BRITISH EURORAP RESULTS 2018

GETTING BACKON TRACK





In partnership with **ageas**





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FOREWORDS

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We need to get back on track. Progress to reduce the rate of death and serious injury on our roads has flatlined since 2010.

The shared international goal is to halve road deaths each decade so that they fall towards zero by 2050. We need to return to taking effective action to reduce serious road deaths by at least 4% annually. This is as achievable today as it has been in the past but it cannot happen without action. This report shows more than 2,500 additional people have died because our efforts have drifted off track.

The government has taken some important recent steps. In 2015, like other leading countries, it endorsed managing risk on the roads systematically and developing a 'safe system'. Risk on our roads can be managed in the same way as risks are managed in rail, aviation, factories, medicine or mining. Major authorities like Highways England and Transport for London have committed to moving towards zero by 2040 which would make their networks as safe as rail and air.

In 2017, the government launched an innovative Safer Roads Fund to enable road authorities to tackle a portfolio of the 50 most dangerous 'A' road sections. Some 1,450 deaths and serious injuries are expected to be saved as a result over the economic life of the measures being implemented. Authorities gained vital practical experience of using the new risk-based approach. It is a huge step forward, if sustained. We can now apply the tools to ensure known high risks are identified and treated even before people are killed or hurt.

This report focuses on the half of all Britain's roads deaths which are concentrated on around 10% of the network. One of the key actions identified internationally is to tackle basic infrastructure safety, particularly targeting main roads where so much death and serious trauma routinely takes place.

Road crashes on our busy main routes are commonly predictable and preventable. Known high infrastructure risks wait to be addressed — unsafe junction layouts, flawed pedestrian crossings, life-threatening roadside hazards and many other deficiencies are commonplace.



This report shows that around 10% of the road sections studied have rates of death and serious injury which are simply unacceptable. These sections have risk some 50 times greater than the safest sections. The 2,500 miles of these roads need to be addressed as a short-term priority.

Immediately, there are 40 persistently high risk roads which must be addressed by the Safer Roads Fund. The cost to the nation's multi-billion transport infrastructure budget is just £75 million. The expected economic returns are as high as or higher than any other programme.

A sustained expenditure of just £75 million per annum over the next five years could similarly address the appalling rate of death and serious injury across the portfolio of unacceptably high risk main roads. It would also enable authorities to become fully fluent in the new 'safe system' skills required.

Getting back on track requires addressing road casualty reduction with purpose and determination. The fact that it also provides high economic returns means it is not just a humanitarian imperative.

ANDY WATSON CHIEF EXECUTIVE, AGEAS (UK) LIMITED

Since 2012, Ageas has supported the Road Safety Foundation in preparing this important report. The report tracks the nation's road safety performance, year on year, across thousands of individual road sections. It ensures that there is a robust evidence base for the nation to review annually whether we are being effective enough in reducing road death and serious trauma.

It is clear in this report that progress this decade in reducing road deaths has stalled.

As one of Britain's leading largest motor insurers, we handle the distress and consequences of serious road crashes which our customers face. Daily, our employees must deal with individuals and families coping with life changing road trauma. We believe it is part of our role to be a strong partner in finding effective ways to reduce road trauma.

Ageas supports the goal shared by leading organisations internationally that we can and must move road deaths towards zero. As a business, we know that setting goals has to be matched by effective actions to achieve them. We know there has to be a business case underpinning actions.



The social cost of road crashes is estimated by government at £35 billion. This equates to just under 2% of Britain's GDP. With costs of this scale, we can take actions that are both humanitarian and make sound economic sense.



In 2017, Ageas welcomed the government's innovative Safer Roads Fund. The first portfolio addressing the 50 most dangerous 'A' roads, identified by this annual report, showed straightforward safety engineering measures expected to pay back investment some 4-5 times over. This is as strong an economic return as any in the transport infrastructure budget.

As a country, there is widespread agreement that we need to invest in our transport infrastructure to make our economy fit for the future. Our health service, social care and policing is under stress. The congestion resulting from serious road crashes on main roads is costly. We now have the knowledge, evidence and opportunity to invest in reducing serious crashes and help address all problems with quick, flexible, affordable and high return measures.

This report proposes a five-year programme targeting the 10% of roads with unacceptably high risks, risks which are 50 times the safest roads. The £75 million per annum cost can be met by ensuring that the transport infrastructure spending focuses on the highest priorities and returns. The high returns exist and there is no higher transport priority than saving violent death and life changing injury.

We need to get back on track.

GETTING BACK ON TRACK

In the six-year period studied in this report, more than 10,000 people were killed and 130,000 seriously injured on Britain's roads.

This year's performance tracking results show that Britain, overall, has not made the progress needed to tackle the vast social and economic cost of road trauma. Annual road deaths since 2010 have not shown material reduction.

BELOW 1,000 BY 2030

A shared goal by major nations and industry worldwide is zero road deaths by 2050. This clear long-term goal and timeline helps define short-term goals and actions. The two most significant English road operators – Highways England and Transport for London - have already stated their aspiration that no-one should be killed on their roads by 2040. Their goals are matched by transparent short-term targets and action.

The relevant Sustainable Development Goal (SDG) for 2020 is to halve global road deaths from a 2010 baseline. The burden on the global economy was a key factor in this SDG's adoption (Britain loses the equivalent of nearly 2% of GDP in road crashes).

As it became improbable that this SDG would be achieved by 2020, some 35 European countries met at high level in 2017. As a result, new initiatives focused on vehicle safety standards, automated driving and road infrastructure safety management were supported.

FIGURE 1: ROAD DEATHS IN GREAT BRITAIN BY YEAR WITH PROJECTIONS





In Britain, the annual number of road deaths would need to reduce to 925 by 2020 to meet the SDG (below 1,000 for the UK including Northern Ireland). However, the trend since 2010 has been of small annual reductions only. If this current rate of reduction continued (see red trend line in Figure 1), there would still be well over 1,000 annual fatalities even in 2050.

If Britain is to get back on track towards zero, it must return to actions which result in halving road deaths every decade (see green trend line in Figure 1). This will require applying specific safety management skills with dedicated budgets rather than relying on safety being delivered as a by-product of other programmes (see for example the Road Safety Management Capacity Review)¹.

In effect, a decade has been lost. 2,549² people have not returned to their families so far because we are not on track to halve our road deaths.

Goals must now be reset. Getting back on track means Britain taking successful action to reduce the annual number of road deaths to below 900 by 2030.

ROAD INFRASTRUCTURE ACTIONS

Action on busy high risk 'A' roads, where so many preventable deaths are concentrated, must become a national priority. The 'most improved' 10 roads in this report have seen their fatal and serious crashes reduce by 69% through straightforward, inexpensive measures. However, only around 0.5% of roads show a significant improvement.

Systematic road safety countermeasure programmes are quick, certain, modular and high-return investments which can be expected to have benefits more than four times greater than their costs. The funding level required relative to transport investment overall is small. Awareness of what these programmes can achieve, and how, can be substantially increased among both policy makers and professionals in the highways sector.

