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The detailed data used to produce these results was commissioned from TRL Limited and included the creation of the British EuroRAP Network of roads, assignment of crashes and traffic data to individual roads and classification of crash types.

Analysis and validation was carried out by Caroline Moore, who also wrote the report. Pre-publication consultation with road authorities on roads listed in the report was carried out by Luke Rogers. Cartography was carried out by Nick Moss using Digital Map Data (c) Collins Bartholomew Ltd (2016). Regional mapping contains Ordnance Survey data (c) Crown Copyright and database right 2016.

Sole responsibility for this report lies with the authors and does not necessarily reflect the opinion of supporters of the Road Safety Foundation or EuroRAP.



Forewords



Lord Whitty of Camberwell Chairman, Road Safety Foundation

We no longer need accept road deaths. The annual death toll can be driven towards zero and travel on our road system can be made as safe as on rail and air. It is a goal achievable within a generation.

The same systematic discipline to measuring and managing risks needs to be applied that is already applied across industries from medicine to mining as well as aviation and rail. Road deaths, for example, are now 10 times greater than all deaths in all workplaces added together. Even on highways, there is greater discipline protecting road workers from risks than the general public.

We know sudden road trauma destroys families but in the past we have failed to count the cost of trauma. Britain loses around 2% of GDP in road crashes. A lifetime of care for a single victim can cost more than £20m. The NHS and care systems suffer avoidable stress.

In October 2016, the OECD called on countries to look again at the economic case for managing risks on the roads systematically. This report helps this focus by identifying the local authorities with the highest costs from road crashes.

Dozens can be killed and maimed in a handful of years on many of the individual stretches of routes highlighted in this report. The report also shows risks can be reduced and lives saved with economic returns that are higher, quicker and more certain than from most projects competing for funds.

In December 2015, the Department for Transport published *Working Together to Build a Safer Road System*. The new approach rightly focused on the components of the road transport system that contribute to its risks - the way we use the roads, the vehicles we use, and the roads we drive on.

This report supports the government's new approach. It provides results for the targetable 10% of British roads where the majority of deaths take place - our motorways and 'A' roads outside major cities totalling more than 25,000 miles (44,400 km).

This report maps how total risk changes on our road system as the same drivers in the same vehicles turn from one road section onto another. It highlights that risks can be twentyfold or higher on some roads than others. The report even shows that the risk of death and serious injury on the main roads of a whole region can be almost double another.

During the survey period, the rate of death and serious injury fell by less than 2% annually. The report lists persistently high risk roads with little or no change. It highlights the modest action taken by road authorities on the 10 most improved roads that led to local falls in serious crashes from 168 to 50 (-70%).

This report presents regional results. It contains separate maps and analysis for the new government corporation responsible for England's strategic roads, Highways England. The company is spearheading the cultural change needed to implement the 'safe system' in practice. Its stated goal is to bring the number of people killed or injured on the network as close as possible to zero by 2040. This goal is matched by immediate, measurable reductions in risk levels it must achieve by 2020 to satisfy its regulator. Highways England plans to address the long ignored high risk roads on its strategic road network, not least its busy single carriageways. Plans now need to be prepared and turned into action.

All the persistent high risk roads identified in this report have rates of death and serious injury that are unacceptable. Some have been on the list for years. For the government's new safety strategy to succeed, it must help remove the cultural and institutional obstacles that permit this chronic loss of life to continue.





Andy Watson Chief Executive, Ageas (UK) Limited

As Britain's third largest motor insurer, every day we support customers who have sadly been involved in road crashes. We have a deep understanding of the distress and suffering they experience.

We are committed to contributing to the development of new evidence-based approaches that will help improve road safety and reduce the severity and frequency of road crashes.

One of the important sources of national evidence is this annual report from the Road Safety Foundation. This is the fifth annual report that Ageas has sponsored which measures, maps and tracks the safety performance of Britain's major road network.

Last year, the Chairman of Highways England spoke at the launch of these annual results with a changed vision for strategic roads. He spoke with intolerance of the high risk single carriageway roads on the national network. He set out the business reasoning for making safety the top priority in more than just name.

At Ageas, we recognise too that it is not enough to highlight the suffering. Priorities have to be set with a business case to compete for scarce investment. That is why we have supported the inclusion in this annual report of analysis setting out the economic cost of road crashes on the main road networks of individual local authorities. The findings show that some local authorities have costs exceeding £0.5bn in the survey period.

We also commissioned the Foundation's report *Making Road Safety Pay*. This set out several key recommendations which have been adopted in the government's new road safety strategy. Others, such as research on developing social impact investment finance for road safety, are making rapid progress.

One of the recommendations accepted by government was to establish an Older Drivers Task Force. Ageas was proud to support the Foundation and the work of two dozen organisations supporting the Task Force who this year published a strategy to help the growing number of older drivers on our roads, *Supporting Safe Driving in Old Age*. These recommendations now need to be put into practice.

One of the Foundation's recent key recommendations is that more needs to be done to identify and prevent the causes of the most serious of crashes. Catastrophic crashes that can wreck lives and bring decades of disability also lead to severe financial and economic loss. They can need much more targeted countermeasures.

The mapping and analysis in this report focuses on death and serious injuries not injury in general. It identifies persistent high risk roads which must be a national priority for known treatments to prevent avoidable death and trauma.

Last year, the Chairman of Highways England spoke at the launch of these annual results with a changed vision for strategic roads. He spoke with intolerance of the high risk single carriageway roads on the national network. He set out the business reasoning for making safety the top priority in more than just name.

Key Findings

British road network

- The number of people killed on Britain's roads decreased from 1,775 in 2014 to to 1,732 in 2015
- 65 people are killed or seriously injured on Britain's roads every day
- Motorcycle fatalities increased by 8% from 339 in 2014 to 365 in 2015
- 51% of fatal casualties occur on non-built-up roads¹
- 6% of fatal casualties occur on motorways

British EuroRAP network of motorways and 'A' roads outside urban cores (2012-14)

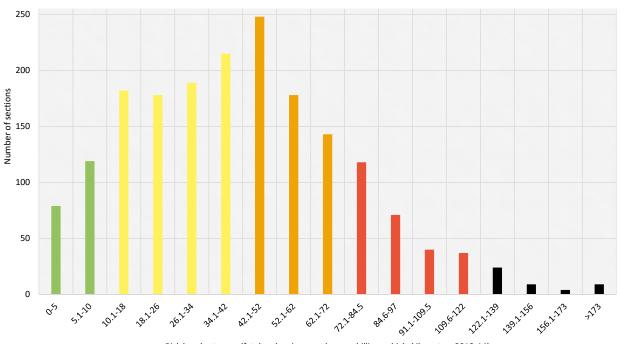
- The British EuroRAP network accounts for 10% of the total road network on which 50% of road deaths
- Fatal and serious crashes on the network have reduced by just 6% between 2009-11 and 2012-14
- Fatal and serious crashes on the network increased by 5% between 2013 and 2014
- The network suffered fatal and serious injury costs of £0.9 billion on motorways, £2 billion on the strategic 'A' road network and £6.4 billion on local authority 'A' roads

- Single carriageway 'A' roads have 8 times the risk of motorways and 3 times the risk of dual carriageway 'A' roads
- The largest single cause of death on the network are crashes where a vehicle ran off the road (29%)
- The largest single cause of serious injury on the network are crashes at junctions (33%)

British EuroRAP Risk Map (2012-14)

- 5% of motor vehicle travel is on unacceptably higher risk roads², 16% on medium, 37% on low-medium and 41% on low risk roads
- 2% of the network mapped was rated at high risk,
 14% medium-high, 31% medium, 40% low-medium and 12% low risk
- 16% of the network mapped has unacceptably higher risk
- 94% of motorway travel but only 2% of single carriageway 'A' roads travel were on roads rated low risk

Figure 1. Risk Rate Distribution 2014-2016



Risk band category (fatal and serious crashes per billion vehicle kilometres 2012-14)

Key regional findings on the British EuroRAP Risk Map (2012-14)

