-built-up ones. On non-built-up roads the predominant accident types suggested high speeds (involving the faster manoeuvres, skidding etc), which lead to high severities. The built-up roads had the highest proportions of vulnerable road user casualties (pedestrians, cyclists and equestrians) and, probably, the highest amount of vulnerable road user traffic, which is difficult to measure.

Accidents on non-built-up roads were more likely to result in fatal or serious injuries, to involve 3 or more vehicles, and to take place away from junctions². Accidents on non-built-up roads were also more likely to involve vehicles that were overtaking, were HGVs, that left the carriageway, and that skidded. Accidents on built-up roads were more likely to involve pedestrians or pedal cycles and for vehicles to be 'waiting to go ahead'.

4.4.3 Dual and single carriageway A-roads

Just over a third (37%) of fatalities on the whole Trunk network were on dual carriageway A-roads. The different design standards of these roads give different accident characteristics.

Comparing dual and single carriageways, single carriageway accidents tend to be more severe; 14.9% of casualties on single carriageways were killed or seriously injured compared with 11.5% on dual carriageways. Single vehicle accidents are more likely on dual carriageways than on single carriageways.

Vehicles involved in accidents on single carriageways were more likely to be turning right and waiting to turn right, overtaking or going ahead – bend, or to have first point of impact “front” or “offside” than vehicles involved in accidents on dual carriageways.

Vehicles involved in dual carriageways were more likely to be changing lane, to have first point of impact “back” or “nearside”, or hit an object off the carriageway than vehicles involved in accidents on single carriageways. Drivers aged 70 and over were more common in accidents on single carriageways.

³ Note that a STATS19 junction accident is one occurring at or within 20m of a junction. Vehicle manoeuvres associated with leaving or joining motorways mainly take place much further than 20m from the junction. Thus, many motorway accidents not classified as occurring at a junction may have been junction-related.

⁴ Involving 3 or more vehicles

4.5 EuroRAP accident categories by road class

EuroRAP is a sister programme to EuroNCAP and aims to provide independent, consistent safety ratings of roads across borders. Over a wide sample of European countries four main collision types lead to about 80% of all fatal collisions on rural main roads (OECD, 1999) and EuroRAP considers these four accident categories when assessing routes. These four main accident categories are: accidents involving pedestrians or cyclists, accidents at junctions, accidents involving a single vehicle leaving the carriageway and head-on accidents. They are assigned in this order so an accident involving a pedestrian at a junction is classed as a vulnerable road user accident rather than a junction accident.

On the HA network between 2004 and 2006 these four accident types accounted for the smaller value of 55% of all fatal collisions so the collision type "shunt" has also been included here. 72% of fatal collisions are covered by the five collision types.

Table 4-5 shows the number of accidents 2004-2006 by accident severity and collision type. Junction accidents account for 28% of all trunk road accidents, although they account for a much lower 16% of fatal accidents. Shunt accidents accounted for 26% of all accidents and showed a similar pattern. On the contrary, accidents involving vulnerable road users accounted for 2% of accidents of all severities but 15% of fatal accidents.

Table 4-5: Accidents by severity and collision type 2004-2006

Collision type	Fatal		Serious		KSI		Slight		Total	
Vulnerable road users	153	15%	303	6%	456	7%	674	2%	1,130	2%
Junction	167	16%	1,235	24%	1,402	23%	11,454	29%	12,856	28%
Single vehicle run-off	141	14%	589	11%	730	12%	2,567	7%	3,297	7%
Head on	96	9%	237	5%	333	5%	1,106	3%	1,439	3%
Shunt	174	17%	1,056	20%	1,230	20%	10,838	27%	12,068	26%
Other	283	28%	1,739	34%	2,022	33%	12,798	32%	14,820	32%
Total	1,014	100%	5,159	100%	6,173	100%	39,437	100%	45,610	100%

The distribution of accident types varies greatly between road types because of the difference in conditions. For example, pedestrians are generally not allowed on motorways and when they are present they are particularly vulnerable. The three tables below show the differences in collision types between the different road types.

Table 4-6 shows the number of motorway accidents by accident severity and collision type. 59% of accidents on motorways are covered by the five collision types, with shunts accounting for 32% of accidents. 1% of accidents of all severities on motorways involved vulnerable road users compared with 12% of fatal accidents on motorways. 7% of accidents of all severities involving a single vehicle leaving the carriageway compared with 15% of fatal accidents.

Table 4-6: Accidents on motorways by severity and collision type 2004-2006

Collision type	Fatal		Serious		KSI		Slight		Total	
Vulnerable road users	50	12%	54	2%	104	4%	73	0%	177	1%
Junction	43	10%	283	13%	326	12%	3,429	17%	3,755	16%
Single vehicle run-off	65	15%	289	13%	354	13%	1,321	6%	1,675	7%
Head on	18	4%	70	3%	88	3%	604	3%	692	3%
Shunt	105	24%	602	27%	707	26%	6,755	33%	7,462	32%
Other	152	35%	943	42%	1,095	41%	8,365	41%	9,460	41%
Total	433	100%	2,241	100%	2,674	100%	20,547	100%	23,221	100%

76% of accidents on dual carriageway A-roads are covered by the five accident types with junctions accounting for 41% of accidents, although these accounted for a much lower 20% of fatal accidents on dual carriageway A-roads. 4% of accidents on dual carriageway A-roads involved vulnerable road users compared with 22% of fatal accidents.

Table 4-7: Accidents on dual A-roads by severity and collision type 2004-06

Collision Type	Fatal		Serious		KSI		Slight		Total	
Vulnerable road users	84	22%	157	8%	241	10%	382	3%	623	4%
Junction	75	20%	638	32%	713	30%	5978	42%	6691	41%
Single vehicle run-off	64	17%	238	12%	302	13%	1021	7%	1323	8%
Head on	16	4%	43	2%	59	2%	250	2%	309	2%
Shunt	59	16%	364	18%	423	18%	3,088	22%	3,511	21%
Other	81	21%	552	28%	633	27%	3,350	24%	3,983	24%
Total	379	100%	1,992	100%	2,371	100%	14,069	100%	16,440	100%

77% of accidents on single carriageway A-roads were covered by the five collision types with Junctions accounting for 40% of the accidents, although these accounted for 24% of fatal accidents. Head-on accidents were more common on single carriageway A-roads than dual carriageways and motorways as here is no median safety barrier, and accounted for 7% of all accidents and 31% of fatal accidents on single carriageway A-roads.

Table 4-8: Accidents on single A-roads by severity and collision type 2004-06

Acc Type	Fatal		Serious		KSI		Slight		Total	
Vulnerable road users	19	9%	90	10%	109	10%	216	5%	325	6%
Junction	48	24%	313	34%	361	32%	2016	42%	2377	40%
Single vehicle run-off	12	6%	61	7%	73	7%	224	5%	297	5%
Head on	62	31%	123	13%	185	17%	251	5%	436	7%
Shunt	10	5%	90	10%	100	9%	986	21%	1,086	18%
Other	50	25%	239	26%	289	26%	1,066	22%	1,355	23%
Total	201	100%	916	100%	1,117	100%	4,759	100%	5,876	100%

4.6 Accident conditions

4.6.1 Hard shoulder and lay-by accidents

Table 4-9 shows the number of accidents which involved a vehicle on, entering or leaving a lay-by or hard shoulder for the different road types. In general, this means lay-bys on A-roads and hard shoulders on motorways, although there will be some exceptions. On motorways, 1.1% of accidents involved a vehicle on, entering or leaving the hard shoulder, and 30% of these were fatal or serious. 1.8% of accidents on A-roads involved a vehicle on, entering or leaving a lay-by.

Table 4-9: Hard shoulder and lay-by accidents, 2006

Road class	Type	Accidents involving a vehicle on, entering or leaving lay-by or hard shoulder				% of road type accidents
		Fatal	Serious	Slight	Total	
Motorways	All	9	16	58	83	1.1%
A-roads	All	8	30	90	128	1.8%
	Built-up	0	0	5	5	0.4%
	Non built-up	8	30	85	123	2.0%
	Dual carriageway	8	22	73	103	2.0%
	Single carriageway	0	8	17	25	1.3%
Total		17	46	148	211	1.4%

More detail on hard shoulder accidents is given in Appendix E.3.

4.6.2 Accidents at roadworks

Table 4-10 shows the number of accidents that were recorded with roadworks present. Overall, 3.8% of accidents in 2006 occurred at roadwork sites, with a higher rate of 4.6% on motorways. Overall, 12% of accidents at roadworks were fatal or serious.

Table 4-10: Accidents at roadworks, 2006

Road class	Type	Fatal	Serious	Slight	Total	% of road type accidents
Motorways	All	2	32	309	343	4.6%
A-roads	All	7	23	182	212	2.9%
	Built-up	1	4	41	46	4.0%
	Non built-up	6	19	141	166	2.8%
	Dual carriageway	6	15	145	166	3.1%
	Single carriageway	1	8	36	45	2.4%
Total		9	55	491	555	3.8%

4.7 Summary

- Half of accidents on trunk roads occurred on motorways.
- Motorways carry the most traffic.
- The accident severity ratio is highest for non built-up A-roads and single carriageway A-roads
- Motorways have the lowest casualty rate (casualties per vehicle km).
- The number of KSI casualties on A-roads has reduced more than on motorways
- In 2006, motorway fatalities were 9.7% above the baseline.
- On motorways, the number of serious injuries has reduced steadily from the baseline to give a reduction of 26% from the baseline.
- On A-roads, the numbers of fatalities and seriously injured have reduced steadily from the baseline by 21% and 35% respectively.
- The casualty rates have reduced more on A-roads than on motorways.

5 AREA DATA

5.1 Accidents and casualties by Area

The HA network is divided into Areas as shown in the Area Map located inside the front cover of this document. Maps of the accidents in 2006 in each of the HA Areas can be found in **Appendix B**. Casualties by customer group for each HA Area can be found in **Appendix C**.

Additional accident analysis for each Area can be found in the Area performance report.

The individual Areas each produce an Area Safety Action Plan (ASAP) which describes how safety is managed in the Area and how safety improvements are identified and delivered to achieve the casualty reduction targets. These plans are prepared with support of many organisations and are reviewed and updated yearly. A major objective is to involve others in the communicating of the works to improved safety in the area and obtain supplementary information from other stakeholders.

The ASAP will:

- summarise the accident and casualty numbers – by road type and by accident/casualty severity
- summarise accident rates (per vehicle-km) – by road type and by accident/casualty severity
- put the statistics into a national context – i.e. the contribution to the safety of the entire English trunk road network
- consider trends, in terms of national casualty reduction targets and in terms of key user groups within the Strategic Safety Action Plan
- plot accidents/accident rates for roads in the whole Area to highlight clusters⁵
- plot severity ratios to enable comparisons between routes
- identify relevant partnerships that will support non-engineering measures, such as education and enforcement, to promote safer roads and reduce accidents and casualties

It is, therefore, clear that much of the data in this document will mirror the data in the ASAP. Where Areas collate their own data there may be slight differences in detail due to different methods used to select trunk road accidents from the total Stats19 dataset. However, any differences should be small.

The HA has developed indicator(s), currently under review, for measuring the safety risk to users of the strategic road network, which can be used by senior management in the Agency to provide strategic direction, can be translated into safety improvement actions, and can be used to demonstrate risks and risk reduction to road users.

It is proposed that the indicators should be focused primarily on two main issues:

- Current level of safety on the network
- Change in performance over time

and that indicators should relate to:

⁵ This will also help to cross-reference problems with particular areas (such as parishes, health regions or areas of social deprivation etc.)

- Areas
- Regions
- A 100-Route network which matches as closely as possible the network currently used for congestion monitoring.

Over time these indicators will form part of performance measurement at Regional and Area level within the HA, and will be reported in future issues of this document

Table 5-1 shows the number of casualties by severity and Area in 2006. The DBFO routes have been grouped together. The 'unknown' Area refers to those accidents which did not fall within the England boundary. The Areas have different lengths and types of road and varying traffic conditions, giving different casualty numbers and casualty rates in each Area. Fatal and serious accidents in 2006 are shown on maps for each Area in **Appendix B**.

Table 5-1: Casualties and accidents by severity and Area, 2006

Area	Casualties				Accidents			
	Killed	Seriously injured	Slightly injured	Total	Fatal	Serious	Slight	Total
1	11	34	596	641	10	29	394	433
2	15	87	848	950	15	64	508	587
3	29	155	1771	1955	26	126	1,175	1,327
4	31	197	1,550	1,778	27	150	1026	1,203
5	39	235	2,712	2,986	34	179	1,738	1,951
6	25	147	967	1,139	23	130	600	753
7	30	116	1,367	1,513	21	98	849	968
8	38	171	1,619	1,828	35	145	997	1,177
9	27	126	1,084	1,237	23	108	652	783
10	21	144	2,213	2,378	20	120	1,341	1,481
11	29	112	1,248	1,389	23	89	819	931
12	24	168	1,332	1,524	23	122	767	912
13	16	87	797	900	15	62	445	522
14	17	70	776	863	16	46	454	516
DBFO	24	173	1,567	1,764	21	147	953	1,121
Unknown	0	1	3	4	0	1	2	3
Total	376	2,023	20,450	22,849	332	1,616	12,720	14,668

5.2 KSI casualty trends by Area

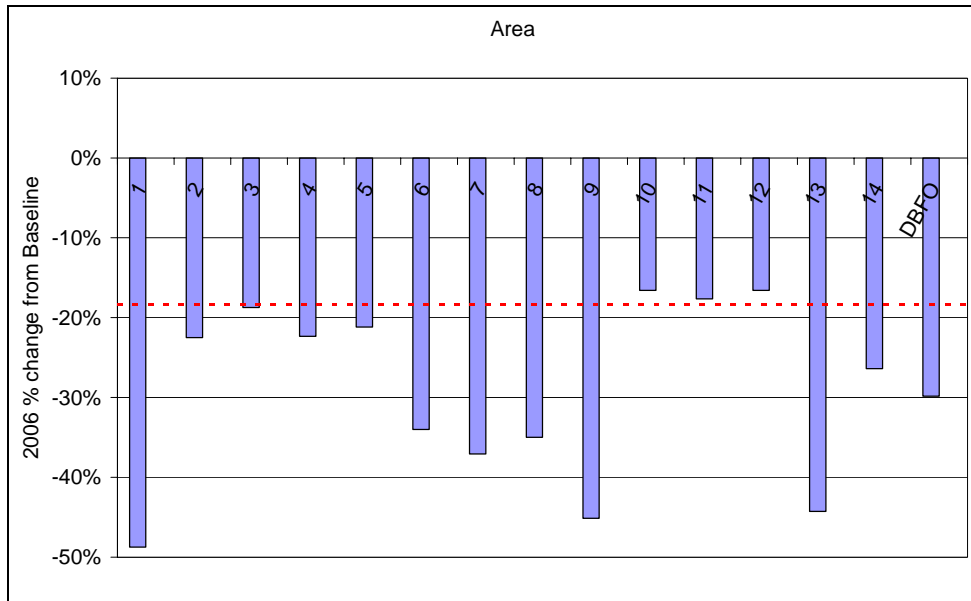
Table 5-2 gives the number of KSI casualties and the performance towards the 2010 target by Area, and the percentage change from the baseline is illustrated in Figure 5-1, where the dotted line at -18.3% indicates the minimum overall reduction required in 2006 to be on target.

The number of KSI casualties in 2006 has reduced from the baseline in all Areas, but Areas 10, 11 and 12 have reduced somewhat less than the minimum reduction required to be on target.

Table 5-2: KSI Casualties 2001-2006 by area

Area	1994-1998 average	2001	2002	2003	2004	2005	2006	2006 % of KSI casualties	2006 % change from baseline
1	88	110	92	71	72	68	45	1.9%	-48.7%
2	132	136	130	128	130	90	102	4.3%	-22.5%
3	226	292	262	269	238	201	184	7.7%	-18.7%
4	294	239	259	265	214	234	228	9.5%	-22.3%
5	348	395	371	344	300	276	274	11.4%	-21.2%
6	261	253	256	170	215	224	172	7.2%	-34.0%
7	232	226	207	175	192	155	146	6.1%	-37.1%
8	321	298	261	281	232	280	209	8.7%	-35.0%
9	279	220	201	141	139	162	153	6.4%	-45.1%
10	198	205	179	224	179	196	165	6.9%	-16.6%
11	171	189	187	138	163	142	141	5.9%	-17.6%
12	230	218	220	206	187	158	192	8.0%	-16.6%
13	185	126	129	167	124	132	103	4.3%	-44.3%
14	118	83	101	101	101	86	87	3.6%	-26.4%
DBFO	281	227	251	245	239	205	197	8.2%	-29.8%
Unknown	3	23	7	6	3	0	1	0.0%	-70.6%
Total	3,366	3,240	3,113	2,931	2,728	2,609	2,399	100.0%	-28.7%

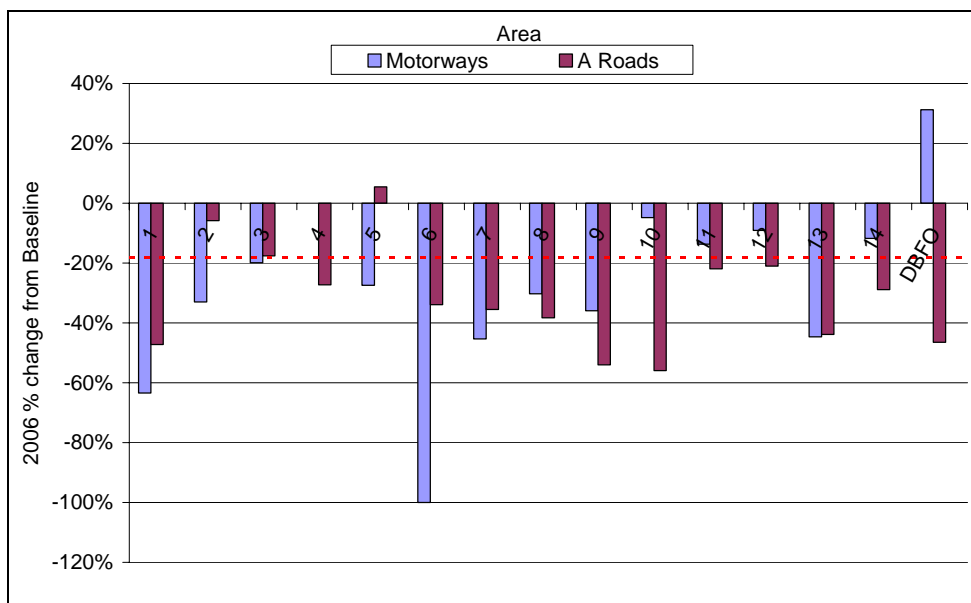
Figure 5-1 2006 % change in number of KSI casualties from baseline by Area



The large variation between the percentage changes in KSI casualties from the baseline in different Areas may be due to the different road types in each Area and different baseline casualty rates and traffic growths.