To make a tangible impact on road deaths by 2030, the scale of the investment from the Safer Roads Fund now needs to become proportionate to the scale of the problem being addressed and the returns available:

- > An immediate £75 million should be released by the Safer Roads Fund to tackle the next tranche of 40 persistently higher risk road sections identified in this report; it is estimated that around 1,100 fatal and serious injuries would be prevented over 20 years³
- The 9% of 'A' roads with unacceptably high risk (some 3,991km) should be targeted by the Safer Roads Fund in a sustained five-year programme investing £75 million per year; it is estimated that over 340 fatalities would be prevented over 20 years⁴
- Recent reviews have found insufficient national capacity in the management and development of safe roads: this should be addressed, in part, through training and development opportunities associated with the Safer Roads Fund programme

¹https://www.gov.uk/government/publications/ road-safety-management-capacity-review

have seen road deaths halved within a decade from a 2010 baseline to actual road deaths (2011-2017).

cost the same per km as the proposals to the Safer Roads Fund and that estimates of fatal and serious injury reductions would be similar; calculation takes into account background trend.

⁴ Based on the assumption that around 2/3 of the unacceptably high risk roads will be good candidates for investment once reviewed in detail; based on an assumption that countermeasures will cost the same per km as the proposals to the Safer Roads Fund and that estimates of fatal and serious injury reductions would be similar; calculation takes into account

KEY FINDINGS

ALL BRITISH ROADS⁵

1,793 people were killed on Britain's roads in 2017, a figure which has changed little since 2011 despite on-going improvements in the safety of vehicles on the road.

In 2017:

- \rightarrow The societal cost ⁶ of road traffic crashes was £35 billion
- > An average of 73 people were killed or seriously injured on Britain's roads every day
- > Motorcycle fatalities increased by 9% from 319 in 2016 to 349
- > 60% of fatal casualties occurred on rural roads
- > 5.5% of fatal casualties occurred on motorways

BRITISH EURORAP NETWORK

The British EuroRAP network (motorways and 'A' roads outside of built-up areas) accounts for around 10% of the total road network, upon which 52% of fatalities occurred between 2014-16.

Fatal and serious crashes on the network have increased by almost 3% between 2011-13 and 2014-16. Some of this increase may be due to changes in reporting of the severity of crashes following the introduction of the CRASH reporting system. In the same period, fatal and serious crash risk per billion vehicle kilometres travelled has reduced by just over 1%.

Between 2014 and 2016, the societal cost of all reported injury crashes⁷ on the EuroRAP network alone was £12.4 billion; comprising £1.3 billion on motorways, £2.5 billion on strategic 'A' roads, and £8.6 billion on local authority 'A' roads.



Road users are almost 30 times as likely to be involved in a fatal or serious crash on our high risk roads than on our low risk roads.

FIGURE 3: PERCENTAGE OF TRAVEL ON SECTIONS WITH HIGH-LOW RISK BANDINGS BY ROAD TYPE



On average, single carriageway 'A' roads have eight times the risk of motorways and more than three times the risk of non-motorway dual carriageway 'A' roads.

⁵ From 'Reported Road Casualties Great Britain: 2017 Annual Report'. Available at: https://assets.publishing. service.gov.uk/government/uploads/system/uploads/attachment_data/file/743848/reported-roadcasualties-annual-report-2017.pdf

⁶ 'Societal costs' are the value of prevention of crashes as calculated and reported by DfT

⁷ Based on 2015 DfT values of prevention of fatal, serious and slight crashes, these are likely to be underestimates due to the under-reporting of slight injury crashes; the figure excludes damage only crashes.

⁸ Risk bandings: black= high risk, red = medium-high risk, orange = medium-risk, yellow = low-medium risk and green = low-risk



PERFORMANCE TRACKING RESULTS

Between 2011-13 and 2014-16, the number of fatal and serious crashes on the ten most improved roads in our list this year fell by 69%, equating to an annual value of prevention of fatal and serious crashes of £12 million and a projected 20-year Net Present Value of £90 million.

Each year, the Road Safety Foundation also identifies 'persistently higher risk' roads. These roads are busy higher risk roads where serious crashes are little improved or worsening over a long period (six years).

In 2016, the top 10 persistently high risk roads on the English local authority network were eligible for DfT's Safer Roads Fund. These 2018 results identify a further 40 persistently higher risk road sections that are not yet being addressed through the fund, including eight of those listed in the top 10 persistently higher risk roads table.

BRITISH EURORAP RISK MAP (2014-16)

3% of vehicle travel is on unacceptably higher risk roads⁹, 11% on medium, 39% on low-medium and 47% on low risk roads.

9% of the network length is unacceptably high risk, 21% is medium risk, 51% is low-medium risk and 19% is low risk.

94% of motorway travel, but only 4% of travel on single carriageways, was on roads rated as low risk.

KEY REGIONAL FINDINGS

The risk of death and serious injury is highest in the South East (26 fatal and serious crashes per billion vehicle kilometres) and lowest in the West Midlands (17).

Risk on single carriageway 'A' roads is highest in the South East (60) and lowest in Scotland (34).

Risk on motorways is highest in the South East and the East of England (7) and lowest in the North East (3).

Risk has reduced most in Yorkshire and the Humber between the two data periods. Risk in the West Midlands and the South East has risen between the two data periods by 14% and 9% respectively.

KEY LOCAL AUTHORITY ROAD FINDINGS

11% of local authority roads by length are high risk or medium-high risk and as such have unacceptably high levels of risk. These unacceptably high risk roads carry 7% of local authority traffic.

A greater proportion of travel on local authority single carriageway roads is on unacceptably high risk roads in England and Wales in comparison to Scotland.

Unlike in England there are no unacceptably high risk dual carriageway 'A' roads in Scotland or Wales.

median risk of low risk roads

KEY ENGLISH STRATEGIC ROAD NETWORK FINDINGS

Between 2011-13 and 2014-16 the number of fatal and serious crashes increased by 10% on the English Strategic Road Network (SRN). Some of this increase may be attributable to the CRASH system.

93% of motorway travel is on low risk sections.

There are no low risk single carriageway roads on the SRN; 10% of travel on SRN single carriageways is on unacceptably high risk sections.

The All between Newmarket and Thetford is the most improved road section on the English SRN; the A259 between Pevensey and Hastings is the highest risk road on the English SRN.

SOCIETAL COSTS AND PRIORITY SECTIONS FOR INVESTMENT

In 2017 the value of preventing (or societal cost) all road traffic crashes was £35 billion, equating to almost 2% of Gross Domestic Product¹⁰.

On the EuroRAP network, the societal cost of all injury crashes between 2014-16 was £12.4 billion. Of this, the cost of crashes on unacceptably high risk sections was £1.6 billion.

There are still 530 kilometres of persistently higher risk roads in Great Britain (excluding those roads being tackled by the Safer Roads Fund), the cost of all injury crashes on these roads was £323 million between 2014 and 2016.

The 40 persistently higher risk sections are a priority for investment because they consistently have higher levels of risk over a prolonged period and they also have more than one fatal or serious crash per mile, meaning that it is relatively easy to generate highly cost-effective treatment programmes. We estimate that the investment necessary to implement remedial treatment programmes on this current tranche of persistently higher risk roads is around £75 million. We estimate that this investment should prevent 1,100 fatal and serious injuries over 20 years¹¹.