- The risk of death and serious injury is highest in the South East (29 fatal and serious crashes per billion vehicle km travelled); it is lowest in the West Midlands (16)
- Risk on single carriageway 'A' roads is highest in the North West (64) and lowest in the West Midlands (34)
- Risk on motorways is highest in East England (9) and lowest in the West Midlands (4)
- Average risk on the strategic 'A' road network is highest in Wales (23); it is lowest in West Midlands (8)
- Average risk on the local authority 'A' road network is highest in the North West (58); it is lowest in West Midlands (32)
- 35% of local authority 'A' roads have unacceptably high risk in the North West
- Only 4% of local authority 'A' roads have unacceptably high risk in the West Midlands
- 69% of local authority 'A' roads are rated low or low-medium risk in the West Midlands
- Only 24% of local authority 'A' roads are rated low to low-medium risk in the South East
- The South West saw an increase in risk of death and serious injury over time of 5% between 2009-11 and 2012-14

 Scotland saw the greatest improvement in risk of death and serious injury over time with a 21% reduction between 2009-11 and 2012-14

Cost of road crashes for non-metropolitan local authorities (2012-14)

- The authority suffering the lowest total economic loss from serious road crashes is East Ayrshire in Scotland (£34 million)
- 3 local authorities in England suffered crash losses in excess of £0.5 billion: Hampshire, Kent and Essex
- The largest single crash cost centre in Britain is Highways England with serious crash costs in excess of £2.1 billion
- The economic cost of serious road crashes per capita ranges nearly fivefold across Britain from the lowest in Wales at £211 (Caerphilly) to the highest in Wales at £988 (Powys)
- The greatest English loss per capita is North Yorkshire (£765)
- The greatest Scottish loss per capita is Aberdeenshire (£821)



Most improved roads

Improved roads are those where there has been a statistically significant reduction in the number of fatal and serious crashes over time. Only 2% of roads on the Risk Mapped network have shown a significant reduction in fatal and serious crashes.

The top 10 'most improved roads' are shown in Table 1. In the earlier data period (2009-11) the 10 roads listed were together 3 times more risky than the later data period (2012-14).

Between 2009-11 and 2012-14, fatal and serious crashes on the roads listed fell by 68% from 168 to 53. This led to an annual economic saving for fatal and serious crashes of £20 million in 2013 values, or £112,000 per kilometre, with a net present value worth approximately £0.3 billion over 20 years.

This year's most improved road is the A227 between Tonbridge and the A25 near Borough Green. Kent County Council are responsible for this road and attribute the reduction in trauma to the introduction of a routine maintenance regime. In addition to a signing and lining package there are yellow backed signs in hazardous locations, good use of double white lines, speed limit roundels and road safety education packages.

Two roads featured in Table 1 were featured in the higher risk tables of the annual Performance Tracking results before. They have reduced from the highest level of risk (black).

The A809, which is this year's fifth most improved road was the highest risk road in Scotland in the 2012 and 2014 Performance Tracking results. In 2014, it was also the second highest 'persistently higher risk road' across Britain with unacceptably high risk between 2007-09 and 2010-12. The A809 has improved because of improvements to the visibility for drivers by ensuring a high standard of signing, lining and road studs and by removing roadside hazards. Furthermore, vehicle activated signs and high friction surfacing have been implemented.

Finally, the A537 once topped the 'persistently higher risk roads' tables regularly in the annual Performance Tracking results. Last year, the road featured for the first time in the table of 'most improved roads'. The measures that were implemented by the Cheshire Safer Road Partnership and Cheshire East Council (formerly Cheshire County Council) have enabled the road to have significantly improved between 2009 and 2014. These include the implementation of motorcycle friendly barriers and average speed cameras. It is important to note that the road reduced from a significantly high level of risk to a medium-high risk which is still unacceptable.

This year's most improved road is the A227 between Tonbridge and the A25 near Borough Green. Kent County Council are responsible for this road and attribute the reduction in trauma to the introduction of a routine maintenance regime. In addition to a signing and lining package there are yellow backed signs in hazardous locations, good use of double white lines, speed limit roundels and road safety education packages.

Table 1. Britain's most improved roads (2009-11 & 2012-14)

Road	Route description	Region/ country	Length (km)	Road type	F&S crashes (09-11)	EuroRAP Risk Rating (09-11) ¹	F&S crashes (12-14)	EuroRAP Risk Rating (12-14)¹	% decrease in F&S crashes over time	Measures implemented include:
A227*	Tonbridge to A25 (Borough Green)	SE	12	Single	10	85.1	1	8.6	-90%	Improved signing and lining including speed limit roundels, double centre line, yellow backing boards, resurfacing, education (local schools)
A3100*	A283 (Milford) to Sandy Lane (Guildford)	SE	10	Single	10	62.7	2	12.7	-80%	'Operation Horizon' - full carriageway resurfacing with improved lining and road studs
A134	Sudbury to Bury St Eds	Е	23	Single	20	82.4	5	20.8	-75%	Resurfacing with new lining and road studs, 40mph limit extended, junction visibility improvements
A34	Walsall to Stafford	WM	23	Single	20	57.1	5	14.6	-75%	Resurfacing, pedestrian crossing upgrades, new footway, motorcycling awareness campaign, fixed camera enforcement
A809*	A811 (Croftamie) to B8050 (Bearsden)	Scot	16	Single	18	247.4	5	69.9	-72%	Improved signing and lining, vehicle activated warning signs, high friction surface, road studs, removal of roadside hazards
A537	Macclesfield to Buxton	NW	12	Single	21	350.4	7	120.0	-67%	Motorcycle friendly barriers, average speed cameras
A8*	A770 (Greenock) to Renfrew	Scot	25	Mixed	17	30.7	6	9.8	-65%	Resurfacing, junction improvements, signing and lining
A6097	A46 (Bingham) to A614 (Oxton)	EM	17	Mixed	19	57.7	7	21.5	-63%	Average speed cameras
A49	Standish to Preston	NW	16	Single	14	77.4	6	34.3	-57%	50mph limited extended, mobile enforcement, cycle improvements
A4042	Abergavenny to M4 J25	Wales	25	Mixed	19	30.1	9	15	-53%	Junction improvements, signing and lining, high friction surfacing

Ranked by percentage reduction in the number of fatal and serious (F&S) crashes between the two data periods; significant reduction in the number of F&S crashes between data periods at the 95% confidence level; minimum of 9 F&S crashes 2009-11; minimum F&S crash density of 1 F&S/mile 2009-11; *indicates roads classified as non-primary; 'EuroRAP Risk Rating based on the number of fatal and serious crashes per billion vehicle km travelled: black (high risk), red (medium-high risk), orange (medium risk), yellow (low-medium risk), green (low risk); measures implemented based on road authority responses to prepublication consultation.

Persistently higher risk roads

'Persistently higher risk roads' are those rated high (black) and medium-high (red) risk in both survey periods and have shown little or no change over time or seen significant increases in the number of fatal and serious crashes.

In previous reports the roads listed were concentrated in the North West and the East Midlands regions. However, roads in the South East of England now account for 5 of the 10 roads featured.

Another trend discontinuity is the significant contribution to risk from motorcyclists. Previously, crashes that involved motorcyclists alone would have been enough to ensure a higher risk rating for most roads. Now, we note that pedestrians and cyclists are almost as likely to be killed or seriously injured as motorcyclists and in 5 of the 10 roads featured are more likely.

All roads featured are non-primary 'A' roads.