Figure 5-2 shows the performance by Area for A-roads and motorways separately. This shows that the A-road KSI casualties have reduced in all Areas apart from Area 5, although the reductions in Areas 2 and 3 are less than the target reduction. Motorway KSI casualties have increased on the DBFO routes but have reduced in all the other Areas, although Areas 10, 11, 12 and 14 have not shown the minimum reductions in motorway KSI casualties required to be on target.

Figure 5-2: 2006 % change in KSI casualties from baseline by area and road class



5.3 Casualty rates by Area and road type

Table 5-3 shows casualty rates by Area and road type. The casualty rate is the number of casualties per vehicle-km travelled, otherwise described as the relative likelihood of an individual being injured

Areas 5 and 7 have the highest Motorway casualty rates and Areas 5 and 10 have the highest dual carriageway casualty rate.

Table 5-3: Casualties and Traffic, 2006, by Area and road class

Area	Motorway			A-road					
	Casualties	Traffic	Casualty rate	Dual carriageway			Single carriageway		
				Casualties	Traffic	Casualty Rate	Casualties	Traffic	Casualty rate
1	64	7.0	9.12	361	23.3	15.49	212	5.1	41.29
2	690	68.7	10.04	163	8.0	20.49	95	2.2	42.43
3	1,048	87.8	11.94	778	45.7	17.03	125	2.7	46.43
4	496	35.6	13.95	937	29.7	31.52	332	9.4	35.29
5	2,415	126.8	19.04	520	14.4	36.19	40		-
6	-		-	836	53.7	15.56	303	9.1	33.14
7	471	25.7	18.34	792	30.6	25.91	250	7.8	32.06
8	961	59.9	16.04	602	33.1	18.18	265	6.4	41.68
9	725	75.8	9.56	182	6.9	26.41	330	10.1	32.64
10	2,049	138.3	14.82	287	8.1	35.50	41	0.6	70.88
11	775	71.8	10.79	551	23.4	23.58	63	1.2	53.86
12	991	72.3	13.71	310	14.1	22.00	219	3.7	58.56
13	403	33.4	12.08	138	4.2	32.82	359	8.9	40.14
14	159	12.8	12.44	574	21.7	26.40	130	3.6	35.83
DBFO	746	65.4	11.41	711	44.9	15.85	307	9.4	32.81
Total	11,996	881.2	13.61	7,743	361.7	21.41	3,071	80.3	38.25

Traffic measured in 10^8 vehicle-km. Casualty rate measured in casualties per 10^8 vehicle-km. Dual carriageway includes roundabout, 1-way and slip road. Casualties on A-roads with unknown road type are not included. Casualties on roads in unknown areas are included in the total for each road type.

6 CUSTOMER GROUPS

6.1 Casualties by customer group

In the documents 'Making the Network Safer: Highways Agency Road Safety Strategic Plan', and the 'Strategic Safety Action Plan' the Agency has identified 10 customer groups with specific requirements for using the network. The Agency is committed to develop and deliver safety objectives tailored to these customer groups to make the network safer for all road users. The actions proposed to achieve these objectives are also given in the documents.

The customer groups and their estimated contributions to the whole trunk road casualty picture in 2006 are given in Table 6-1. 84% of casualties on the network were car drivers and passengers. The vulnerable road user groups (Pedestrians, cyclists and equestrians) had a high percentage of KSI casualties, as did Power Two Wheeler (PTW) users. 38 % of PTW users involved in accidents were killed or seriously injured. Although no casualties were recorded as equestrians in 2006, there were 4 casualties recorded as 'other non-motorised vehicle'. These are defined in Stats20 (guidelines for completing the Stats19 accident report form) as miscellaneous types of vehicle without a motor, other than pedal cycles. Examples are horse-drawn vehicles, self-propelled invalid carriages and pedestrian controlled vehicles without a motor. Note that the figure for workers on the network may be in addition to the casualties reported in Stats19.

For more details on each of the starred (♣) customer groups please see the customer group factsheets located in the Road Safety Community on the Agency's Portal. Customer group casualties by HA Area can be found in **Appendix C** of this document.

Table 6-1: Customer group casualties, 2006

Customer group casualties	Killed	Seriously injured	Slightly injured	Total Casualties	% of all casualties ⁶	% KSI
♣ Pedestrians	45	63	93	201	0.9%	53.7%
♣ Cyclists	8	32	118	158	0.7%	25.3%
♣ Equestrians	0	0	0	0	0%	-
♣ PTW riders and passengers	46	328	622	996	4.4%	37.6%
♣ Car drivers and passengers	240	1,343	17,720	19,303	84.5%	8.2%
Bus/coach drivers & passengers	2	11	109	122	0.5%	10.7%
♣ Goods vehicle drivers and passengers	33	235	1,718	1,986	8.7%	13.5%
♣ Casualties aged 1-15	10	75	1,046	1,131	4.9%	7.5%
♣ Casualties aged 16-19	27	173	1,617	1,817	8.0%	11.0%
♣ Casualties aged 70+	36	119	675	830	3.6%	18.7%
People with reduced mobility ⁷	u	u	u	u	<5% ⁸	u
Workers on the network ⁹	2	19	40	61	u	u

u indicates where data is unknown

⁶ These percentages sum to more than 100% as some casualties fall into more than one group. For example, a young driver in the 'high risk' age group may be injured on a motorcycle.

⁷ Includes people under the influence of alcohol/drugs

⁸ This percentage is estimated as precise figures are not available.

⁹ These casualties may be in addition to those recorded on Stats19.

6.2 KSI casualties by customer group

Table 6-2 shows the number of KSI casualties by customer group, and the 2006 reduction from the baseline. Those groups with high severity show a greater proportion of KSI casualties, for example pedestrians accounted for 0.9% of all casualties (Table 6-1), but 4.5% of KSI casualties.

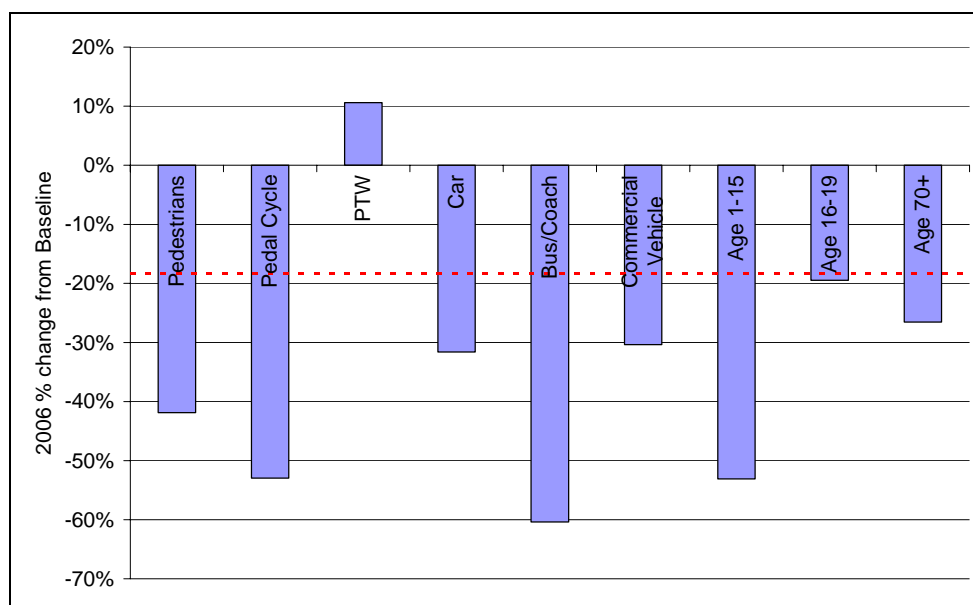
There has been a reduction of at least 18.3% (the minimum required to be on target in 2006) in KSI casualties in 2006 from the baseline for all customer groups except for PTW users. PTW user KSI casualties have shown a 10% increase from the baseline, but have reduced from the 2005 figure.

Table 6-2: KSI Casualties by customer group, 2001-2006

Customer group	1994-1998 average	2001	2002	2003	2004	2005	2006	2006 % of KSI casualties	2006 % change from baseline
Pedestrians	186	152	142	135	118	109	108	4.5%	-41.9%
Pedal cyclists	85	55	54	51	38	53	40	1.7%	-52.9%
PTW users	340	382	421	468	364	396	374	15.6%	+10.0%
Car occupants	2,319	2,211	2,032	1,889	1,834	1,711	1,583	66.0%	-31.7%
Bus/Coach occupants	33	18	29	11	18	3	13	0.5%	-60.6%
Goods Vehicle occupants	385	405	399	358	342	316	268	11.2%	-30.4%
Ages 1-15	181	150	132	124	119	77	85	3.5%	-53.0%
Ages 16-19	248	203	221	226	238	249	200	8.3%	-19.4%
Ages 70+	211	202	203	171	135	172	155	6.5%	-26.5%

Figure 6-1 shows the percentage change in the number of KSI casualties from the baseline by customer group. The dotted line at -18.3% shows the minimum overall reduction required to be on course for the 2010 target in 2006.

Figure 6-1: 2006 % change in KSI casualties from baseline by customer group



6.3 Accidents by customer group

Table 6-3 shows the number and the percentage of accidents which involved an *injured* member of each of the customer groups, and the same information for accidents which involved a member of each of the customer groups (who was not necessarily injured).

For example, although only 11.1% of accidents involved injured commercial vehicle occupants 31.7% of accidents involved these vehicles in total.

For more details on each of the starred customer groups please see the factsheets located in the operational folder.

Table 6-3: Accidents involving customer groups, 2006

Customer group	Accidents involving injured customer groups		Total accidents involving customer group	
	No.	%	No.	%
♣ Pedestrians	188	1.3%	188	1.3%
♣ Cyclists	157	1.1%	162	1.1%
♣ Equestrians	0	0.0%	0	0.0%
♣ PTW riders and passengers	933	6.4%	956	6.5%
♣ Car drivers and passengers	12,403	84.6%	13,404	91.4%
Bus/coach drivers & passengers	55	0.4%	139	0.9%
♣ Commercial vehicle drivers and passengers	1,629	11.1%	4,649	31.7%
♣ High-risk age group (Children, 1 – 15 year olds)	841	5.7%	841 ¹⁰	5.7%
♣ High-risk age group (16-19 year olds)	1,480	10.1%	1,864	12.7%
♣ High risk age group (70+ year olds)	693	4.7%	972	6.6%
Total accidents	14,668	100%	14,668	100%

These percentages sum to more than 100% as some accidents involve more than one group. For example, an accident involving a child pedestrian and an 18-year old car driver involves four customer groups.

¹⁰ Includes accidents involving a driver or a casualty in the age group, does not include all accident where a member of the age group was present as uninjured passengers and pedestrians are not recorded in Stats19.

6.4 KSI accidents by customer group

Table 6-4 shows the number of KSI accidents involving each customer group. For example, in 2006 there were 649 KSI accidents involving a goods vehicle, 33.3% of all KSI accidents and a reduction of 27.1% from the baseline.

Table 6-4: KSI Accidents involving customer groups, 2001-2006

Customer Group	1994-1998 average	2001	2002	2003	2004	2005	2006	2006 % of KSI accidents	2006 % change from baseline
Pedestrians	182	149	143	131	113	108	104	5.3%	-42.9%
Pedal cyclists	86	57	58	52	39	51	39	2.0%	-54.7%
PTW users	326	370	406	447	345	385	371	19.0%	13.8%
Car occupants	2,073	2058	1929	1876	1751	1664	1575	80.9%	-24.0%
Bus/coach occupants	43	30	27	19	26	16	26	1.3%	-39.5%
Goods Vehicle occupants	890	909	856	823	735	736	649	33.3%	-27.1%
Ages 1-15	263	230	188	193	173	158	153	7.9%	-41.8%
Ages 16-19	298	249	271	272	291	271	251	12.9%	-13.3%
Ages 70+	218	213	196	180	166	181	167	8.6%	-23.4%

Figure 6-2 shows KSI accidents for selected customer groups by quarter. KSI accidents involving cars, goods vehicles, 16-19 year olds and 70+ year olds were more common in quarters 3 and 4 whereas 68% of PTW accidents occurred in quarters 2 and 3 (April - September). This is likely to be due to higher motorcycle traffic during this period.

Figure 6-2: 2006 KSI accidents by Year quarter and customer group

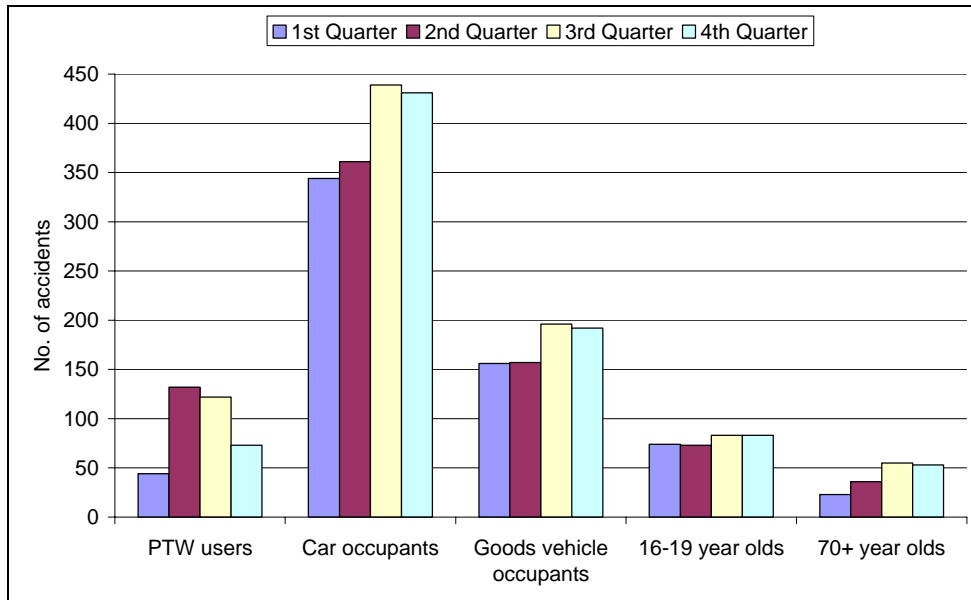
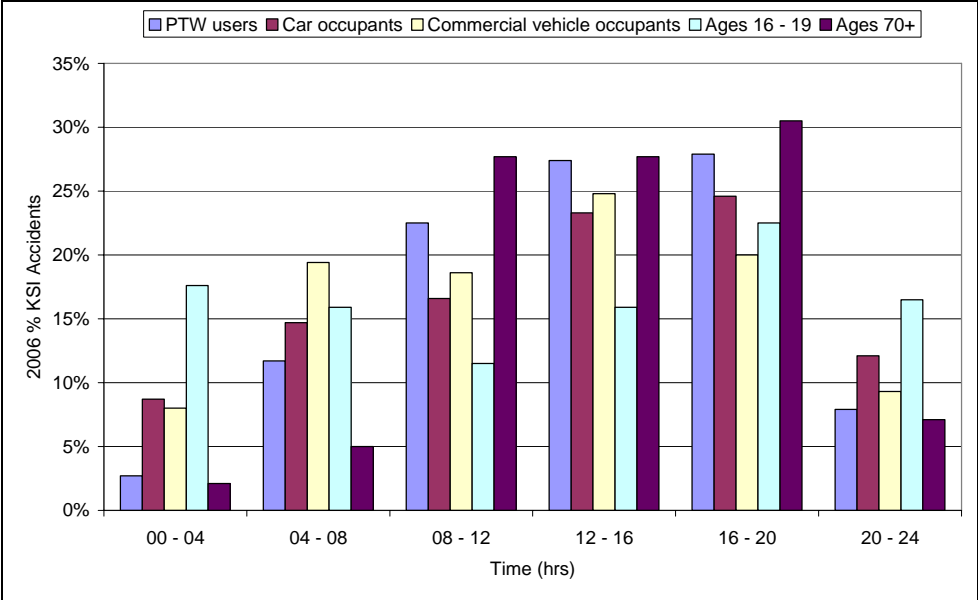


Figure 6-3 shows the percentage of KSI accidents involving selected customer groups by time of day. 25% of KSI car occupants and 28% of PTW users were in accidents between 4pm and 8pm. The 70+ age group had the highest proportional of KSI accidents during the day; 56% between 8am and 4pm and 31% between 4pm and 8pm. KSI accidents involving 16-19 year olds were relatively more common between 8pm and 4am, with 23% of accidents involving 16-19 KSI occurring between 8pm and midnight.