There are 3,991km of unacceptably higher risk road on the EuroRAP network. Assuming that two-thirds of these sections would make good candidates for investment, we estimate that the cost of treating these roads would be £75 million per year over a five-year period. We estimate that this investment could prevent over 340 fatalities over a 20-year period¹².

¹⁰ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/ file/743848/reported-road-casualties-annual-report-2017.pdf; GDP is currently around £2 trillion according to the World Bank

¹¹ Based on an assumption of a similar investment per km and percentage reduction in fatal and serious injuries to the Safer Roads Fund proposals, taking into account background trend

¹² Based on an assumption of a similar investment per km and percentage reduction in fatal and serious injuries to the Safer Roads Fund proposals, taking into account background trend

CRASH REPORTING SYSTEM

The new Collision Reporting And SHaring (CRASH) system has been introduced by some police forces to modernise the way that road crash data are collected and uploaded by police officers at the crash scene. The system will soon allow motorists to enter information about a crash they have been involved in but that was not attended by the police. One of the improvements within the new CRASH system is that it removes the subjective assessment of severity by police officers, replacing it with a system whereby the police officer can describe the injuries sustained, which are then automatically assigned a severity by the system. This means that the classification of severity is more objective, and as a result some crashes that would have historically been coded as 'slight' are now recognised as 'serious' in the new system. This means that some increases in the number of serious crashes are due, not to a change in crash severity, but because of the system used to classify the crashes. The system has not been introduced across Great Britain at the same time. By mid-2016, only 22 of the 39 police forces in England were operating CRASH¹³ The Office for National Statistics (ONS) is due to publish a report on the impact of CRASH, but this is still being finalised.

This has implications for Risk Mapping and Performance Tracking. With the Risk Mapping bands, it is possible that some sections may have been given a higher risk band because CRASH is used locally; however, most will have just been assigned a slightly higher risk score and not moved bands. For the Performance Tracking, some sections may have improved to medium risk and so not met the criteria for persistently higher risk under the old reporting system.

The Road Safety Foundation has explored a number of options. At the time of writing, it is not possible to adjust at the national level and adjusting serious crash numbers at a route level would be even less possible. We considered including 'slight crashes' in the risk mapping for the first time, alongside 'fatal' and 'serious', to remove the issue of changes in classification. However, slight crashes follow a different pattern to fatal and life-changing serious crashes. This would run counter to both the UK and European policy focus and also the principles of safe system design. The Road Safety Foundation has therefore decided to continue using the data without adjustments to methodology since, this year at least, the impact is likely to be marginal. The charity will continue to consult with leaders in the field for future years on the basis of emerging evidence.

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PERFORMANCE TRACKING ANALYSIS

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. Around 0.5% of road sections on the EuroRAP 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 (2011-13) the 10 roads listed together had a risk more than three times that of the later data period (2014-16).

Between 2011-13 and 2014-16, fatal and serious crashes on the roads listed in Table 1 fell by 69% from 186 to 57. The annual value of preventing these fatal and serious crashes (societal benefit) was £12 million in 2015 values, or £65,000 per kilometre, with a Net Present Value worth £90 million over 20 years. Note that this calculation does not include any benefits from preventing slight or damage only crashes.

This year's most improved road stretch is the A161 in Yorkshire and the Humber between the junction with the A18 and the junction with the M62. The East Riding of Yorkshire is responsible for more than half of this road and attributes the reduction in trauma to engaging with motorcyclist groups and re-routing part of the road around, rather than through an industrial area with a short section of dual carriageway linking directly to the M62.



TABLE 1: BRITAIN'S MOST IMPROVED ROADS (2011-13 TO 2014-16)¹⁴

ROAD NO.	FROM - TO	REGION / COUNTRY	LENGTH (KM)	ROAD TYPE	FATAL AND SERIOUS CRASHES (11-13)	EURORAP RISK RATING (11-13)	FATAL AND SERIOUS CRASHES (14-16)	EURORAP RISK RATING (14-16)	% DECREASE IN FATAL AND SERIOUS (F&S) CRASHES OVER TIME	CONFIDENCE LEVEL	MEASURES IMPLEMENTED INCLUDE	RO 	IOAD IO.	FROM - TO	REGION / COUNTRY	LENGTH (KM)	ROAD TYPE	FATAL AND SERIOUS CRASHES (11-13)	EURORAP RISK RATING (11-13)	FATAL AND SERIOUS CRASHES (14-16)	EURORAP RISK RATING (14-16)	% DECREASE IN FATAL AND SERIOUS (F&S) CRASHES OVER TIME	CONFIDENCE LEVEL	MEASURES IMPLEMENTED INCLUDE
A161	Between the junction with the A18 and the junction with the M62	Yorkshire and the Humber	24.3	Single	13	128.3	1	9.4	-92%	99%	The north-west end of the A161 has been re-routed, now by-passing an industrial area on a short dual carriageway section, joining the M62 directly rather than going through the industrial area. Engagement with motorcyclist groups concerning a surprisingly sharp bend at one end.	A5	535	Between the junction with the A537 and the junction with the A50 in Holmes Chapel	North West	10.2	Single	12	133.9	2	21.2	-83%	97%	Speed limits have been reduced and vehicle- activated speed limit reminders have been introduced. A number of carriageway improvement schemes were also implemented along this section to improve the safety for motorists including surface dressing, carriageway structural
A6135	Between the junction with the M1 and Halfway	East Midlands	6.0	Single	11	180.8	1	16.4	-91%	98%	As well as completing various resurfacing and surface dressing work over the years, a crossroads was signalised in 2015.		.72	Between the junctions with the A7	Scotland	45.0	Single	21	71.7	7	21.9	-67%	97%	patching and road lining. Improved surfacing and signing. Localised speed limit reductions and bend treatments
A38	Between junctions 22 and 24 of the M5	South West	19.1	Mixed	20		6	15.9	-70%	98%	A shared use and segregated walking and cycling route has been introduced. Major improvement schemes which have been completed including on both ends of the route at the junctions with the M5. Roundabouts have been signalised, speed limits have been reduced	 A1	1	Between the junction with the M1 and A41 near Grahame Park and the junction with the A5135 at Rowley Green	London	7.5	Dual	17	33.5	5	10.1	-71%	97%	Speed limits have been reduced and there has been various resurfacing and relining work, for example on the approaches to a roundabout, improving lane discipline, traffic deflection angle and stopping distances.
	Between the junction with the A3090 and the M27 spur and the junction with the A35	South East	8.6	Mixed	16	187.3	4	44.6	-75%	97%	and cycle crossing facilities have been improved. Improvements included various resurfacing and surface dressing activity, an upgrade of a Pelican crossing to a Puffin crossing and a localised speed limit reduction.	A3	130	Between the junction with the A322 near Bagshot and the junction with the M25 near Egham	South East	14.6	Mixed	20	61.4	7	20.9	-65%	96%	Pedestrian facilities introduced at a junction. Works undertaken over a long period of time with increases in congestion which may have contributed to the improvement.
A285	Between the junction with the A272 and the junction with the A27	South East	18.9	Single	29	168.6	12	68.7	-59%	97%	Signing, lining and surface dressing improvements including double white lines to reduce overtaking and high-friction surfacing on bends. Upgrades to crash barrier to make it more motorcycle-friendly, junction visibility improvements, some reductions in speed limits and vehicle-activated speed limit reminders.	A1	NII	Between the junction with the A14 near Newmarket and the junction with the A134 north of Thetford	East of England	33.7	Mixed	27	30.8	12	13.2 Detween the	-56%	96%	The Fiveways to Thetford Major Projects scheme was finished in 2015/16 which included conversion of part of the road to dual carriageway and completion of a by-pass around Elveden.