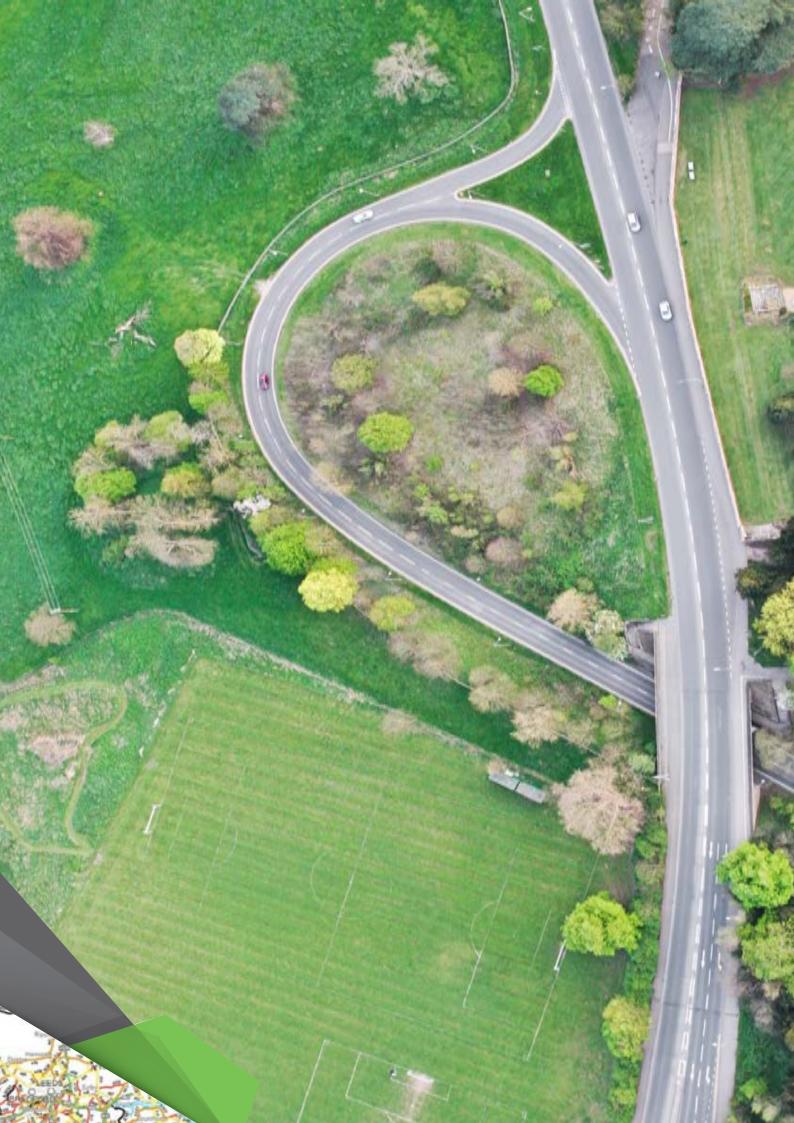
The road at the top of this year's list is the A285 between Chichester and Petworth which last topped this table in the 2014 results. It is a rural, winding road located within the South Downs National Park. It is popular with motorcyclists who account for 39% of crashes causing death or serious injury. Half of the crashes causing death or serious injury occur from running off the road. Narrow lanes, poor alignment and tree lined roadsides contribute to this problem. In recent years West Sussex County Council has implemented several road safety treatments including the laying of a high-specification road surface to improve skidding resistance, localised road widening, crash barrier upgrades, improvements to the signing and lining along the road plus the introduction of a 30mph limit at Duncton and Halnaker villages. Sussex Police and the Sussex Safer Roads Partnership have also instigated a motorcycle safety initiative, including speed enforcement in an effort to reduce collisions involving motorcyclists.



Table 2. Britain's persistently higher risk roads (2009-11 & 2012-14)

										% co	ntribut	ion of	crash t	ypes (12-14)²
Road	Route description	Region/country	Length (km)	Road type	F&S crashes (09-11)	EuroRAP Risk Rating (09-11) ¹	F&S crashes (12-14)	EuroRAP Risk Rating (12-14)¹	% of crashes with m0torcyclist involvement (12-14)	Pedestrians/ cyclists	Junctions	Run-offs	Head-ons	Rear end shunts	Other
A285*	A27 (Chichester) to Petworth	SE	19	Single	17	149.1	23	199.6	39%	4%	22%	48%	17%	4%	4%
A18*	Laceby to Ludborough	EM/ Y&H	16	Single	10	131.8	16	189.7	31%	6%	31%	44%	13%	0%	6%
A588*	A585 (Blackpool) to Lancaster	NW	29	Single	24	153.1	28	179.2	50%	7%	46%	43%	4%	0%	0%
A27*	M27 J12 to J11	SE	6	Mixed	16	101.9	22	140.0	55%	36%	55%	0%	0%	0%	9%
A532*	A530 to A534 (Crewe)	NW	5	Single	10	154.6	9	134.3	22%	56%	44%	0%	0%	0%	0%
A32*	M27 J10 to Gosport	SE	11	Mixed	24	91.9	33	130.1	39%	48%	39%	0%	0%	3%	9%
A6*	M6 J33 to Lancaster	NW	9	Single	29	170.8	21	129.3	19%	67%	10%	10%	0%	5%	10%
A361*	Chipping Norton to Banbury	SE	21	Single	15	86.9	22	128.7	18%	36%	27%	23%	5%	0%	9%
A36*	M3 J2 to A35 (Southampton)	SE	7	Single	15	150.2	12	123.7	33%	42%	50%	8%	0%	0%	0%
A643*	Brighouse to Morley	Y&H	12	Single	11	119.3	11	117.7	36%	27%	27%	18%	9%	0%	18%

Ranked by EuroRAP Risk Rating 2012-14; no significant reduction in the number of F&S crashes between data periods or significant increase in the number of F&S crashes between data periods at the 95% confidence level; minimum number of 9 F&S crashes in both data periods; minimum F&S crash density of 1 F&S/mile in both data periods; EuroRAP Risk Rating is either high risk (black) or above average of medium-high risk (red) roads in both data periods; *indicates roads classified as non-primary; 'EuroRAP Risk Rating based on the number of fatal and serious crashes per billion vehicle km travelled: black (high risk), red (medium-high risk), orange (medium risk), yellow (low-medium risk), green (low risk); 'percentages may not sum due to rounding. Some of the roads listed may have had measures implemented since 2013.





Risk Rating of Britain's Motorways and A Roads

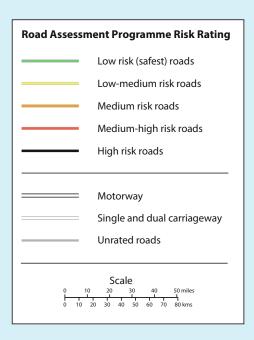
This map shows the statistical risk of death or serious injury occurring on Britain's motorway and A road network for 2012-2014. Covering 44,500km in total, the British EuroRAP network represents just 10% of Britain's road network but carries 56% of the traffic and half of Britain's road fatalities.

The risk is calculated by comparing the frequency of road crashes resulting in death and serious injury on every stretch of road with how much traffic each road is carrying. For example, if there are 20 crashes on a road carrying 10,000 vehicles a day, the risk is 10 times higher than if the road has the same number of crashes but carries 100,000 vehicles.

Some of the roads shown have had improvements made to them recently, but during the survey period the risk of a fatal or serious injury crash on the black road sections was 23 times higher than on the safest (green) roads.

For more information on the Road Safety Foundation go to **www.roadsafetyfoundation.org**.

For more information on the statistical background to this research, visit the EuroRAP website at **www.eurorap.org**.



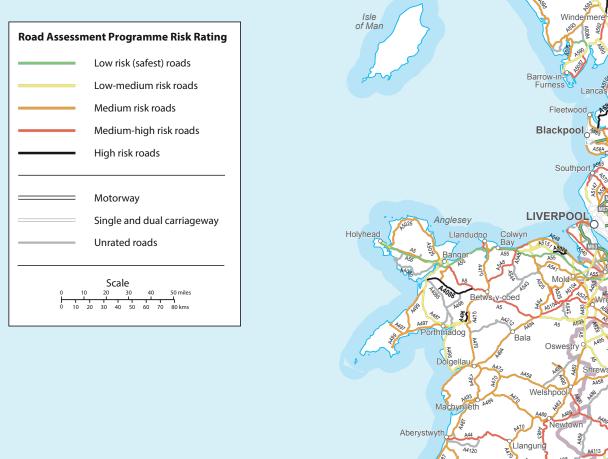
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© Road Safety Foundation 2016. Digital Map Data © Collins Bartholomew Ltd 2016. The Foundation is indebted to the Department for Transport (DfT) for allowing use of data in creating the map. This work has been financially supported by Ageas. Crash information is for 2012-2014. Traffic data is the average for 2012-2014 weighted by section length with local corrections where appropriate. The roads shown are based on the 2013 network but the map excludes the centres of major cities. No results are presented for roads shown in grey - these are roads that are not statistically robust enough for analysis. Risk rates on road sections vary but it is expected that, on average, those off the A road network will have higher rates than sections on it. Generally motorways and high quality dual carriageway roads function in a similar way and are safer than single carriageway or mixed carriageway roads.

Prepared under licence from EuroRAP AISBL using Risk Bands 2020 protocols © Copyright EuroRAP AISBL. This map may not be reproduced without the consent of the Road Safety Foundation.

Regional Analysis

The following analysis considers the crash costs on all roads in non-metropolitan local authorities where the costs, and scope for progress, are significant.

The economic loss is determined from the fatal and serious crash data contained in police records only. The authorities Rutland, Isles of Scilly, Orkney Islands, Merthyr Tydfil and Torfaen have been excluded from the analysis as the figures for the number of crashes causing death or serious injury were too low to compare with the rest of the British non-metropolitan authorities.