Figure 6-3: 2006 % KSI accidents by time of day and customer group



6.5 Casualties by customer group and road type, 2006

Table 6-5 shows the number of KSI and total casualties by customer group and road type. Each customer group has a different amount of traffic on each of the road types, and hence the numbers of casualties do not give the risk to that road user.

About half of injured pedestrians were in accidents on dual carriageway A-roads. On all roads the severity of injured pedestrians was high, with about half of pedestrians receiving fatal or serious injuries.

About 70% of pedal cyclists and 45% of motorcyclists were injured in accidents on dual carriageway A-roads. Motorcyclist casualties were more severely injured than pedal cyclists.

54% of car user casualties were in accidents on motorways. 7.1% of these casualties were killed or seriously injured compared with 8.5% on dual carriageways and 12.1% on single carriageways.

1-15 and 16-19 year olds were also most severely injured on single carriageway A-roads, and 70+ year olds were more severely injured on both A-road types compared with motorways.

Table 6-5: Casualties by customer group and road type, 2006

Customer group	Motorways			A Dual			A Single		
	KSI	Total	% KSI	KSI	Total	% KSI	KSI	Total	% KSI
Pedestrians	25	45	55.6%	59	103	57.3%	24	53	45.3%
Pedal cycle	0	1	0.0%	27	110	24.5%	13	47	27.7%
PTW	135	342	39.5%	154	443	34.8%	84	210	40.0%
Car	730	10,351	7.1%	541	6,384	8.5%	306	2,532	12.1%
Bus	6	53	11.3%	6	54	11.1%	1	11	9.1%
GV	143	1,167	12.3%	95	612	15.5%	30	206	14.6%
1-15	35	596	5.9%	26	320	8.1%	24	214	11.2%
16-19	71	782	9.1%	87	744	11.7%	41	288	14.2%
70+	45	327	13.8%	69	314	22.0%	41	189	21.7%
Total	1,043	11,996	8.7%	890	7,743	11.5%	459	3,071	14.9%

6.6 Casualty rate trends by customer group

Table 6-6 shows the traffic and casualty rates for PTW, car, LGV and HGV casualties. Rate data for the other customer groups are not readily available because of the difficulty of determining appropriate traffic flow break downs. The casualty rate for PTWs in 2006 was 275 lower than baseline and was 148 casualties per 10⁸ vehicle km, eight times higher than that of car casualties, which have a smaller reduction of 16% in their rate since the baseline. The PTW KSI casualty rate was 35 times higher than for cars in 2006, and has shown a smaller reduction since the baseline than for cars.

Table 6-6: Traffic and casualty rates by customer group, 2001-2006

		94-98 average	2001	2002	2003	2004	2005	2006	2006 % change from baseline
Traffic (10 ⁸ veh-km)	PTW	5.2	6.6	6.6	7.0	6.5	6.7	6.7	29%
	Car	831.8	934.9	954.7	960.8	978.7	986.7	1000.0	20%
	LGV	113.2	132.0	134.3	140.1	149.1	153.6	160.1	41%
	HGV	136.1	148.6	150.3	149.8	155.5	153.7	154.6	14%
Casualty rate	PTW	202.8	167.1	185.7	180.6	164.9	162.4	147.7	-27%
	Car	23.0	22.8	21.7	20.9	21.2	20.2	19.3	-16%
	LGV	9.4	9.6	9.7	9.0	8.7	7.4	6.9	-27%
	HGV	8.2	7.3	7.1	7.0	6.5	6.3	5.7	-30%
KSI casualty rate	PTW	65.6	57.5	64.2	66.5	55.7	59.2	55.5	-15%
	Car	2.8	2.4	2.1	2.0	1.9	1.7	1.6	-43%
	LGV	1.4	1.5	1.3	1.2	1.1	0.8	0.7	-50%
	HGV	1.7	1.4	1.5	1.2	1.2	1.3	1.0	-41%

Casualty rate measured in casualties per 10⁸ vehicle-km.

Figure 6-4 shows the casualty rates (casualties per 10⁸ vehicle km) for PTW, car, LGV and HGV occupant casualties, and Figure 6-5 shows the corresponding KSI casualty rates.

Figure 6-4: Casualty rates by customer group 1994-2006

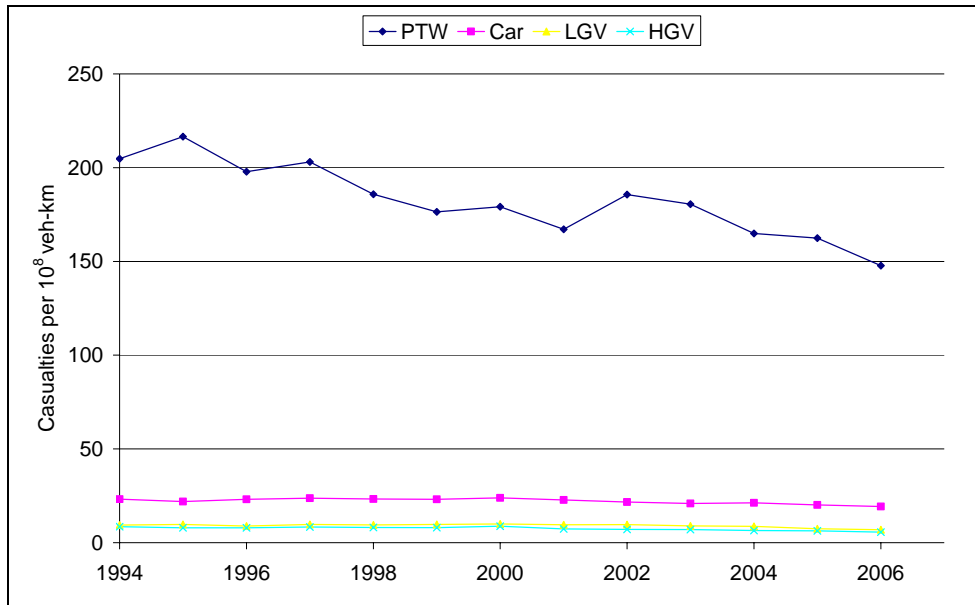
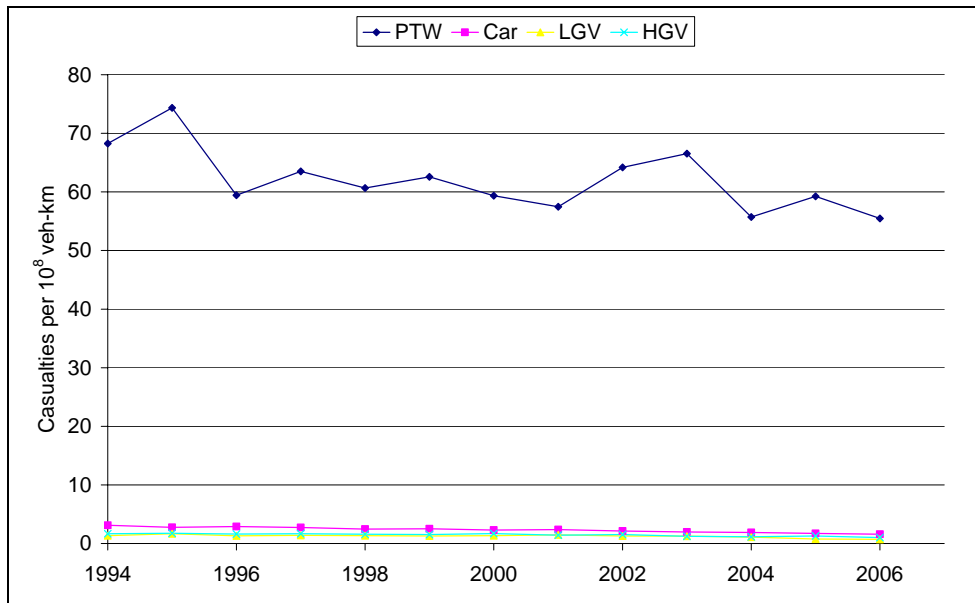


Figure 6-5: KSI Casualty rates by customer group 1994-2006



6.7 Summary

- 84% of casualties in 2006 were car drivers and passengers.
- 38% of motorcyclist casualties were killed or seriously injured
- Goods vehicles were involved in 32% of accidents and their occupants accounted for 9% of all casualties.

- All of the customer groups identified in the Strategic Safety Action Plan have shown a reduction in the number of KSI casualties from the 1994-98 baseline except PTWs which have increased by 10%.
- The number of child KSI casualties has reduced by 53% from the baseline.
- The PTW casualty rate was eight times higher than for cars
- The casualty rates and KSI casualty rate for PTW, car, LGV and HGV users have reduced from the baseline. Rate data for the other customer groups is not readily available.

7 ACHIEVING TARGETS

7.1 Engineering and non-engineering measures

It is estimated that about two thirds of casualty savings are achieved through non-engineering measures (such as, training programmes, publicity campaigns, improvements to vehicles etc) and one third through the installation of engineering schemes. Some non-engineering measures should be targeted at a national level and others for a local audience.

7.2 National and local level measures

Measures designed to tackle local problems at a local level (such as education or publicity campaigns or engineering schemes) are likely to achieve casualty savings only in the locality of measures themselves. Therefore, depending on the distribution of measures carried out over the road network, the practicality of achieving casualty savings will be different on different parts of the network.

7.3 Estimated costs and savings

The Department for Transport produces an annual Highways Economic Note giving the valuation of the benefits of prevention of road accidents and casualties. These include amounts to reflect pain, grief and suffering, and the lost output and medical costs associated with road injuries.

The average value of prevention per accident by severity and road class in 2005 is shown in Table 7-1. Note that these values are based on data for all Great Britain, and include accidents on non-trunk roads. The values for 2006 will be published later this year in both Road Casualties Great Britain and Highways Economic Note 1.

Table 7-1: Average value of prevention per accident by severity and road class, June 2005

Accident severity	Built-up	Non built-up	Motorway	All
Fatal	1,558,290	1,699,140	1,751,150	1,644,790
Serious	179,210	206,700	213,540	188,920
Slight	18,130	21,620	25,570	19,250
All injury accidents	49,580	105,900	78,930	64,440
Damage only	1,590	2,360	2,270	1,710
Average cost per injury including an allowance for damage only accidents	77,820	124,280	96,160	89,820

Source: Highways Economic Note 1 (DfT, 2007)

7.4 Research

In addition to managing and improving the safety of the network through its road building and maintenance programme, the Highways Agency supports DfT and Government strategies and publicity campaigns. The Agency also has its own extensive research and development programme, the results of which have been, and are being, used to improve road design, vehicle technology, traffic management, road user information and road user behaviour.

HA has a lot of research under way which relates to the safety of the network and the integration of safety into other areas of its work. The HA research compendium can be found on the HA web site at <http://www.ha-research.co.uk/>

'A Road Safety Good Practice Guide' (DTLR, 2001) and 'Collision Prevention and Reduction' (IHT, 2007) contain much that is also relevant to managers of the trunk road network.

8 SUGGESTED ACCIDENT TYPES FOR LOCAL STUDIES AND TARGETS

8.1 Suggested accident types for local studies

In each previous issue of this report accident problems have been identified as being of concern at a national level and considered worthy of further attention at a local level. They were:

- Scattered accidents and the potential for route and mass action treatments (1999)
- Close-following accidents (1999, 2001, 2002)
- Speed-related accidents (1999)
- Pedestrian accidents on motorways (1999)
- Accidents involving light or heavy goods vehicles (2000, 2004)
- Accident causation attributed to driver fatigue (2000, 2001)
- Accidents involving child casualties (2000, 2004)
- Casualty trends (2001)
- Single-vehicle accidents (2001)
- Roundabout accidents (2001)
- Fatal accidents (2002, 2003)
- High speed pedestrian crossing accidents (2002)
- Shunt accidents (2003)
- Accidents involving powered two-wheelers (TWMV – 2002, PTW – 2003, 2004)
- Accidents involving cars (2003, 2004)
- Vulnerable road users (pedestrians, cyclists and equestrians) (2004)
- High risk age groups (Children, 16-19 and 70+) (2004)
- Accidents involving vehicle hitting objects off the carriageway (2004)
- Accidents at roadworks (2006)
- Accidents on hard shoulders (2006)
- Contributory factors in accidents (2006)

This year, three topics have been produced, in Appendix E

- Contributory factors in accidents
- Hard shoulder accidents
- Accidents involving vehicles which hit objects that were off the carriageway

This year, accident factsheets for each of the customer groups will be produced separately and will be available in the Road Safety Community on the Agency's Portal in 2007 quarter 4.

8.2 Targets for all road casualties in Great Britain

TRL Report 663 'Monitoring progress towards the 2010 casualty reduction target – 2005 data', prepared for Department for Transport by J Broughton and G Buckle (TRL Ltd) provides analyses of accidents and casualties in Great Britain and progress towards the 2010 casualty targets.

Overall, the KSI target to reduce the KSI casualties by 40% by 2010 in Great Britain is likely to be achieved, based on the current trend.

Although there is no specific target to reduce deaths, in recent years they have not been decreasing in line with the serious injuries, which is a worrying development. A principal challenge therefore is to reduce the number of deaths on the road. This will require major new measures.

The Child KSI target and slight casualty rate target for Great Britain are likely to be exceeded.

The accident statistics were analysed, and an increase in the proportion of accidents with the following characteristics suggested that there may be a decline in driving standards:

- Accidents at bends
- Accidents involving a hit object
- Accidents involving a vehicle leaving the carriageway
- Accidents with contributory factors 'loss of control' and 'careless/thoughtless/reckless'
- Drink/drive accidents

A report including analyses of the 2006 accident data will be available later in the year.

9 USEFUL SOURCES OF INFORMATION

9.1 National data for local comparisons

Appendix D contains tables of national data 2004-2006 for motorways, built-up and non built-up A-roads, which can be used for comparison with local data. The national data is used to establish expected levels of accidents or casualties of a given type on the whole network. Corresponding data at a local level are available using HAPMS (Highway Agency Pavement Management System). See Appendix D for further explanation.

9.2 English trunk road investigatory levels

The English trunk road investigatory level tables are in Appendix D, and also available as a spreadsheet tool. These are based on average figures for accidents and casualties 2004-2006. They give information about more accident types than the national data for local comparison, and can be used for purposes of comparing local values with national values and so identifying local problems to investigate.

9.3 Factsheets

This year, accident factsheets for each of the customer groups will be produced separately and will be available in the Road Safety Community on the Agency's Portal in 2007 quarter 4. These are based on three years of accident data (2004-2006). Factsheets on other topics may also be produced.

9.4 Supplementary documentation

Making The Network Safer: 'Highways Agency Road Safety Strategic Plan'

'Operational Guide to the Safety Strategic Plan'

'Strategic Safety Action Plan'

Programme Objective Guide (POG) (available on HA Intranet)

Maintenance and Making Better Use – Process and Procedures Guide

Computer software: - (these systems can be used to investigate safety, road condition and accidents)

HAGIS (Highways Agency Geographical Information System),

HAPMS (Highways Agency Pavement Management System), and

HAEIS (Highways Agency Executive Information System).

Further casualty information:

Road Casualties Great Britain: 2006 – Annual Report (DfT, 2007)

<http://www.dft.gov.uk/pgr/statistics/datatablespublications/accidents/casualtiesgbar/roadcasualtiesgreatbritain2006>

A Road Safety Good Practice Guide (DTLR 2001)

<http://www.dft.gov.uk/pgr/roadsafety/laquidance/roadsafetygoodpracticeguide>

Tomorrows roads – safer for everyone – the first 3-year review (DfT, 2004)

<http://www.dft.gov.uk/pgr/roadsafety/strategytargetsperformance/tomorrowsroadssafe/foreveryo4866>

Tomorrows roads – safer for everyone – the second 3-year review (DfT, 2007)
<http://www.dft.gov.uk/pgr/roadsafety/strategytargetsperformance/2ndreview/>

Highways Economic Note No.1 2005 Valuation of the Benefits of Road accidents and casualties (DfT 2007) <http://www.dft.gov.uk/pgr/roadsafety/ea/pdfeconnote105>

Collision Prevention and Reduction (IHT, 2007) (IHT, 6 Endsleigh Street, London, WC1H 0DZ)

Monitoring progress towards the 2010 casualty reduction target - 2005 data, TRL report 663 (TRL, 2007)
http://www.trl.co.uk/store/report_detail.asp?srid=6162&pid=211

9.5 Highways Agency contact points documentation

The Agency welcomes comment and consultation. If you have any matters you wish to raise with respect to the content of this document please contact:

Stuart Lovatt or David Brown

E-mail: stuart.lovatt@highways.gsi.gov.uk

david.brown@highways.gsi.gov.uk

If you have a road safety issue which is specific to a location on the trunk road network please direct your enquiry to the appropriate Area or Route manager. A list of those staff can be found on the Agency's web site at: www.highways.gov.uk

Appendix A. GLOSSARY

Adults: Persons aged 16 years and over (except where otherwise stated).

Built-up roads: Accidents on 'built-up roads' are those which occur on roads with speed limits (ignoring temporary limits) of 40 mph or less.

Buses and Coaches: Vehicles equipped to carry 17 or more passengers regardless of use.