¹⁴ Ranked by the level of confidence in the reduction in the number of fatal and serious (F&S) crashes between the two data periods, measured using a Poisson test and taking account of background trend; EuroRAP Risk Rating based on the number of fatal and serious crashes per billion vehicle kilometres 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 pre-publication consultation

PERSISTENTLY HIGHER RISK ROADS

Each year, the Road Safety Foundation identifies 'persistently higher risk' roads. Roads that are persistently higher risk are a cause for significant concern. These roads had an average of at least one fatal or serious crash per mile along their length in the three-year survey period, and so meet the density requirement and were rated high (black) or medium-high (red) risk in both data periods (2011-13 and 2014-16). The roads identified in Table 2 had an average AADT of over 15,000 vehicles, ranging from 8,500 AADT to around 25,000 AADT.

In the 2016 analysis, all of the local 'A' roads featured in this top 10 list were also in the top 50 highest risk local 'A' roads and eligible for funding from DfT's Safer Road Fund. Eight of the top 10 persistently higher risk roads this year are not being treated through the Safer Roads Fund.

In total there are 40 persistently higher risk roads that are not being addressed by the Safer Roads Fund, with a total length of 530 kilometres. A total of 1,397 fatal and serious crashes occurred on these roads between 2011 and 2016, and the associated societal costs of reported injury crashes between 2014 and 2016 was £323 million¹⁵.

The average funding level of the Safer Roads Fund was £140,500 per kilometre of road (with an expected benefit-cost ratio of 4.4); applying this figure to the remaining 530 kilometres of persistently higher risk roads would mean an investment level of around £74.5 million. Since persistently higher risk roads must have a minimum of one fatal and serious crash per mile in both data periods, it is likely that these road sections would yield greater Benefit Cost Ratios (BCRs) than the first Safer Roads Fund sections and pay back their costs more than four times.

For many years, the persistently higher risk roads list was dominated by roads in the North and the Midlands. However, this year's report confirms the findings of more recent years that the most acute problems are now being seen in the South East. Of the top 10 persistently high risk roads, four are in the South East, and there are two each in the East of England and the North West, with one apiece in Wales and the East Midlands.

Another recent change in trend is the significant contribution to risk from motorcyclists. Previously the persistently higher risk roads list was dominated by roads with a high overall proportion of crashes involving motorcycles. This year, fewer than half of the crashes on each of the roads in the top 10 involved motorcyclists, but six of the roads in this table have more than 50% of crashes involving vulnerable road users (pedestrians and cyclists).

The road at the top of this year's list is the A254 between Margate and Ramsgate in Kent. This short section of road was in the persistently high risk list last year and it has worsened over the last three years with an average of seven fatal and serious crashes each year. A third of these involved a motorcyclist, almost half were at junctions, and almost as many involved vulnerable road users.

Kent County Council has implemented some specific crash remedial measures since 2016. These have included altering timing on traffic lights, introducing red light cameras, improving signing, introducing high-friction surfacing, and altering junction layouts enlarging them for increased capacity. In addition, the council has undertaken iRAP surveys¹⁶ on this road, amongst others, in partnership with RSF, and is developing treatment programmes, looking at possible engineering measures that can be implemented within six months. Its education team has also studied road user behaviour traits and is scoping out an appropriate intervention to focus on influencing road user behaviour.

¹⁵ Based on 2015 DfT values of prevention of fatal, serious and slight crashes, these are likely to be underestimates due to the under-reporting of slight injury crashes; the figure excludes damage only crashes

¹⁶ Proactive surveys assessing the intrinsic safety performance of a road that can be used to guide and model

TABLE 2: BRITAIN'S PERSISTENTLY HIGHER RISK ROADS(2011-13 AND 2014-16)17

											% contribution
ROAD NO.	FROM - TO	BEING ADDRESSED THROUGH DFT's SAFER ROADS FUND	REGION / COUNTRY	LENGTH (KM)	ROAD TYPE	FATAL AND SERIOUS CRASHES (11-13)	EURORAP RISK RATING (11-13)	FATAL AND SERIOUS CRASHES (14-16)	EURORAP RISK RATING (14-16)	% OF CRASHES WITH MOTORCYCLIST INVOLVEMENT (14-16)	PEDESTRIANS/CYCLISTS
A254	Between the junction with the A28 in Margate and the junction with the A255 near Ramsgate	Ν	South East	6.5	Single	6	84.9	21	282.4	33%	43%
A603	Between junction 12 of the M11 and the junction with the A1134 and Newmarket Road	Ν	East of England	5.2	Single	14	190.1	13	169.5	31%	62%
A5028	Between the junction with Bedford Road and the junction with the A45	Ν	East Midlands	6.7	Single	6	83.2	12	165.8	25%	75%
A21	Between the junction with the A2100 and the junction with the A259 at Hastings	Ν	South East	5.8	Single	14	127.9	17	150.2	29%	59%
A5028-A551	Between the junction with the A554 and the junction with the A553	Ν	North West	9.3	Mixed	9	75.8	18	145.4	22%	56%
A1156	Between the junction with the A14 and the junction with St Helens Street and Woodbridge Road	Ν	East of England	5.1	Single	15	158.4	14	142.1	36%	50%
A259	Between Whitehawk / Black Hawk and the junction with the A26	Ν	South East	13.7	Single	29	115.0	37	136.5	16%	46%
A6	Between the junction with the A589 in Lancaster and junction 33 of the M6	Y	North West	10.9	Single	24	111.9	28	129.4	18%	57%
A32	Between junction 10 of the M27 and the Delme Roundabout, and between the Quay Street Roundabout and the ferry terminal at Gosport		South East	11.8	Mixed	35	110.1	42	129.3	43%	43%
A548	Between the junction with the A55 and the junction with the A548	N	Wales	7.3	Single	8	120.9	 8	116.9	0%	75%



¹⁷ Ranked by EuroRAP Risk Rating 2014-16; no significant rec minimum of 6 F&S crashes in both data periods; minimum F risk (black) or above average of medium-high risk (red) road: crashes per billion vehicle kilometres travelled: black (high r risk); percentages may not sum due to rounding; some of th

rash types (14-16)									
JUNCTIONS	RUN-OFFS	HEAD-ONS	REAR END SHUNTS	OTHER					
48%	0%	0%	10%	0%					
38%	0%	0%	0%	0%					
8%	0%	0%	0%	17%					
29%	6%	6%	0%	0%					
28%	0%	6%	0%	11%					
50%	0%	0%	0%	0%					
30%	5%	5%	0%	14%					
21%	7%	7%	4%	4%					
33%	2%	2%	5%	14%					
25%	0%	0%	0%	0%					

i in the number of F&S crashes between data periods at the 95% confidence level; sh density of 1 F&S/mile in both data periods; EuroRAP Risk Rating is either high th data periods; EuroRAP Risk Rating based on the number of fatal and serious d (medium-high risk), orange (medium-risk), yellow (low-medium risk), green (lowis listed may have had measures implemented since the analysis period.