The results for each non-metropolitan road authority can be found on the Foundation's website (roadsafetyfoundation.org).

Tables 3 and 4 give the lowest and highest risk authorities based on their total economic loss. The tables show the percentage of costs arising on the Strategic Road Network (SRN) and on the network of motorways and 'A' roads outside urban cores (the British EuroRAP network).

The authorities with the lowest costs (Table 3) are low population authorities in Wales and Scotland where the total amount of travel – and so the total exposure to risk- is low and fatal and serious injuries are generally fewer. Nevertheless the annual cost of serious road crashes is significant in both absolute and relative terms to these authorities.

Table 3: Economic loss 2012-14 (lowest)

Authority (includes SRN)	Economic loss (£m)	% of cost on SRN	% of cost on EuroRAP network
East Ayrshire	34	12%	30%
South Ayrshire	35	34%	66%
Caerphilly	38	0%	52%
Redcar and Cleveland	39	2%	50%
Moray	40	34%	54%

The authorities bearing the highest costs (Table 4) are larger ones with significant volumes of travel within their boundaries. These are all located in England, particularly in the South East. The economic burden of serious road crashes in Hampshire, Kent and Essex each exceed £0.5 billion over the three year data period. Targeting the EuroRAP network within each authority could pay substantial dividends, especially in Kent, Lincolnshire and North Yorkshire where over 50% of costs came from this network.

Table 4: Economic loss 2012-14 (highest)

Authority (includes SRN)	Economic loss (£m)	% of cost on SRN	% of cost on EuroRAP network
Hampshire	642	16%	49%
Kent	604	20%	60%
Essex	545	14%	38%
North Yorkshire	461	10%	55%
Lincolnshire	438	8%	57%



Tables 5 and 6 give the lowest and highest risk authorities based on their economic loss per capita.

The road authorities in Table 5 with the lowest crash costs per capita are scattered across Britain. The SRN does not feature significantly in Table 5 but the EuroRAP network accounts for a significant proportion of loss per capita in most authorities shown.

Table 5: Economic loss per capita 2012-14 (lowest loss authorities)

Authority (includes SRN)	Economic loss (£m)	% of cost on SRN	% of cost on EuroRAP network	Population ('000s)	Economic loss per capita (£)	Economic loss per capita (£) – EuroRAP network
Caerphilly	38	0%	52%	179	211	110
North Somerset	56	11%	50%	206	273	136
East Ayrshire	34	12%	30%	122	278	84
Fife	105	13%	68%	367	287	196
Redcar and Cleveland	39	2%	50%	135	288	143

Of the five authorities in Table 6 with the highest economic loss per capita, three are found in Scotland and one each in Wales and England. In most of these authorities there are high proportions of economic loss per capita for both the SRN and the EuroRAP network. This suggests a proportion of the loss is suffered from those travelling through the authorities.

Table 6: Economic loss per capita 2012-14 (highest loss authorities)

Authority (includes SRN)	Economic loss (£m)	% of cost on SRN	% of cost on EuroRAP network	Population ('000s)	Economic loss per capita (£)	Economic loss per capita (£) – EuroRAP network
Powys	131	56%	71%	133	988	698
Aberdeenshire	212	30%	71%	258	821	579
North Yorkshire	461	10%	55%	603	765	425
Perth and Kinross	110	53%	79%	148	746	592
Argyll and Bute	65	54%	87%	88	739	640



Tables 7 and 8 give the lowest and highest loss authorities based on their economic loss per traffic (£ per thousand vehicle km travelled). Table 8 shows a higher proportion of the cost falling on the EuroRAP network for all authorities shown compared with those in Table 7.

Table 7: Economic loss per traffic 2012-14 (lowest risk)

Authority (includes SRN)	Economic loss (£m)	% of cost on SRN	% of cost on EuroRAP network	Traffic (billion vehicle km)	% of traffic on EuroRAP network	Economic loss per traffic (£ per thousand veh km)
West Berkshire	70	11%	43%	8.5	47%	8.2
North Somerset	56	11%	50%	6.8	81%	8.2
Staffordshire	247	19%	53%	27.1	72%	9.1
Worcestershire	195	19%	66%	19.2	88%	10.2
East Ayrshire	34	12%	30%	3.0	62%	11.2

The economic loss per traffic on the SRN for the authorities identified in Table 8 varies from 8% to 56%. A high proportion of the loss per traffic occurs on the EuroRAP network.

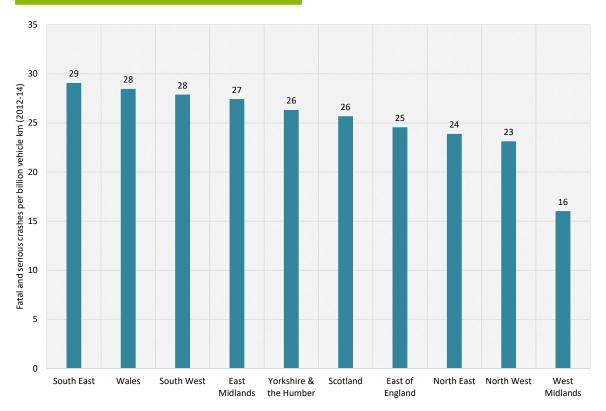
Table 8: Economic loss per traffic 2012-14 (highest risk)

Authority (includes SRN)	Economic loss (£m)	% of cost on SRN	% of cost on EuroRAP network	Traffic (billion vehicle km)	% of traffic on EuroRAP network	Economic loss per traffic (£ per thousand veh km)
Powys	131	56%	71%	4.4	79%	30.0
Aberdeenshire	212	30%	71%	8.1	81%	26.1
Lincolnshire	438	8%	57%	17.5	73%	25.1
Argyll and Bute	65	54%	87%	2.6	80%	24.9
Denbighshire	61	8%	46%	2.6	44%	23.6



Figures 2 to 6 give the regional analysis for the British EuroRAP network only.

Figure 2. Average risk of death or serious injury on the EuroRAP network by English region/Scotland/Wales (2012-14)

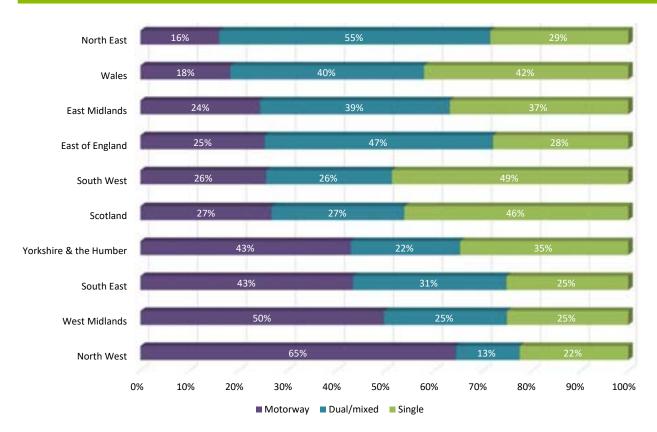


For the first time, the part of Britain with the highest rate of death and serious injury on the network is the South East. The risk on the South East network is over 80% higher than the risk for the network in the West Midlands, the English region with the lowest rate of death and serious injury.

The West Midlands EuroRAP network is significantly safer than all other regions and nations. The second safest region, the North West is 44% more unsafe than the West Midlands.

Each part of Britain performs better or worse depending on the amount of travel on safer road types such as motorways or relatively unsafe roads like single carriageways. Figure 3 gives the distribution of travel per region.

Figure 3. Distribution of travel on each road type by English region/Scotland/Wales (2012-14)



The North West carries the largest volume of its traffic on motorways (65%). However, underperforming motorways and single carriageways (see Figures 4 and 5) mean that the region's risk performance is not as good as the top performer, West Midlands.

The distribution of travel in Scotland and the South West are almost identical. Scotland performs worse than the South West because of underperforming motorways. These are nearly 20% worse than those of the South West (see Figure 4). The performance of the single carriageways in the South West and Scotland are almost identical (see Figure 5).

The highest risk motorways on the network are in the East of England and the highest risk single carriageway 'A' roads are in the North West. The West Midlands has the safest of both road types. The difference in risk between the safest and least safe single carriageway 'A' roads and motorways varies. The riskiest motorways (rated low-medium risk) are on average twice as risky as the safest (rated low risk); the riskiest single carriageway 'A' roads (rated high risk) are on average 4 times as risky as the safest (rated low to medium risk).