Commercial Vehicle: LGV or HGV

Cars: Includes Taxis, estate cars, invalid tricycles, three and four wheel cars, minibuses and motor caravans except where otherwise stated.

Darkness: From half an hour after sunset to half an hour before sunrise, i.e. "lighting-up time".

Daylight: Total of categories Daylight: street lights present, Daylight: no street lighting, Daylight: street lighting unknown.

Dual Carriageway: Includes roundabouts and one way streets, and slip roads for 2005 data

Fatal accident: An accident in which at least one person is *killed*.

Flooded: Surface water over 3cm deep

HGV: Heavy Goods Vehicle, combined category of vehicles over 3.5 tonnes maximum permissible gross vehicle weight (mgw) but under 7.5 tonnes mgw and those vehicles 7.5 tonnes gmw and over.

Junction Detail: Junction is defined as a place where two or more roads meet (excluding where one of the roads crosses the other by a bridge or flyover) whatever the angle of the axes of the road. The meeting point of a public highway and private drive (in use at time of accident) is a junction for this purpose.

At a junction: Within 20 metres of a junction

Roundabout: Includes the whole of the circular highway and sections of the roads leading into it (within 20metres of the circular highway). Roundabout also includes sections of large gyratory systems which are within 20 metres of entrance/exit points

Slip Roads: Road joining grade separated roads (i.e. roads at different levels); minor similar roads (e.g. filter lanes) are not included

Multiple Junction: Junction with more than 4 arms (except roundabouts)

Private drive: Private drive or entrance, only coded when in use by a vehicle involved in the accident.

Killed: Human casualties who sustained injuries which caused death less than 30 days (before 1954 about two months) after the accident. Confirmed suicides are excluded.

KSI: Killed or seriously injured.

LGV: Light Goods Vehicle, Goods vehicles not over 3.5 tonnes maximum permissible gross vehicle weight.

Motorcycle: Unless otherwise stated, Up to 2004 *motorcycles* includes Mopeds, Motor cycles 125cc and under and motor cycles over 125cc. From 2005, *motorcycles* includes the three Stats 19 categories: motorcycle 50cc and under, 50cc to 125cc, 125cc to 500cc and over 500cc.

Motorways: Motorway and A(M) roads.

Non Built-up roads: Accidents on 'non built-up roads' are those which occur on roads with speed limits of 50 mph or more.

Other Vehicles: Other motor vehicles includes ambulances, fire engines, trams, refuse vehicles, road rollers, agricultural vehicles, excavators, mobile cranes, tower wagons, army tanks, pedestrian-controlled vehicles with a motor etc. *Other non motor vehicles* include those drawn by animals, ridden horses, invalid carriages without a motor, street barrows etc.

PTW (Powered two-wheeler): Motorcycle or moped, also called 'two wheeled motor vehicle' (TWMV)

Rural Roads: Major roads and minor roads outside urban areas and having a population of fewer than 10 thousand.

Serious accident: One in which at least one person is seriously injured but no person (other than a confirmed suicide) is *killed*.

Serious injury: An injury for which a person is detained in hospital as an "in-patient", or any of the following injuries whether or not they are detained in hospital: fractures, concussion, internal injuries, crushings, burns (excluding friction burns), severe cuts and lacerations, severe general shock requiring medical treatment and injuries causing death 30 or more days after the accident.

Severity: Of an accident; the severity of the most severely injured casualty (either *fatal*, *serious* or *slight*). Of a casualty; *killed*, *seriously injured* or *slightly injured*.

Severity Ratio: Accident Severity ratio is the number of KSI accidents divided by the total number of accidents. Casualty Severity Ratio is the number of KSI casualties divided by the total number of casualties.

Skidded: Includes overturned and jack-knifed vehicle.

Slight accident: One in which at least one person is slightly injured but no person is killed or seriously injured.

Slight injury: An injury of a minor character such as a sprain (including neck whiplash injury), bruise or cut which are not judged to be severe, or slight shock requiring roadside attention. This definition includes injuries not requiring medical treatment.

TWMV (Two wheeled motor vehicle): Motorcycle, also called PTW (powered two-wheeler)

Urban Roads: Major and minor roads within an urban area with a population of 10 thousand or more. The definition is based on the 1991 Office of the Deputy Prime Minister definition of urban settlements. The urban areas used for this document are based on 2001 census data.

Vehicles involved in accidents: Vehicles whose drivers or passengers are injured, which hit and injure a pedestrian or another vehicle whose driver or passengers are injured, or which contributes to the accident. Vehicles which collide, after the initial accident which caused injury, are not included unless they aggravate the degree of injury or lead to further casualties. Includes pedal cycles ridden on the footway.

Vehicle Manoeuvres: Manoeuvre of vehicle immediately before the accident occurred.

Ahead Other: Vehicle travelling freely along carriageway

Waiting to go Ahead: Vehicle waiting in a queue of traffic which would otherwise be travelling along the carriageway

Waiting to turn left: Vehicle waiting in a queue of traffic which would otherwise be turning left

Waiting to turn right: Vehicle waiting in a queue of traffic which would otherwise be turning right

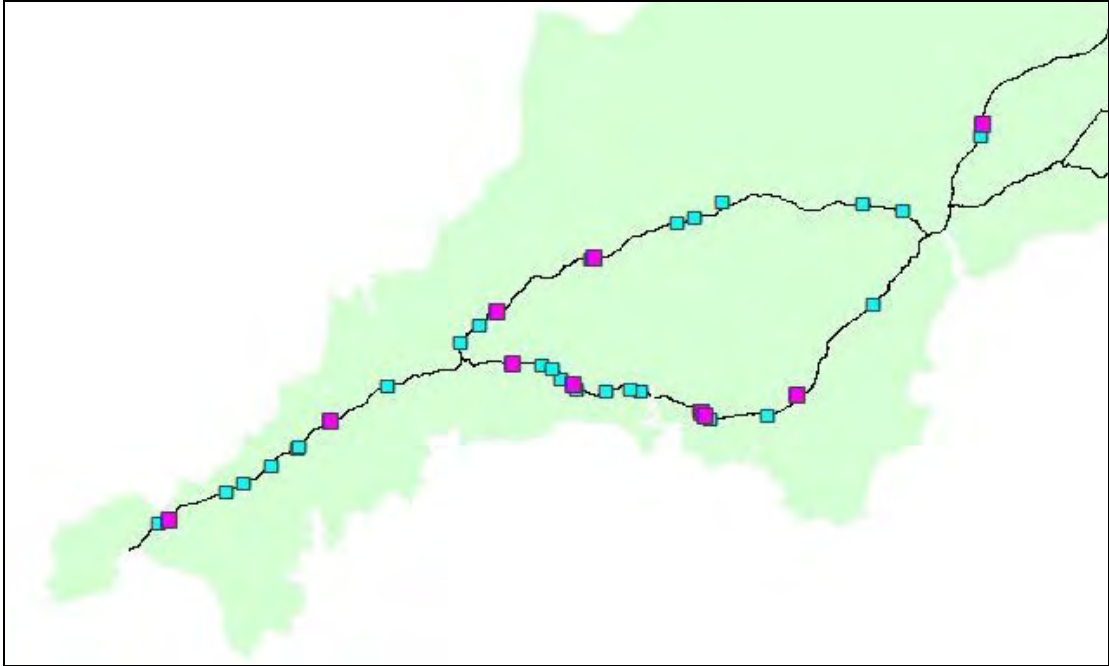
Overtaking: Total of categories, overtaking moving vehicle on its offside, overtaking stationary vehicle on its offside and overtaking vehicle on its nearside