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 2014-2016. More than half of Britain's road fatalities are on the British EuroRAP network, which covers 48,500km in total, representing around 10% of Britain's road network, and which carries almost 70% of the traffic.

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, the risk on a road carrying 10,000 vehicles a day with 20 crashes is ten times the risk on a road that has the same number of crashes but which 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 almost 30 times that of 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**.





© Road Safety Foundation 2018. Digital Map Data © Collins Bartholomew Ltd 2018. 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 2014-2016. Traffic scalculated using the averages for 2014-2016 weighted by section length. The roads shown are based on the 2015 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

REGIONAL AND NATIONAL ANALYSIS

The distribution of travel across the EuroRAP network shows that a greater proportion of traffic travels on motorways in England (39%), when compared to Scotland and Wales (28% and 18% respectively).



The South East has the highest rate of fatal and serious crashes per kilometre travelled. An individual is more likely to be involved in a fatal or serious crash travelling on roads on the EuroRAP network in the South East in comparison to anywhere else in Great Britain. Wales follows as a close second.





Region / Country

The differing risk rates across regions can also be examined by road type. Motorways in the South East and in the East of England have the highest rate of fatal and serious crashes per kilometre travelled. Motorways in the North East and South West are less than half as risky as motorways in the South East and in the East of England.

NETWORK BY ENGLISH REGION/SCOTLAND/WALES



Scotland has the least risky dual carriageway 'A' roads. Dual carriageway 'A' roads in the South East, Yorkshire and the Humber, and the North West are more than twice as risky as those in Scotland.





Single carriageways in the South East are the highest risk; single carriageways in Scotland are the lowest risk.





Figure 9 identifies those regions that have seen a reduction in fatal and serious crash risk, and those that have seen an increase over the two data periods (2011-13 and 2014-16). The greatest improvements are evident in Yorkshire and the Humber. Performance is slipping in the West Midlands, the South East and the South West.

FIGURE 9: CHANGE IN RISK ON THE EURORAP NETWORK OVER TIME BY ENGLISH REGION/ **SCOTLAND/WALES**



HIGHEST RISK ROAD IN EACH ENGLISH REGION, SCOTLAND AND WALES

The highest risk roads in each British region or nation are listed in Table 3. Roads are ranked by EuroRAP risk rating from highest to lowest.

Roads featured in Table 3 have been obtained by implementing stricter filters to the dataset than used to produce the Risk Map. Roads that are featured in this table need attention because not only are they higher risk, but they also have a high number of crashes causing death or serious injury. More extensive remedial measures are more likely to be viable because of the significant crash cost burden.

All of the roads in Table 3 are non-primary 'A' roads. Several of the roads have high proportions of crashes involving motorcycles, pedestrians and cyclists and a high proportion of junction crashes.



TABLE 3: THE HIGHEST RISK ROAD IN EACH OF SCOTLAND, WALES AND EACH ENGLISH REGION (2014-16)¹⁸

									% contribution	by crash types (14
ROAD NO.	FROM - TO	BEING ADDRESSED THROUGH DFT's SAFER ROADS FUND	REGION / COUNTRY	LENGTH (KM)	ROAD TYPE	FATAL AND SERIOUS CRASHES (14-16)	EURORAP RISK RATING (14-16)	% OF CRASHES WITH MOTORCYCLIST INVOLVEMENT (14-16)	PEDESTRIANS/CYCLISTS	JUNCTIONS
A496	Between the junction with the A470 and the junction with the A487	Ν	Wales	7.8	Single	11	354.4	27%	27%	27%
A254	Between the junction with the A28 in Margate and the junction with the A255 near Ramsgate	Ν	South East	6.5	Single	21	282.4	33%	43%	48%
A682	Between Barrowford and the junction with the A65		North West	21.8	Single	21	274.0	67%	10%	10%
A603	Between junction 12 of the M11 and the junction with the A1134 and Newmarket Road	Ν	East of England	5.2	Single	13	169.5	31%	62%	38%
A5028	Between the junction with Bedford Road and the junction with the A45	Ν	East Midlands	6.7	Single	12	165.8	25%	75%	8%
A3082	Between the junction with the B3415 and B3269 and the junction with the A390	Ν	South West	6.6	Single	5	159.0	0%	60%	40%
A173	Between the junction with the A171 and the junction with the A174	Ν	North East	5.0	Single	5	144.8	20%	0%	40%
A645	Between the junction with the A628 and the junction with the A638	Ν	Yorkshire and the Humber	8.9	Single	15	 122.0	27%	40%	40%
A814	Between the junctions with the A82 and near Clydebank train station	Ν	Scotland	9	Single	6	121.5	0%	67%	17%
A428	Between the junction with the A46 and the junction with the A5	Ν	West Midlands	21.3	Single	25	109.8	32%	44%	40%
A1055	Between the junction with the A10 and the junction with the North Circular (A406)	Ν	London	11.5	Single	14	50.4	50%	36%	21%



)			
RUN-OFFS	HEAD-ONS	REAR END SHUNTS	OTHER
27%	9%	0%	9%
0%	0%	10%	0%
52%	19%	0%	10%
0%	0%	0%	0%
0%	0%	0%	17%
0%	0%	0%	0%
20%	40%	0%	0%
7%	7%	0%	7%
0%	0%	0%	17%
12%	4%	0%	0%
0%	14%	0%	29%

ing 2014-16; minimum of 6 F&S crashes 2014-16; minimum F&S crash density of P Risk Rating based on the number of fatal and serious crashes per billion vehicle gh risk), red (medium-high risk), orange (medium-risk), yellow (low-medium risk), may not sum due to rounding; some of the roads listed may have had measures sis period.

LOCAL AUTHORITY ROAD **ANALYSIS**

Figure 10 shows the risk rate distribution for local authority 'A' roads alone. It shows that 16% (376) of local authority sections (11% of local authority 'A' roads by length), are classified as unacceptably high risk (either high or medium-high risk).



Figure 11 shows the proportion of travel (kilometres driven) which occurs on roads in each risk banding, by road type. Dual carriageway 'A' roads have a greater proportion of lower risk travel than mixed or single carriageway roads.

(ALL LOCAL AUTHORITY 'A' ROADS)





Figure 12, Figure 13 and Figure 14 show how this pattern of travel changes in England, Scotland and Wales. With two exceptions (the A74 in Glasgow and the A4061 in Bridgend are both medium risk), all dual carriageway 'A' road travel on local authority roads is on low or low-medium risk roads in Wales and Scotland. In contrast, there is one dual carriageway 'A' local authority road in England which is high risk (the A1172 in Northumberland), ten such roads which are medium-high risk, and a further 17 such roads which are medium risk. Similarly, a greater proportion of travel on high, medium-high and medium risk sections occurs on local single carriageway 'A' roads in England (46%) when compared to Scotland (25%) and Wales (30%).