Figure 4. Average risk of death or serious injury on the EuroRAP motorway network by English region/Scotland/Wales (2012-14)

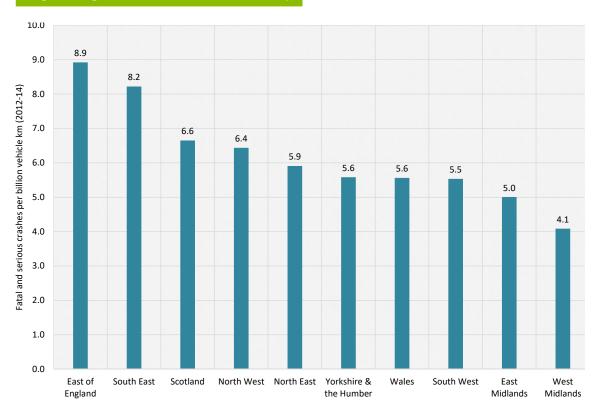


Figure 5. Average risk of death or serious injury on the EuroRAP single carriageway 'A' road network by English region/Scotland/Wales (2012-14)

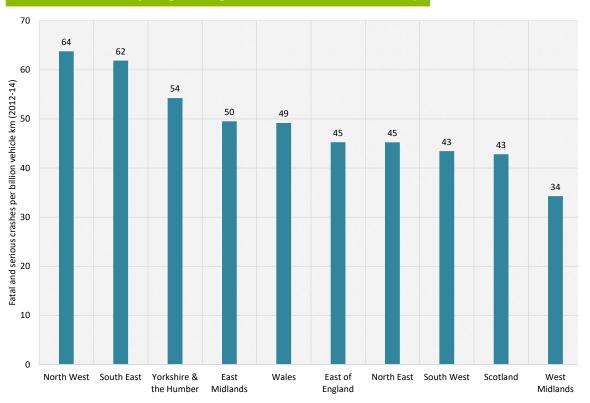
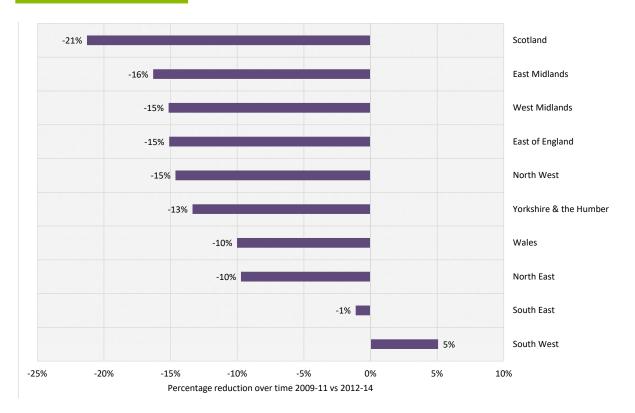


Figure 6. Change in average risk of death or serious injury on the EuroRAP network over time by region/nation (2012-14)



There was a 21% reduction on risk of death and serious injury on the network surveyed in Scotland, making it the most improved of the British regions and nations. Scotland previously topped the table for the highest risk region on the British EuroRAP network, though it now features in the middle. The South West has seen risk increase by 5% and as a result the South West is third worst. It was previously second best behind West Midlands for the performance of the region's single carriageways and motorways. With it's performance now lagging behind Scotland and East Midlands respectively in those categories, the overall performance has dropped.

We turn now to consider the performance of the crash cost centres across the British EuroRAP network. The rate of economic loss per capita and per traffic (£ per thousand vehicle km travelled) is given per crash cost centre in Table 9. The Welsh trunk roads lose the highest economic loss per capita. The loss is similar to the rate lost on the Welsh non-primary 'A' roads, both networks are similar in length. 70% of the EuroRAP trunk road network in Wales is made up of single carriageways. Per traffic, the English non-primary 'A' roads come out as the most unsafe and the English and Welsh motorway network as the safest.

Table 9: Economic loss by crash cost centre (2012-14

Crash cost centre	Total Economic loss (£m) 2012-14	Economic loss per capita 2012-14 (£)	Economic loss per traffic 2012-14 (£ per thousand veh km)
Highways England Motorways Trunk roads Total	792 1,313 2,105	16 24 40	3 9 5
Transport Scotland Motorways Trunk roads Total	66	12	4
	371	70	15
	437	82	10
Welsh Government Motorways Trunk roads Total	26	9	3
	303	98	14
	329	107	11
English local authority 'A' roads Primary Non-primary Total	2,471	46	16
	3,106	59	21
	5,628	104	18
Scottish local authority 'A' roads Primary Non-primary Total	119	22	12
	388	73	18
	507	95	16
Welsh local authority 'A' roads Non-primary	299	97	17
TOTAL	9,240	150	11

Figure 7. Distribution of travel in each crash cost centre (2012-14)

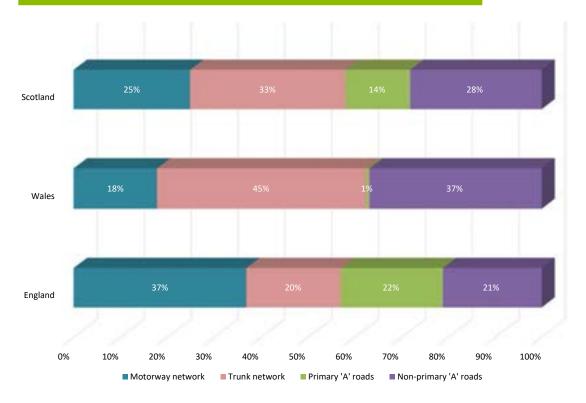
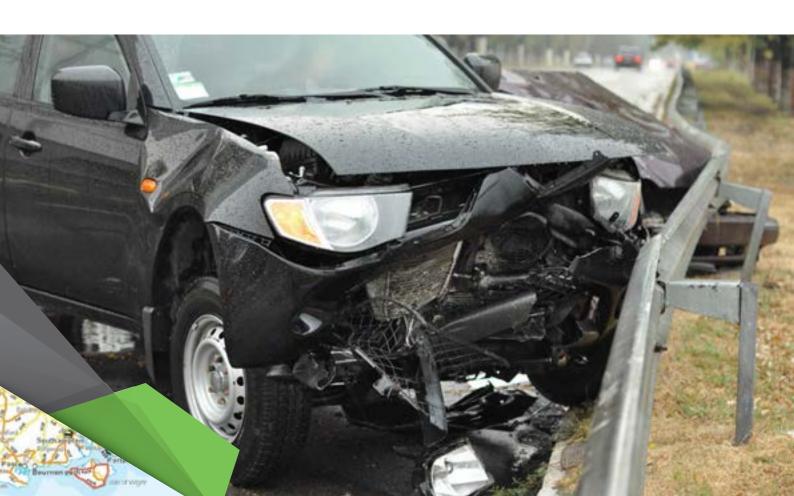


Figure 7 gives the distribution of travel across each crash cost centre in Britain. There is a stronger reliance on the trunk road networks in Wales and Scotland which have sparser motorway networks.



Highest risk road in each of Scotland, Wales and English regions

The highest risk roads in each British region or nation are listed in Table 10. Roads are ranked by EuroRAP risk rating from highest to lowest.

Roads featured in the table have been obtained by implementing stricter filters to the dataset used to produce the Risk Map. Therefore, the Risk Map may show roads that are higher risk. Roads that are featured in these tables need attention because not only are they

high risk but they have a high number of crashes causing death or serious injury.

The majority of crashes across the combined network of roads featured in Table 10 are at junctions. With the exception of the A688, all roads are non-primary 'A' roads. The highest risk road in Britain is the A285 between Chichester and Petworth.