Appendix B. ACCIDENT MAPS 2006

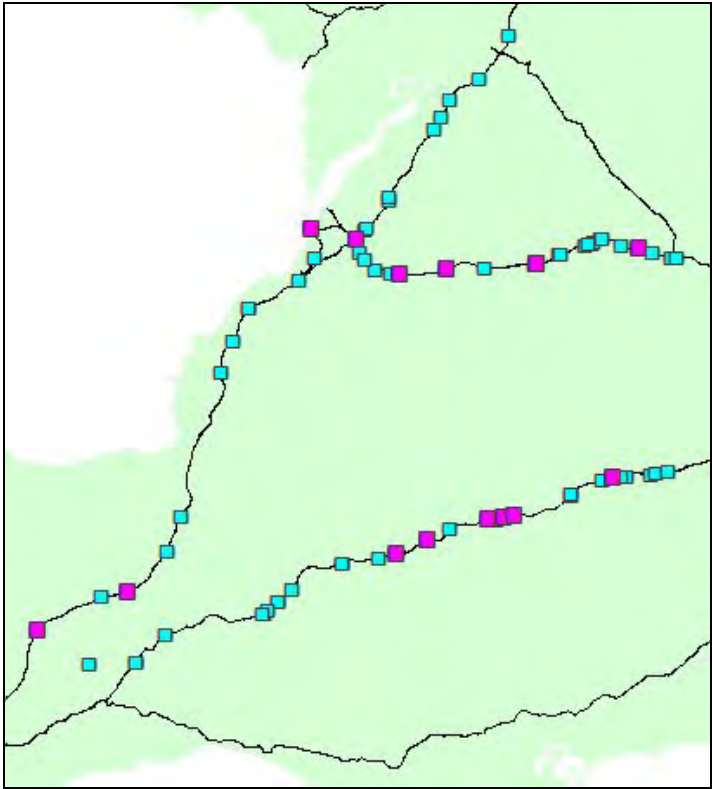
Key

- Fatal accident
- Serious accident

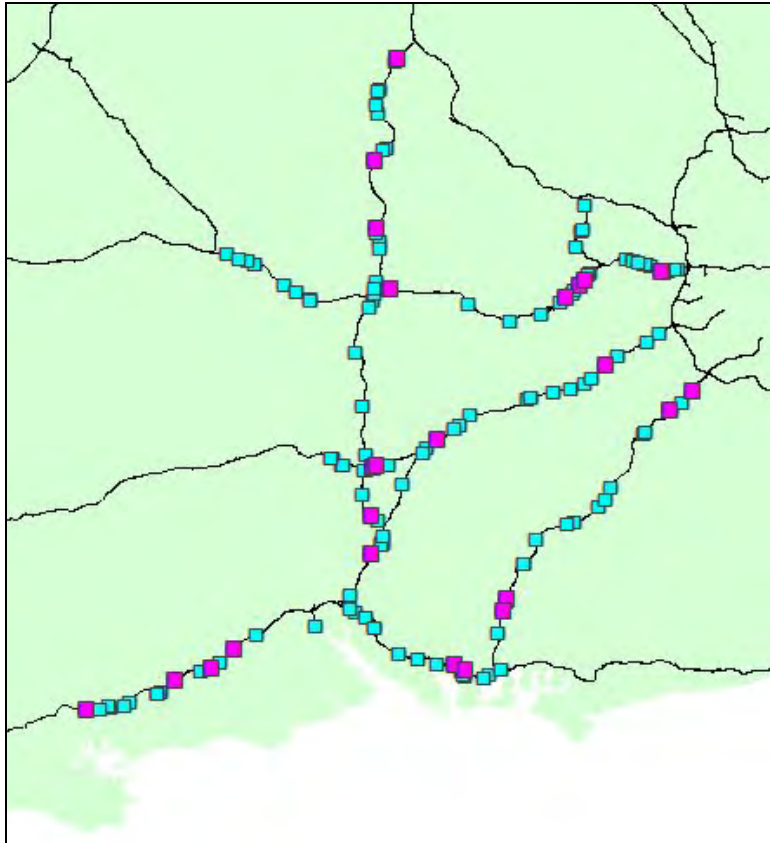
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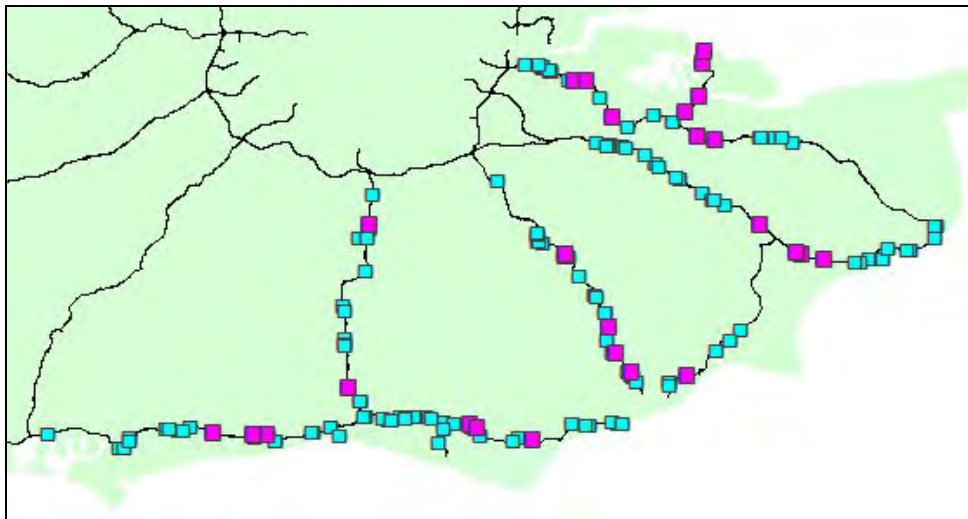
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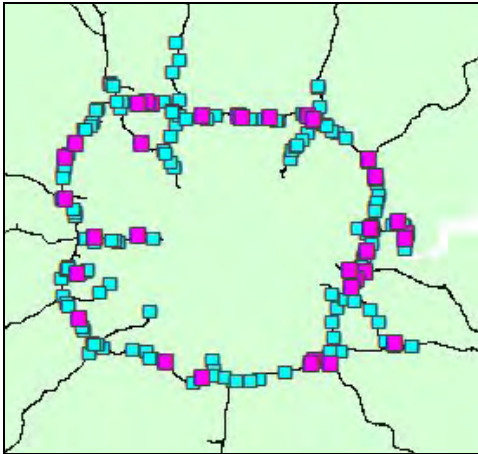
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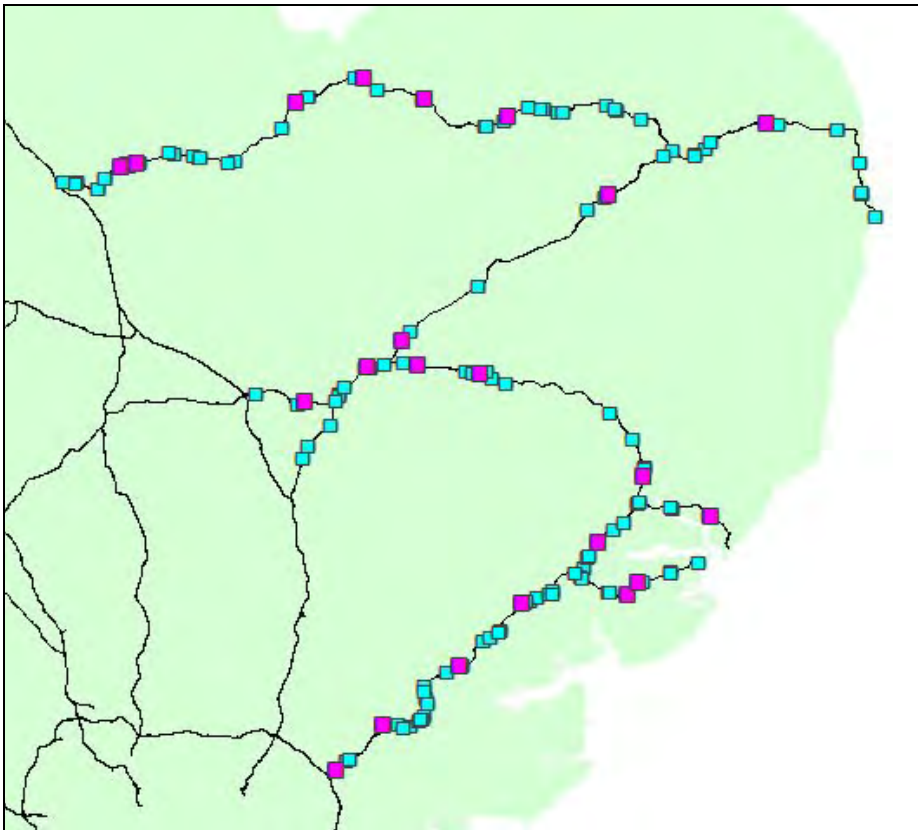
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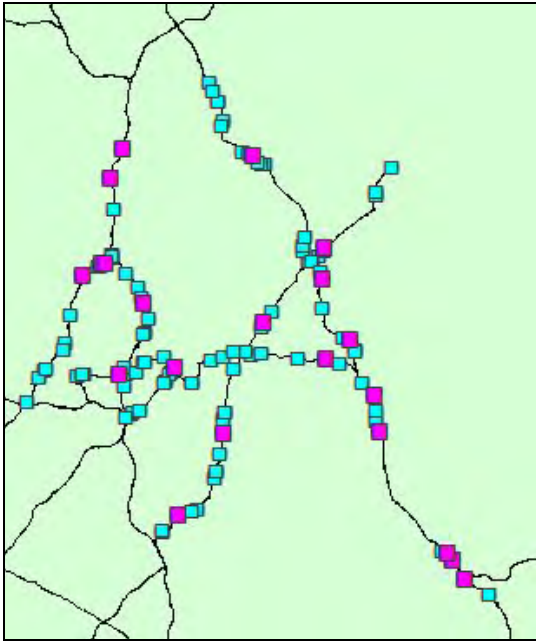
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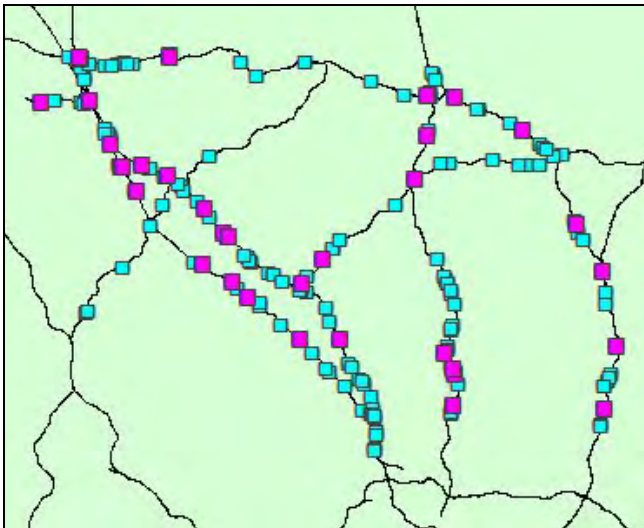
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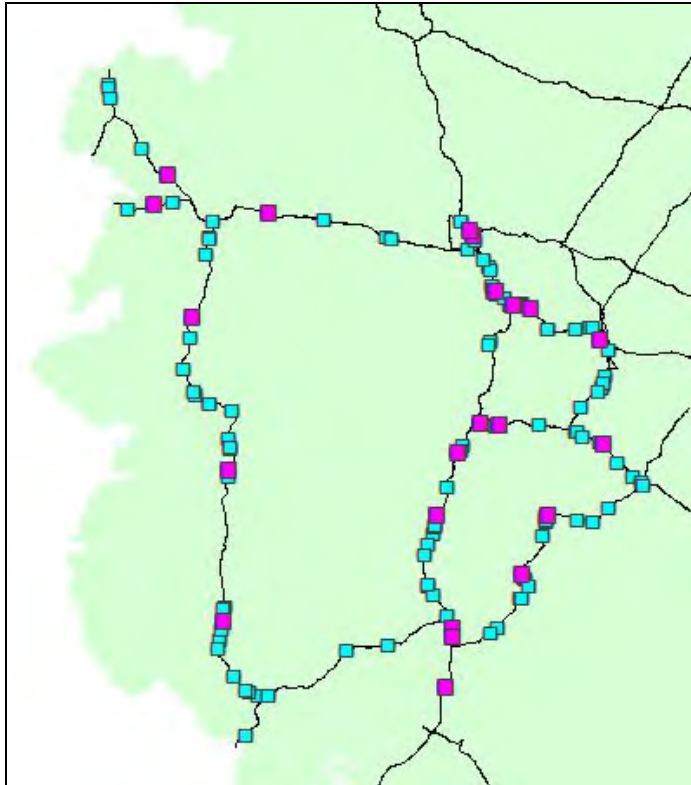
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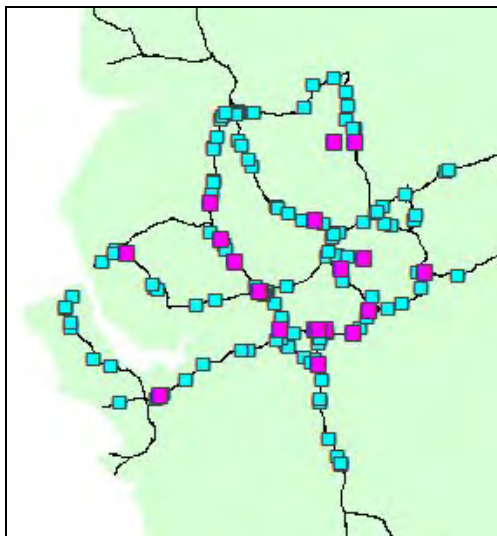
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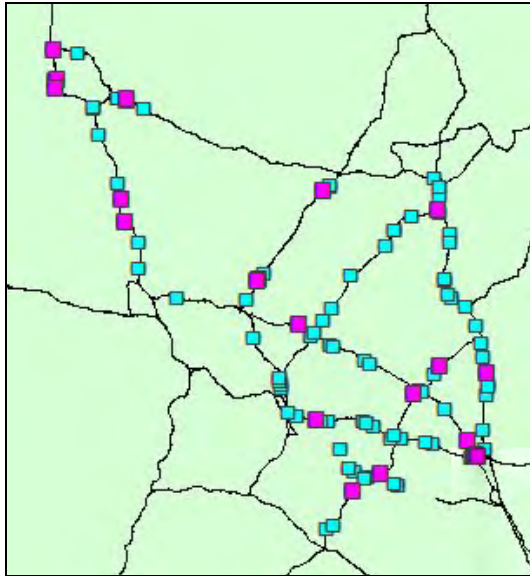
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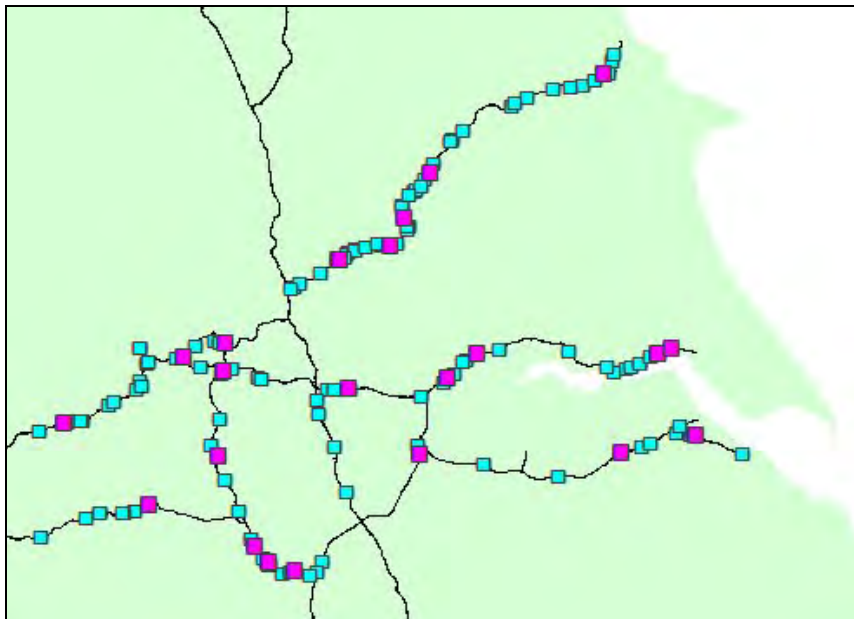
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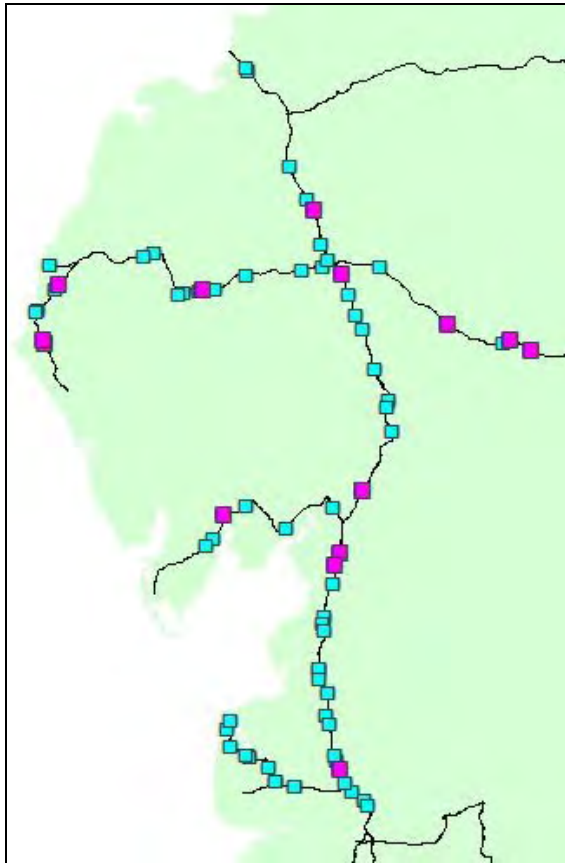
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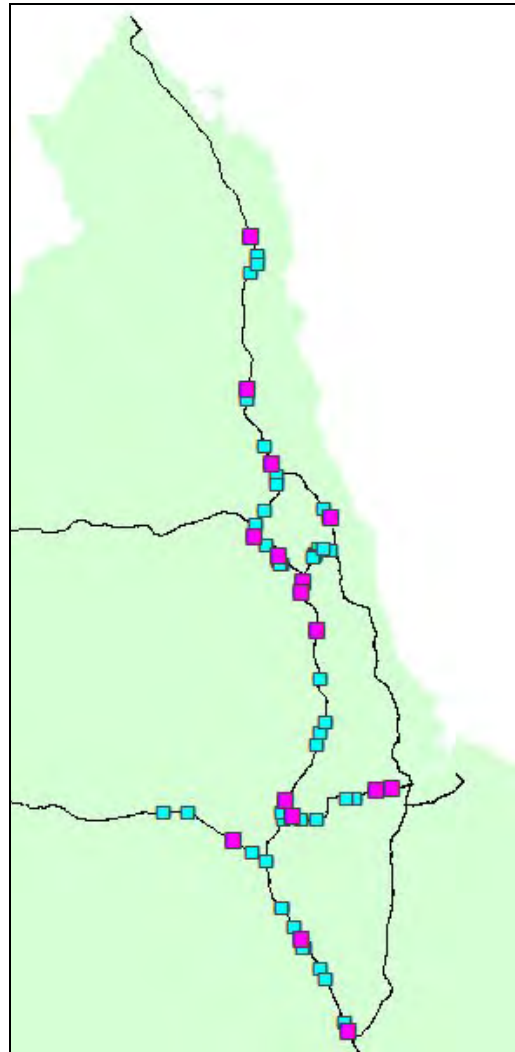
Area 12



Area 13



Area 14



Appendix C. CUSTOMER GROUP CASUALTIES BY HA AREA

Note that the customer groups are not exclusive, for example a 16-19 year old casualty may also be a car occupant.

Area 1

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	2	3	3	8	1.2%
Pedal cycle	0	1	5	6	0.9%
PTW	1	6	27	34	5.3%
Car	8	21	540	569	88.8%
Bus/Coach	0	0	1	1	0.2%
Goods vehicles	0	2	19	21	3.3%
Casualty age 1-15	0	0	28	28	4.4%
Casualty age 16-19	2	4	68	74	11.5%
Casualty age 70+	0	1	29	30	4.7%
Total casualties	11	34	596	641	100.0%

Area 2

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	1	4	4	9	0.9%
Pedal cycle	1	1	2	4	0.4%
PTW	1	11	19	31	3.3%
Car	10	64	758	832	87.6%
Bus/Coach	0	0	3	3	0.3%
Goods vehicle	2	7	57	66	6.9%
Casualty age 1-15	0	4	41	45	4.7%
Casualty age 16-19	0	6	76	82	8.6%
Casualty age 70+	3	7	36	46	4.8%
Total casualties	15	87	848	950	100.0%

Area 3

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	4	3	8	15	0.8%
Pedal cycle	1	0	5	6	0.3%
PTW	6	30	76	112	5.7%
Car	17	111	1,569	1,697	86.8%
Bus/Coach	1	0	4	5	0.3%
Goods vehicle	0	11	105	116	5.9%
Casualty age 1-15	1	3	88	92	4.7%
Casualty age 16-19	3	15	140	158	8.1%
Casualty age 70+	3	9	51	63	3.2%
Total casualties	29	155	1,771	1,955	100.0%

Area 4

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	2	3	10	15	0.8%
Pedal cycle	0	4	17	21	1.2%
PTW	7	41	64	112	6.3%
Car	18	133	1,324	1,475	83.0%
Bus/Coach	0	1	5	6	0.3%
Goods vehicle	4	12	118	134	7.5%
Casualty age 1-15	2	5	80	87	4.9%
Casualty age 16-19	2	16	140	158	8.9%
Casualty age 70+	1	10	62	73	4.1%
Total casualties	31	197	1,550	1,778	100.0%

Area 5

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	4	5	2	11	0.4%
Pedal cycle	2	2	3	7	0.2%
PTW	6	49	94	149	5.0%
Car	24	139	2,426	2,589	86.7%
Bus/Coach	0	0	5	5	0.2%
Goods vehicle	3	38	176	217	7.3%
Casualty age 1-15	2	7	118	127	4.3%
Casualty age 16-19	2	15	172	189	6.3%
Casualty age 70+	1	12	84	97	3.2%
Total casualties	39	235	2,712	2,986	100.0%

Area 6

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	5	11	15	31	2.7%
Pedal cycle	1	2	10	13	1.1%
PTW	2	22	37	61	5.4%
Car	16	97	821	934	82.0%
Bus/Coach	0	1	10	11	1.0%
Goods vehicle	1	14	71	86	7.6%
Casualty age 1-15	1	7	63	71	6.2%
Casualty age 16-19	0	20	96	116	10.2%
Casualty age 70+	6	14	50	70	6.1%
Total casualties	25	147	967	1,139	100.0%

Area 7

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	6	2	8	16	1.1%
Pedal cycle	0	2	18	20	1.3%
PTW	3	27	36	66	4.4%
Car	19	72	1,143	1,234	81.6%
Bus/Coach	0	0	22	22	1.5%
Goods vehicle	2	12	139	153	10.1%
Casualty age 1-15	0	6	63	69	4.6%
Casualty age 16-19	3	7	88	98	6.5%
Casualty age 70+	4	9	36	49	3.2%
Total casualties	30	116	1,367	1,513	100.0%

Area 8

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	6	4	11	21	1.1%
Pedal cycle	0	3	4	7	0.4%
PTW	5	35	66	106	5.8%
Car	24	98	1,363	1,485	81.2%
Bus/Coach	0	2	8	10	0.5%
Goods vehicle	3	29	165	197	10.8%
Casualty age 1-15	0	4	65	69	3.8%
Casualty age 16-19	4	8	116	128	7.0%
Casualty age 70+	3	10	47	60	3.3%
Total casualties	38	171	1,619	1,828	100.0%

Area 9

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	2	3	5	10	0.8%
Pedal cycle	0	5	6	11	0.9%
PTW	3	18	42	63	5.1%
Car	20	87	911	1,018	82.3%
Bus/Coach	0	1	3	4	0.3%
Goods vehicle	2	12	112	126	10.2%
Casualty age 1-15	0	3	51	54	4.4%
Casualty age 16-19	3	4	91	98	7.9%
Casualty age 70+	3	8	50	61	4.9%
Total casualties	27	126	1,084	1,237	100.0%

Area 10

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	1	7	2	10	0.4%
Pedal cycle	0	0	4	4	0.2%
PTW	1	15	35	51	2.1%
Car	15	100	1,924	2,039	85.7%
Bus/Coach	1	1	13	15	0.6%
Goods vehicle	3	21	230	254	10.7%
Casualty age 1-15	0	8	134	142	6.0%
Casualty age 16-19	0	15	166	181	7.6%
Casualty age 70+	1	4	49	54	2.3%
Total casualties	21	144	2,213	2,378	100.0%

Area 11

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	2	7	6	15	1.1%
Pedal cycle	2	0	15	17	1.2%
PTW	3	20	32	55	4.0%
Car	19	69	1,060	1,148	82.6%
Bus/Coach	0	0	3	3	0.2%
Goods vehicle	3	15	126	144	10.4%
Casualty age 1-15	2	6	47	55	4.0%
Casualty age 16-19	1	13	86	100	7.2%
Casualty age 70+	2	3	29	34	2.4%
Total casualties	29	112	1,248	1,389	100.0%

Area 12

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	3	3	6	12	0.8%
Pedal cycle	1	5	8	14	0.9%
PTW	2	21	26	49	3.2%
Car	18	122	1,161	1,301	85.4%
Bus/Coach	0	1	5	6	0.4%
Goods vehicle	0	16	122	138	9.1%
Casualty age 1-15	0	13	60	73	4.8%
Casualty age 16-19	2	26	113	141	9.3%
Casualty age 70+	1	5	29	35	2.3%
Total casualties	24	168	1,332	1,524	100.0%

Area 13

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	0	3	6	9	1.0%
Pedal cycle	0	1	8	9	1.0%
PTW	2	10	23	35	3.9%
Car	10	57	648	715	79.4%
Bus/Coach	0	3	21	24	2.7%
Goods vehicle	3	12	86	101	11.2%
Casualty age 1-15	0	1	68	69	7.7%
Casualty age 16-19	1	7	55	63	7.0%
Casualty age 70+	2	10	29	35	3.9%
Total casualties	16	87	797	900	100.0%

Area 14

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	4	1	3	8	0.9%
Pedal cycle	0	2	1	3	0.3%
PTW	2	4	16	22	2.5%
Car	8	51	689	748	86.7%
Bus/Coach	0	1	2	3	0.3%
Goods vehicle	3	10	62	75	8.7%
Casualty age 1-15	0	3	44	47	5.4%
Casualty age 16-19	3	2	76	81	9.4%
Casualty age 70+	3	5	29	35	4.1%
Total casualties	17	70	776	863	100.0%

All DBFO

Customer group	Killed	Seriously injured	Slightly injured	Total	% of casualties
Pedestrian	3	4	4	11	0.6%
Pedal cycle	0	4	12	16	0.9%
PTW	2	19	29	50	2.8%
Car	14	121	1,380	1,515	85.9%
Bus/Coach	0	0	4	4	0.2%
Goods vehicle	4	24	130	158	9.0%
Casualty age 1-15	2	4	96	102	5.8%
Casualty age 16-19	1	15	134	150	8.5%
Casualty age 70+	3	12	51	66	3.7%
Total casualties	24	173	1,567	1,764	100.0%

Appendix D. NATIONAL DATA FOR LOCAL COMPARISON

D.1 National data for local comparisons (2004-2006)

Tables D.1.1 to D.1.8 show the national data 2004-2006 for motorways, built-up and non built-up A-roads, which can be used for comparison with local data. The national data are used to establish expected levels of casualties or accidents on the network. Corresponding summary data at a local level is now available using HAPMS (Highways Agency Pavement Management System).