FIGURE 12: PERCENTAGE OF TRAVEL ON SECTIONS WITH HIGH-LOW RISK BANDINGS BY ROAD **TYPE (ENGLAND LOCAL AUTHORITY 'A' ROADS)**



FIGURE 13: PERCENTAGE OF TRAVEL ON SECTIONS WITH HIGH-LOW RISK BANDINGS BY ROAD **TYPE (SCOTLAND LOCAL AUTHORITY 'A' ROADS)**



FIGURE 14: PERCENTAGE OF TRAVEL ON SECTIONS WITH HIGH-LOW RISK BANDINGS BY ROAD **TYPE (WALES LOCAL AUTHORITY 'A' ROADS)**







ENGLISH STRATEGIC ROAD NETWORK ANALYSIS

Since 2015, RSF has published a Risk Map separately for the Strategic Road Network (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 committed 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 safety rating or better.

The number of fatal and serious crashes increased by more than 10% between the two data periods. Some of this increase is likely to be attributable to the new crash reporting system.

93% of motorway travel is on low risk sections, the remaining 7% is on lowmedium risk sections.

67% of dual carriageway 'A' road travel is on low risk sections.

While the majority of travel on single carriageways is on low-medium risk sections, 10% is on medium-high risk sections and a further 8% is on medium risk sections.



FIGURE 16: PERCENTAGE OF TRAVEL ON SECTIONS WITH HIGH-LOW RISK BANDINGS BY ROAD **TYPE (ENGLISH SRN)**



FIGURE 17: DISTRIBUTION OF TRAVEL BY ROAD TYPE (ENGLISH SRN)



Motorways on the English SRN have heavier traffic than other road types. Motorways have average traffic flows nearly five times those of English SRN single carriageways. That results in two-thirds of SRN travel (67%) being on motorways and just 1.5% of travel on the single carriageway trunk roads.



Single carriageway

Mixed dual / single carriageway

Non-motorway dual carriageway

Motorway



RISK RATING OF ENGLAND'S STRATEGIC ROAD NETWORK

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, the risk on a road carrying 10,000 vehicles a day with 20 crashes is ten times the risk on a road that has the same number of crashes but which carries 100,000 vehicles.

www.roadsafetyfoundation.org.

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



This map shows the statistical risk of death or serious injury occurring on England's Strategic Road Network for 2014-2016.

For more information on the Road Safety Foundation go to





PERFORMANCE TRACKING RESULTS

The most improved road on the English SRN, is the All between the junction with the A14 near Newmarket and the junction with the A134 north of Thetford. On this section Highways England has implemented a major scheme to dual the remaining single carriageway section of the A11 and by-pass the village of Elveden.

TABLE 4: THE ENGLISH SRN'S MOST IMPROVED ROAD (2011-13 AND 2014-16)¹⁹

ROAD NO.	FROM - TO	REGION / COUNTRY	LENGTH (KM)	ROAD TYPE	FATAL AND SERIOUS CRASHES (11-13)	EURORAP RISK RATING (11-13)	FATAL AND SERIOUS CRASHES (14-16)	EURORAP RISK RATING (14-16)1	% DECREASE IN F&S CRASHES OVER TIME	CONFIDENCE LEVEL	MEASURES IMPLEMENTED INCLUDE
A11	Between the junction with the A14 near Newmarket and the junction with the A134 north of Thetford	East of England	33.7	Dual	27	30.8	12	13.2	-56%	96%	The Fiveways to Thetford Major Projects scheme was finished in 2015/16 which included conversion of part of the road to dual carriageway and completion of a by- pass around Elveden.

The A21 between Hurst Green and Hastings has been the highest risk road on the English SRN since we first undertook this analysis in 2015. However, this year it has been overtaken by the A259 between Pevensey and Hastings.

TABLE 5: PERSISTENTLY HIGHEST RISK ROADS ON THE ENGLISH SRN (2011-13 AND 2014-16)2

					(2		<u>(</u> 9		зт	% cont	% contribution by crash types (14-16)						
ROAD NO.	FROM - TO DESCRIPTION	REGION/COUNTRY	LENGTH (KM)	ROAD TYPE	FATAL AND SERIOUS CRASHES (11-13	EURORAP RISK RATING (11-13)	FATAL AND SERIOUS CRASHES (14-10	EURORAP RISK RATING (14-16)	% OF CRASHES WITH MOTORCYCLIS INVOLVEMENT (14-16)	PEDESTRIANS/CYCLISTS	JUNCTIONS	RUN-OFFS	HEAD-ONS	REAR END SHUNTS	OTHER		
A259	Pevensey to Hastings	South East	19.1	Mixed	32	86.4	44	115.1	55%	32%	45%	9%	7%	5%	2%		
A21	Hurst Green to Hastings	South East	17.4	Single	26	109.3	25	96.7	20%	4%	20%	28%	36%	4%	8%		
A5183	M1 Junction 9 to the south-east of Dunstable	East of England	9.0	Single	15	89.9	14	78.1	29%	21%	57%	0%	7%	7%	7%		

There are several safety schemes planned for the A259 section. These include improving or installing new crossings, footpaths and cycle paths for pedestrians and cyclists at Little Common; junction improvements (highfriction surfacing, visibility, passively safe signing) for motorised and non-motorised users at the Marsh Road junction; a review and treatment of headwalls and other hazards along the rural section; improvements to cycle facilities in Bexhill; and a review of bus stop locations.

Highways England is progressing a number of safety schemes on the A21 including a full review of signs and lines, junction improvement studies, and barrier installation at locations where trees and roadside furniture are at risk of vehicle strike.



A safety review of the A21 was conducted towards the end of 2017 and a number of the outputs are being considered for development or progressed into schemes; some of this is quite significant and could include RIS2 junction improvements.

The A5183 is a section of the former A5 which was detrunked in May 2017; it is also now subject to a weight restriction meaning that the traffic flow has both reduced and altered. The de-trunking formed part of wider network enhancements including a new junction on the M1, junction 11A, and a subsequent new A5-M1 link road north of Dunstable joining the junction with the A5 just south of Hockliffe. HGV traffic now uses junction 11A of the M1 rather than junction 9, utilising the new link road to bypass both the weight restriction on the A5138 and Dunstable town centre.

SOCIETAL COST AND PRIORITIES FOR INVESTMENT

In Great Britain societal costs of crashes are calculated using 'values of prevention' published by DfT annually. These values of prevention include both direct economic costs such as hospital and medical care, and an estimate of the monetised broader societal impact of crashes comprising estimates of lost output and human costs based on the willingness to pay principle.

The cost of road crashes is astonishing. In 2016 the cost of road traffic crashes was £36 billion which is the equivalent of almost 2% of Gross Domestic Product²¹.

On the EuroRAP network, the societal cost of all reported injury crashes between 2014-16 was £12.4 billion. Note that this sum does not include damage only or any correction for under-reporting and so should be considered very conservative.