Table 10. The highest risk road in each of Scotland, Wales and each English region (2012-14)

								% co	ntribut	ion of	crash t	ypes (12-14)²
Road ¹	Route description	Region/country	Length (km)	Road type	F&S crashes (12-14)	EuroRAP Risk Rating (09-11) ¹	% of crashes with m0torcyclist involvement (12-14)	Pedestrians/ cyclists	Junctions	Run-offs	Head-ons	Rear end shunts	Other
A285*	A27 (Chichester) to Petworth	SE	19	Single	23	199.6	39%	4%	22%	48%	17%	4%	4%
A588*	A585 (Blackpool) to Lancaster	NW	29	Single	28	179.2	50%	7%	46%	43%	4%	0%	0%
A5026*	Full road (Holywell)	Wales	10	Single	9	175.4	44%	0%	33%	22%	22%	0%	22%
A909*	Burntisland to Kelty	Scot	14	Single	11	172.3	9%	27%	0%	0%	36%	0%	36%
A6033*	Littleborough to Todmorden	Y&H	9	Single	12	132.6	25%	50%	25%	17%	8%	0%	0%
A4173*	A38 (Gloucester) to A46 (Pitchcombe)	SW	9	Single	10	128.3	20%	30%	30%	10%	10%	0%	20%
A126*	A13 to Tilbury	Е	13	Single	19	121.0	21%	37%	58%	5%	0%	0%	0%
A688	Barnard Castle to A68 (West Auckland)	NE	17	Single	15	107.3	27%	27%	47%	13%	7%	0%	7%
A427*	A6003 to A43 (Corby)	EM	6	Mixed	9	103.0	0%	56%	22%	11%	0%	0%	11%
A428*	A46 (Coventry) to A5	WM	20	Single	20	93.7	30%	60%	35%	5%	0%	0%	0%

Ranked by EuroRAP Risk Rating 2012-14; minimum number of 9 F&S crashes 2012-14; minimum F&S crash density of 1 F&S/mile 2012-14; * indicates roads classified as non-primary; ¹EuroRAP Risk Rating based on the number of fatal and serious crashes per billion vehicle km travelled: black (high risk), red (medium-high risk), orange (medium risk), yellow (low-medium risk), green (low risk); ²percentages may not sum due to rounding. Some of the roads listed may have had measures implemented since 2013.



Risk Rating of England's Strategic Road Network

This map shows the statistical risk of death or serious injury occuring on England's strategic road network for 2012-2014.

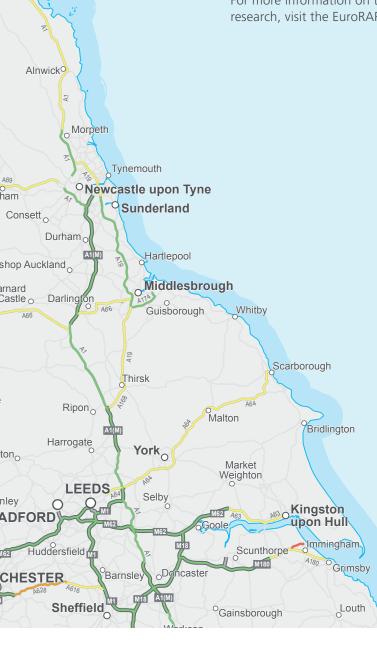
The risk is calculated by comparing the frequency of road crashes resulting in death and serious injury on every stretch of road with how

much traffic each road is carrying. For example, if there are 20 collisions on a road carrying 10,000 vehicles a day, the risk is 10 times higher

than if the road has the same number of collisions but carries 100,000 vehicles.

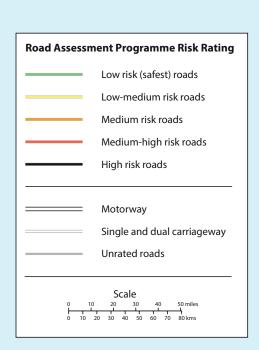
For more information on the Road Safety Foundation go to **www.roadsafetyfoundation.org**.

For more information on the statistical background to this research, visit the EuroRAP website at **www.eurorap.org**.



Berwick-

upon-Tweed







© Road Safety Foundation 2016. Digital Map Data © Collins Bartholomew Ltd 2016. The Foundation is indebted to the Department for Transport (DfT) for allowing use of data in creating the map. This work has been financially supported by Ageas. Crash information is for 2012-2014. Traffic data is the average for 2012-2014 weighted by section length with local corrections where appropriate. The roads shown are based on the 2013 network but the map excludes the centres of major cities. No results are presented for roads shown in grey - these are roads that are not statistically robust enough for analysis. Risk rates on road sections vary but it is expected that, on average, those off the A road network will have higher rates than sections on it. Generally motorways and high quality dual carriageway roads function in a similar way and are safer than single carriageway or mixed carriageway roads.

Prepared under licence from EuroRAP AISBL using Risk Bands 2020 protocols © Copyright EuroRAP AISBL This map may not be reproduced without the consent of the Road Safety Foundation.

How safe is the English strategic road network?

Since 2015, RSF have published a Risk Map separately for the SRN in England. A government owned company, Highways England, was created in 2015 with responsibility for national roads in England.

The company has set a clear long term goal to bring the number of people killed or injured on the network as close as possible to zero by 2040. It has pledged that, by the end of 2020, 90% of travel on the roads for which it has responsibility will be on roads with a 3-star EuroRAP safety rating or better.

We have calculated the most improved and highest risk SRN roads. The most improved road on the SRN, is the A1 between J65 of the A1(M) and the A69 in Newcastle upon Tyne. Crashes reduced on this road by 68% from 25 to 8 between the two data periods surveyed, improving the road from a low-medium risk to low risk. Improvements to the Newcastle and Gateshead Western

Bypass road included the introduction of a permanent 50mph speed limit on a significant length of the road plus a £61m road improvement scheme adding eight miles of extra lanes, a new footbridge, new footpath and cycle path. During the roadworks temporary lower speed limits were enforced with average speed cameras. Consistent improvements are being seen on the A1. The EuroRAP section to the north of the section featured below between Newcastle and Morpeth was featured in the 2014 Performance Tracking results when the road reduced from low-medium risk to low risk and the fatal and serious crashes reduced from 15 in 2007-09 to 4 in 2010-12.

Table 11. The English strategic road network's most improved road (2009-11 & 2012-14)1

Road	Route description	Region/ country	Length (km)	Road type	F&S crashes (09-11)	EuroRAP Risk Rating (09-11)1	F&S crashes (12-14)	EuroRAP Risk Rating (12-14)¹	% decrease in F&S crashes over time	Measures implemented include:
A1	A1(M) J65 to A69 (Newcastle upon Tyne)	NE	13	Dual	25	21.7	8	6.9	68%	Speed limit reduction from 70mph to 50mph, new road surface, new cycle track and footbridge, improved incident response

 $^{{}^{\}scriptscriptstyle 1}\!\mathsf{Same}$ methodology as applied in roads listed in Table 1.



The highest risk is road is the A21 between Hurst Green and Hastings. The road is entirely rural and passes through several villages. This road featured as the highest risk road on the SRN in the 2015 report but showed a medium-high risk. Crashes tend to be concentrated at junctions and bends.

Table 12. Persistently highest risk road on the English strategic road network (2009-11 & 2012-14)1

	Route description	Region/country	Length (km)	Road type	F&S crashes (09-11)	EuroRAP Risk Rating (09-11)1	F&S crashes (12-14)	EuroRAP Risk Rating (12-14)1	% of crashes with m0torcyclist involvement (12-14)	% contribution of crash types (12-14) ²					
Road										Pedestrians/ cyclists	Junctions	Run-offs	Head-ons	Rear end shunts	Other
A21	A229 - Hastings	SE	23	Single	43	123.8	38	107.3	29%	37%	16%	11%	0%	8%	29%

¹Same methodology as applied in roads listed in Table 2.

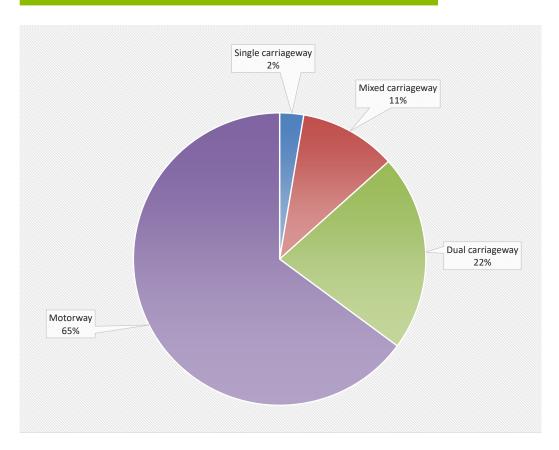
After consulting with Highways England it was found that local schemes have been implemented to improve blackspots. However, with blackspots removed, the unacceptably higher risk is now attributed to a road issue and prioritising improvements for a road like the A21 within the strategic road network has been difficult. All the strategic roads were once subjected to the same criteria and so priority was always given for motorways, which carry a higher volume of traffic.