Each Table gives data for one Stats19 variable – the full list of categories for each variable can be found in the Glossary of this document (Appendix A). The data within each table are given separately for the three key road types: built-up A-roads, non-built-up A-roads and motorways. Tables D.1.1 to D.1.4 contain accident data. D.1.5 and D.1.6 contain data relating to the accident-involved vehicles, and D.1.7 and D.1.8 contain data relating to the casualties resulting from the accidents. Within each road type there are 4 columns of data; the first column gives the number of:

- fatal accidents (D.1.1 to D.1.4);
- vehicles involved in fatal accidents (D.1.5 and D.1.6);
- fatal casualties (D.1.7 and D.1.8).

Similarly:

- the second column gives the numbers of fatal or serious accidents (D.1.1 to D.1.4) etc.;
- the third column gives the total number of accidents/vehicles/casualties;
- the fourth column gives the percentage of all accidents/vehicles/casualties in that category and road type that were in fatal or serious accidents/casualties – i.e. the value in the second column divided by the value in the third column .

Example:

D.1.3 column 8 shows that, over the whole network of non-built-up trunk A-roads (with speed limits greater than 40mph) 6,238 of the 18,928 accidents in the 3 year period (2004-2006) occurred on wet or damp roads. This means that about 33% of accidents on non-built trunk A-roads were on wet or damp roads. Supposing that on some local stretch of non-built-up trunk road 50% of all the accidents were on wet or damp roads, this would suggest that this is a problem that requires further investigation as the number of accidents is greater than one would expect. It is, of course, possible that there was a particularly high rainfall on this road compared with the national average rainfall but, if not, then further studies should be undertaken – for example into where the accidents are occurring, the types of vehicles and manoeuvres involved, the incidence of skidding etc. If however, the percentage of accidents that were on wet or damp roads was close to or less than 33% this would be unlikely to warrant further investigation.

D.1.1 Accidents by accident severity and junction detail (2004-2006)

Junction detail	'A' Built Up				'A' Non Built Up				Motorway			
	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI
Not at or within 20m of junction	11	128	975	13.1	409	2,140	11,792	18.2	386	2,338	19,441	12.0
Roundabout	3	75	1,209	6.2	10	228	2,703	8.4	2	46	1,297	3.5
Mini roundabout	0	1	14	7.1	1	2	8	25.0	0	0	3	0
T/staggered junction	7	70	575	12.2	51	285	1,453	19.6	0	6	65	9.2
Slip road	4	19	154	12.3	39	282	1,938	14.6	41	260	2,186	11.9
Crossroads	0	23	267	8.6	11	74	319	23.2	0	1	13	7.7
Multiple junction	2	4	65	6.2	2	18	66	27.3	1	6	60	10.0
Private drive/entrance	0	7	86	8.1	12	60	275	21.8	0	0	4	0
Other / Unknown	0	10	116	8.6	19	73	374	19.5	3	17	152	11.2
Total accidents	27	337	3,461	9.7%	554	3,162	18,928	16.7%	433	2,674	23,221	11.5%

D.1.2 Accidents by accident severity and year (2004-2006)

Year	'A' Built Up				'A' Non Built Up				Motorway			
	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI
2004	8	108	1,178	9.2%	190	1,110	6,690	16.6%	132	936	8,065	11.6%
2005	10	123	1,129	10.9%	187	1,064	6,203	17.2%	155	884	7,677	11.5%
2006	9	106	1,154	9.2%	177	988	6,035	16.4%	146	854	7,479	11.4%
Total accidents	27	337	3,461	9.7%	554	3,162	18,928	16.7%	433	2,674	23,221	11.5%

D.1.3 Accidents by accident severity and road surface condition (2004-2006)

Road surface condition	'A' Built Up				'A' Non Built Up				Motorway			
	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI
Dry	23	255	2,434	10.5%	379	2,120	12,232	17.3%	317	1,868	15,880	11.8
Wet or damp	4	80	962	8.3%	163	971	6,238	15.5%	110	760	6,987	10.9
Snow	0	1	11	9.1%	4	21	117	17.9%	1	13	88	14.8
Frost or ice	0	1	26	3.8%	5	35	235	14.9%	3	22	153	14.4
Flood (more than 30mm)	0	0	4	0.0%	2	7	57	12.2%	2	9	78	11.5
Oil, Diesel or mud	0	0	4	0.0%	0	5	19	26.3%	0	1	13	7.7
Unknown	0	0	20	0.0%	1	3	30	10.0%	0	1	22	4.5
Total accidents	27	337	3,461	9.7%	554	3,162	18,928	16.7%	433	2,674	23,221	11.5%

Note: Oil, diesel, and mud categories only apply to data before 2005

D.1.4 Accidents by accident severity and lighting condition (2004-2006)

Lighting condition	'A' Built Up				'A' Non Built Up				Motorway			
	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI
Daylight	12	222	2,650	8.4%	307	2,052	13,704	15.0%	195	1,643	16,440	10.0
Darkness, street lights lit	11	91	665	13.7%	49	329	1,952	16.9%	99	362	3,511	10.3
Darkness, street lights unlit	1	6	28	21.4%	4	12	93	12.9%	0	14	147	9.5
Darkness, no street lighting	3	18	84	21.4%	186	740	3,023	24.5%	135	404	2,960	13.6
Darkness, street lighting unknown	0	0	34	0.0%	8	29	156	18.6%	4	13	163	8.0
Total accidents	27	337	3,461	9.7%	554	3,162	18,928	16.7%	433	2,674	23,221	11.5%

D.1.5 Vehicles by accident severity and vehicle manoeuvre (2004-2006)

Vehicle manoeuvre	'A' Built Up				'A' Non Built Up				Motorway			
	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI
Reversing	0	0	25	0	5	10	50	20.0	1	8	55	14.5
Parked	0	14	84	16.7	49	212	724	29.3	43	139	443	31.4
Waiting to go ahead, held up	0	22	998	2.2	18	296	3,968	7.5	56	360	5,376	6.7
Stopping	0	16	715	2.2	31	386	4,493	8.6	82	564	7,393	7.6
Starting	2	15	231	6.5	8	56	527	10.6	3	15	312	4.8
U-turn	0	3	29	10.3	10	66	221	29.9	0	1	6	16.7
Turning left	0	9	246	3.7	4	58	537	10.8	2	11	167	6.5
Waiting to turn left	0	3	88	3.4	1	7	178	3.9	0	4	110	3.6
Turning right	1	54	548	9.9	46	283	1,252	22.6	0	3	66	4.5
Waiting to turn right	0	2	114	1.8	9	48	343	14.0	0	1	34	3.0
Changing lane to left	0	10	130	7.7	20	157	1,002	15.7	26	241	2,034	11.8
Changing lane to right	2	12	104	11.5	18	187	1,464	12.8	35	294	3,684	7.9
Overtaking moving veh. on its o/s	0	22	119	18.5	69	299	1,394	21.4	35	193	1,666	11.6
Overtaking stationary veh. on its o/s	0	12	45	26.7	4	35	174	20.1	0	5	48	10.4
Overtaking on nearside	0	4	27	14.8	5	38	164	23.2	1	35	240	14.6
Going ahead - LH bend	8	30	147	20.4	65	311	1,256	24.8	43	170	856	19.9
Going ahead - RH bend	4	34	230	14.7	61	260	1,014	25.6	32	101	561	18.0
Going ahead - other	30	338	3,156	10.7	756	3,680	20,853	17.6	648	3,618	28,970	12.5
Unknown	0	0	5	0	0	2	36	5.6	0	1	7	14.3
Total vehicles	47	600	7,041	8.5%	1,179	6,391	39,650	16.1%	1,007	5,764	52,028	11.1%

D.1.6 Vehicles by accident severity and vehicle group (2004-2006)

Vehicle type	'A' Built Up				'A' Non Built Up				Motorway			
	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI
Pedal cycle	3	26	205	12.7%	26	108	286	37.8%	0	1	11	9.1%
PTW	10	123	464	26.5%	85	643	1,615	39.8%	49	380	1,039	36.6%
Car	26	364	5,395	6.7%	754	4,241	30,765	13.8%	622	3,787	39,678	9.5%
Bus or coach	0	7	107	6.5%	7	38	169	22.5%	6	28	164	17.1%
LGV	2	27	352	7.7%	61	396	2,495	15.9%	52	393	3,336	11.8%
HGV	5	49	460	10.7%	229	868	3,913	22.2%	273	1,130	7,422	15.2%
Other and unknown	1	4	58	6.9%	17	97	407	23.8%	5	45	378	11.9%
Total vehicles	47	600	7,041	8.5%	1,179	6,391	39,650	16.1%	1,007	5,764	52,028	11.1%

D.1.7 Casualties by casualty injury and casualty class (2004-2006)

Casualty class	'A' Built Up				'A' Non Built Up				Motorway			
	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI
Driver/rider	19	251	3,199	7.8%	402	2,744	20,164	13.6%	309	2,205	24,453	9.0%
Vehicle/pillion passenger	6	74	1,338	5.5%	148	1,100	9,132	12.0%	136	1,027	12,610	8.1%
Pedestrian	6	65	224	29.0%	72	159	264	60.2%	53	111	185	60.0%
Total casualties	31	390	4,761	8.2%	622	4,003	29,560	13.5%	498	3,343	37,248	9.0%

D.1.8 Casualties by casualty injury and casualty user group – as defined in the HA Strategic Safety Plan - (2004-2006)

Customer group	'A' Built Up				'A' Non Built Up				Motorway			
	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI	Fatal	KSI	Total	% KSI
Pedestrians	6	65	224	29.0%	72	159	264	60.2%	53	111	185	60.0%
Pedal cyclists	3	26	198	13.1%	24	105	275	38.2%	0	0	7	0.0%
PTW riders and passengers	10	123	459	26.8%	79	639	1,663	38.4%	47	372	1,037	35.9%
Car drivers and passengers	11	154	3,551	4.3%	393	2,661	24,408	10.9%	319	2,313	32,015	7.2%
Bus or Coach drivers and passengers	0	3	75	4.0%	2	19	302	6.3%	1	12	190	6.3%
LGV drivers and passengers	0	5	133	3.8%	16	170	1,386	12.3%	23	219	2,019	10.8%
HGV drivers and passengers	1	14	97	14.4%	32	217	1,101	19.7%	53	301	1,653	18.2%
Equestrians	0	0	0	0.0%	0	0	0	0.0%	0	0	0	0.0%
High risk age group (Children 1-15)	3	33	341	9.7%	18	115	1,566	7.3%	11	104	2,011	5.2%
High risk age groups (16-19, 70+)	11	94	726	12.9%	142	704	4,082	17.2%	46	305	3,363	9.1%
Total Casualties	31	390	4,761	8.2%	622	4,003	29,560	13.5%	498	3,343	37,248	9.0%

Note that the customer groups are not exclusive; hence the sum of casualties in all customer groups is more than the total number of casualties. For example, a casualty can be a car driver and aged 16-19

D.2 English trunk road investigatory levels (2004-2006)

The investigatory level tables below are those found in Annex 3 of the Operational Folder and are based on average values for English trunk roads, averaged over the three year period 2004-2006. They give information about more accident types than just those in Section D.1 above and can be used for purposes of comparing local values with national values and so identifying local problems. Table D.2.1 gives actual accident rates by road type and accident and casualty severity ratio values¹¹. D.2.2 gives percentages for categories of accidents, and D.2.3 gives percentages for categories of vehicles. For example in D.2.2 column 4, 13.4% of all motorway accidents occurred at night on an unlit road. Values relating specifically to Vulnerable Road Users are shown in red text. Additional definitions can be found in the glossary in Appendix A.

D.2.1 English trunk road investigatory levels (2004-06 average) by road class and type

INTERVENTION LEVEL CATEGORY		Road class / type				
		Trunk A road			Motorway	All trunk roads
		Built-up	Non-built-up	All A roads		
Accidents per year	All accidents per 10 ⁸ veh-km	62.0	14.9	16.9	8.9	11.6
	<i>Number of accidents</i>	1,154	6,309	7,463	7,740	15,203
	<i>Dual-carriageways only</i>	-	4,804	-	-	-
	<i>Single-carriageways only</i>	-	1,489	-	-	-
	<i>Traffic (10⁸ veh-km)</i>	18.6	424	443	867	1750
	Fatal accidents per 10 ⁸ veh-km	0.48	0.44	0.44	0.17	0.26
	<i>Number of fatal accidents</i>	9	185	194	144	338
	Serious accidents per 10 ⁸ veh-km	5.6	2.0	2.2	0.9	1.3
	<i>Number of serious accidents</i>	103	869	973	747	1,720
	All accidents per 100km	537	173	193	263	224
	<i>Dual-carriageways only</i>	-	196	-	-	-
	<i>Single-carriageways only</i>	-	126	-	-	-
	Non-junction accidents per 100km	151	108	110	220	158
	Accidents KSI severity ratio	0.10	0.17	0.16	0.12	0.14
<i>Dual-carriageways only</i>	-	0.15	-	-	-	
<i>Single-carriageways only</i>	-	0.21	-	-	-	
Casualties per year	Casualty KSI severity ratio	0.08	0.14	0.13	0.09	0.11
	<i>Dual-carriageways only</i>	-	0.12	-	-	-
	<i>Single-carriageways only</i>	-	0.17	-	-	-

It should be noted that where the carriageway type was recorded as 'Roundabout' or 'one way' (all years) or 'slip road' (2005 data onwards), that accident was allocated to the dual-carriageway data set.

¹¹ Accident KSI severity ratio for a particular road type = number of accidents involving death or serious injury/total number of accidents – for that road type
 Casualty KSI severity ratio for a particular road type = number of fatal or serious casualties/total number of casualties - for that road type

D.2.2 Percentage of all accidents of various types on English trunk roads (2004-06), by road class and type

INVESTIGATION LEVEL CATEGORY		Road Class/type				
		Trunk A road			Motorway %	All trunk roads %
		Built-up %	Non Built-up %	All A-roads %		
Pedestrians	Involved at least one pedestrian injury	6.3	1.3	2.1	0.7	1.4
Age of casualty	Involved at least one child injury ¹²	8.4	5.9	6.3	6.3	6.3
No. of vehicles involved	Only involved one vehicle	16.2	24.9	23.5	21.1	22.3
	Involved three or more vehicles	14.9	22.3	21.2	27.2	24.2
HGV / LGV	Involved at least one HGV/LGV	20.7	27.6	26.6	37.1	31.9
Road Surface	Dry	70.3	64.6	65.5	68.4	67.0
	Wet/Flood	27.9	33.3	32.4	30.4	31.4
	<i>Dual-carriageways only</i>	-	32.6	-	-	-
	<i>Single-carriageways only</i>	-	35.3	-	-	-
	Ice/Snow	1.1	1.4	1.7	1.0	1.4
Lighting	Occurred in daylight	76.6	72.4	73.0	70.8	71.9
	Occurred at night on an unlit road	3.2	16.5	14.4	13.4	13.9
Junction types	Not at a junction	28.2	62.3	57.0	83.7	70.6
	At or within 20m of a junction	71.8	37.7	43.0	16.3	29.4
	At a private drive junction	2.5	1.5	1.6	0.0	0.8
	<i>Dual-carriageways only</i>	-	0.6	-	-	-
	<i>Single-carriageways only</i>	-	4.3	-	-	-
	At a T/Y junction	16.6	7.7	9.1	0.3	4.6
	<i>Dual-carriageways only</i>	-	3.5	-	-	-
	<i>Single-carriageways only</i>	-	21.0	-	-	-
	At a crossroads	7.7	1.7	2.6	0.1	1.3
	At a roundabout ¹³	35.3	14.3	17.6	5.6	11.5
	At a slip road junction	4.4	10.2	9.3	9.4	9.4
<i>Dual-carriageways only</i>	-	12.5	-	-	-	
<i>Single-carriageways only</i>	-	3.1	-	-	-	
All accidents	At least one vehicle skidded ¹⁴	22.7	45.6	42.0	45.2	43.7
	<i>Dual-carriageways only</i>	-	46.9	-	-	-
	<i>Single-carriageways only</i>	-	41.3	-	-	-
Wet/Flood accidents ¹⁵	At least one vehicle skidded	30.5	51.6	48.8	52.0	50.4
	<i>Dual-carriageways only</i>	-	53.3	-	-	-
	<i>Single-carriageways only</i>	-	46.5	-	-	-

It should be noted that where the carriageway type was recorded as 'Roundabout' or 'one way' (all years) or 'slip road' (2005 data onwards), that accident was allocated to the dual-carriageway data set.