In Table 6 the length of roads that are unacceptably high risk (medium-high or high risk) are identified along with the societal cost of all injury crashes that occurred on them during the three-year analysis period 2014-16. This table excludes roads being addressed through the Safer Roads Fund.

TABLE 6: SOCIETAL COSTS ASSOCIATED WITH MEDIUM-HIGH RISK AND HIGH RISK ROADS IN GREAT **BRITAIN (EXCLUDING THOSE BEING ADDRESSED THROUGH THE SAFER ROADS FUND)**

COUNTRY	ROAD TYPE	LENGTH IN KM	SOCIETAL COSTS OF REPORTED INJURY CRASHES 2014-2016 ²²
England	Trunk roads	90	£70 million
	Local 'A' roads	2,473	£1,136 million
Scotland	Trunk roads	109	£12 million
	Local 'A' roads	658	£75 million
Wales	Trunk roads	236	£65 million
	Local 'A' roads	425	£86 million
	TOTAL	3,991	£1,444 million

Table 7 shows the length of roads classed as persistently higher risk along with societal costs of the injury crashes that occurred on them during the three-year analysis period (2014-16). This table excludes roads being addressed through the Safer Roads Fund. There are still 530 kilometres of persistently higher risk roads in Great Britain, the cost of all injury crashes on these roads was £323 million between 2014 and 2016.

²¹ The value of prevention of road crashes in 2016 was £36 billion from 'Reported Road Casualties Great Britain 2016 Annual Report' Available at: https://assets.publishing.service.gov.uk/government/uploads/system/ uploads/attachment_data/file/668504/reported-road-casualties-great-britain-2016-complete-report.pdf; GDP was around $\pounds2$ trillion in 2016 according to the World Bank

²² Based on 2015 DfT values of prevention of fatal, serious and slight crashes, these are likely to be underestimates due to the under-reporting of slight injury crashes; the figure excludes damage only crashes

TABLE 7: SOCIETAL COSTS ASSOCIATED WITH PERSISTENTLY HIGHER RISK²³ ROADS IN GREAT BRITAIN

ROAD TYPE	LENGTH IN KM	SOCIETAL COSTS OF REPORTED INJURY CRASHES 2014-2016 ²⁴
Trunk roads	45	±47 million
Local authority roads	485	£276 million
TOTAL	530	£323 million

The cost of reported injury crashes²⁵ per kilometre travelled is lowest on motorways (£3 per thousand kilometres travelled) and highest on single carriageways (£23 per thousand kilometres travelled). The cost of reported injury crashes per kilometre travelled is lower on trunk roads (£6 per thousand kilometres travelled) than local authority roads (£19 per thousand kilometres travelled).

FIGURE 18: COST OF REPORTED INJURY CRASHES PER THOUSAND KILOMETRES TRAVELLED BY **ROAD TYPE ON THE EURORAP NETWORK (2014-16)**



²³ Persistently higher risk roads identified as per those in Table 2



²⁴ Based on 2015 DfT values of prevention of reported injury crashes, these are likely to be under-estimates due to under-reporting; the figure excludes damage only crashes

²⁵ Based on 2015 DfT values of prevention of reported injury crashes, these are likely to be under-estimates due to under-reporting; the figure excludes damage only crashes

Reported injury crash costs²⁶ per kilometre length per year are lowest on single carriageway trunk roads (£65,862) and highest on local authority non-motorway dual carriageways (£151,739). Injury crash costs per kilometre length per year for each road type are slightly lower for local authority roads (£83,910) than for trunk roads (£87,928).

FIGURE 19: COST OF INJURY CRASHES PER KILOMETRE LENGTH PER YEAR BY ROAD TYPE ON THE **EURORAP NETWORK (2014-16)**



SAFER ROADS FUND

The Safer Roads Fund has seen grant expenditure of nearly £100 million by DfT to be spent on 49²⁷ highest-risk road local 'A' road sections in England as identified by the Road Safety Foundation's 2016 analysis. The schemes covered 700 kilometres, with a portfolio spend of £140,500 per kilometre of eligible road. The estimated benefits of the investment are compelling, since the schemes are estimated to save 1,450 fatal and serious injuries (a 23% reduction) over the next 20 years amounting to a Benefit Cost Ratio (BCR) of 4.4 meaning that for every £1 invested, societal benefit is estimated to be £4.40.

If similar reductions were achieved through treating the remaining persistently higher risk roads (some 530 kilometres), then a £74.5 million investment could prevent around 1,100 fatal and serious injuries over the next 20 years²⁸. Returns may be greater because the persistently higher risk roads have been filtered not just by risk but also by crash density meaning that more crashes can be prevented per kilometre through engineering measures.

In the longer term it is suggested that the unacceptably higher risk roads should be reviewed to determine whether they are likely to be good candidates for investment. If two-thirds of these were found to be good candidates, the investment necessary would be £75 million every year for five years. This investment could prevent as many as 4,500 fatal and serious injuries over a 20-year period²⁹.

²⁶Based on 2015 DfT values of prevention of reported injury crashes, these are likely to be under-estimates due to under-reporting; the figure excludes damage only crashes

²⁷One local authority decided not to submit a proposal to the Safer Roads Fund

²⁸ Assuming a similar spend per km and percentage reduction as per the Safer Roads Fund and taking into account background trend

²⁹ Assuming a similar spend per km and percentage reduction as per the Safer Roads Fund and taking into account background trend



ABOUT OUR WORK

RISK MAPPING

The EuroRAP Risk Maps for Britain's major roads have been published by the Road Safety Foundation since 2002. These well-known colour-coded maps show the risk to a road user of being involved in a crash involving death or serious injury.

These annual Risk Maps for Britain's motorways and 'A' roads have become a key national road safety performance indicator revealing measurement of risk on roads across nations, regions and authorities. The majority of British road deaths are concentrated on the mapped network (which is around 10% of the whole road network).

PERFORMANCE TRACKING

Performance Tracking uses the data compiled for each risk map to assess how risk on the network as a whole, and on individual roads, has changed over time. It is a way of measuring progress and the effectiveness of investment in safer roads. Prince Michael Road Safety Awards are made annually to an authority with a road section showing strong improvement.

Performance Tracking is carried out in two main stages:

- > Risk Mapping compares consecutive three-year data periods to identify roads for two lists:
 - > Those road sections that have improved: shown by a statistically significant reduction in the number of fatal and serious crashes between the two data periods
 - > Those road sections that are persistently higher risk: these are busy roads that are medium-high or high risk in both three-year data periods and have not made any significant improvement in performance between the data periods
- > Highway 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

STAR RATING AND SAFER ROADS INVESTMENT PLANS

Much as Euro NCAP tests Star Rate the in-built safety standard of new cars, Star Rating gives a measure of the in-built safety of roads. These ratings are based on road attribute data and provide a simple and objective measure of the level of safety built in to the roads for vehicle occupants, motorcyclists, pedestrians and cyclists. Around a million kilometres of road have now been surveyed using this methodology worldwide.

The Star Ratings reflect risk contributed by each of the road attributes that are coded – the higher the risk, the lower the rating. The risk is calculated using 'crash modification factors' that describe relationships between road attributes and crash risk. Star Rating information can be viewed using charts, tables and maps.