With the new company, Highways England, different criteria can be applied and road based safety improvements are proposed for the A21. Issues on the road which plan to be improved are the visibility of villages and to standardise the designs within each village; a range of measures, including compliance, improving driver behaviours and improve driver awareness of the road conditions are also being considered.

The A21 was studied as part of an RSF research project in 2014 and Star Ratings were obtained. The rural high speed roads achieved only 2-star in their entirety. The road performs well when it comes to maintenance, but more action needs to be taken to achieve minimum 3-star for the road. While there is central hatching for a significant proportion of the road and the quality of the signage and lining is adequate, action is required beyond these simple measures. In particular, roadside hazards need to be addressed, so that the distance to them is considerably longer and the run-off area needs to be widened as it is less than one metre in its current state.

Figures 8 to 11 give summary analysis for roads on the SRN.

Figure 8. Distribution of travel on each road type (2012-14)



Motorways on the SRN have heavier traffic than other road types. Typically, the traffic flow at an average road on the motorway network is 6 times higher than the flow at an average road on the strategic single carriageway network. That results in nearly two-thirds of travel (65%) being on motorway and just 2% of travel on the single carriageway trunk roads.

Figures 9 and 10 study the economic loss on the SRN and compares the average loss per traffic and kilometres respectively. A comparison with the same calculations for the English local authority 'A' roads on the British EuroRAP network is given in each graph.

While the British EuroRAP network sees the risk on single carriageway 'A' roads as 8 times the risk of motorways, the risk is 7 times higher on the English SRN. The economic loss shown in Figure 9 is just under 7 times higher per traffic. The difference between the economic loss per traffic on dual and single carriageways on the SRN is nearly threefold compared with just two fold on the local authority maintained 'A' roads.

Across the English SRN the economic loss per kilometre (Figure 10) is marginally different between each road type compared with a higher loss per kilometre on the dual carriageway 'A' roads maintained by local authorities.

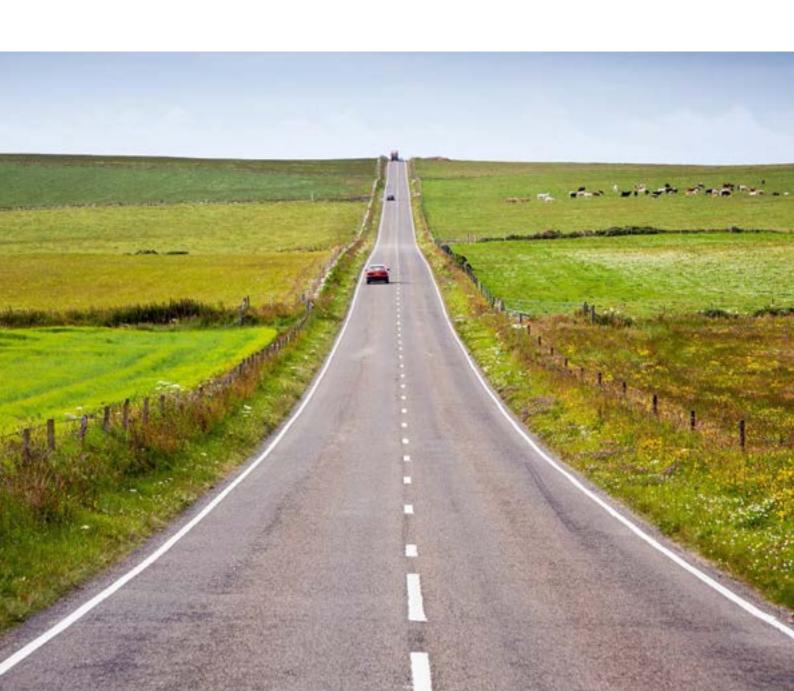


Figure 9. Fatal and serious crash cost per traffic by road type (2012-14)

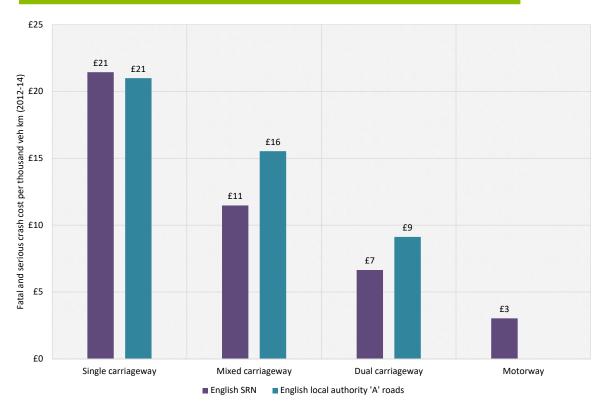
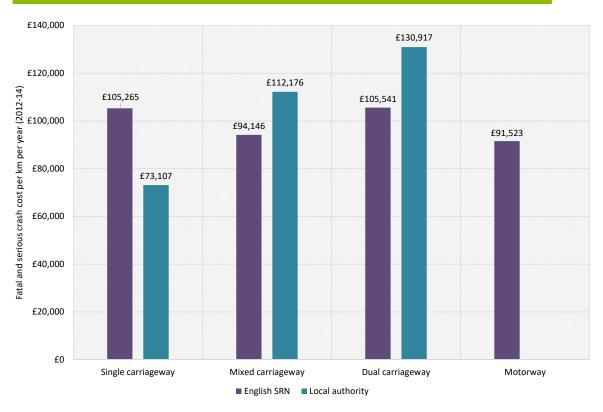
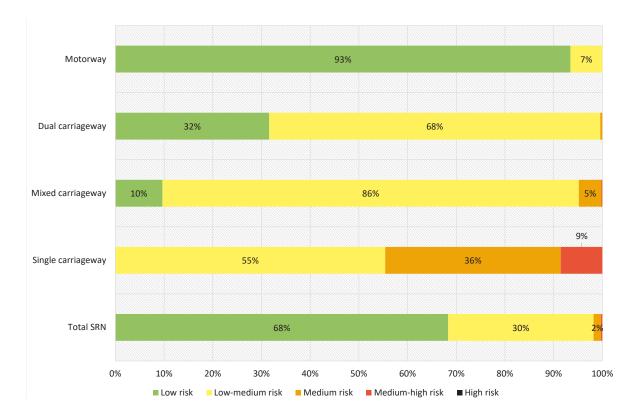


Figure 10. Annual fatal and serious crash cost per km by road type (2012-14)



Backpeol ar

Figure 11. Distribution of risk across each road type on the SRN by travel (2012-14)



Just 2% of the SRN network is given a medium risk rating and two-thirds a low risk rating.

93% of motorway travel is on low risk roads, almost the same proportion of all travel across the British EuroRAP network of motorways. No single carriageway roads rated low risk.

About Risk Mapping

The first EuroRAP Risk Maps for Britain's major roads were published by the Road Safety Foundation in 2002.

These well-known colour coded maps show the risk to a road user of being killed or seriously injured. They highlight the significantly changing risk, for example, as the same drivers in the same vehicles turn from one road into another.

These risks can often be 10 or even 20 times greater on one road rather than on another. Even taken as an average, single carriageways are now 8 times riskier than motorways, while dual carriageways are 3 times riskier.

These annual Risk Maps for Britain's motorways and 'A' roads have become a key national road safety measurement of risk on roads. The majority of British road deaths are concentrated on the 10% of road network mapped.

About Performance Tracking

Performance Tracking uses the data compiled for each risk map to assess how risk on the network as a whole, and on an individual road, has changed over time. It is a way of measuring success and the effectiveness of investment in safer roads.

This is done in several stages:

- Risk Mapping compares consecutive three-year data periods to identify roads that have shown a statistically significant reduction or increase in the number of crashes causing fatal and serious injuries, and those roads for which there has been little or no change;
- 2. Data for individual years is checked to assess consistency of trends over time;
- 3. Road authorities are consulted in order to build up information on specific issues affecting road safety, and on the types of engineering, enforcement or education measures that may have been implemented and any actions planned in the immediate future.

About Star Rating

Just as the Euro NCAP Star Rating rates the in-built safety of vehicles, EuroRAP Star Rating rates the in-built safety of roads.

Measuring infrastructure safety helps managers of road networks measure and manage their contribution to road safety. The Star Rating makes clear the contribution for which they are wholly responsible, regardless of changes in traffic law, vehicle safety, demography, or the economy.