¹² Accident involving casualties aged less than 16 years

¹³ Roundabout includes mini roundabout

¹⁴ Accident involving at least one vehicle with skidding category other than "no skidding, jack-knifing, overturning"

¹⁵ Accidents on wet, damp or flooded roads

D.2.3 Percentage of all vehicles involved in all accidents of various types on English trunk roads (2004-06), by road class and type

INVESTIGATORY LEVEL CATEGORY		Road class				
		Trunk A road			Motorway %	All trunk roads %
		Built-up %	Non-built-up %	All A roads %		
Vehicle types	Pedal cycle	2.9	0.7	1.1	0.02	0.5
	Powered two-wheelers (PTW)	6.6	4.1	4.5	2.0	3.2
	Light goods vehicle	5.0	6.3	6.1	6.4	6.3
	Heavy goods vehicle	6.5	9.9	9.4	14.3	11.9
	Bus or coach	1.5	0.4	0.6	0.3	0.4
Driver age and sex	Male drivers/riders (all ages)	67.2	69.3	69.0	71.9	70.5
	Male drivers/riders under 25 years old	11.7	10.9	11.0	9.1	10.0
	Male drivers/riders over 59 years old	8.0	8.4	8.3	6.9	7.6
	Female drivers/riders under 25 years old	5.4	5.9	5.8	5.2	5.5
	Female drivers/riders over 59 years old	2.6	2.2	2.2	1.4	1.8
Vehicle manoeuvre	Parked	1.2	1.8	1.7	0.9	1.3
	Waiting to go ahead	14.2	10.0	10.6	10.3	10.5
	Stopping	10.2	11.3	11.2	14.2	12.8
	Turning right	7.8	3.2	3.9	0.1	1.9
	<i>Dual-carriageways only</i>	-	1.9	-	-	-
	<i>Single-carriageways only</i>	-	7.2	-	-	-
	Waiting to turn right	1.6	0.9	1.0	0.1	0.5
	<i>Dual-carriageways only</i>	-	0.3	-	-	-
	<i>Single-carriageways only</i>	-	2.7	-	-	-
	Overtaking a moving vehicle on its o/s	1.7	3.5	3.2	3.2	3.2
	Going ahead on a bend (left or right)	5.4	5.7	5.7	2.7	4.1
	Going ahead - other	44.8	52.6	51.4	55.7	53.7
	Changing lane (left or right)	3.3	6.2	5.8	11.0	8.5
<i>Dual-carriageways only</i>	5.3	7.9	7.6	11.0	9.7	
<i>Single-carriageways only</i>	0.6	1.0	0.9	5.3	1.0	
Skidding	Skidded, jack-knifed or overturned	12.1	25.5	23.5	24.7	24.1
Leaving carriageway	Vehicle left carriageway	7.8	21.1	19.1	20.7	20.0

It should be noted that where the carriageway type was recorded as 'Roundabout' or 'one way' (all years) or 'slip road' (2005 data onwards), that accident was allocated to the dual-carriageway data set.

Appendix E. ADDITIONAL TOPICS

- E.1 Contributory factors 2006
- E.2 Accidents involving vehicles which hit objects that were off the carriageway (2002 to 2006)
- E.3 Hard Shoulder accidents (2002-2006)

E.1 Contributory factors 2006

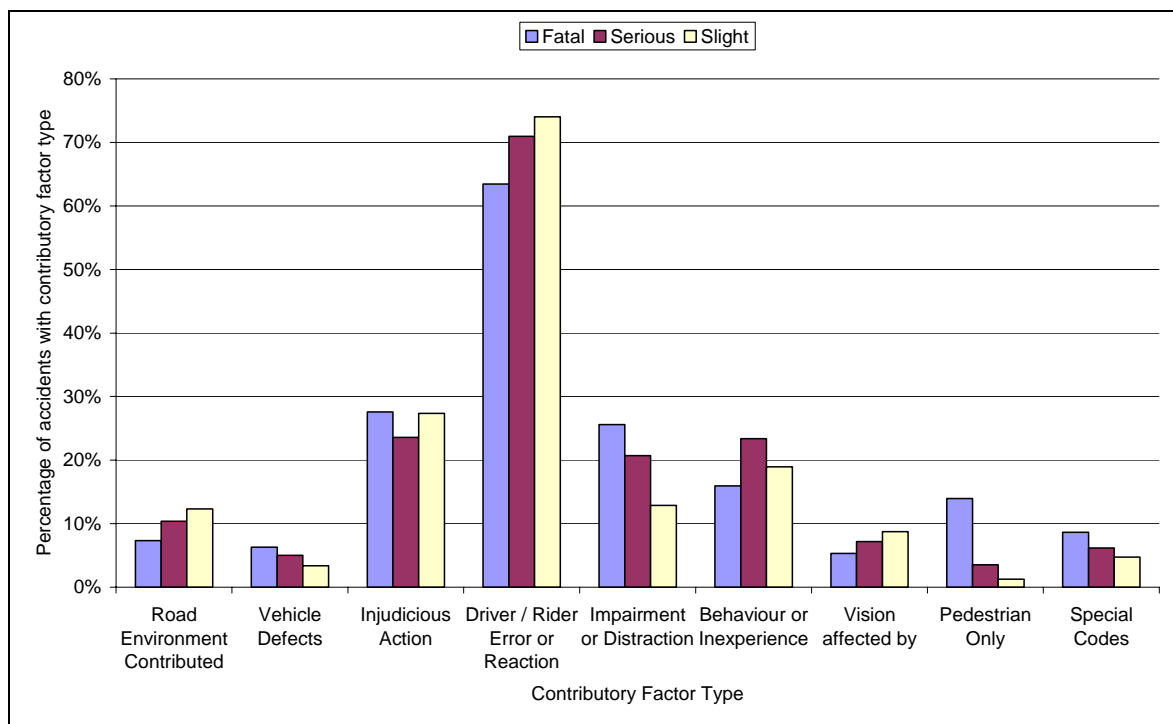
Since 2005, contributory factors have been recorded nationally as part of Stats19.

Each accident can have up to six contributory factors. They are not recorded in any order, but an indication is given as to whether each factor is very likely or possible. The vehicle or casualty to which the factor applies is also given. One contributory factor can be recorded for more than one vehicle/casualty, and each vehicle/casualty can have none, one, or more contributory factors. These factors reflect the opinion of the reporting officer at the time of reporting and may not be the result of extensive investigation.

Overall in 2006, 13,776 out of the 14,668 (94%) trunk road accidents were given at least one contributory factor. Twelve police forces completed contributory factors for all accidents, but contributory factor data were available for only 51% of accidents from Devon and Cornwall Police. Dorset Police, who in 2005 provided no contributory factor data, provided factors for 90% of accidents in 2006.

There are nine categories of contributory factors. The chart below shows the percentage of accidents in each category. The 'driver/rider error or reaction' category (codes 401 to 410 in table below) was the most frequent, recorded for 73% of accidents.

Figure E 1: Contributory Factor Type by accident severity, 2006



Note: The individual percentages sum to more than 100% as accidents can have up to six Contributory Factors

On average, the 13,776 accidents with contributory factors in 2006, had just over two contributory factors recorded per accident, as shown in the table below. Fatal accidents with factors had, on average, more factors per accident than slight accidents with factors (2.52 factors per accident compared with 2.26); however, a larger percentage of fatal accidents had no contributory factors recorded at all (9% compared with 6% of slight accidents).

Table E. 1: Number of accidents with different numbers of factors by severity

No. of factors	Fatal		Serious		Slight		Total	
	Number	%	Number	%	Number	%	Number	%
0	31	9%	80	5%	781	6%	892	6%
1	85	26%	466	29%	3,761	30%	4,312	29%
2	103	31%	491	30%	4,273	34%	4,867	33%
3	41	12%	306	19%	2,198	17%	2,545	17%
4	33	10%	152	9%	984	8%	1169	8%
5	22	7%	64	4%	423	3%	509	3%
6	17	5%	57	4%	300	2%	374	3%
Total number of accidents	332	100%	1,616	100%	12,720	100%	14,668	100%
Av. factors per acc with CFs	2.52	-	2.37	-	2.24	-	2.26	-

The table overleaf shows the number of accidents and percentage of accidents coded with each contributory factor.

Most frequent Contributory Factors were:

- Failed to look properly (30%)
- Failed to judge other person's path or speed (26%)
- Loss of control (19%)
- Following too close (15%)
- Poor turn or manoeuvre (12%)
- Careless, reckless or in a hurry (12%)
- Sudden braking (12%)
- Travelling too fast for conditions (11%)

Fatigue was contributory in 5% of accidents. Alcohol or drugs were contributory in 4% of accidents. Vehicle defects (defective tyres, lights, brakes, steering, suspension or mirrors) were contributory in 4% of accidents:

In fatal accidents, the most frequent were:

- Loss of control (35%)
- Failed to look properly (15%)
- Failed to judge other person's path or speed (15%)
- Travelling too fast for conditions (13%)
- Fatigue (12%)

Table E. 2: Number of accidents recorded with each contributory factor

Factor	Description	Total	%
101	Poor or defective road surface	32	0.2%
102	Deposit on road (eg. oil, mud, chippings)	136	1.0%
103	Slippery road (due to weather)	1,095	7.9%
104	Inadequate or masked signs or road markings	30	0.2%
105	Defective traffic signals	12	0.1%
106	Traffic calming (eg. speed cushions, road humps, chicanes)	3	0.0%
107	Temporary road layout (eg. contraflow)	100	0.7%
108	Road layout (eg. bend, hill, narrow carriageway)	109	0.8%
109	Animal or object in carriageway	239	1.7%
201	Tyres illegal, defective or under-inflated	267	1.9%
202	Defective lights or indicators	13	0.1%
203	Defective brakes	78	0.6%
204	Defective steering or suspension	56	0.4%
205	Defective or missing mirrors	2	0.0%
206	Overloaded or poorly loaded vehicle or trailer	101	0.7%
301	Disobeyed automatic traffic signal	66	0.5%
302	Disobeyed Give Way or Stop sign or markings	126	0.9%
303	Disobeyed double white lines	31	0.2%
304	Disobeyed pedestrian crossing facility	8	0.1%
305	Illegal turn or direction of travel	74	0.5%
306	Exceeding speed limit	421	3.1%
307	Travelling too fast for conditions	1,485	10.8%
308	Following too close	2,115	15.4%
309	Vehicle travelling along pavement	9	0.1%
310	Cyclist entering road from pavement	17	0.1%
401	Junction overshoot	186	1.4%
402	Junction restart (moving off at junction)	184	1.3%
403	Poor turn or manoeuvre	1,706	12.4%
404	Failed to signal or misleading signal	209	1.5%
405	Failed to look properly	4,098	29.7%
406	Failed to judge other person's path or speed	3,596	26.1%
407	Passing too close to cyclist, horse rider or pedestrian	45	0.3%
408	Sudden braking	1,672	12.1%
409	Swerved	994	7.2%
410	Loss of control	2,606	18.9%
501	Impaired by alcohol	518	3.8%
502	Impaired by drugs (illicit or medicinal)	55	0.4%
503	Fatigue	683	5.0%
504	Uncorrected, defective eyesight	12	0.1%

Factor	Description	Total	%
505	Illness or disability, mental or physical	213	1.5%
506	Not displaying lights at night or in poor visibility	17	0.1%
507	Cyclist wearing dark clothing at night	13	0.1%
508	Driver using mobile phone	40	0.3%
509	Distraction in vehicle	373	2.7%
510	Distraction outside vehicle	224	1.6%
601	Aggressive driving	362	2.6%
602	Careless, reckless or in a hurry	1675	12.2%
603	Nervous, uncertain or panic	247	1.8%
604	Driving too slow for conditions, or slow vehicle (eg. tractor)	38	0.3%
605	Learner or inexperienced driver/rider	457	3.3%
606	Inexperience of driving on the left	124	0.9%
607	Unfamiliar with model of vehicle	117	0.8%
701	Stationary or parked vehicle(s)	71	0.5%
702	Vegetation	2	0.0%
703	Road layout (eg. bend, winding road, hill crest)	41	0.3%
704	Buildings, road signs, street furniture	7	0.1%
705	Dazzling headlights	20	0.1%
706	Dazzling sun	191	1.4%
707	Rain, sleet, snow or fog	321	2.3%
708	Spray from other vehicles	137	1.0%
709	Visor or windscreen dirty or scratched	7	0.1%
710	Vehicle blind spot	474	3.4%
801	Pedestrian crossing road masked by stationary or parked vehicle	8	0.1%
802	Pedestrian failed to look properly	107	0.8%
803	Pedestrian failed to judge vehicle's path or speed	89	0.6%
804	Pedestrian wrong use of pedestrian crossing facility	3	0.0%
805	Pedestrian dangerous action in carriageway (eg. playing)	45	0.3%
806	Pedestrian impaired by alcohol	48	0.3%
807	Pedestrian impaired by drugs (illicit or medicinal)	8	0.1%
808	Pedestrian careless, reckless or in a hurry	44	0.3%
809	Pedestrian wearing dark clothing at night	25	0.2%
810	Disability or illness, mental or physical	27	0.2%
901	Stolen vehicle	33	0.2%
902	Vehicle in course of crime	25	0.2%
903	Emergency vehicle on a call	34	0.2%
904	Vehicle door opened or closed negligently	8	0.1%
999	Other - please specify below	604	4.4%

E.1.1 Contributory factors by accident severity

The percentage of KSI accidents and the percentage of slight accidents with each contributory factor were calculated (where there were at least 20 accidents), and the percentages compared to give which contributory factors were more or less likely in KSI accidents and slight accidents. The table below shows the contributory factors which had a significantly higher occurrence in KSI accidents. The biggest difference was in 'loss of control' which was recorded for 28% of KSI accidents compared to 17% of slight accidents. Fatigue, exceeding speed limit and impaired by alcohol were also more common in KSI accidents. 'Following too close' and 'failed to judge other person's path or speed' were less common in KSI accidents.

Table E. 3: Contributory factors with a higher occurrence in KSI accidents

Factor	Description	KSI accidents	% of KSI accidents	Slight accidents	% of slight accidents
410	Loss of control	520	28.3%	2,086	17.5%
503	Fatigue	164	8.9%	519	4.3%
306	Exceeding speed limit	109	5.9%	312	2.6%
501	Impaired by alcohol	120	6.5%	398	3.3%
601	Aggressive driving	81	4.4%	281	2.4%
602	Careless, reckless or in a hurry	255	13.9%	1,420	11.9%
802	Pedestrian failed to look properly	45	2.4%	62	0.5%
806	Pedestrian impaired by alcohol	36	2.0%	12	0.1%
999	Other	110	6.0%	494	4.1%
505	Illness or disability, mental or physical	53	2.9%	160	1.3%
509	Distraction in vehicle	72	3.9%	301	2.5%
409	Swerved	154	8.4%	840	7.0%
805	Pedestrian, dangerous action in carriageway	26	1.4%	19	0.2%
809	Pedestrian wearing dark clothing at night	21	1.1%	4	0.0%
201	Tyres illegal, defective or under-inflated	51	2.8%	216	1.8%
502	Impaired by drugs	21	1.1%	34	0.3%
803	Pedestrian failed to judge other person's path or speed	24	1.3%	65	0.5%
607	Unfamiliar with model of vehicle	25	1.4%	92	0.8%

Table E. 4: Contributory factors with a lower occurrence in KSI accidents

Factor	Description	KSI accidents	% of KSI accidents	Slight accidents	% of slight accidents
308	Following too close	149	8%	1,966	16%
406	Failed to judge other person's path or speed	378	21%	3,218	27%
405	Failed to look properly	447	24%	3,651	31%
408	Sudden braking	138	8%	1,534	13%
103	Slippery road (due to weather)	108	6%	987	8%
710	Vehicle blind spot	30	2%	444	4%

E.1.2 Contributory factors in PTW accidents

In 2006 there were 956 accidents involving a PTW. 907 of these had some contributory factors recorded for the accident. The percentage of PTWs coded with each contributory factor was compared to the corresponding figures for cars (where there were at least 20 vehicles with a contributory factor). The tables below show the contributory factors which had a significantly higher occurrence for PTWs than for cars. The greatest difference was 'loss of control' which was a contributory factor for 17% of PTWs compared with 10% of cars. There were no contributory factors which had significantly lower occurrence for PTWs than for cars.

Table E. 5: Contributory factors with a higher occurrence in PTWs than cars

Factor	Description	PTWs	% of PTWs	% of cars
410	Loss of control	158	16.9%	9.5%
605	Learner or inexperienced driver/rider	60	6.4%	1.7%
403	Poor turn or manoeuvre	86	9.2%	5.1%
102	Deposit on road	35	3.7%	0.4%
306	Exceeding speed limit	37	4.0%	1.5%
999	Other	31	3.3%	1.9%
601	Aggressive driving	24	2.6%	1.4%

E.2 Accidents involving vehicles which hit objects that were off the carriageway (2002 to 2006)

Between 2002 and 2006 there were 30,264 accidents (39% of all 77,407 accidents) which involved at least one vehicle leaving the carriageway and 77% (23,271) of these involved the vehicle which left the carriageway hitting an object that was off the carriageway.

Table E. 6 shows the number of casualties in accidents in the five year period by whether their vehicle left the carriageway and hit an object. 17% of the casualties from vehicles which left the carriageway were killed or seriously injured compared with 9% of casualties from vehicles which did not leave the carriageway.

56% of the casualties from vehicles which left the carriageway and hit an object off the carriageway were associated with vehicles that hit crash barriers and 11% were from vehicles which hit a tree. One quarter of casualties from vehicles which hit a tree were killed or seriously injured, compared with 14% of those from vehicles which hit a crash barrier.