Increasing numbers of road authorities around the world are setting Star Ratings as policy targets. This approach can be attractive to senior officers and elected members who are accountable for ensuring that policies are being effective at the macro level, and that funds are well allocated.

For example, Highways England has a delivery plan commitment to ensure that 90% of travel on the Strategic Road Network occurs on 3-star roads or better by 2020. Star Ratings can also be applied to designs. This can motivate designers of new and improved roads to think about risk management in a fresh wav.

Safer Roads Investment Plans (SRIPs) identify ways in which fatal and serious injuries can be prevented in a cost-effective way. The ViDA software that prepares Star Ratings also calculates the casualty reduction that might be expected from implementing any of around 90 countermeasures individually or in logical combinations. The software examines every 100m along an inspected road, comparing the value of crashes that might be prevented against the cost of implementing a countermeasure. The software provides an economic appraisal of a Safer Road Investment Plan (SRIP). This SRIP can be interrogated at the individual section, region or national (portfolio) level to assess the appropriateness and effectiveness of individual options for improvement. SRIPs can be refined to allow economic appraisal of a locally acceptable treatment programme through modelling a User Defined Investment Plan (UDIP). The appraisal period is normally 20 years, allowing the cost of implementing each measure to be evaluated against the expected casualty savings over the economic life of the investment. ViDA provides present values (PVs) and Benefit to Cost Ratios (BCRs) for appraisal of each proposed countermeasure (ViDA is extensively documented at www.irap.org).

NOTES

Value of prevention/societal costs

A value of crash prevention reflects the societal cost of road crashes. This is calculated for each road of the British EuroRAP network by determining the total value of prevention of the reported injury crashes that have occurred. DfT's 2015 values for the prevention of a crashes have been used in this report.

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 around 10% of Britain's road length, more than half of all road deaths occur on it. This annual report therefore provides key indicators that track Britain's road safety performance.

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.

Primary road network

The primary road network is the network of 'A' roads and are identified by the familiar green-backed 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.



Region and nation allocation

A road is allocated to the region or nation in which 80% or more of its length is contained.

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. Most commonly 'mixed' will refer to roads that have lengths that are both single and dual carriageway 'A' road.

Strategic Road Network (SRN)

The Strategic Road Network (SRN) is the term used 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 this 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.

Trunk roads

Trunk roads are strategic motorways, dual carriageways and primary 'A' roads.

ABOUT US

ABOUT THE ROAD SAFETY FOUNDATION

The Road Safety Foundation 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 charity has enabled work across each of these components and published several reports which have provided the basis of new legislation, government policy or practice.

For the last decade, the charity has focused on developing the Safe Systems approach, and in particular leading the establishment of the European Road Assessment Programme (EuroRAP) and, through EuroRAP, the global UKbased charity, iRAP (the International Road Assessment Programme).

Since the inception of EuroRAP in 1999, the Foundation has been the UK member responsible for managing the programme in the UK (and, more recently, Ireland), ensuring that the UK provides a global model of what can be achieved.

The Foundation plays a pivotal role in raising awareness and understanding of the importance of road infrastructure at all levels, through:

- > Annual publication of EuroRAP Risk Mapping and Performance Tracking in a form which can be understood by the general public, policymakers and professionals alike
- > Supporting use of the iRAP and EuroRAP protocols at an operational level by road authorities, in order to support engineers in improving the safety of the road infrastructure for which they are responsible
- > Proposing the strategies and goals that the government should set in order to prevent tens of thousands of fatalities and disabling injuries

The Road Safety Foundation was a founder member of the FIA Foundation (established as an independent UK registered charity in 2001 by the Fédération Internationale de l'Automobile, FIA) and frequently works with FIA members and other organisations both in Britain and abroad, including the RAC Foundation, the AA, IAM RoadSmart, RoadSafe, PACTS (The Parliamentary Advisory Council for Transport Safety) and professional bodies such as ADEPT (the Association of Directors of Environment, Economy, Planning and Transport).

The formal objectives of the charity, which was founded in the 1980s, are to:

- > Carry out, or procure, research into all factors affecting the safe use of public roads
- > Promote and encourage the safe use of public roads by all classes of road users through the circulation of advice, information and knowledge gained from research
- Conceive, develop and implement programmes and courses of action designed to improve road safety, which are to include the undertaking of any projects or programmes intended to educate young children or others in the safe use of public roads

The library of the Road Safety Foundation's published work is at www.roadsafetyfoundation.org.



ABOUT EURORAP

The European Road Assessment Programme (EuroRAP AISBL) is dedicated to saving lives through safer roads and is an international not for profit association 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, and by 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, 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 general insurer in the UK, backed by an international insurance group with businesses across Europe and Asia. Over five million people in the UK choose to insure their cars, homes, travels or businesses with Ageas, benefitting from its award-winning service in their time of need.

As the third largest UK car insurer, Ageas knows only too well the impact that incidents on the roads can have on its customers, their families and friends, other road users and public services. That's why Ageas has partnered with the Road Safety Foundation since 2012 - helping make Britain's roads safer for everyone.

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ACKNOWLEDGEMENTS

carried out by Dr Suzy Charman and Brian Lawton. Cartography was carried



GETTING BACK ON TRACK



storic actuals 🛛 😽 50% reduction from 2010-2020

The highest annual number of road deaths since 2011 were recorded on Great Britain's roads in 2017. After decades of trauma reduction, we have reached a plateau. In effect, a decade has been lost. 2,549 people have not returned to their families so far because we are not on track to halve our road deaths this decade. It is time to break that plateau and get back on track.

Road traffic crashes had an estimated societal cost of £35 billion in 2017. This equates to more than we spend every year on GP services and primary schools in combination. Breaking the trend and halving road deaths each decade would mean an end to the pain, grief and suffering caused by road crashes by 2050. It would also make good economic sense – saving society billions of pounds every year and reducing the strain on our health service and social care systems.

More than half of all Britain's road deaths are concentrated on around 10% of the road network – the motorways and 'A' roads outside urban cores. This annual report maps and analyses the risk of death and serious injury on this network where so much loss of life and economic cost is concentrated.

In partnership with Ageas

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significantly improved road in this survey is a stretch of the A161 in Yorkshire. Overall, the 10 most improved roads realised a 69% reduction in deaths and serious injuries. The annual value of preventing these crashes was £12 million in 2015 values.

Road safety engineering treatments are highly effective and the impact of countermeasures is well documented. The recent results from the Safer Roads Fund show that road rehabilitation packages can compete with major transport projects. The ± 100 million investment made through the Safer Roads Fund is projected to prevent 1,450 fatal and serious injuries, with a value of prevention of ± 550 million and a benefic cost ratio of 4.4.

This year's report identifies 40 persistently highrisk routes. These are the highest priority routes for systematic and proactive road safety treatment. Trauma savings can be expected to be at least as high as those already seen through the Safer Roads Fund, with 1,100 fatal and serious injuries to be prevented during the next two decades with a £75 million investment. A further 3,991km of roads remain either medium-high or high risk. A five-year £375 million investment to address these would make a serious contribution to Getting Back on Track.



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