EuroRAP was launched by the same partnership that developed Euro NCAP: the UK, Dutch and Swedish governments together with Europe's leading motoring organisations and charities.

In 2007, EuroRAP piloted a method to Star Rate the in-built safety of roads to complement the Euro NCAP Star Rating of vehicles. The methodology involves road inspections at 100 metre intervals and was developed by the International Road Assessment Programme (iRAP), which systematically captures data on more than 50 locational and risk factors known to determine the safety of a road.

Global research and development cooperation followed, resulting not only in a commonly applied measurement system but also the software, ViDA, developed by iRAP together with the support needed for practical applications. This work continues today. ViDA may be consulted free of charge at http://www.irap.net/en/resources/vida-online-software.

About Safer Road Investment Plans

ViDA not only Star Rates the safety of a road for vehicle occupants, motorcyclists, pedestrians and cyclists but also, by generating Safer Road Investment Plans (SRIPs), suggests the practical safety engineering measures that road engineers can deploy to deliver high return improvements.

These commonly include safer junctions, roadsides, footpaths, crossings and speed management.

Today Star Rating protocols measuring the safety of road infrastructure are being applied in more than 70 countries as varied as Australia, United States, China, Philippines, India and Mexico. SRIPs drawn up from this work help to shape significant investments globally.

Notes

Strategic road network

The *strategic road network* is the term used recently to describe national networks of motorways and trunk roads. These motorways and trunk roads are the responsibility of national governments in England (Department for Transport), Wales (Welsh Government) and Scotland (Scottish Government).

In England, a new government company, Highways England, became responsible in 2015 for the Strategic road network. The Department for Transport has delegated responsibility for the network in England to Highways England. In Scotland, day to day responsibilities are managed by an Agency, Transport Scotland and in Wales, the Welsh government.

Primary road network

The *primary road network* is the network of 'A' roads and are identified by the familiar 'green' signs at the roadside. This network is important for through traffic and heavy commercial vehicles.

Roads on the primary road network are the responsibility of either national or local governments. The busiest roads on the primary road network are generally strategic roads overseen by national governments.

Non-primary 'A' roads

The network of *non-primary 'A' roads* have white signs at the roadside. The non-primary 'A' road network is the responsibility of local authorities.

The EuroRAP network

The EuroRAP network consists of all motorways and 'A' roads outside urban cores as shown on the map contained in the centre of this report.

Though the EuroRAP network comprises only 10% of Britain's road length, half of all road deaths occur on it. Accordingly this report uses the network to provide key indicators tracking Britain's road safety performance.

Crash cost centre

The economic loss of serious road crashes is calculated in this report and the relevant road authority or groups of road authorities or *crash cost centre* are identified for the roads of the network in question. In this way we can calculate the economic loss and identify the authority shouldering the burden of that loss. This in turn allows us to see which authorities are most likely to benefit significantly from cost reductions as a result of improving safety on the roads for which they are responsible.

Road type

Road type is the road type accounting for 80% or more of the road's length. The road type assigned is 'mixed' if the 80% figure cannot be reached.

Region and nation allocation

A road is allocated to the region or nation in which 80% or more of its length is contained. The region assigned is 'mixed' if the 80% figure cannot be reached.

Non-metropolitan authority

An authority is labelled *non-metropolitan* if at least 25% of the population is rural.

Economic loss

A crash cost is given to each road of the British EuroRAP network by assigning the total value of prevention costs defined by the Department for Transport for fatal and serious crashes. 2013 values have been used in this report³.

³DfT (2015) WebTAG: TAG data book, December 2015.

About the Road Safety Foundation

The Road Safety Foundation (RSF) is a UK charity advocating road casualty reduction through simultaneous action on all three components of the safe road system: roads, vehicles and behaviour.

The RSF has enabled work across each of these areas. Several of its published reports have provided the basis of new legislation and government policy. For the last 16 years the charity has focused on leading the establishment in the UK of the European Road Assessment Programme (EuroRAP).

The Road Safety Foundation plays a pivotal role in raising awareness of the importance of road infrastructure at all levels including:

- Regular publication of EuroRAP safety rating measures in a format readily accessible and understood by the general public, policymakers and professionals
- Issuing guidance on the use of EuroRAP protocols at operational level by road authorities so that road engineers are able to improve the safety of the road infrastructure for which they are responsible
- Proposing national strategies and benchmarks.

The Road Safety Foundation is registered in England and Wales under company no. 02069723. It is a UK registered charity (no. 295573) with its registered office being 60 Trafalgar Square, London, WC2N 5DS.

For more information please visit www.roadsafetyfoundation.org

About EuroRAP

The European Road Assessment Programme (EuroRAP) is dedicated to saving lives through safer roads and is an international not for profit association.

It is registered in Belgium under number 50962003 with company number 0479824257. EuroRAP's registered office is Rue de la Science 41, 1040, Brussels.

EuroRAP works to reduce death and serious injury through a programme of systematic testing of risk, identifying the major shortcomings that can be addressed by practical road improvement measures. It forges partnerships between those responsible for a safe road system – civil society, governments, motoring organisations, vehicle manufacturers and road authorities - and aims to ensure that assessment of risk lies at the heart of strategic decisions on road improvements, crash protection and standards of road management.

Its members are automobile and touring clubs, charities, national and regional road authorities, and universities and research institutes. EuroRAP is supported by the FIA Foundation, ACEA, and the International Road Assessment Programme (iRAP).

For more information please visit www.eurorap.org

About Ageas

Ageas is a leading provider of award-winning insurance solutions in the United Kingdom.

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The UK business is part of a listed international insurance Group with a heritage spanning 190 years. The Group offers Retail and Business customers Life and Non-Life insurance products designed to suit their specific needs, today and tomorrow. As one of Europe's larger insurance companies, Ageas concentrates its activities in Europe and Asia, which together make up the major part of the global insurance market. Ageas ranks among the market leaders in the countries in which it operates.

For more information please visit www.ageas.co.uk or email press.uk@ageas.co.uk

Making Road Travel as Safe as Rail and Air



We no longer need accept road deaths. The annual death toll can be driven towards zero. Travel on our road system can be made as safe as on rail and air within a generation.

Sudden road trauma destroys families but in the past we have failed to count the economic cost. Britain loses around 2% of GDF in road crashes. A lifetime of care for a single victim can cost more than £20m. The NHS and care systems are put under stress.

The key is to eliminate known high risks systematically. This report provides evidence on the risks that road users face across the targetable 10% of British roads where half of all deaths take place - our motorways and 'A' roads outside major cities. The risks are mapped across thousands of stretches of road totalling more than 25,000 miles.

The report also shows where risks are falling over time – and where they are not.

The most improved road in Britain is a stretch of the A227 in Kent. The most persistent high risk road is a stretch of the A285 in West Sussex

During the survey period, Britain's rate of death and serious injury fell by less than 2% annually. Modest action by road authorities on just the 10 most improved roads led to local falls in serious crashes of 70% saving over 100 deaths and serious injuries. The report also names 10 most persistently high risk roads.

Dozens can be killed and maimed in a handful of years on many of the individual stretches of routes highlighted in this report. The report also shows risks can be reduced and lives saved with economic returns that are higher, quicker and more certain than most projects competing for funds. This report presents results for every region of Britain. It shows that the highest risk of death and serious injury is now on the stressed main roads of South East England – the risks are near double the West Midlands.

The report shows separate results for the new government corporation responsible for England's strategic roads, Highways England. The company is spearheading the cultural change needed from complacent acceptance of death on the road: Highways England aim to bring the number of people killed or injured on the network as close as possible to zero by 2040. This bold goal is matched by immediate, measurable reductions in the risk levels that it plans to achieve by 2020.

This report maps how risks change on our road system as the same drivers in the same vehicles turn from one road section on to another. It highlights that risks can be twentyfold or higher on some roads than others.

It is not enough to highlight suffering. Priorities and a business case are needed to compete for scarce investment. This report reveals the economic cost of road crashes on the main road networks of individual local authorities. Some had crash costs exceeding £0.5bn in the survey period.

The government has a welcome new safety strategy based on adopting a new systematic approach. That approach to reducing death and trauma has been launched on strategic roads.

The government also wants high return investment in infrastructure to boost the economy. All the persistent high risk roads identified have rates of death and serious injury that are unacceptable. Investing to eliminate busy high risk road will bring strong economic returns. This investment is a critical step towards enabling road travel to become as safe as rail and air.



icanhelp@roadsafetyfoundation.org

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