Table E. 6: Casualty injury by whether the vehicle hit an object off the carriageway

Did vehicle leave carriageway?	Did vehicle hit an object off carriageway?	What object was hit?	Killed	Seriously injured	Slightly injured	Total casualties
Casualties from vehicles for which it is unknown if left carriageway			0	1	16	17
Casualties from vehicles which did not leave the carriageway			990	6,009	74,039	81,038
Yes, vehicle left the carriageway	Yes, vehicle hit an object which was off the carriageway	Bus stop/shelter	0	2	21	23
		Central crash barrier	172	970	8,590	9,732
		Entered ditch	57	391	2,071	2,519
		Lamp post	52	219	1,017	1,288
		Nearside/offside crash barrier	150	914	6,291	7,355
		Other permanent object	137	768	3,310	4,215
		Road sign/traffic signals	52	322	1,555	1,929
		Submerged in water (completely)	5	5	9	19
		Telegraph / electricity pole	5	30	95	130
		Tree	178	697	2,559	3,434
All casualties from vehicles which hit an object off carriageway			808	4,318	25,518	30,644
Casualties from vehicles which left the carriageway but no object was hit			254	1,399	7,815	9,468
Casualties from vehicles which left carriageway but it is unknown whether an object was hit			0	1	0	1
All casualties from vehicles which left the carriageway			1,062	5,718	33,333	40,113
Total casualties			2,052	11,728	107,388	121,168

Table E. 7 and Table E. 8 show the number of casualties for motorways and A-roads respectively. 35% of casualties on motorways were from vehicles which left the carriageway compared to 31% of A-road casualties. Casualties from vehicles which left the carriageway on a motorway were more likely to hit a crash barrier than on an A-road (38% compared with 24%) and were less likely to hit a tree (9% compared with 15%).

Table E. 7 gives that 15% of the casualties from with vehicles which left the carriageway on Motorways were killed or seriously injured compared with 7% of casualties from vehicles which did not leave the carriageway on Motorways.

69% of the casualties from vehicles which left the carriageway and hit an object off the carriageway on Motorways were associated with vehicles that hit crash barriers and 9% were from vehicles which hit a tree.

Table E. 7: Casualty injury by whether the vehicle hit an object off the carriageway for Motorways

Did vehicle leave carriageway?	Did vehicle hit an object off carriageway?	What object was hit?	Killed	Seriously injured	Slightly injured	Total Casualties
		Cas from vehicles for which it is unknown if left carriageway	0	1	5	6
		Casualties from vehicles which did not leave the carriageway	396	2,384	37,684	40,464
Yes, vehicle left the carriageway	Yes, vehicle hit an object which was off the carriageway	Bus stop/shelter	0	0	0	0
		Central crash barrier	114	598	5,891	6,603
		Entered ditch	26	158	865	1,049
		Lamp post	27	68	316	411
		Nearside/offside crash barrier	107	652	4,722	5,481
		Other permanent object	60	355	1,607	2,022
		Road sign/traffic signals	14	83	376	473
		Submerged in water (completely)	0	2	4	6
		Telegraph / electricity pole	1	10	12	23
		Tree	58	254	1,182	1,494
		All casualties from vehicles which hit object off carriageway	407	2,180	14,975	17,562
		Casualties from vehicles which left the carriageway but no object was hit	85	555	4,030	4,670
		Casualties from vehicles which left carriageway but it is unknown whether an object was hit	0	1	0	1
		All casualties from vehicles which left the carriageway	492	2,736	19,005	22,233
		Total motorway casualties	888	5,121	56,694	62,703

Table E. 8 gives that 20% of the casualties from with vehicles which left the carriageway on A-roads were killed or seriously injured compared with 10% of casualties from vehicles which did not leave the carriageway on A-roads.

38% of the casualties from vehicles which left the carriageway and hit an object off the carriageway on A-roads were associated with vehicles that hit crash barriers and 15% were from vehicles which hit a tree.

Table E. 8: Casualty injury by whether the vehicle hit an object off the carriageway for A-roads

Did vehicle leave carriageway?	Did vehicle hit an object off carriageway?	What object was hit?	Killed	Seriously injured	Slightly injured	Total casualties
Cas from vehicles for which it is unknown if left carriageway			0	0	11	11
Casualties from vehicles which did not leave the carriageway			594	3,625	36,355	40,574
Yes, vehicle left the carriageway	Yes, vehicle hit an object that was off the carriageway	Bus stop/shelter	0	2	21	23
		Central crash barrier	58	372	2,699	3129
		Entered ditch	31	233	1,206	1,470
		Lamp post	25	151	701	877
		Nearside/offside crash barrier	43	262	1,569	1,874
		Other permanent object	77	413	1,703	2,193
		Road sign/traffic signals	38	239	1,179	1,456
		Submerged in water (completely)	5	3	5	13
		Telegraph/electricity pole	4	20	83	107
		Tree	120	443	1,377	1,940
All casualties from vehicles that hit an object off carriageway			401	2,138	10,543	13,082
Casualties from vehicles which left the carriageway but no object was hit			169	844	3,785	4,798
Casualties from vehicles which left carriageway but it is unknown whether an object was hit			0	0	0	0
All casualties from vehicles which left the carriageway			570	2,982	14,328	17,880
Total A-road casualties			1,164	6,607	50,694	58,465

E.2.1 Stats19 Contributory factors (2005 and 2006 only)

Since 2005, contributory factors have been recorded nationally as part of Stats19. Each accident can have between one and six contributory factors. They are not recorded in any order, but an indication is given as to whether each factor is 'very likely' or 'possible'. The vehicle or casualty to which the factor applies is also given. One contributory factor can be

recorded for more than one vehicle/casualty, and each vehicle/casualty can have none, one or more contributory factors. These factors reflect the opinion of the reporting officer at the time of reporting and may not be the result of extensive investigation.

Overall, 92% and 94% of trunk road accidents were given at least one contributory factor in 2005 and 2006 respectively, and 8,678 out of the 9,155 (95%) accidents involving at least one vehicle which left the carriageway and hit an off carriageway object had contributory factors.

The most common contributory factor in accidents where a vehicle left the carriageway and hit an object off the carriageway was 'loss of control' which was recorded in 37% of these accidents. 'Failed to look properly' was the second most common factor, recorded for 18% of these accidents.

26% of vehicle leaving the carriageway accidents with fatigue as a contributory factor were fatal or serious but this factor was less common, recorded for 9% of vehicle leaving the carriageway accidents.

Table E. 9: Most common contributory factors present in accidents where at least one vehicle left the carriageway and hit an off carriageway object

Factor	Description	KSI Accidents	Slight Accidents	% KSI	% of vehicle leaving carriageway and hitting object accidents
410	Loss of control	722	2,523	22%	37%
405	Failed to look properly	214	1,322	14%	18%
403	Poor turn or manoeuvre	218	1,038	17%	14%
409	Swerved	222	974	19%	14%
406	Failed to judge other person's path or speed	204	983	17%	14%
307	Travelling too fast for conditions	204	767	21%	11%
103	Slippery road (due to weather)	121	814	13%	11%
602	Careless, reckless or in a hurry	206	724	22%	11%
503	Fatigue	200	555	26%	8%

E.2.2 Accidents involving a vehicle leaving the carriageway summary

2002-2006

- 35% of casualties on motorways, and 31% of casualties on A-roads were from vehicles which left the carriageway
- 17% of the casualties from vehicles which left the carriageway on the network (20% on A-roads, 15% on Motorways) were killed or seriously injured.
- 9% of the casualties from with vehicles which did not leave the carriageway on the network (10% on A-roads, 7% on Motorways) were killed or seriously injured.
- 56% of the casualties from vehicles which left the carriageway on the network and hit an object off the carriageway (38% on A-roads, 69% on Motorways) were associated with vehicles that hit crash barriers and 11% (15% on A-roads, 9% on Motorways) were from vehicles which hit a tree.

2005 and 2006 only

- 'Loss of control' was a contributory factor in 37% of accidents involving a vehicle leaving the carriageway and hitting an object which was off the carriageway.
- 'Failed to look properly' and 'failed to judge other persons path or speed' were contributory factors in 18% and 14% of vehicle leaving the carriageway and hitting an off carriageway object accidents respectively.
- 26% of accidents involving 'fatigue' and a vehicle leaving the carriageway and hitting an off carriageway object were fatal or serious compared with 24% of all accidents involving fatigue

E.3 Hard Shoulder accidents (2002-2006)

E.3.1 Research

A report 'Safety on hard shoulders on D2 and D3 motorways' (Summersgill et al 1998) was produced for TSE, HA. The work looked in-depth at the pattern of stopping by vehicles on UK motorways and also at the patterns of accidents on the hard shoulder. The main conclusions of relevance are as follows:

- Most occupants did not follow the current Highway Code advice to leave the vehicle when stopped on the shoulder for any reason;
- There are many short duration (less than 2 minutes) 'non-essential' stops on the shoulder;
- The shoulder accident rate is 70 per cent higher within 200m of emergency telephones than more than 200m from an emergency telephone;
- The hard shoulder accident rate has decreased rapidly and more quickly than other motorway accident rates. This is probably due to a large reduction in breakdown rates through time as a consequence of improved engineering in vehicles. The introduction of Vibraline may also have had an effect;
- As well as the decrease in shoulder accidents, the severity of these has also decreased, although the accident severity of shoulder accidents remains much higher than non-shoulder accidents;
- Accidents on the hard shoulder were more common at night on un-lit motorways than non-shoulder accidents;
- Weather condition did not affect shoulder/non shoulder accident occurrence indicating that spray is not an important factor causing shoulder accidents;
- 'Comfort' stops were not clustered whereas vehicle check stops showed slight clustering in the vicinity of emergency phones;
- Drivers showed a tendency to avoid stopping on the shoulder at elevated or bridge sections;
- Most stops on the shoulder were discretionary but half the time spent on the shoulder was associated with broken-down vehicles;
- Two-thirds of the time spent by broken-down vehicles on the shoulder was waiting for recovery vehicles;
- 58% of hard shoulder accidents involved a parked vehicle being hit by a vehicle veering into the shoulder, 10% of shoulder accidents involved a pedestrian hit on the shoulder;
- The risk of injury to a pedestrian on the motorway while on the hard shoulder is roughly twice that of a vehicle occupant driving for the same period;
- The risk of injury accident involvement of occupants of vehicles parked on the shoulder is 70% that of pedestrians;
- Occupants of parked heavy vehicles are much less at risk of serious injury than occupants of light vehicles.

E.3.2 Accident Analysis

Accident data were extracted from Stats19 database of trunk road (2006 network) injury accidents, 2002-2006.

Hard shoulder accidents are those defined as involving a vehicle on, entering or leaving a hard shoulder or lay-by on a Motorway or A(M) road.

E.3.3 Hard shoulder accidents

There were 531 injury accidents over the five-year period that involved a vehicle on, entering or leaving a hard shoulder, which accounted for 1.4% of *all* motorway accidents; 165 were KSI accidents representing 3.5% of all (4,766) motorway KSI accidents.

Hard shoulder accidents are very high severity, 31% were fatal or serious, compared with 12% of all motorway accidents. 51 people were killed over the five year period.

Table E. 10: Hard shoulder accidents by severity and year

Accident Severity	2002	2003	2004	2005	2006	Total accidents
Fatal	16	11	3	12	9	51
Serious	20	23	27	28	16	114
Slight	87	55	79	87	58	366
Total	123	89	109	127	83	531
Fatal + serious	36	34	30	40	25	165
Accident severity ratio	29%	38%	28%	31%	30%	31%

There is some variability in the number and severity ratio of hard shoulder accidents each year. Hard shoulder accidents accounted for a similar percentage of accidents for each month, (between 0.7% and 1.2%), suggesting that seasonal factors are not important in these accidents.

Compared to all motorway accidents, those at hard shoulders were more likely to occur in the dark or between 8pm and 8am.

E.3.4 Vehicles in hard shoulder accidents

In total there were 1,255 vehicles involved in hard shoulder accidents, of which 55% were cars and 31% were HGVs.

Table E. 11: Vehicles in hard shoulder accidents by accident severity and vehicle type

Vehicle type	Fatal	Serious	Slight	Total	% of total	% KSI
Pedal cycle	0	0	1	1		0%
PTW	1	4	15	20	2%	25%
Car	66	141	488	695	55%	28%
Bus	1	1	1	3		67%
LGV	15	30	56	101	8%	45%
HGV	58	96	239	393	31%	39%
Other/unknown	5	11	26	42	3%	38%
Total	146	283	826	1,255	100%	34%

1.4% of all vehicles in accidents on motorways were in a hard shoulder accident. Vehicles driven by females had a lower involvement, but this is probably a characteristic of the vehicle types involved in hard shoulder accidents.

E.3.5 Casualties in hard shoulder accidents

There were 886 casualties in hard shoulder accidents over the 5-year period. 225 of these were killed or seriously injured, and 62 were pedestrians.

Table E. 12: Casualties in hard shoulder accidents by user group and casualty injury

User group		Killed	Seriously injured	Slightly injured	Total casualties	% of casualties	% KSI
Pedestrian		14	16	32	62	7%	48%
Occupant	Pedal Cycle	0	0	1	1	0%	0%
	PTW	0	5	14	19	2%	26%
	Car	36	78	437	551	62%	21%
	LGV	6	17	42	65	7%	35%
	HGV	8	39	127	174	20%	27%
	Other/unknown	1	5	8	14	2%	43%
Total		65	160	661	886	100%	25%

174 of the casualties (20%) were HGV occupants, compared with 4.6% for all motorway accidents. 7% of casualties were pedestrians, of which 48% were killed or seriously injured.

57 of the 65 fatalities were adults aged 20-69, 3 were aged 70+, there was one child (0-15 years) and one 16-19 year old; one age was undisclosed.

For vehicle occupants, frontal impact vehicles had the most casualties, but where impact occurred, rear impact casualties were most severely injured; 27% were killed or seriously injured. 34% of the vehicle occupant fatalities were in front impact vehicles. Offside and nearside impacts were less severe, with 16% and 23% of casualties killed or seriously injured.

Table E. 13: Casualties in hard shoulder accidents by vehicle first point of impact and casualty injury

Class	1st point of impact	Killed	Seriously injured	Slightly injured	Total casualties	% of casualties	% KSI
Pedestrian		14	16	32	62	7%	48%
Occupant	Did not impact	1	6	14	21	2%	33%
	Front	22	67	293	382	43%	23%
	Back	18	45	172	235	27%	27%
	Offside	3	12	79	94	11%	16%
	Nearside	7	14	70	91	10%	23%
	Unknown	0	0	1	1		
Total		65	160	661	886	100%	25%

E.3.6 Pedestrians in hard shoulder accidents

- 62 pedestrians were injured in hard shoulder accidents over the 5-year period. This represents 20% of all pedestrians involved in accidents on motorways (317).
- 14 pedestrians were killed and 16 were seriously injured.

Table E. 14: Pedestrians in hard shoulder accidents by vehicle type hit and casualty injury

Vehicle type	Killed	Seriously injured	Slightly injured	Total	% of pedestrians	% KSI
Car	5	7	13	25	40%	48%
LGV	2	2	3	7	11%	57%
HGV	6	5	12	23	37%	48%
Other/unknown	1	2	4	7	11%	43%
Total	14	16	31	62	100%	48%

- 25 of the 62 pedestrians were hit by a car, and 23 by an HGV; the severity ratios of these were similar.
- Pedestrians on the hard shoulder are particularly vulnerable; 30 of the 62 pedestrians in hard shoulder accidents were killed or seriously injured

- 19 of the pedestrians were stationary, in carriageway, not crossing, 4 were walking along the carriageway and 5 were crossing the road. The remaining 34 were described with a movement as other or unknown (of which 13 were described as being on the footway or verge).
- The majority of the casualties were adults; there were 3 child pedestrian casualties, all of whom were slightly injured.
- In 2006, the Stats19 data also recorded whether a pedestrian was injured during the course of 'on the road' work. In 2006, 3 out of the 9 injured pedestrians in hard shoulder accidents were in the course of 'on the road' work.

E.3.7 Stats19 Contributory factors (2005 and 2006 only)

Since 2005, contributory factors have been recorded nationally as part of Stats19. Each accident can have between one and six contributory factors. They are not recorded in any order, but an indication is given as to whether each factor is 'very likely' or 'possible'. The vehicle or casualty to which the factor applies is also given. One contributory factor can be recorded for more than one vehicle/casualty, and each vehicle/casualty can have none, one or more contributory factors. These factors reflect the opinion of the reporting officer at the time of reporting and may not be the result of extensive investigation.

Overall, 92% and 94% of trunk road accidents were given at least one contributory factor in 2005 and 2006 respectively, and 203 out of the 210 (97%) accidents involving at least one vehicle entering, on or leaving the hard shoulder (on the motorway) and had contributory factors.

The most common contributory factor in motorway accidents with at least one vehicle on, entering or leaving the hard shoulder was 'failed to look properly' which occurred in 22% of motorway hard shoulder accidents. 29% of motorway hard shoulder accidents which had 'failed to look properly' as a contributory factor were fatal or serious.

54% of motorway hard shoulder accidents with 'fatigue' as a contributory factor were fatal or serious compared with 24% of accidents with 'fatigue' as a contributory factor.

Table E. 15: Most common contributory factors present in motorway accidents where at least one vehicle was on, entering or leaving the hard shoulder

Factor	Description	KSI Accidents	Slight Accidents	% KSI	% of motorway hard shoulder accs
405	Failed to look properly	13	32	29%	22%
503	Fatigue	21	18	54%	19%
410	Loss of control	14	21	40%	17%
602	Careless, reckless or in a hurry	5	20	20%	12%
403	Poor turn or manoeuvre	4	20	17%	12%
406	Failed to judge other person's path or speed	6	18	25%	12%
409	Swerved	10	14	42%	12%

E.3.8 References

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